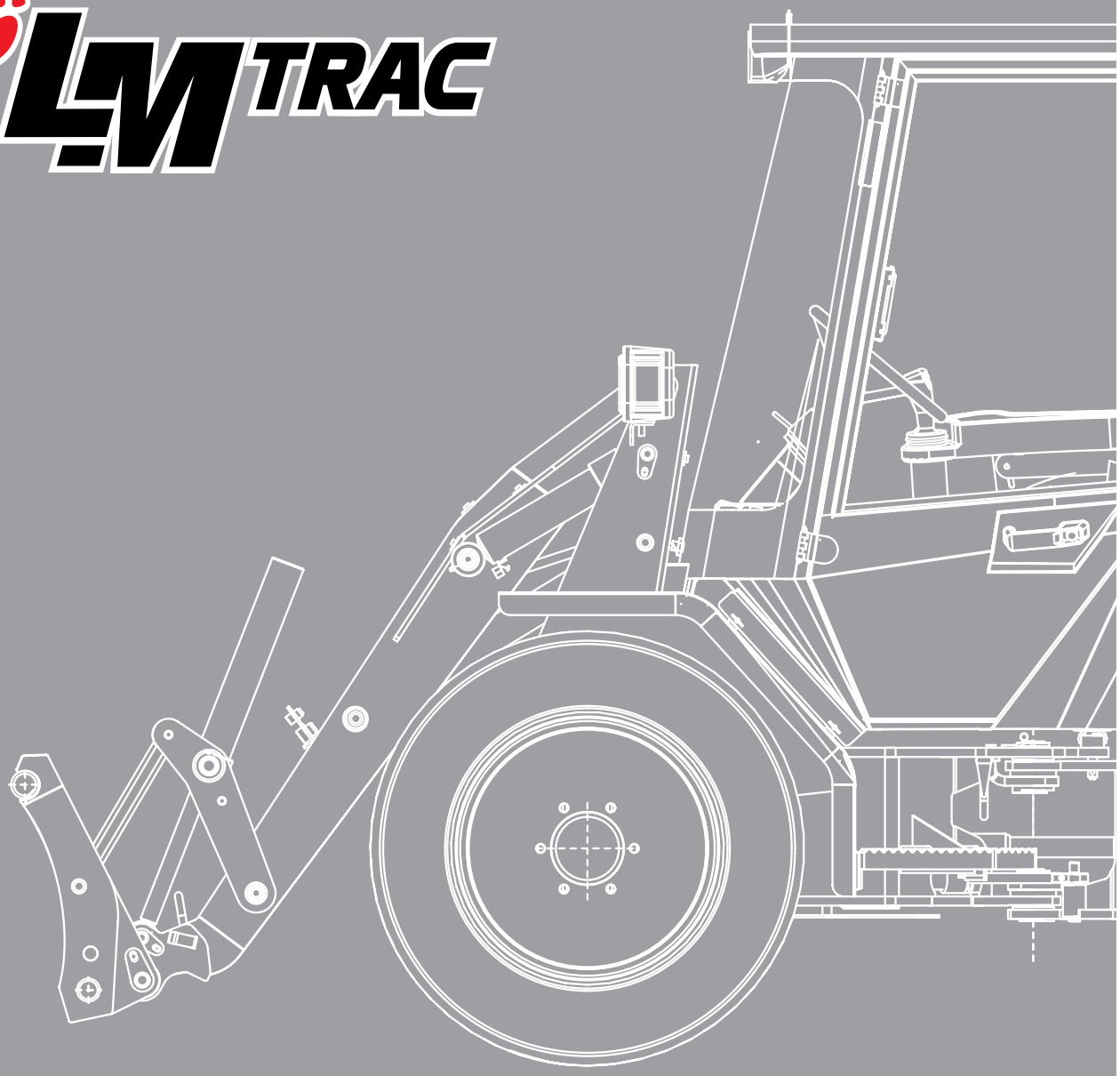
# OWNER'S MANUAL



## LM Trac 286

## 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.

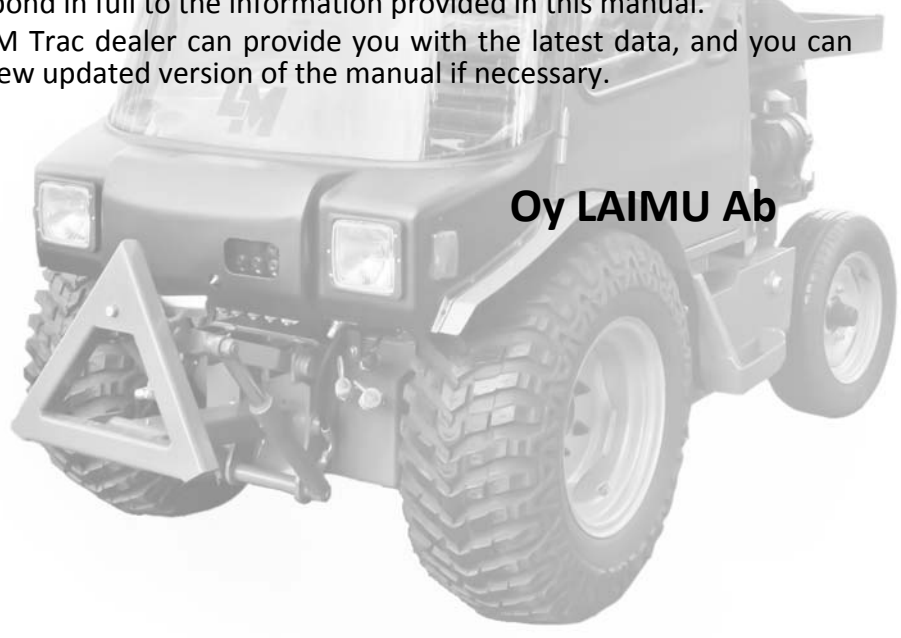
The user manual must be on board the machine at all times. If the manual is no longer readable or is lost, order a new one or the additional manuals that you need from your LM Trac dealer.

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 plate

Write the data in the rows below:

Owner: _____ _____

Address: _____ Tel.: _____

Main machine:Serial number: _____ Model:_____

Engine: Serial number:_____ Model:_____

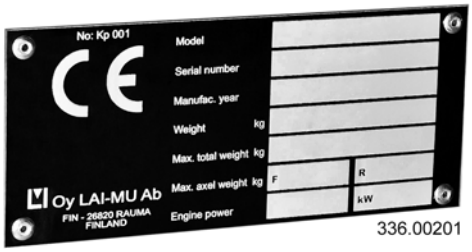
Dealer: _____ Tel.: _____

Spare parts provider: _____ Tel.: _____

Maintenance provider: _____ Tel.: _____

The machine's type plate (A) is located behind the lower front corner of the right-side door to the cabin.


1.Figure

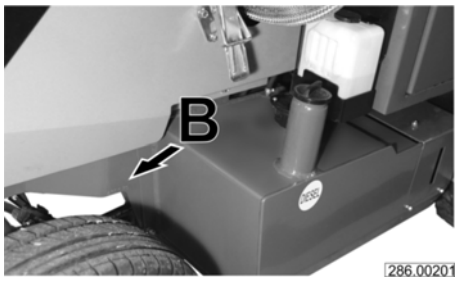



The type plate comprises:

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.

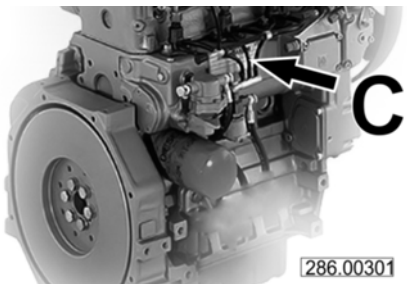
The serial number is also stamped on the machine's frame below the fuel tank (B).

Figure 1.




The engine's type plate (C) is located on the right side of the engine's cylinder block next to the fuel pump.

Figure 2.




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

**NOTES:**

## 1.2 User manual structure

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 operation

06 Maintenance

07 Technical specifications

The LM Trac machine embodies the latest technology and its operation and maintenance also set requirements for the person 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.

# 1.0 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 the 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.

## 1.1 Markings and symbols

**Varoitus! Varning! Warning!**

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

Huomaa! Notera! Note!

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.*

## 1.2 Safety instructions

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

### 1.2.1 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 LAIMU 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.

### 1.2.2 During operation

- Enter and exit the machine is a safe way. Always use the handgrips 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.
- Do not go into the turning area of the machine's body link (336–686 machines) while the engine is running, as you may be crushed.

### 1.2.3 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.

### 1.3 During maintenance

- Park the machine on hard level terrain, lower all tools and stop the engine.
- Always keep first aid equipment and a fire extinguisher near the maintenance area.
- If you are working underneath a raised bonnet/platform body, support it mechanically in the upper position.
- 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” 4.3.4 p. 31 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.
- Do not open the radiator cap before the liquid has cooled down. Unscrew the cap carefully and let the pressure discharge slowly.

**Varoitus! Varning! Warning!**

**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 instead, for example. 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.

### 1.4 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 a component that carries a label, 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:

## 2.0 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 04 Cabin and controls, 05 Driving and use and 06 Maintenance.

### Varoitus! Varning! Warning!

The rear-wheel steered LM Trac 286 is a special machine designed for property maintenance and garden work only. Using the machine for something it is not designed for is forbidden and the manufacturer is not responsible for any damage caused in such use or as a result thereof.

In order to use the machine effectively, familiarise yourself with its operating principles. Taking into account the lightness of the machine and rather low power, you must master its special features in order to achieve great performance both quantitatively and qualitatively.

**LM Trac 286** has a component structure so maintenance and repairs are quick and easy to perform.

The power source, **Lombardini LDW1603 CHD Plus** diesel engine, and the connected drive-, working- and steering hydraulics pumps form a single entity. This entity is mounted on the body with rubber pads so that the engine vibrations are not transmitted to the body creating undesired noise and vibration. The safety cabin is also mounted on the body with rubber pads to minimise undesired noise.

Tools are mounted on the tool mounting in front of the machine, e.g. the A frame.

The fuel and hydraulic oil tanks and the battery are located low on the sides of the body to achieve a low centre of gravity. The machine is equipped with rear-wheel steering.

The efficient use of the LM Trac 286 machine requires that the driver understand the principle of the machine's driving automation.

The drive power train is fully hydraulic, which enables highly flexible driving forwards/backwards.

**The double action drive pedal** is used for the operations performed in the traditional mechanical power train by the clutch/brake pedal and for directional changes.

When the drive pedal is pressed with the ball of the foot the machine moves FOREWARD and with the heel BACKWARDS.

The position of the drive pedal affects driving speed and direction through the amount of oil provided for the hub motor. The rotation speed of the motor is regulated by a separate hand throttle. In practice, the hand throttle is used to set a suitable motor rotation speed and the drive pedal is used to select the driving direction and speed. When pressure on the drive pedal is released, an automatic braking action resulting from the hydrostatic power train takes place while driving both forwards and backwards.

**Using the brake pedal** is usually only necessary to keep the machine in place on a sloping surface, for example.

**LM Trac 286** machine's speed ranges:

| | | |
|---|---|---|
| 2-WD: | Fast 0–20 km/h | Slow 0–10 km/h |
| | Reverse: | Always 10 km/h |
| 4-WD: | Fast 0–13 km/h | Slow 0–6.5 km/h |
| | Reverse: | Always 6.5 km/h |

A three-cylinder freely breathing diesel engine rotates the variable displacement axial piston pump. The pump operates the two-speed hub

motors located in the wheel hubs. Driving speed can be adjusted steplessly throughout the speed range.

The function corresponding to the traditional differential lock is created by means of electro-hydraulic valves that can be used to equalise oil flow to the hub motors. This generates an equal tractive capacity to all drive wheels. The efficient use of the machine requires that the driver understand the principle of the machine's driving automation.

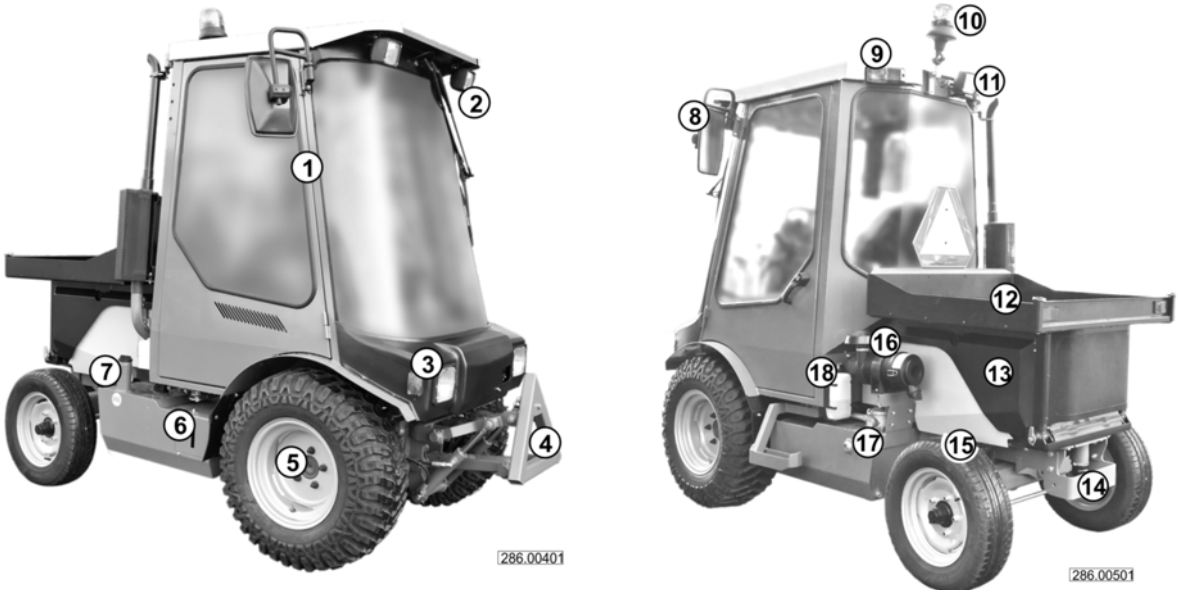
The implementation of the work hydraulics also differs from the traditional mechanical use. **The LM Trac 286** main machine supplies all actuators hydraulically. The power source is a fixed-displacement gear pump.

The steering mechanism of the machine is hydrostatically boosted rear-wheel steering. Steering functions also when the machine is turned off, but it is quite stiff. The system comprises a separate steering hydraulics pump, steering gear (orbitrol) and steering cylinder.

The machine is equipped in connection with hub motors with plate-compressor brakes submerged in oil that serve as both driving and parking brakes. The second braking system is an automatic braking function that results from the fully hydraulic drive power train that in practice also serves as a service brake.

## 2.1 Main components and external equipment

Figure 1.

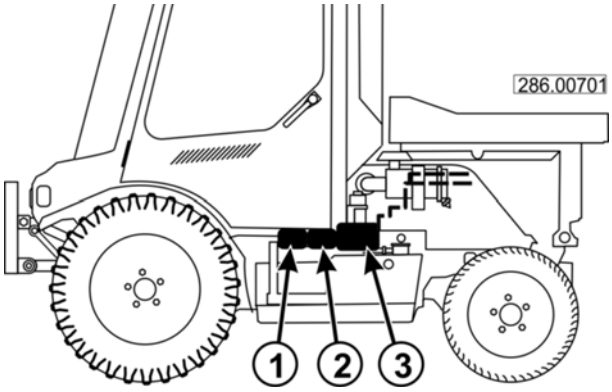



| | | |
|---|---|---|
| 1. Cabin | 2. Front working lights | 3. Headlights |
| 4. Front lifter | 5. Hub motors | 6. Battery |
| 7. Fuel tank | 8. Mirrors | 9. Rear lights |
| 10. Flashing beacon | 11. Rear working light | 12. Platform body |
| 13. Engine | 14. Towing equipment (accessory) | 15. Fuel filter/water separator |
| 16. Air filter | 17. Hydraulic oil tank | 18. Coolant expansion tank |

The battery is maintenance-free and requires no special service. Check however that the battery cables are properly attached, and that the cable connectors and the outside of the battery are clean. Check that the battery is firmly attached.

### 2.1.1 Hydraulic pumps

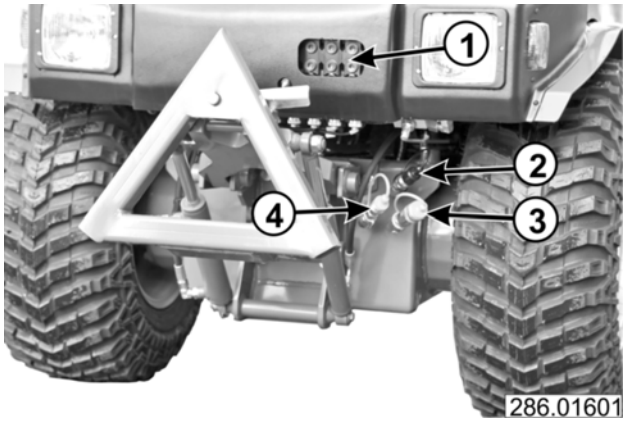
Figure 2.




| | | |
|---|---|---|
| 1. Steering and cylinder hydraulics pump | 2. Engine hydraulics pump | 3. Drive hydraulics pump |

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

Figure 3.

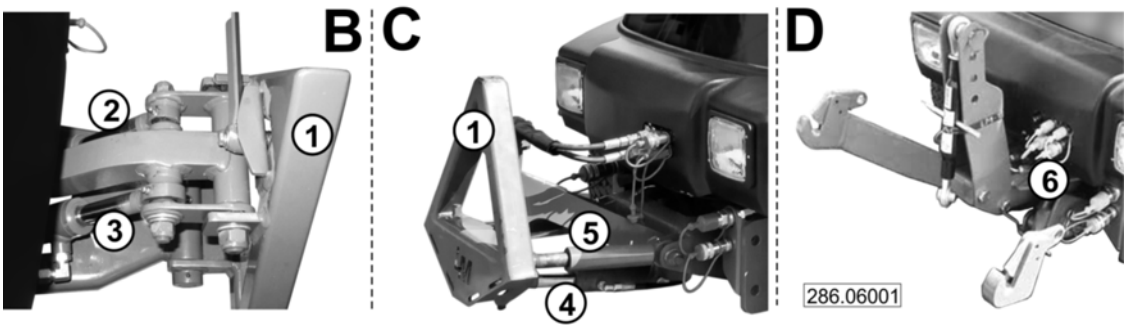



| | |
|---|---|
| 1. Cylinder hydraulics connectors (3 pairs) | 2. Engine hydraulics 1 |
| 3. Engine hydraulics 2 | 4. Leak oil connector |
| 5. Tank line, hydraulics return | |

### 2.2.1 Front lifter and quick coupling device

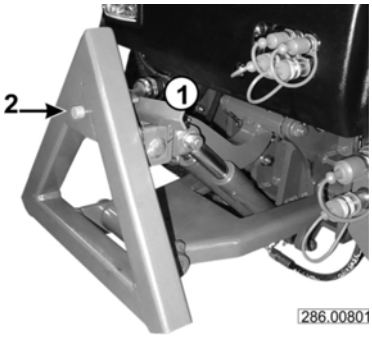
Depending on your choice, your machine is equipped with the A frame with lifter B or C (rotating) or three-point attachment device D.

Figure 4.




| | | |
|---|---|---|
| 1. A frame | 2. B lifter relief cylinder | 3. B lifter lift cylinder |
| 4. C rotating lifter lift cylinder | 5. C rotating lifter rotation cylinders (2 pcs) | 6. 3-point device (D) lift cylinder |

Figure 5.




**Tool locking to A frame (B)**

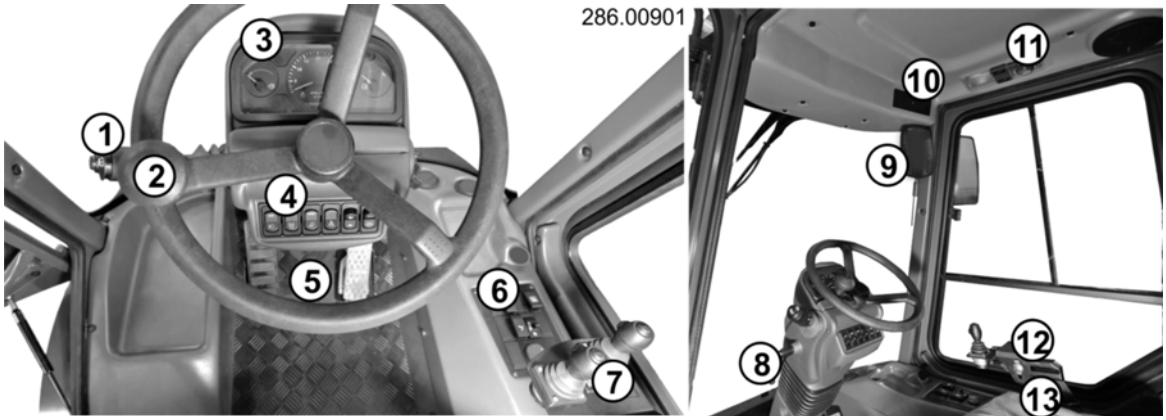
| |
|---|
| 1. Locking pin opening lever |
| 2. Locking pin |

Huomaa! Notera! Note!

**Ensure that the tool is securely locked in place before starting work.**

## 2.3 Cabin from inside

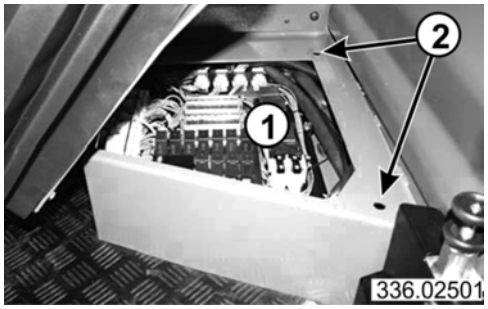
Figure 6.




| | | |
|---|---|---|
| 1. Multi-function switch | 2. Steering wheel | 3. Instrument panel |
| 4. Switch panel | 5. Pedals | 6. Right side panel |
| 7. Hydraulics joysticks | 8. Steering column adjustment | 9. Rear view mirror |
| 10. Player | 11. Cabin lights | 12. Right arm rest |
| 13. Driver's seat and seat adjustments | | |

### 2.3.1 Switchboard

Figure 7.




The switchboard (1), fuses and relays are located underneath the driver's seat.

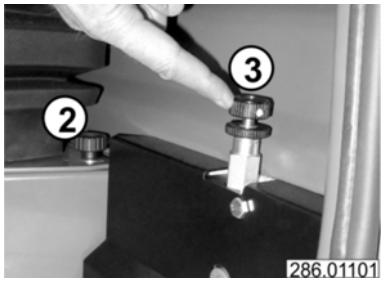
The seat must always be fixed in place with the original screws (2) when driving the machine.

**Varoitus! Varning! Warning!**

If the driver's seat has been opened, always ensure it is secured with the original mounting screws before driving.

**Relief cylinder regulating valve**

Figure 8.




If your machine is equipped with the A frame, see *Figure 4. p. 11.*, the regulating valve (3) of the relief cylinder is located on the left side of the seat on the back wall of the cabin.

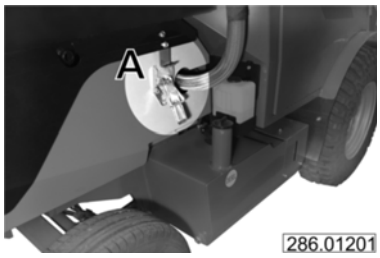
## 2.4 Fuel and washing liquid tanks

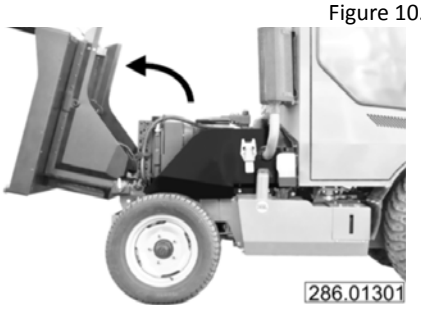
Figure 9.


1. Fuel tank
2. Windscreen washing liquid tank

## 2.5 Bonnet/platform body

Figure 10.



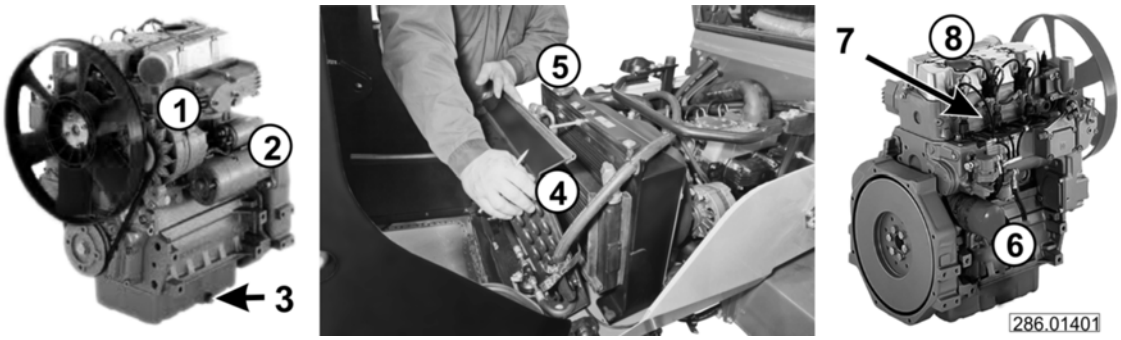




The engine bonnet/platform body is equipped with hinges and can be tipped, when the latch (A) is opened.

**Varoitus! Varning! Warning!**
The bonnet must not be overloaded.

### 2.5.1 Engine compartment components

Figure 11.




| | | |
|---|---|---|
| 1. Charging generator | 2. Starting motor | 3. Oil discharge plug |
| 4. Radiator/condenser cores | 5. Radiator core cap | 6. Oil filter |
| 7. Oil dipstick | 8. Oil filler neck | |

**Varoitus! Varning! Warning!**
Never open the radiator cap while the engine is running!

Wait until the engine has cooled down sufficiently (the system is pressureless) and open the cap carefully! If necessary, add coolant into the expansion tank.

Hot liquid discharged with great pressure causes severe burns.

The level of cool coolant must reach above the core. In autumns, ensure that the coolant is frost-proof.

Usually coolant is added to the expansion tank.

See detailed instructions in section 06 Maintenance.

# 3.0 CABIN AND CONTROLS

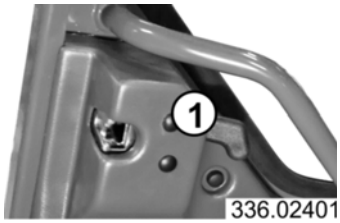
## 3.1 Doors, locks

Figure 12.


Open the (left) door from the outside by pressing the opening button (1) and pulling the handle (2). The door can be locked with the key.

**PLEASE NOTE!** The right side door serves as an emergency exit and can only be opened from the inside.

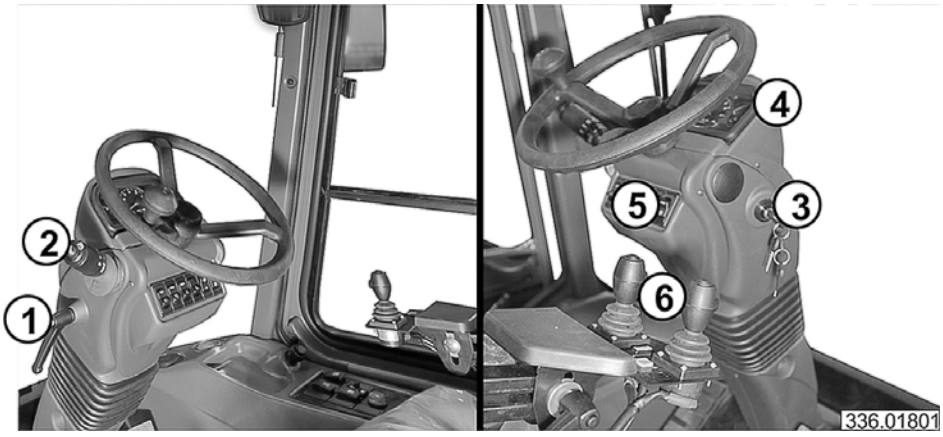
Figure 13.




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

## 3.2 Controls

Figure 14.




| | | |
|---|---|---|
| 1. Steering column locking screw | 2. Multi-function switch | 3. Ignition switch |
| 4. Instrument panel | 5. Steering column switch panel | 6. Hydraulics joysticks |

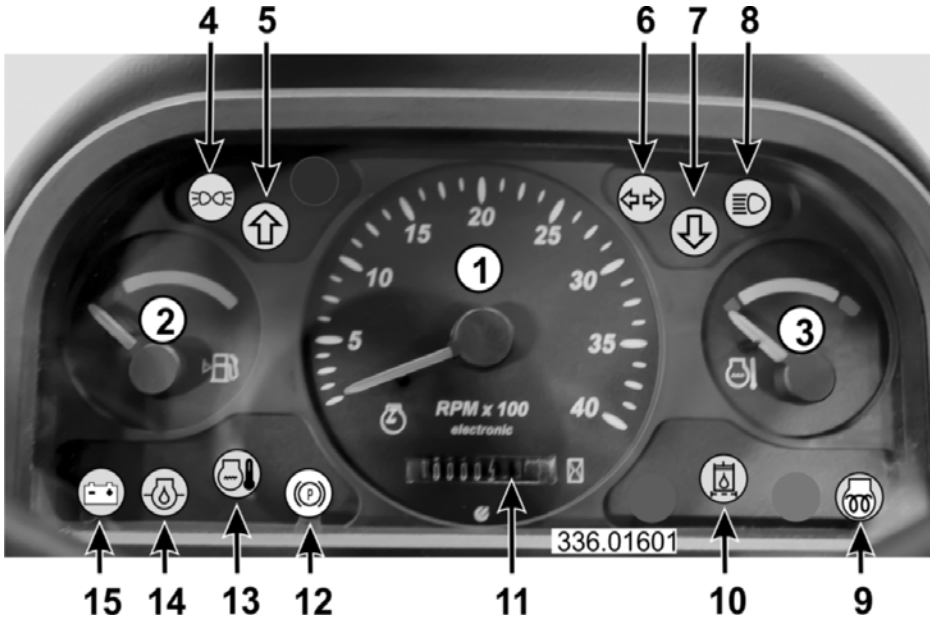
## 3.3 Multi-function switch

Figure 15.


1.Horn – Press the button.
2. Windscreen washer – Press the frame ring.
3. Windscreen wiper – Rotate the sleeve.
4. Right-turn signal – Turn upwards.
5. Left-turn signal – Turn downwards.
6. Low beam/high beam
   – high beam – Push the switch forwards.
   – low beam – Pull the switch backwards.

## 3.4 Instrument panel

Figure 16.




| | | |
|---|---|---|
| 1. Tachometer | 2. Fuel gauge | 3. Engine temperature gauge |
| 4. Parking lights indicator | 5. Not used | 6. Turn signal indicator |
| 7. Not used | 8. High beam indicator | 9. Glow indicator |
| 10. Hydraulics return filter indicator | 11. Operating time counter | 12. Parking brake indicator |
| 13. Engine overheat warning light | 14. Engine oil pressure warning light | 15. Charge indicator |

1. The tachometer indicates the engine revolutions as rev/min. The reading is multiplied by 100, e.g., 35 = 3,500 rev/min.
2. The fuel gauge indicates the fuel amount remaining in the tank. When the pointer is in the red zone, approximately 7 litres of fuel remain.
3. The engine temperature gauge indicates the temperature of the engine coolant.

The running temperature is normal when the pointer is in the green zone. If the pointer is in the red zone, the engine is overheating and warning light (13) illuminates. Immediately adjust the engine revolutions to idle and let the engine cool down for a moment. Turn off the engine and determine the cause of overheating and correct it before continuing work.

When the pointer is in the blue zone, the running temperature is too low. Let the engine warm up to the normal (green) running temperature before heavy loading.

In very cold or hot conditions it may be necessary to change the engine thermostat to suit the conditions.

4. The parking lights indicator (green) illuminates when the lights are switched on.
5. Not used
6. The indicator flashes when a turn signal is switched on (left/right).
7. Not used
8. The high beam indicator (blue) illuminates when the beam is switched on.
9. The glow indicator (yellow) illuminates when the engine is preheated and turns off when the engine is ready to be started.

Huomaa! Notera! Note!

**NOTE**: **The engine is equipped with automatic preheating**. Turn the ignition key into the glow position and start the engine when the indicator extinguishes.

Figure 17.


10. The hydraulics return filter indicator (red) illuminates when the return filter is clogging up. Turn off the engine and replace the return filter.
11. The operating hour meter indicates the total operating time of the machine (the running time of the engine) for scheduling periodic maintenance, for example. The display numbers are hours and 1/10ths of an hour.
12. The red parking brake indicator illuminates when the parking brake is engaged.
13. The engine overheat warning light (red) illuminates if the engine's running temperature becomes too high. See point 3.
14. The engine oil pressure warning light (red) illuminates if the oil pressure is too low.

## Varoitus! Varning! Warning!

**Turn off the engine immediately.** Find and repair the cause of the indicator illumination (sensor failure or lubricating system problem) before restarting the engine.

15. The charge indicator (red) illuminates when power is turned on and should go out when the engine is started.
If the charging voltage decreases too much while the engine is running, the warning light illuminates. Turn off the engine. Determine and correct the cause before resuming work.

## 3.5 Steering column switch panel

An indicator illuminates in the switches to indicate their active state

Figure 18.


| | | |
|---|---|---|
| 1. Headlight switch with 3 positions: OFF/Parking lights ON/Headlights ON | 2. Beacon switch: ON/OFF | 3. Front working lights switch: ON/OFF |
| 4. Hazard lights switch: ON/OFF | 5. Speed range selection switch* with 2 positions: Fast range (hare)/ Slow range (tortoise) | 6. Parking brake switch: ON/OFF |

*The speed range selection must always be made when the machine is in standstill.

## 3.6 Right arm rest and side panel

Figure 19.

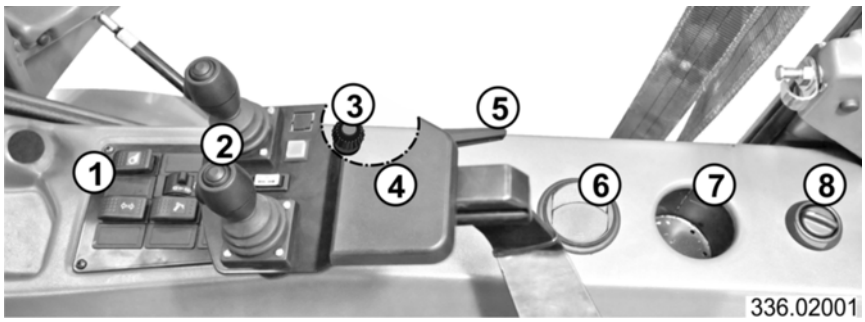
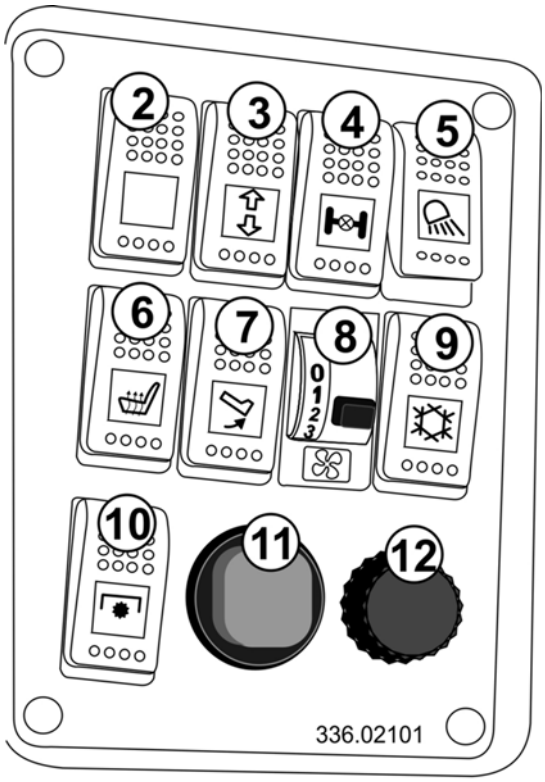


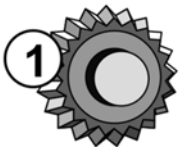

Table: 7

| | | |
|---|---|---|
| 1. Side panel switches | 2. Joysticks | 3. Hand throttle |
| 4. Arm rest | 5. Arm rest position locking lever | 6. Heater vents |
| 7. Cup holder | 8. Cabin temperature control valve: Red > warm, Blue> cold | |

### 3.6.1 Side panel

Figure 20.
Table: 9




| |
|---|
| 1. Hand throttle |
| 2. Free |
| 3. Engine hydraulics switch, front (+ tool rotation direction change). |
| 4. Differential lock (spring-return) |
| 5. Rear working light switch |
| 6. Seat/mirror heating switch |
| 7. Rear hydraulics selection switch (accessory) |
| 8. Heater/air conditioning fan switch |
| 9. Air conditioning switch (accessory) |
| 10. Engine hydraulics switch, rear (accessory) |
| 11. Alarm indicator, central alarm (orange) |
| 12. Air conditioning control (accessory) |

Huomaa! Notera! Note!

The positions and number of switches may differ from the figure depending on your machine's equipment.

## 3.7 Symbols and their meaning

Huomaa! Notera! Note!

**The symbols are dependent on your machine and its equipment!**

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

On different machines, the meaning of some symbols pertaining to the use of hydraulics may vary to some extent due to differences in equipment and functions.

**Hazard lights switch**

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

**Parking lights/headlights 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 brake lights function even if the power is turned off. Remember to switch off the headlights before you stop the engine.

**Front working lights 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 lights 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)**

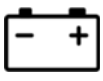
The beacon illuminates when the lower part of this switch is pressed. The indicator on the switch illuminates when the beacon is on.

**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.

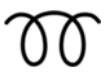
**Hydraulic oil temperature gauge**

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



**Glow indicator**

This indicator illuminates when the automatic preheating is on or the manual preheating is used (286 and 336 machines).

**Engine oil pressure indicator**

This indicator illuminates when the engine oil pressure falls too low. The light illuminates when power is switched on, and extinguishes 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 from 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 with a new one **IMMEDIATELY**!

**Return filter indicator**

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

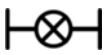
Replace the filter with a new one **IMMEDIATELY**!

**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.

**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 turning off 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**

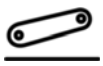
The front tool lock is opened and closed by keeping the bottom part of this switch pressed down, and by simultaneously operating the cylinder hydraulics actuator.

**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.

Huomaa! Notera! Note!

On different machines, the meaning of some symbols pertaining to the use of hydraulics may vary to some extent due to differences in equipment and functions.



**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.

**Engine hydraulics switch, rear**

ON/OFF switch. The switch is used to switch the rear engine hydraulics on and off.

**Engine hydraulics switch, front**

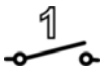
3-position switch, ON/OFF/ON. The engine hydraulics use can be run in two directions depending on the switch position. In the middle position, the use of engine hydraulics is switched OFF.

**.Hydraulics selection switch to the rear**

ON/OFF switch. The switch is used when using a device connected to the rear cylinder hydraulics (e.g., platform body tipping = bonnet opening).

**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**

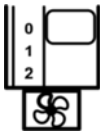
This switch is used to connect power to the first power take-out socket located at the rear of the machine. Power is disconnected when the switch is released.


**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 See "Starting" on page 31.




**Heater fan switch**

The fan switch has 4 positions:

0) OFF

1) Speed I

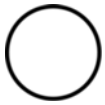
2) Speed II

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 lowest possible draught.

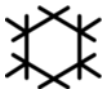
**Heater control**

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 too a 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

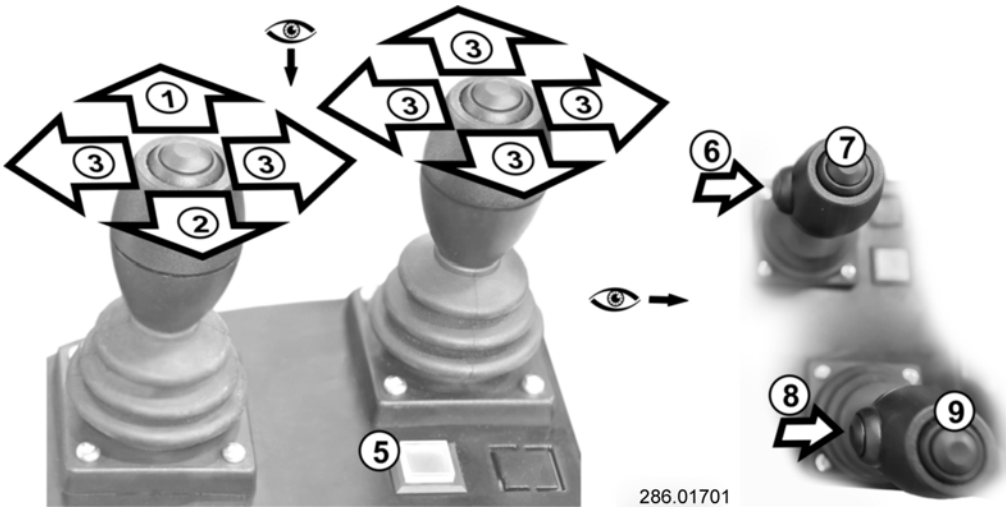
The switch returns to position 1 when released (spring-return).


**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.

## 3.8 Arm rest, joysticks and pedals

Figure 21.




**Joystick movements:**

1. Lowering the lifter.
2. Raising the lifter.
3. Cylinder hydraulics uses.

- The hydraulics cylinders connected to the machine (max. 3 pcs) are controlled by moving the joysticks in question.

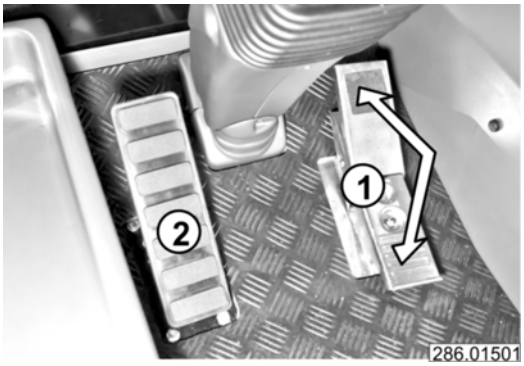
4. Front lifter float selection switch (accessory).

6, 7, 8 and 9 are not in use.

## 3.9 Pedals

Your machine is equipped with a so-called double action drive pedal (1) and brake pedal (2).

Figure 22.




The driving direction is selected by pressing either the upper part (forwards) or lower part (backwards) of the drive pedal. By releasing the pedal the machine stops due to the fully hydraulic drive power train.

### 3.9.1 Radio

Figure 23.


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 right door. The switch is located in the same place. Remember to turn off the dome light before exiting the cabin.

### 3.9.2 Heater vents

Figure 24.


**Air vents**

There are vents in the cabin for both heating and air conditioning. The vents may be rotated, and their flaps may be turned to the desired position. The vents may also be closed.

**Internal circulation vent**

Figure 25.


The internal circulation vent (1) is located to the right of the driver's leg.

Keep the vent normally closed. If you wish to heat the cabin quickly, open the vent so that the same indoor air is recirculated through the heater and the cabin heating improves.

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

### 3.9.3 Emergency exit

Huomaa! Notera! Note!

The right-hand door serves as the emergency exit!

**Varoitus! Varning! Warning!**

The emergency exit must always be in working order.

- ► 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).
- ► Do not install any protruding parts at the edges of the emergency exit that may catch on clothing when exiting through it.

## 3.10 Flashing beacon

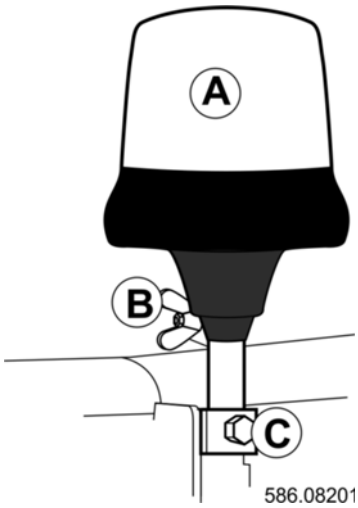



Figure 26.

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).

Huomaa! Notera! Note!

When using the flashing beacon, follow local traffic legislation.

# 4.0 DRIVING AND OPERATION

## 4.1 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.
- Perform daily maintenance according to the maintenance programme.

### 4.1.1 Running-in a new machine

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

Figure 1.

- ► Warm the engine and hydraulics before loading them.
- ► Do not operate the engine at idle or full load for longer than five (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.

Huomaa! Notera! Note!

**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.**

## 4.2 Start-up preparations

### 4.2.1 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.

### 4.2.2 Fuel types

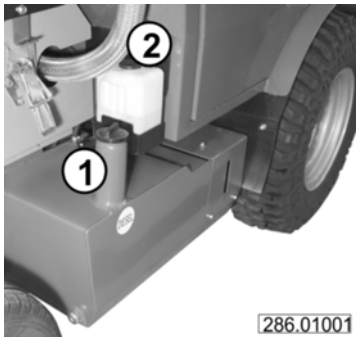



Figure 27.

The fuel tank is located on the right side of the machine. Top up the tank through the filler neck (1) with fuel meeting the required standard (DIN EN590).

If a tax-free fuel is used, it must be motor-grade.

Diesel fuel can also be used in the machine.

Either summer or winter grade fuel must be used to suit the conditions.

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

Table: 13

| 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.

**Varoitus! Varning! Warning!**

**Heating oil must not be used as fuel for the engine.**

### 4.2.3 Seat adjustments

Huomaa! Notera! Note!

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

**Standard seat**

Figure 28.

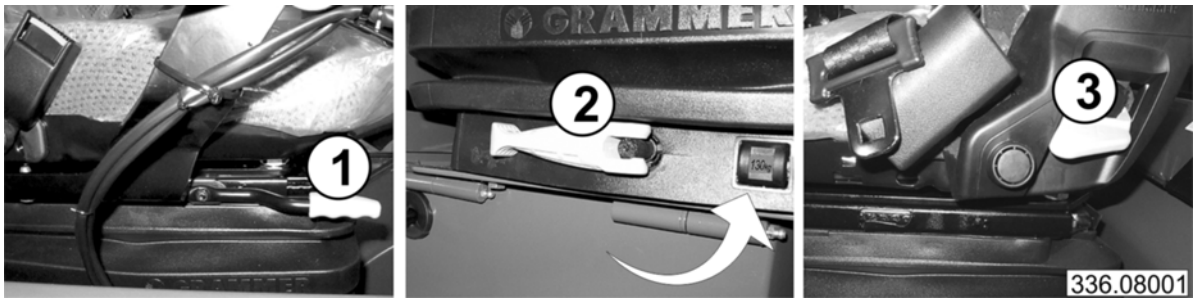
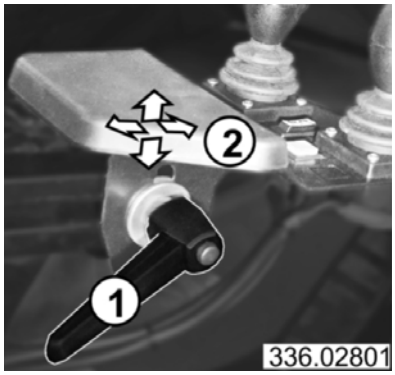



Table: 14

| | | |
|---|---|---|
| 1. Seat distance adjustment. Lift the lever (1) and push the seat forwards/backwards. | 2. Suspension stiffness adjustment. Adjust the suspension by rotating the lever (2). | 3. Backrest tilt adjustment. Lift the lever (3) and adjust the backrest tilt. |

### 4.2.4 Armrest, mirror and steering column adjustment

Figure 29.




**Do the following adjustments before setting off:**

**Adjust the right armrest**
You can adjust the height, distance and tilt of the armrest (2) steplessly by loosening the locking lever (1).
Remember to tighten the locking lever.

**Adjust mirrors**
Adjust the external and internal mirrors before setting off.

**Steering column adjustment**

Figure 30.

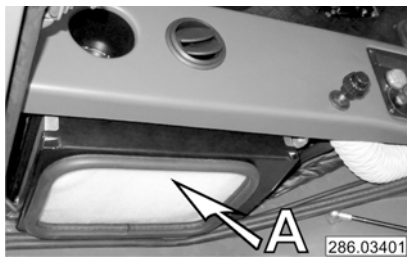

Adjust the tilt angle of the steering column by loosening the locking lever (1) on its left side so that the steering column controls are at a convenient distance and you can maintain an ergonomic driving position together with the seat adjustments.

**Varoitus! Varning! Warning!**
Never adjust the steering column while the machine is moving!

### 4.2.5 Cabin temperature adjustment

The temperature adjustment knob (A) is located in the panel on the right side of the driver.

Figure 31.




Adjust the cabin temperature to suit you when the engine is in its normal running temperature by turning the adjustment knob (A):

red = hot

blue = cold

## 4.3 Starting the engine

Huomaa! Notera! Note!

**Read all safety instructions!**
**Read all safety labels!**
**Do not run the engine in a confined space!**
**Preheating is not automatic!**
**Start the engine only when seated at the driver's 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.

See 4.3.2 on page 31.

### 4.3.1 Starter lock (parking brake switch)

Figure 32.


**Info!**

The machine is equipped with a starter lock. The engine will not start unless the parking brake switch (A) is ON and the engine hydraulics switch (B) OFF!

### 4.3.2 Starting

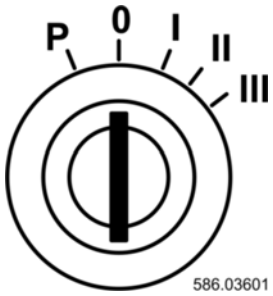



Figure 33.

**Ignition switch positions:**

**P.** Not in use.

**O.** Power off.

**I.** Power on + automatic preheating.

**II.** Not in use.

**III.** START.

1. Ensure that the parking brake is ON.
2. Ensure that the engine hydraulics switch is OFF.
3. Check that all the controls are in neutral or off.
4. Adjust the hand throttle to medium.
5. Turn on the power, ignition switch position I.
6. Check that the following warning lights turn on:

- Engine oil pressure indicator
- Charge indicator
- Parking brake indicator
- Glow indicator (automatic glow).

**Info!**

The machine is equipped with the so-called automatic glow (as in passenger cars). Preheating is turned on when the power is turned on. The glow indicator illuminates in the instrument panel and extinguishes automatically when the engine can be started.

7. Turn the ignition key to the START position when the glow indicator goes out. Release the key as soon as the engine starts and adjust the revolutions almost to idle.
8. Once the engine is running, check that the oil pressure and charge indicators extinguish. If a warning light remains on, stop the engine and determine the cause.

### 4.3.3 Additional engine heaters

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.

Huomaa! Notera! Note!

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

### 4.3.4 Using an auxiliary battery

**Varoitus! Varning! Warning!**

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

Huomaa! Notera! Note!

**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 auxiliary 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 the other end of the black cable to the frame of the machine.
7. Start the engine of the machine providing the power, and let it run for 2–5 minutes.
8. Start the engine.
9. Detach the starter cables in reverse order (6, 5, and 4).

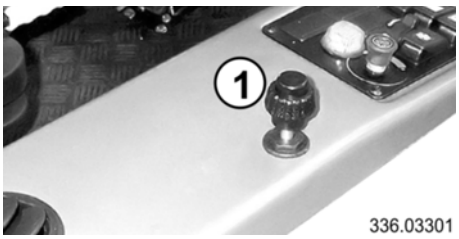
## 4.4 Warm-up operation

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 front lifter 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.

## 4.5 Hand throttle

Figure 34.




Adjust the engine revolutions by pressing the button in the middle of the control (1) and by pulling the control outwards. Fine adjustment is done by rotating the ring of the control.

## 4.6 Stopping the engine

Huomaa! Notera! Note!

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

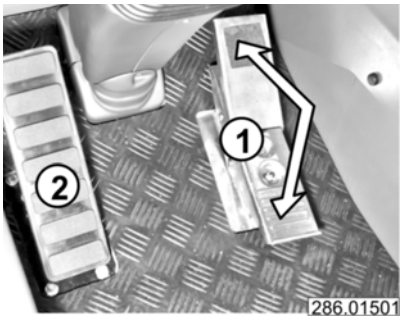
1. Drive the machine onto hard, level terrain.
2. Lower all tools onto the ground and apply the parking brake.
3. Decrease the engine RPM to idle, and move all controls to neutral or off.
4. Let the engine run at idle for a few minutes to balance the heat and cool it down.
5. Turn the ignition key to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

## 4.7 Driving

The functions related to driving the LM 286 multi-function machine forwards/backwards are performed with the double action drive pedal.

### 4.7.1 Drive pedal (double action)

Figure 35.




With the double action drive pedal (1) you can change the driving direction with the pedal as follows:

- ► By pressing the upper part of the pedal with the ball of the foot, the machine moves FORWARD.
- ► By pressing the lower part of the pedal with the heel, the machine moves BACKWARD.
- ► In the middle position of the pedal, the machine remains stationary.

The engine revolutions and, thus, also the driving speed are adjusted using the hand throttle.

See 4.5 Hand throttle page 32.

### 4.7.2 Brake pedal

The machine is also equipped with a separate brake pedal (2) that is usually only necessary for keeping the machine in place on a sloping surface, for example.

### 4.7.3 Economic driving

- ► Be proactive in your driving and with your speed.
- ► Avoid unnecessary and quick changes in speed, i.e. always adjust your driving and working speed to the prevailing situation while observing external factors and conditions.
- ► Avoid unnecessary idling.

## 4.8 Towing

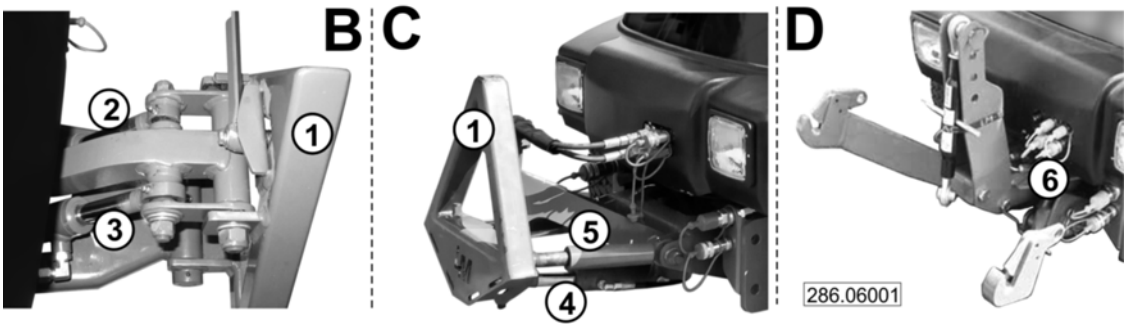
**Varoitus! Varning! Warning!**

**If the machine is damaged, do not tow it. If the machine has to be transported, a transport platform must be used.**

### 4.8.1 Connecting tools

- ► Connect a tool to the A frame (B, C) or the three-point device (D).

Figure 36.




- ► Connect the hydraulic hoses.

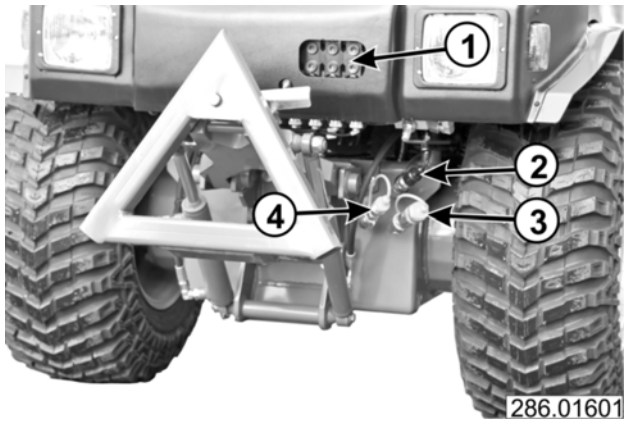
**Varoitus! Varning! Warning!**

**Ensure that the tool is securely locked to the A frame or the 3-point attachment before starting work with the machine.**

**Remove a connected tool as follows:**

A. Lower the tool onto level ground.
B. Disconnect the hydraulic hoses.
C. Disconnect the locking on the A frame or the 3-point attachment.
D. Reverse the machine away from the tool.

### 4.8.2 Connecting/disconnecting hydraulic hoses




| | |
|---|---|
| 1. Cylinder hydraulics connectors (3 pairs) | 2. Engine hydraulics 1 |
| 3. Engine hydraulics 2 | 4. Leak oil connector |
| 5. Tank line, hydraulics return | |

- ► Lower the front lifter together with the tool on the A frame or the 3-point attachment onto a level surface.
- ► 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.

### 4.8.3 Rear towing equipment (e.g. a towing hitch)

If the machine is equipped with rear towing equipment (accessory), a tool or trailer can be towed with it.

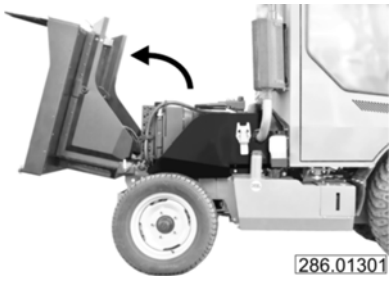
The towing equipment has a ball with a diameter of 50 mm.

Huomaa! Notera! Note!

Always observe road traffic legislation in effect.

### 4.8.4 Using the bonnet/platform body

Figure 37.


The bonnet/platform body can be tipped by opening the latch (A) and turning it as shown in the figure. Always ensure that the bonnet is tipped to its extreme position, if you are working underneath it.

**Varoitus! Varning! Warning!**

**After closing the bonnet/platform body, remember to check that you lock it with the latch!**

**Varoitus! Varning! Warning!**

**Ensure that the bonnet/platform body is tipped to its extreme position, if you are working underneath it!**

## 4.9 Tools with hydraulic motor operation

Tools with hydraulic motor operation can be attached to the front of the machine.

The hydraulic output of the tool installed at the front cannot be adjusted as such, but can be affected by changing the engine revolutions with the hand throttle.

**Hydraulic output to the front/rear output**

Table: 6

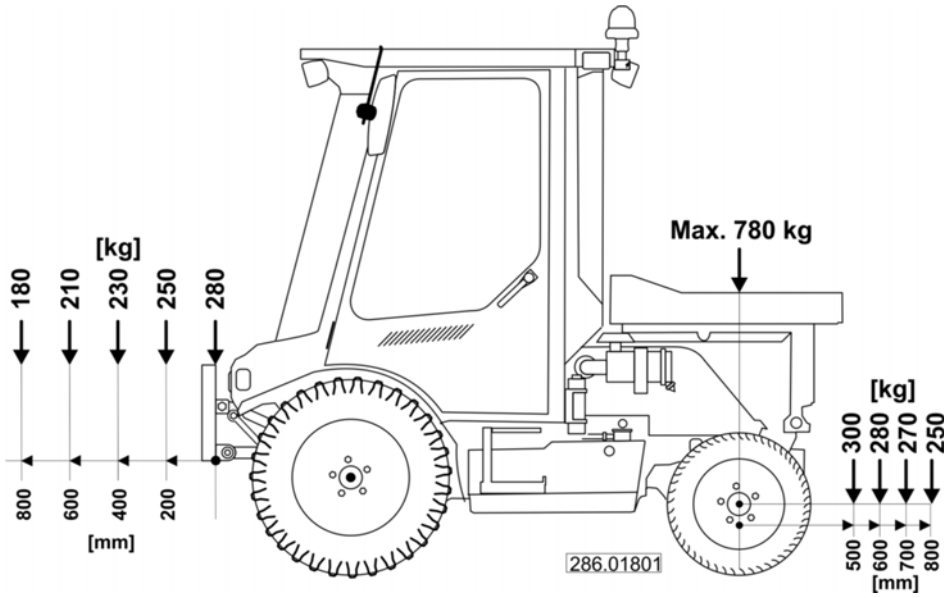
| Engine revolutions | Output (approximate) |
|---|---|
| 1,000 r/min | 17 l/min |
| 2,000 r/min | 34 l/min |
| 3,000 r/min | 51 l/min |

Huomaa! Notera! Note!

**Always remember to check the highest permitted output from the tool manual or type plate.**
**Never exceed the highest permitted output of the tool.**
**Whenever possible, use the lowest possible output of the tool (by adjusting the engine revolutions).**

## 4.10 Engine loading diagram

Figure 38.




The diagram displays the max. loads at different distances from the A frame and rear axle.

**Varoitus! Varning! Warning!**

**The indicated max. loads must not be exceeded!**

# 5.0 MAINTENANCE

## 5.1 General

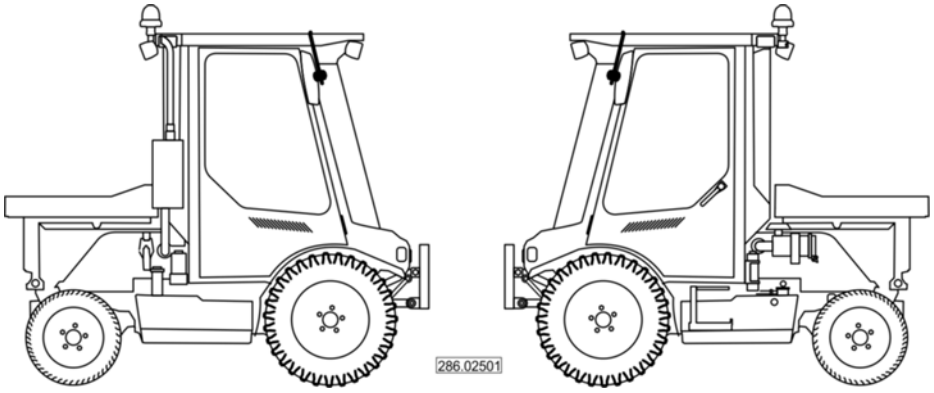
Correct, timely maintenance is one of the key requirements for the machine's operational reliability. The operator is responsible for carrying out all periodic maintenance work according to the maintenance programme as scheduled in the maintenance table.

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.

Figure 39.




### Varoitus! Varning! Warning!

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

- ► Drive the machine onto durable, level terrain or on a maintenance ramp/ hoist.
- ► Apply the parking brake.
- ► Lower all tools and stop the engine.
- ► Remove the ignition key from the ignition switch.
- ► Attach a tag to the steering wheel that forbids starting the machine.
- ► If you lift up the bonnet/platform body, turn it to its extreme position.

**If the maintenance work requires lifting the machine, proceed as follows:**

- ► Only use suitable lifting tools with sufficient strength.
- ► Support the raised machine with approved and sufficiently strong stands that prevent unintended movement of the machine.

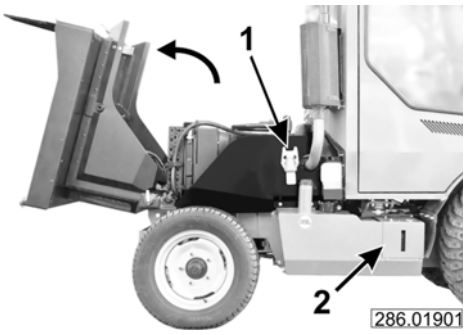
### Varoitus! Varning! Warning!

**Never go under the machine before it has been secured in place in a safe manner that meets all applicable regulations.**
**Never go underneath a raised bonnet/platform body unless it has been tipped to its extreme position!**

### 5.1.1 Access

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

Figure 40.




1. Remove latch 1 and tip the platform body/bonnet.

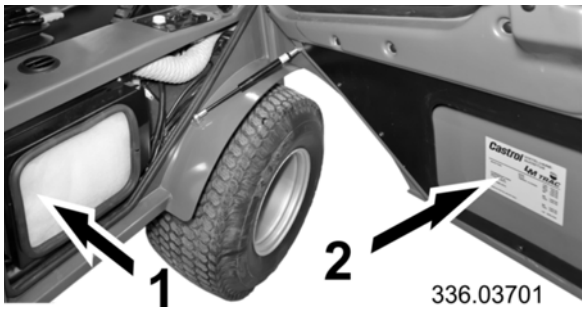
Huomaa! Notera! Note!

**Tip the platform body/bonnet to its extreme position, if you are going to work underneath it.**

The weight of the platform body/bonnet prevents it from falling onto you, if it is tipped to its extreme position.

2. Removing the battery casing.

Figure 41.




By opening the right-side door (from inside) you will find:

1. the cabin fresh-air filter
2. the oil recommendation table.

Figure 42.


The switch board, relays and fuses (1) are located underneath the driver's seat.

- ► Remove the screws (2) and turn the seat up.
- ► Remember to fasten the screws when you turn the seat back down.

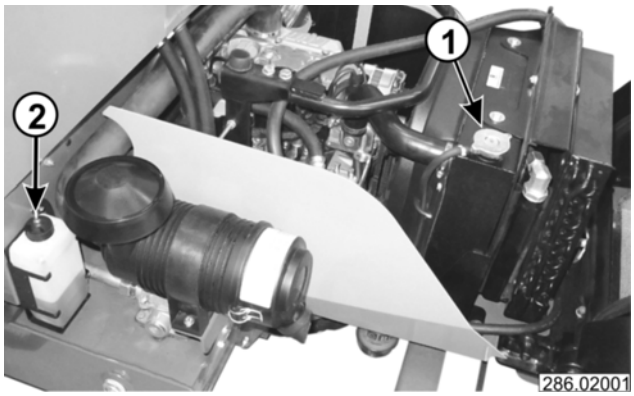
### 5.1.2 Cooling system

**Varoitus! Varning! Warning!**

**Do not open the radiator cap (1) while the engine it hot!**

Hot steam or coolant causes severe burns.

Figure 43.




Always add coolant to the expansion tank (2).

**Varoitus! Varning! Warning!**

**Do not perform maintenance work on a pressurised hydraulics system!**

### 5.1.3 Towing the machine

**Varoitus! Varning! Warning!**

**TOWING THE MACHINE IS FORBIDDEN!**

**Info!**

*If the machine has to be transported, a transport platform must always be used.*

### 5.1.4 Lowering the lifter in case of failure

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

### 5.1.5 Bleeding the fuel system

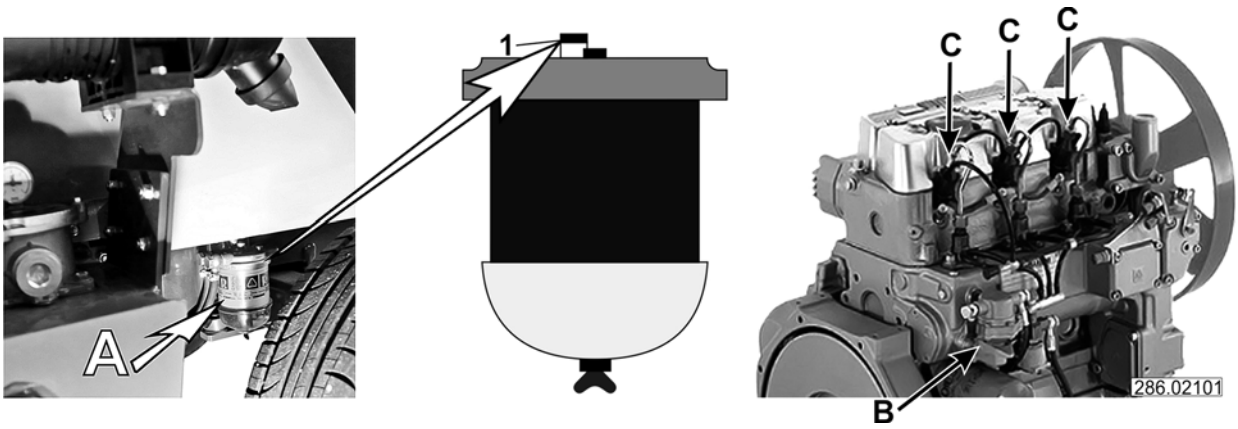
If fuel runs out while driving, the system is equipped with automatic bleeding and no bleeding needs to be performed.

However, if the fuel filter has been replaced, the filter needs to be bled.

Perform the bleeding as follows:

- ► Bleeding the filter (A) is done using the bleed screw (1) on its cover. Loosen the bleed screw, pump using the manual operation (B) of the fuel transfer pump or run the engine with the starter for a moment, until the fuel coming from the bleed screw stops “bubbling”.
- ► Retighten the bleed screw.

Figure 44.




If the engine runs unsteadily or knocks after this at normal operating temperature, check the bleeding as follows:

1. Loosen at least two of the spray pipe connections (A).
2. Run the engine with the starter or pump using manual operation (B) of the fuel transfer pump, until there are no air bubbles in the fuel leaking out of the spray pipes.
3. Carefully tighten all the loosened spray pipes.

### 5.1.6 Air filter maintenance

When cleaning the air filter, always check that the filter and all seals are in good condition. A damaged or wet filter must always be replaced immediately with a new one. Clean the air filter dust cup daily.

Huomaa! Notera! Note!

**Never remove or clean the air filter unnecessarily. When the filter is removed, there is always a risk of impurities entering the engine.**

See 5.7.4 on page 49.

## 5.2 Electric system maintenance

Precautions for performing maintenance on the electric system!

- ► Always disconnect the battery cables before doing maintenance work or repairs on the electric system.
- ► Always disconnect the earthing cable first (–).
- ► When connecting cables ensure that you connect them to the correct terminals.
- ► Always connect the positive cable (+) first and only then the earthing cable (–).

**Varoitus! Varning! Warning!**

**Smoking and lighting a naked flame in the immediate vicinity of the battery is expressly forbidden!**

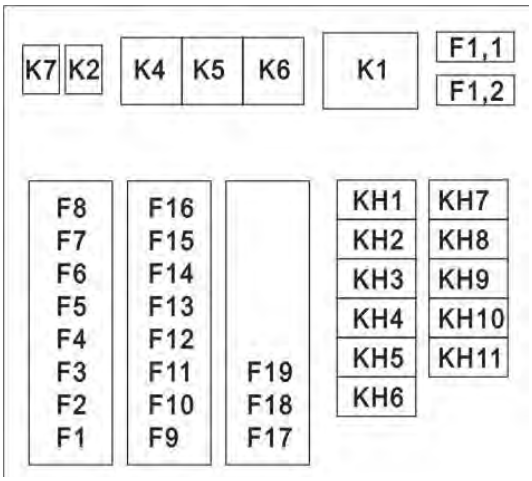
### 5.2.1 Fuses and relays

The fuses and relays (1) are located underneath the driver's seat in the switchboard. Fuses can be checked and replaced when the seat is tilted forwards after removing the mounting screws (2).

Always keep the fuse box clean. Whenever a fuse needs to be replaced, you must determine the cause for its break down.

The fuses are BLADE fuses.

Figure 45.



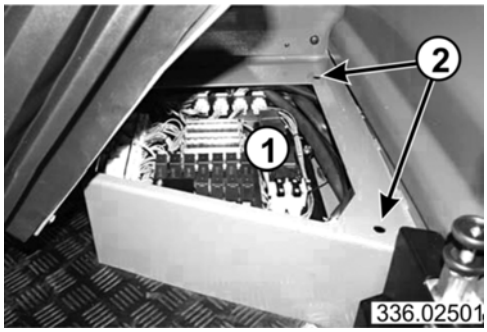




Table: 7

**Fuses:**

| Pos | Function | Fuse |
|---|---|---|
| F1 | Parking light, left | 3 A |
| F2 | Parking light, right | 3 A |
| F3 | Headlight, left | 7.5 A |
| F4 | Headlight, right | 7.5 A |
| F5 | High beams | 10 A |
| F6 | Indicators/Gauges | 7.5 A |
| F7 | Wiper/Intermittent/Washer | 10 A |
| F8 | Glow relay control/Front working lights | 15 A |
| F9 | Turn signals | 10 A |
| F10 | Parking brake/4WD | 7.5 A |
| F11 | Differential lock/Slow driving range/Brake light/Reversing alarm | 10 A |
| F12 | Mirror heating/Radio/Dome light/Air-ride seat | 10 A |
| F13 | Engine hydraulics/Tipping hydraulics (YH9 and YH10) | 7.5 A |
| F14 | Rear working lights | 7.5 A |
| F15 | Heater fan/AC | 15 A |
| F16 | Engine stopping solenoid | 10 A |
| F17 | Hazard lights/Beacon | 15 A |
| F18 | Radio memory/Dome light switch | 7.5 A |
| F19 | Joystick | 20 A |
| F1,1 | Preheating | 50 A |
| F1,2 | Main power | 50 A |

**Only use the above fuse sizes!**

Huomaa! Notera! Note!

**Attach the seat using the original mounting screws before setting off!**

**Relays:**

Figure 46.

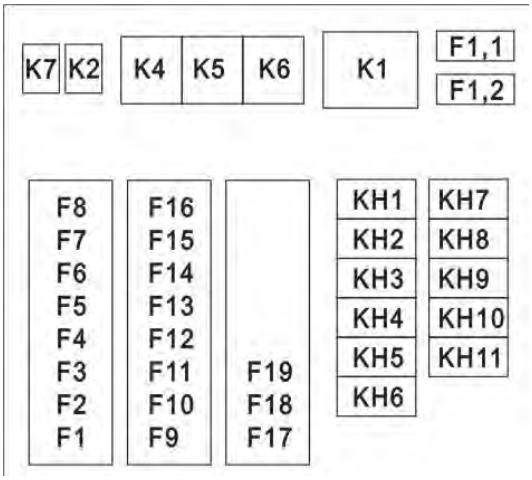




Table: 8

| POS | FUNCTION |
|---|---|
| K1 | Main power |
| K2 | Starter lock |
| | |
| K4 | Turn signal |
| K5 | Intermittent |
| K6 | Preheating |
| K7 | 4WD |

**Front valve relays:**

Table: 9

| POS | FUNCTION |
|---|---|
| KH1 | Valve YH1 |
| KH2 | Valve YH2 |
| KH3 | Valve KV (Front lifter float) |
| KH4 | Valve YH3 |
| KH5 | Valve YH4 |
| KH6 | YH4 valve float |
| KH7 | Valve YH5 |
| KH8 | Valve YH6 |
| KH9 | YH6 valve float |
| KH10 | Valve YH7 |
| KH11 | Valve YH8 |

## 5.3 Headlight adjustment

The correct adjustment of headlights is important when driving on public roads. The lights can be adjusted quickly and precisely at a service station or repair shop using an optical device.

If an optical device is not available, the lights can be adjusted according to the attached figure.

- ► Ensure before the adjustment that the machine is under a normal load and that the tyre pressures are correct.
- ► Drive the machine close to a wall (almost touching it on a level surface).
- ► Draw two crosses on the wall at the centre of the headlamps.
- ► Reverse the machine to a distance of 5 m from the wall.

**Height (1):**

- ► Switch on the low beam. The horizontal top edge of the light pattern of the low beam must be 50 mm below the crosses drawn on the wall for both headlights.
- ► If necessary, adjust the height of the headlights to the correct level.

**Lateral direction (2):**

- ► Switch on the high beam. In the lateral direction, the centre point of the light pattern of both headlights should be approximately at the crosses you made.
- ► If necessary, adjust the lateral direction of the headlights to the correct position.

Dimensions:

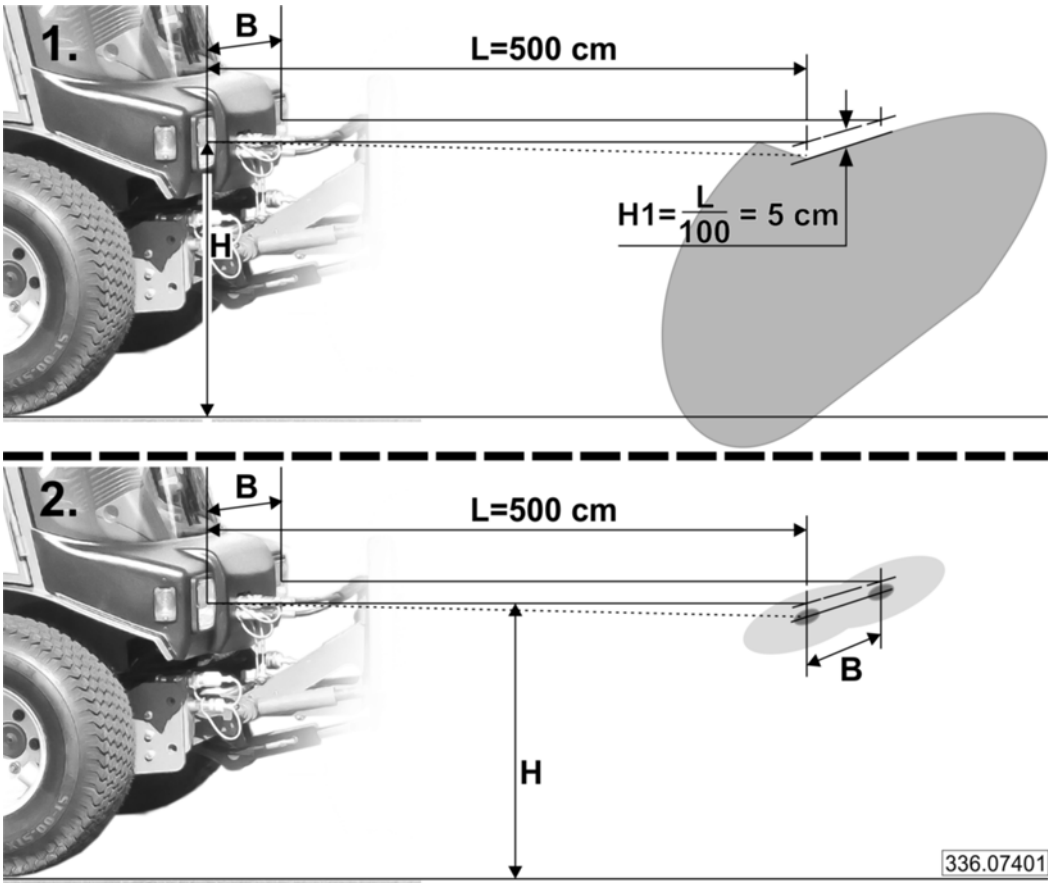
L = measuring distance = 500 cm

B = lateral distance between the headlight centre points

H = height of the headlight centre points from the ground

H1 = L:100 L = 500 cm => H1 = 5 cm

Figure 47.



### 5.3.1 Welding

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

1. Remove the key from the ignition switch.
2. Disconnect the earthing cable (–) of the battery.
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.

### 5.3.2 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.

**Varoitus! Varning! Warning!**

**Do not top up the tank or do maintenance work on the fuel system during welding or close to naked flames, lit cigarettes, etc.**

Sparks and flames can cause for the gases being released from the battery to explode.

**Varoitus! Varning! Warning!**

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

- Always disconnect the earthing cable of the battery first and 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.

## 5.4 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 acid and heavy metals. Ensure that batteries are disposed of according to valid regulations.

Huomaa! Notera! Note!

**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.*

## 5.5 Periodic maintenance

### 5.5.1 Maintenance item table

Periodic maintenance items with their scheduled intervals.

Table: 10

| MAINTENANCE ITEMS | Maintenance intervals according to operating hours. | | | | | |
|---|---|---|---|---|---|---|
| | 10 | 125 | 250 | 500 | 1,000 | 2,000 |
| 1. Indicator function check | X | | | | | |
| 2. Engine oil level check | X | | | | | |
| 3. Engine coolant level check | X | | | | | |
| 4. Engine air filter check and dust pocket cleaning | X | | | | | |
| 5. Hydraulic oil level check | X | | | | | |
| 6. Windscreen washer fluid level check | X | | | | | |
| 7. Greasing (weekly or every 50 h) | (X) | | | | | |
| 8. Checking items 1–7 | | X | | | | |
| 9. Fan belt tension check | | X | | | | |
| 10. Battery fluid level check | | X | | | | |
| 11. Engine oil change | | X | | | | |
| 12. Wheel fastener tightening torque check | | X | | | | |
| 13. Radiator/condenser core cleaning | | X | | | | |
| 14. Cabin fresh-air filter cleaning | | | X | | | |
| 15. Engine air filter replacement | | | X | | | |
| 16. Engine oil filter replacement | | | X | | | |
| 17. Fuel water separator cleaning and fuel filter replacement | | | X | | | |
| 18. Oil leaks, connectors and hoses check, retightening connections | | | X | | | |
| 19. Tyre inflation pressure check | | | X | | | |
| 20. Brake function check | | | X | | | |
| 21. Hydraulic oil return filter replacement | | | | X | | |
| 22. Drive pump filter replacement | | | | X | | |
| 23. Air conditioning maintenance (accessory) | | | | | X | |
| 24. Hydraulic oil change and tank cleaning (or once a year) | | | | | X | |
| 25. Fuel tank cleaning | | | | | X | |
| 26. Nozzle check and cleaning | | | | | X | |
| 27. Pressure measurement and necessary adjustment of drive hydraulics | | | | | X | |
| 28. Pressure measurement and necessary adjustment of work hydraulics | | | | | X | |
| 29. Cooling system cleaning | | | | | | X |
| 30. Alternator check | | | | | | X |
| 31. Starter check | | | | | | X |
| 32. Handbrake valve coil replacement | | | | | | X |

**The 10 h (daily) maintenance work or checks must be performed every day before starting use.**

- The 125/250 and 500 h maintenance work or checks are done at the indicated operating hour intervals.
- The 1,000 h maintenance work must be done every 1,000 h or at least once a year.
- The 2,000 h maintenance work must be done every 2,000 h or at least every other year.
- When you are working in extremely dusty, humid or otherwise demanding conditions, we recommend performing maintenance work and checks more frequently than indicated here.

**PLEASE NOTE!** Copy this page and mark on the copy the performed maintenance items.

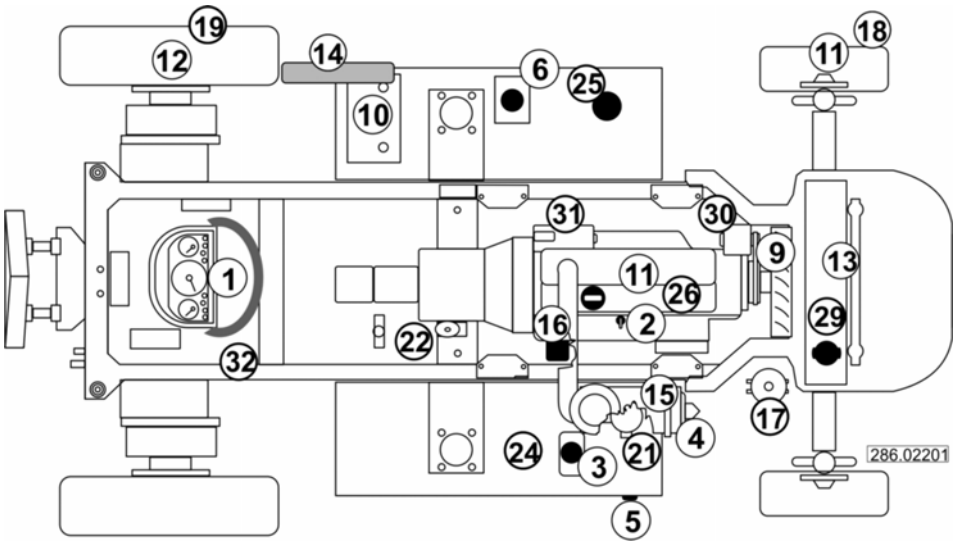
Give the copy to the customer when necessary. Remember to note the completion of the service in the service memo.

### 5.5.2 Maintenance item locations

The reference numbers marked in the figures refer to the maintenance items found in the maintenance item table on the previous page.

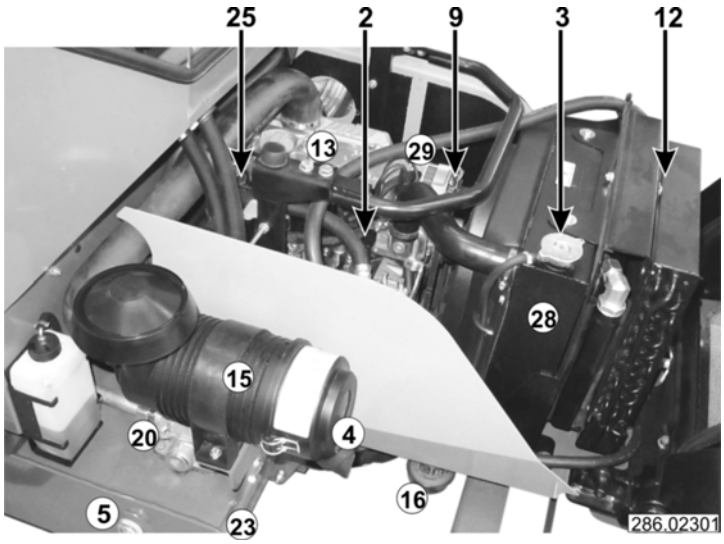
**All maintenance items:**

Figure 48.




**Engine compartment maintenance items:**

Figure 49.




**Info!**

*The titles of maintenance instructions found below include a number in brackets that refers to both the maintenance item table and the above maintenance item location figures.*

## 5.6 Recommended lubricants and volumes

Table: 33

| Item | Volume | Quality recommendation | OE | Note: |
|---|---|---|---|---|
| Fuel tank | 35 l | DIN E590 Diesel | DIN E590 Diesel | Summer/winter grade must be used according to prevailing conditions |
| Cooling system | 9 l | Water/glycol 50/50 | Water/glycol 50/50 | Never use only water |
| Motor oil | 5 l | 15W40 API CE | Castrol CRD 10W/30 | In temperatures below –15 °C use 5W-30 multi-grade oil |
| Hydraulic oil | 55 l | ISO-VG46 DIN 51524 part 1 DIN 51502 HLP 46 | Castrol AWH 46 | |
| Washer fluid | 1.5 l | Water/washer fluid 50/50 | Water/washer fluid 50/50 | Never use only water |
| Lubrication points | | Molybdenum disulphide grease | Castrol MS1 GREASE | |
| Air conditioning | 0.9 kg | R 134A coolant | R 134A coolant | |

* See “Fuel Grades” in this manual.

## 5.7 Daily maintenance

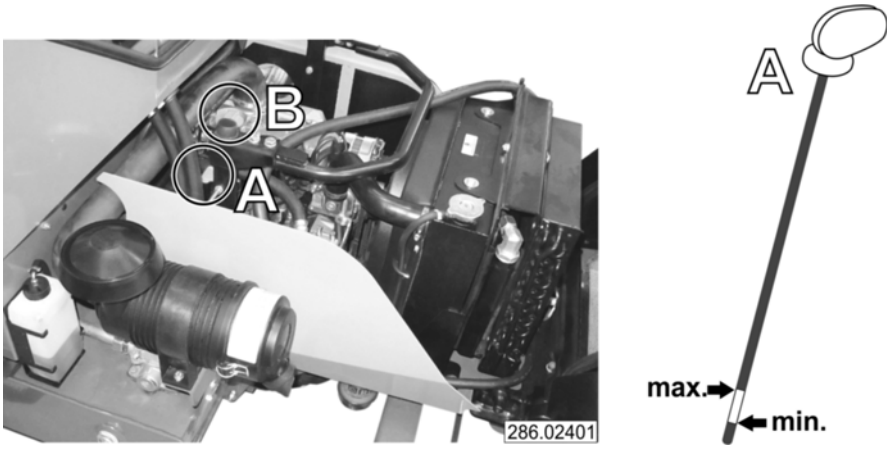
Perform the following maintenance procedures daily, before starting the engine.

### 5.7.1 Indicators and warning lights (1)

Check that all the indicators and warning lights are functioning.

### 5.7.2 Engine oil level check (2)

Figure 50.




A. Dipstick B. 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 (A), 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.
4. If necessary, add the recommended oil through the oil filler neck (B) and recheck the oil level.

**Info!**

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

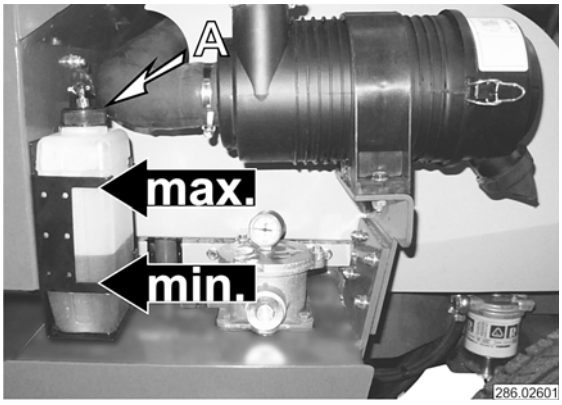
### 5.7.3 Coolant level check (3)

**Varoitus! Varning! Warning!**

**Never open the radiator cap (C) when the engine is hot.**

In a hot engine the fluid is pressurised and its temperature can exceed evaporation point (100 °C). When released, the fluid evaporates and discharges with great pressure causing severe burns.

Figure 51.




Check that the expansion tank (3) level is between the min. and max. marks when the engine (coolant) is cold.

If necessary, add coolant to the expansion tank by opening the expansion tank cap (3).

**Info!**

*Always use a mix of water and anti-freeze as coolant in a ratio of 1:1 (50% water + 50% anti-freeze).*
*Besides the antifreezing compound, the anti-freeze includes vital compounds that prevent engine and cooling system corrosion.*

Huomaa! Notera! Note!

**If you need to add coolant frequently, there is a leak in the cooling system.**

Proceed as follows:

- ► Check all hoses and connections and the radiator core.
- ► Repair the leak and add the required amount of coolant.
- ► Run the engine until its hot and check that the system is intact.

Huomaa! Notera! Note!

**Remember to check coolant's resistance to freezing regularly and always before the cold season.**

### 5.7.4 Air filter check/cleaning/replacement (4)

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

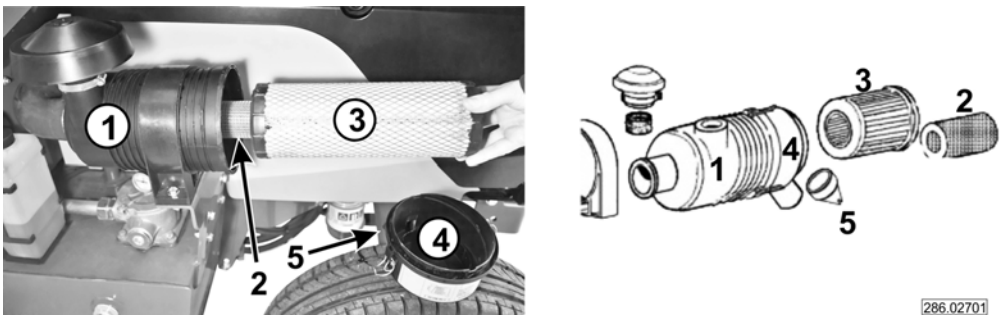
► Turn off the engine.

**Varoitus! Varning! Warning!**

**Never open the air filter while the engine is running!**

► Remove the filter cover fasteners and the cover.
► Remove the filter element (3) by rotating and pulling it out from the case.

Figure 52.




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

Huomaa! Notera! Note!

**Do not remove the safety element (2) from its place.**

► Clean the inside of the cover (4) and the filter element case (1) by wiping.
► Check the filter element (3) and seals. 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 definitely be replaced.
► Clean and check the dust pocket (5). If the dust pocket is damaged or does not close properly, replace it with a new one.

**Info!**

*If the filter element is damaged, the safety element must also be replaced.*
*Otherwise, check the condition of the safety element, but do not remove it if it is in working order.*
*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.
► 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.*

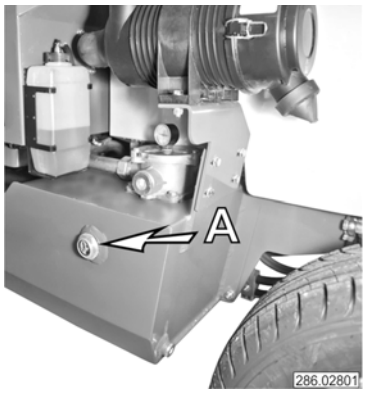
**Replace the safety element (2) when necessary:**

► By rotating and pulling it out.
► Clean the case.
► Press a new element in by rotating it.

### 5.7.5 Hydraulic oil level check (5)

The hydraulic oil level is checked from the sight glass (A) of the hydraulic oil tank provided on the left side of the machine. The oil level must be visible in the sight glass when the oil is cold.

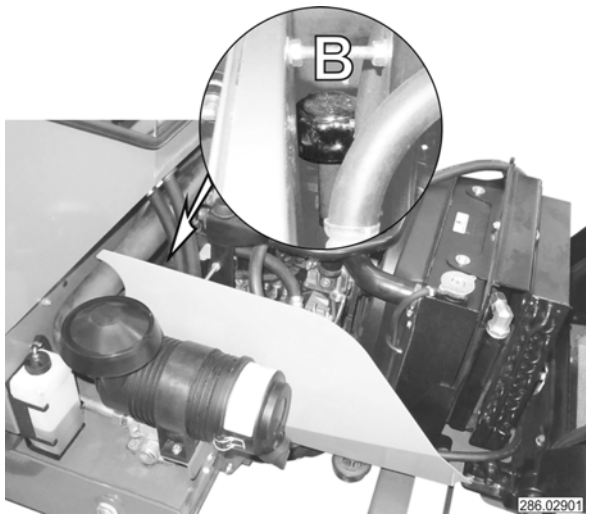
Figure 53.




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

Oil can be added through the filler neck (breather cap B) on the left front corner of the engine compartment, or through the leak oil connector at pressure.

Figure 54.




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

**Info!**

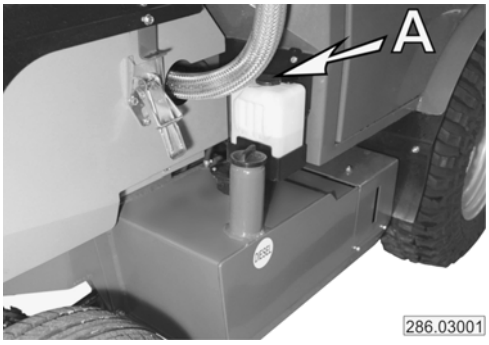
*The grade of the added oil must match the oil in the tank.*
*The hydraulic oil tank is at an overpressure of 0.35 bar.*

See the recommended oil 5.6 on page 47.

### 5.7.6 Washer fluid level check (6)

The washing fluid tank (A) is located on the right side of the machine behind the cabin.

Figure 55.




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.

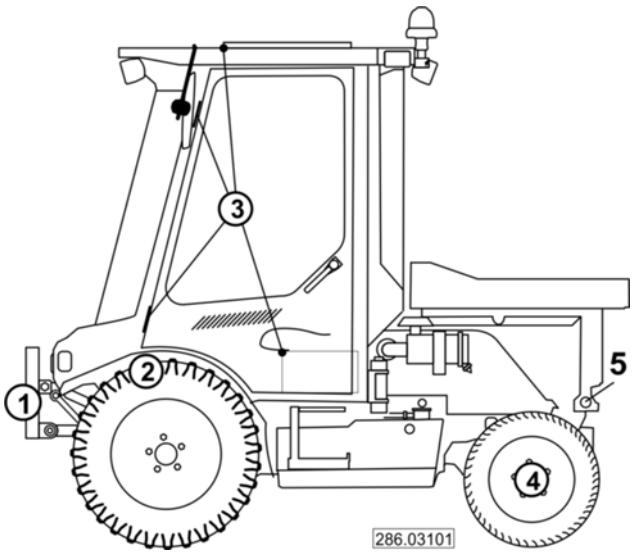
### 5.7.7 Lubrication (7)

Lubricate all grease nipples with 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 all lubrication points:**

Figure 56.




| | | |
|---|---|---|
| 1. | Front lifter | 5 nipples |
| 2. | Driving and brake pedal | Oil (with an oil can) |
| 3. | Door and hatch hinges and locks | 8 nipples |
| 4. | Rear axles | 6 nipples (2WD) 8 nipples (4WD) |
| 5. | Tipping platform hinges | 2 nipples |

- ► Lubricate all sliding surfaces that do not have a grease nipple using a high-quality well-penetrating spray lubricant and/or graphite-based grease.

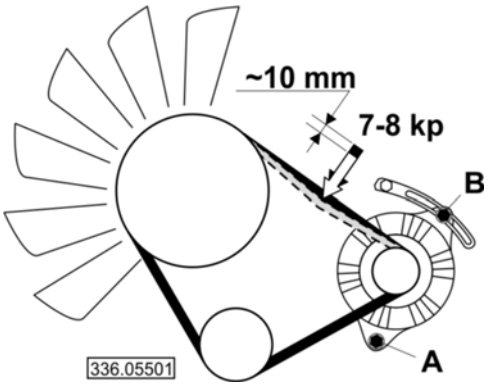
## 5.8 Maintenance every 125 operating hours

**Also carry out maintenance items 1–7.**

### 5.8.1 Fan belt tension check/adjustment (9)

► Check the condition of the alternator belt. If the belt is worn or oily, replace it with a new one.

Figure 57.




► Press the belt with your thumb, applying a force of 7–8 kPa. The belt must flex by approx. 10 mm.

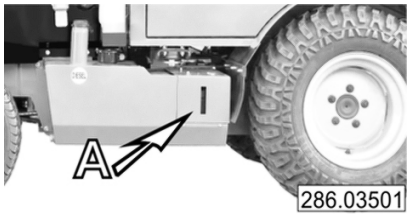
**Adjusting belt tension:**

1. Loosen the fastener (A) (fastener below the alternator).
2. Loosen the adjustment locking screw (B).
3. Adjust belt tension by turning the alternator.
4. Tighten the adjustment locking screw (B), and check belt tension.
5. Tighten fastener (A) or redo items 2–4.

### 5.8.2 Battery fluid level check (10)

The battery is located on the right side of the body in front of the fuel tank under the protective cover (A).

Figure 58.




► Remove the battery's protective cover.

If the battery is a so-called maintenance-free battery:

► Only check the cleanliness of the terminals/clamps and the battery. Clean when necessary and lubricate the clamps with chassis grease.

If the battery cells are equipped with filler plugs:

► Open the plugs.
► Check the cells' fluid levels. The fluid levels must be 5–10 mm above the cells.
► When necessary add clean battery water and close the plugs carefully.
► Never add acid or use naked flame to check the fluid level.

**Varoitus! Varning! Warning!**

**The fluid contained in the battery is highly corrosive acid!**

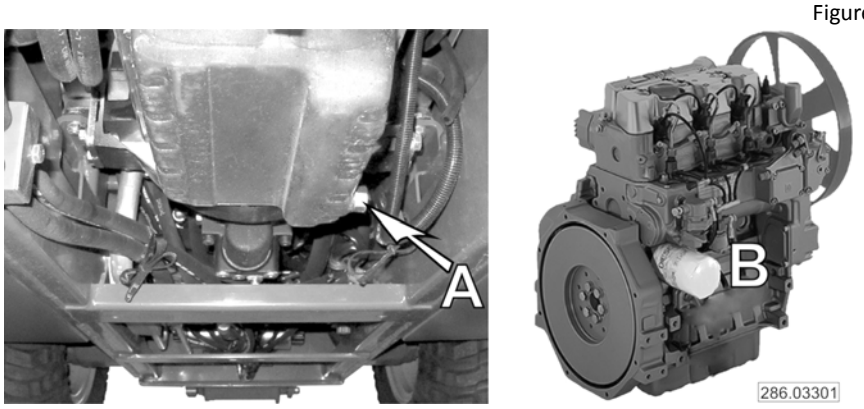
If you get acid on your clothes or skin, rinse it off immediately with plenty of water. If acid gets into your eyes, rinse it off immediately with plenty of water and seek medical care.

### 5.8.3 Engine oil change (11)

**Oil draining:**

- ► Warm up the engine.
- ► Pull the oil dipstick out (oil drains quicker).

Figure 59.




- ► Open the engine oil drain plug (A) in the oil sump and drain the oil into a container.

**Oil filling:**

- ► Clean the drain plug (A) and retighten it in position in the oil sump so that the oil stops draining.
- ► Add the correct volume of the correct grade engine oil through the valve cover filler neck.
- ► Start the engine and let it run for a moment. Check that the oil pressure indicator turns off.
- ► Turn off the engine and check the oil level after a moment using the dipstick. Add oil if necessary.

**Info!**

*See the oil recommendation and volume from the recommendation table: 5.6 on page 47.*

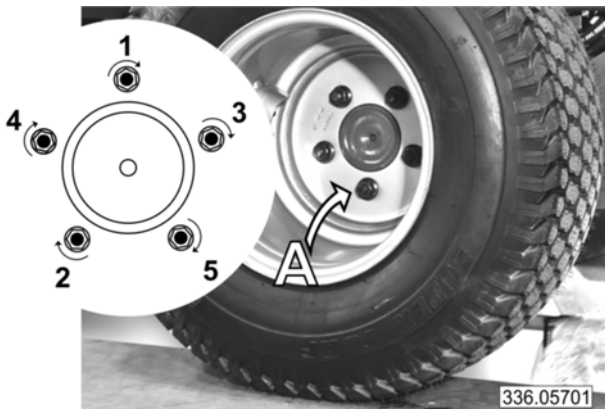
### 5.8.4 Wheel fastener tightening torque check (11)

Figure 60.

Check the tightening torque of the wheel fasteners (A) and retighten if necessary.

The tightening order is as indicated in the figure.

The tightening torque is **200 Nm**.

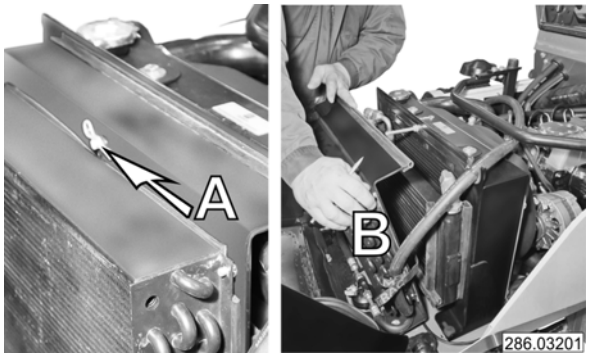


### 5.8.5 Radiator and condenser core cleaning (12)

Clean the radiator core and the cores of the oil condenser and air conditioning condenser by blowing compressed air away from the engine as follows:

- ► Remove the pin (A).
- ► Carefully turn the cores out.
- ► Blow the cores with compressed air away from the engine.

Figure 61.




Huomaa! Notera! Note!

**Do not use a pressure washer or clean the cores mechanically.**

## 5.9 Maintenance every 250 operating hours

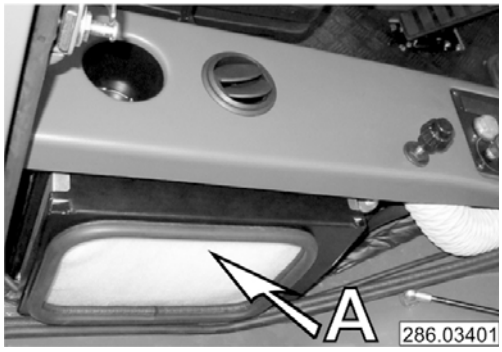
**Also carry out maintenance items 1–12.**

### 5.9.1 Cabin fresh-air filter cleaning (14)

The fresh-air filter is located behind the right door.

- ► Open the door and remove the filter.

Figure 62.




- ► Clean the filter with compressed air, for example, by blowing from the clean side toward the dirty side.
- ► Replace a damaged or dirty filter.

### 5.9.2 Engine air filter replacement (15)

The engine air filter must be replaced according to the maintenance interval table or if the filters are very dirty or damaged.

- ► Turn off the engine for the replacement.

A clogged filter causes the running sound to change or increased smoke generation and loss of power.

- ► Remove the old filters and install the new filters carefully into position.

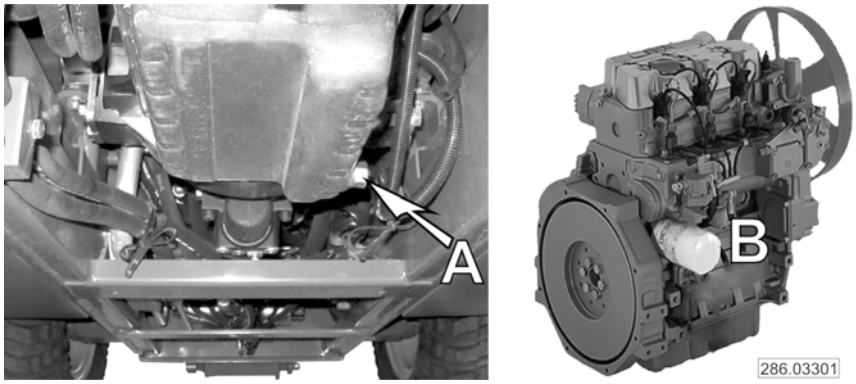
**Info!**

*See the air filter replacement instructions; 5.7.4 on page 49.*

### 5.9.3 Engine oil filter replacement (16)

**While the oil is draining, change the new oil filter (B):**

Figure 63.



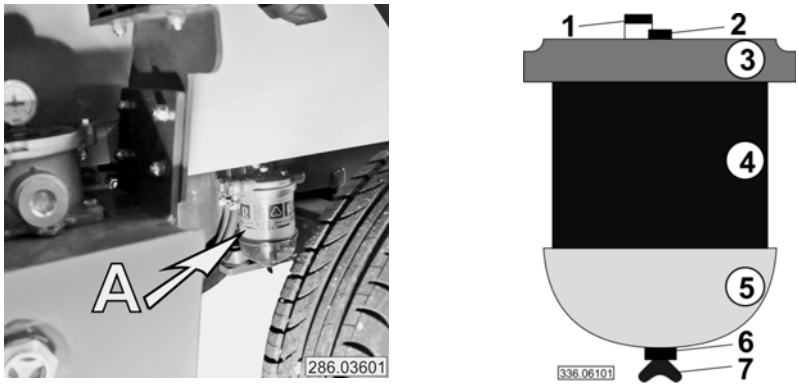

- ► Remove the old filter with a filter wrench.
- ► Wipe off drained oil and ensure that the sealing face of the filter base is clean.
- ► Lubricate the sealing face of the new filter with fresh lubricating oil.
- ► Rotate the filter into position until the sealing face makes contact and then tighten by hand by approximately half a turn.
- ► Start the engine and let it run for a moment. Check that the oil pressure indicator extinguishes.
- ► Turn off the engine and check the oil level after a moment using the dipstick. Add oil if necessary.

### 5.9.4 Fuel water separator cleaning and fuel filter replacement (17)

**Water separator draining:**

- ► Open the drain plug (7) in the bottom of the filter (A) and drain the filter cup.
- ► Close the drain plug (7).

Figure 64.




**Filter replacement:**

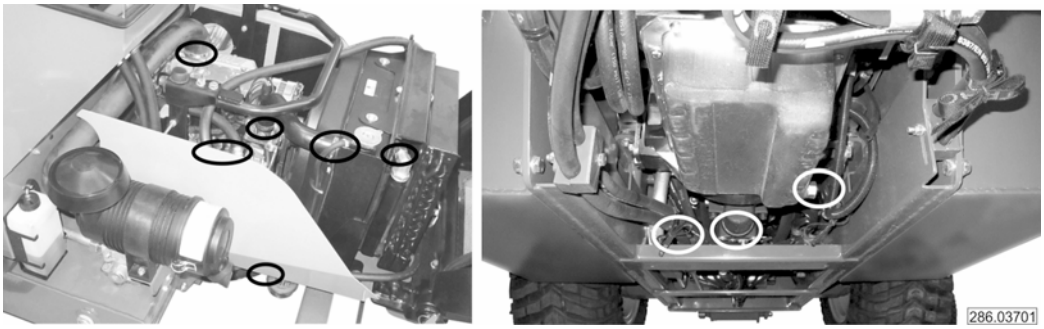
- ► Open the fastener (2) on top of the filter. Take hold of the nut (6) below and remove the old filter.
- ► Clean all parts carefully before reassembly.
- ► Install a new filter and seals.
- ► Bleeding the filter is done using the bleed screw (1) on its cover. Loosen the bleed screw and run the engine for a moment with the starter until the fuel coming from the bleed screw stops “bubbling” (no air left in the fuel).
- ► Retighten the bleed screw.

### 5.9.5 Oil/fluid leak check and connector/connection tightening (18)

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.

Figure 65.

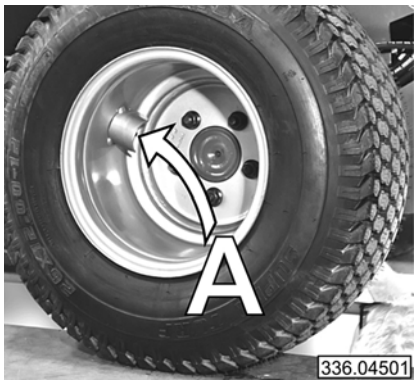



Check the following in the machine:

- Fluid and hydraulic hose connections, radiators/condensers, drain/filler plugs in the engine compartment and under the machine.

### 5.9.6 Tyre inflation pressure check (19)

Figure 66.




Check the tyre inflation pressure using a pressure gauge from valve (A).

A tyre pressure of 2.0 bar is used under normal conditions.

However, the tyre pressure may vary depending on the operation and operating conditions of the machine. The permitted tolerance is 1.0–2.0 bar.

### 5.9.7 Parking brake function check (20)

Check the parking brake function (the switch marked with A).

Figure 67.


The machine must stay safely in position on a slope of 20% when the parking brake is engaged (switch A is ON).

If there are problems with the parking brake function, contact an authorised service workshop immediately.

Huomaa! Notera! Note!

**Using the machine is strictly forbidden if the parking brake is not functioning normally.**

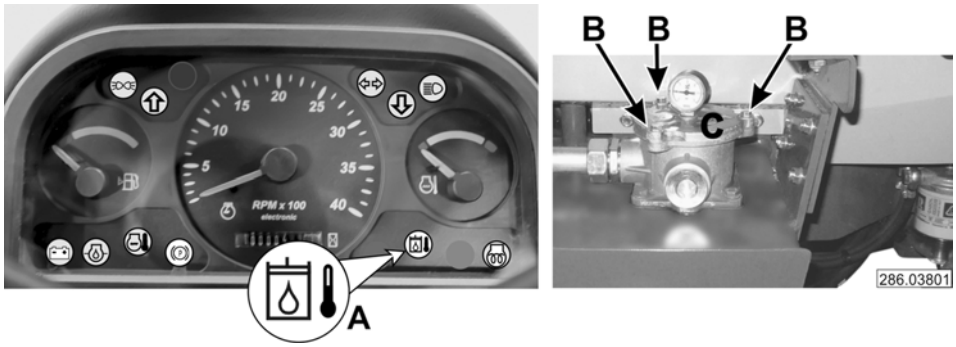
## 5.10 Maintenance every 500 operating hours

**Also carry out maintenance items 1–19.**

### 5.10.1 Hydraulic oil return filter replacement (21)

The hydraulics return filter element must be changed according to the maintenance interval table or immediately if the indicator (A) illuminates.

Figure 68.




The hydraulics return filter is located on the left side of the machine on top of the hydraulic oil tank.

**Filter replacement:**

- ► Turn off the engine.
- ► Remove the screws (B, 3 pcs) on the cover of the return filter.
- ► Lift the used filter element out of the filter chamber (C).
- ► Clean all parts and seal surfaces carefully.
- ► Install a new filter element and O ring seals.
- ► Install the filter cover in position. Tighten the fasteners carefully.
- ► Start the engine and check for possible leaks.

### 5.10.2 Drive pump filter replacement (22)

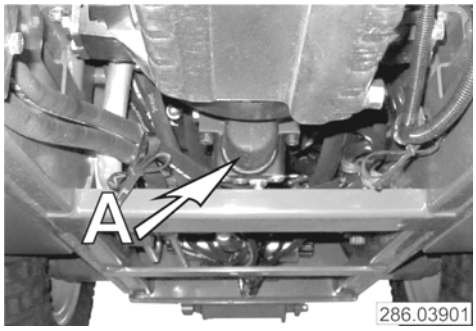
The drive pump filter is changed from underneath the machine.

The filter is located behind the drive pump on the front side of the engine.

The engine must not be running when replacing the filter!

- ► Drive the machine onto a maintenance ramp and lift the maintenance ramp to a suitable height.

Figure 69.




- ► Remove the filter (A) by rotating it open.
- ► Lubricate the seal of the new filter with fresh clean oil and rotate it into position.
- ► Tighten by hand by approximately half a turn when the seal face makes contact.
- ► Start the engine and check for filter tightness.

## 5.11 Maintenance every 1,000 operating hours

**Also carry out maintenance items 1-21.**

### 5.11.1 Air conditioning maintenance (accessory) (23)

Check the air conditioning function. When it comes to air conditioning repairs and fluid filling, contact an authorised service workshop.

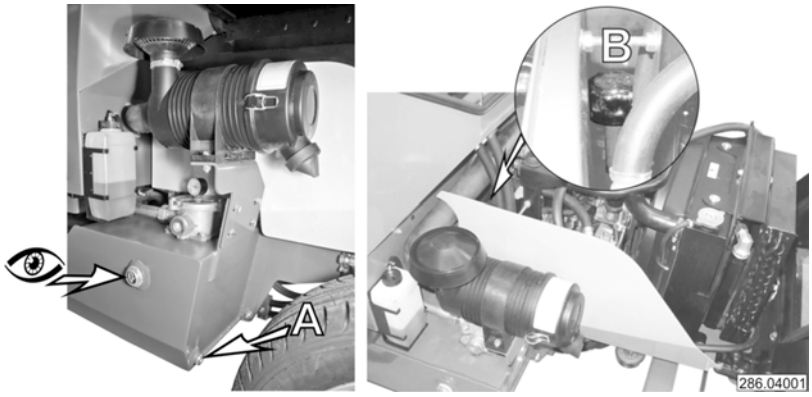
The adding of air conditioning coolant/the checking and adding of lubricant must be done every 3 years in an authorised service workshop.

### 5.11.2 Hydraulic oil change and tank cleaning (24)

**Draining:**

- ► Warm up the hydraulic oil by loading the hydraulics system.
- ► Lower the front lifter down and turn off the engine.
- ► Open the plug (A) on the bottom of the tank and drain the old oil into a container.

Figure 70.




- ► Install the drain plug (A). If you use Teflon tape for sealing, make sure that tape pieces are not carried into the tank.

**Info!**

*Ensure that waste oil is disposed of appropriately.*

**Filling:**

- ► Fill the tank with recommended oil up to the middle of the sight glass provided in the tank through the filler neck (B) underneath the bonnet.
- ► Run the engine for a moment while raising and lowering the front lifter, for example.
- ► Turn off the engine and recheck the oil level from the sight glass.
- ► Add oil if necessary.

**Info!**

*See the oil recommendation and volume, 5.6 on page 47.*

### 5.11.3 Fuel tank cleaning (25)

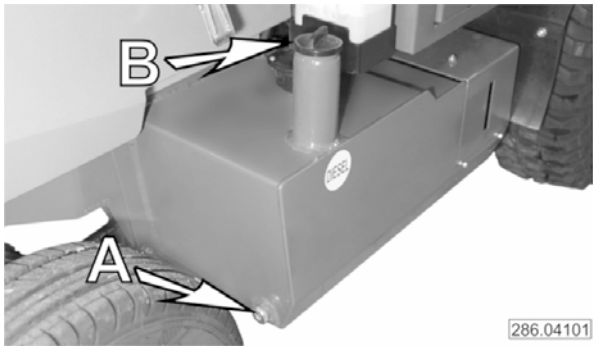
It is recommended always to clean the fuel tank before winter. This helps to prevent fuel system problems caused by water.

The best way to prevent the formation of condensation water is always to keep the tank as full as possible, for example, by topping up the tank at the end of the day.

**Tank cleaning:**

- Open the drain plug (A) on the bottom of the tank and drain the contents into a container.

Figure 71.




Never drain fuel onto the ground.

- Flush the tank as necessary with clean fuel.

- Clean the drain plug and reinstall it. If you use Teflon tape for sealing, make sure that tape pieces are not carried into the tank.

- Fill the tank (B) with fresh, clean fuel.

**Varoitus! Varning! Warning!**

**Using spirit mixed with fuel is expressly forbidden!**

Spirit weakens the lubrication properties of the fuel causing damage to the pump and nozzles and may cause damage to the seals.

### 5.11.4 Nozzle check and cleaning (26)

Nozzles need to be in good condition for the engine to work flawlessly. Their maintenance and repair requires special tools and equipment. It is recommended to use an authorised service workshop.

**A nozzle in need of repair:**

- Knocking running sound.

When the engine is cold, knocking may be heard when the engine is idling, but if the knocking continues at normal operating temperature, the nozzles are probably to blame. Air trapped inside the fuel system may also cause knocking.

► Bleed the fuel system. If the knocking continues, take the machine to an authorised service workshop.

**Smoke generation.**

Smoke may be caused by a faulty nozzle or clogged air filter.

► Check the air filter. If the smoke generation continues, take the machine to an authorised service workshop.

### 5.11.5 Pressure measurement and necessary adjustment of drive hydraulics (27)

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

### 5.11.6 Pressure measurement and necessary adjustment of work hydraulics (28)

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

## 5.12 Maintenance every 2,000 operating hours

**Also carry out maintenance items 1-25.**

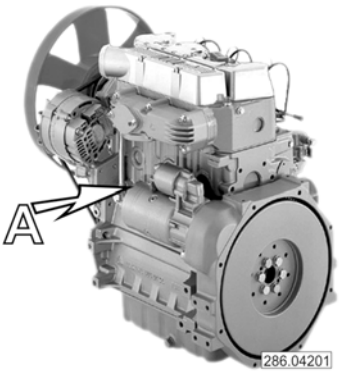
### 5.12.1 Cooling system cleaning (29)

The thorough cleaning of the cooling system is performed as follows:

**Draining and washing:**

1. Open the radiator filler plug.
2. Open the cylinder block drain plug (A) and disconnect the hoses going to the heater. Also disconnect the water hoses going to the radiator from the radiator. Drain the old coolant into a container.

Figure 72.




3. Empty the coolant pump by running the engine with the starter for 2–3 s.
4. Clean the drain plug (A) and reinstall. Tighten carefully.
5. Carefully connect and tighten the hoses you disconnected earlier.

**Info!**

*Ensure the appropriate disposal of the old coolant. Never pour old coolant onto the ground!*

**Filling:**

6. Fill the system completely with coolant (50% clean water and 50% anti-freeze) through the filler plug.

Figure 73.

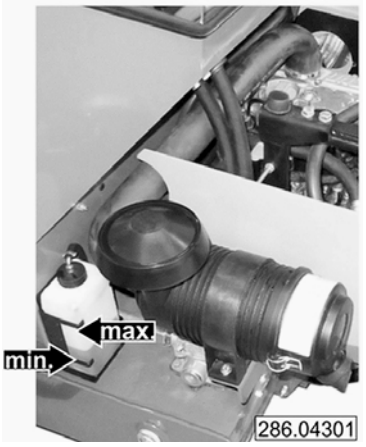

7. Close the filler plug carefully.
8. Fill the expansion tank with coolant to the Min. marking.
9. Run the engine to the normal operating temperature.
10. Check that the expansion tank fluid level is between the Min./Max. markings. Add or drain fluid as necessary.

**If you wish to flush the cooling system, use clean water for the first fill and redo items 1–9.**

Huomaa! Notera! Note!

**Always use coolant for the final fill!**

Figure 74.




Add coolant into the expansion tank as necessary.

**Info!**

*Always use a mix of water and anti-freeze as coolant in a ratio of 1:1 (50% water + 50% anti-freeze).*
*Besides the antifreezing compound, the anti-freeze includes vital compounds that prevent engine and cooling system corrosion.*

The volume of the cooling system is approximately 12 l.

**Varoitus! Varning! Warning!**

**Never pour cold coolant into a hot engine. The cap of a hot, over-pressurised system must be opened very carefully.**

### 5.12.2 Alternator check (30)

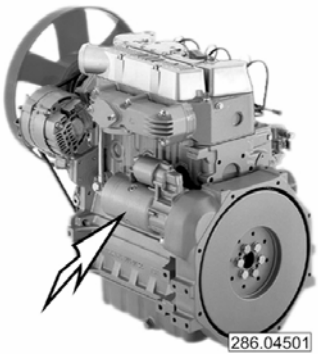
Check that all alternator cables are intact and connections clean. Dirty or loose cable connections may cause charging failures.

Figure 75.


### 5.12.3 Starter check (31)

Check that all starter cables are intact and connections clean. Dirty or loose cable connections may cause starting failures.

Figure 76.




### 5.12.4 Hand brake valve coil replacement (32)

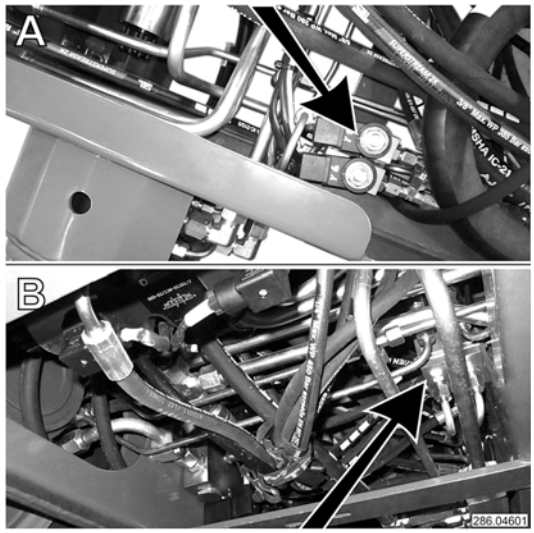
Figure 77.

The hand brake valve is located at the front of the machine chassis in the vicinity of the left front tyre hub motor. The valve coil is changed as follows:

Figure 78.

**A. The coil seen from above.**

**B. The coil seen from underneath the machine.**




- ► Disconnect the electric wires of the coil.
- ► Open the mounting nut, remove the coil and install a new one.
- ► Install and tighten the mounting nut.
- ► Connect the electric wires of the coil.

## 5.13 Machine storage

### 5.13.1 Short-term storage for less than 2 months

No special actions are required, if:

- The machine has been regularly serviced.
- The machine is clean.
- The coolant's resistance to freezing is sufficient for the prevailing temperature.
- The fuel tank is full.
- Appropriate storage for the battery has been arranged.

### 5.13.2 Long-term storage for more than 2 months

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

- ► Clean the machine from inside and out and carry out general lubricating procedures.
- ► Clean the engine air filter case and element.
- ► Drain and flush the cooling system, and fill it with the recommended anti-freeze mixture.
- ► Open the fuel filter drain tap, and let out any water and deposits. Close the tap.
- ► Clean and pour 5 l of protective fuel or 1.5% oil into the fuel tank.
- ► Fill the tank with clean fuel.
- ► Let the engine run until it reaches normal temperature, and drive the machine for a while.
- ► Raise the front lifter to the up position.
- ► Change the engine oil and filter.
- ► Disconnect the nozzles and pour approximately 0.5 dl of protective oil into every cylinder. Rotate the engine with the starter for a moment (the stop lever in the engine bay must be in the STOP position).
- ► Connect the nozzles and use new seals.
- ► Loosen the fan belt.
- ► Protect easily rusting parts with protective oil (CRC or similar).
- ► Cover the air filter and exhaust pipe openings with plastic film.
- ► Disconnect the battery cables.
- ► Ensure that the battery is fully charged. If the machine is stored in a cold environment, remove the battery from the machine. Check the battery charge every 30 days.
- ► Store the machine in a dry, warm space, and protect it against sunlight.
- ► To prevent rust, grease all exposed cylinder shafts.

## 5.14 Machine commissioning

### 5.14.1 After storage of less than 2 months

- ► Check that the battery is fully charged.
- ► Check the oil and fluid levels and tyre inflation pressures.
- ► Perform general lubrication.
- ► Bleed the fuel system if necessary.
- ► Start the engine, but do not over rev it.
- ► Do a test drive to make sure that all equipment functions normally.

### 5.14.2 After storage of more than 2 months

- ► Remove the protective covers and lower the machine.
- ► Remove the plastic film from the exhaust pipe and intake air opening.
- ► Check tyre pressures.
- ► Open the fuel filter drain tap, and let out any water and deposits. Close the tap.
- ► Check the engine oil level.
- ► Check the coolant level.
- ► Check that the battery is fully charged.
- ► Lubricate the battery terminals, connect the battery clamps and tighten them properly.
- ► Perform general lubrication.
- ► Check the hydraulic oil level.
- ► Check the TV-belt condition and tighten it.

- ► Start the engine, but do not over rev it.
- ► Ensure that all covers and hatches are in place and properly attached.

## Varoitus! Varning! Warning!

**Before starting the engine, ensure that all the controls are in neutral and that the parking brake is engaged.**
**Do not run the engine in a confined space! Sufficient ventilation must be ensured under all conditions.**

# 6.0 TECHNICAL SPECIFICATIONS

## 6.1 Dimensions

Table 6:

| DIMENSIONS* | [mm] | WEIGHTS* | [kg] |
|---|---|---|---|
| Length | 2,680 mm | Kerb weight | 1,140 kg |
| Width | 1,340 mm | Front axle weight | 720 kg |
| Height | 2,095 mm | Rear axle weight | 420 kg |
| Wheelbase | 1,540 mm | Largest permitted weight for front axle | 1,600 kg |
| Track width | 1,005 mm | | 1,200 kg |
| Turn radius, min | 1,025 mm | Largest permitted weight for rear axle | 1,600 kg |
| Turn radius, max | 2,825 mm | | |
| Ground clearance | 180 mm | Largest permitted total weight | |

* The above values apply to a machine with the so-called basic equipment and standard tyres.

The values of a machine with accessory equipment may differ from the above values.

### 6.1.1 Engine, general

Lombardini LDW 1603 CHD PLUS, 3-cylinder 4-stroke diesel, liquid cooling, indirect fuel injection, rotation direction in anti-clockwise direction seen from the flywheel side

| | |
|---|---|
| Cylinder diameter: | 88 mm |
| Stroke: | 85 mm |
| number of cylinders: | 3 pcs |
| Displacement: | 1,649 $cm^2$ |
| Nominal output: | 27.6 kW/37.5 hp (2,400 r/min) |
| Maximum torque: | 113 Nm (1,600 r/min) |
| Min. idle: | 900 r/min |

### 6.1.2 Engine lubrication system

Guided-vane pump and replaceable main flow filter.

| | |
|---|---|
| Oil filter: | Paper |

### 6.1.3 Fuel system

| | |
|---|---|
| Fuel | Diesel* |
| Fuel filter: | Paper |

* Heating oil must not be used as fuel.

### 6.1.4 Cooling system

Thermostat-controlled, overpressurised cooling system.

Water pump output 75 l/3,000 r/min.

### 6.1.5 Drive hydraulics

Rexroth, variable-displacement axial-piston pump:

| | |
|---|---|
| Output: | 0–60 l/min/2,400 r/min |
| Pressure: | 350 bar |
| Relief valve opening pressure: | 350 bar |
| Supply pressure: | max. 2.5 Mpa (25 bar) |

Closed, 2WD or 4WD system with driving direction change

forwards/backwards with the drive pedal. Two speed ranges.

| | | |
|---|---|---|
| Hub motors: | Two-speed radial-piston type | |
| Anti-skid: | Electro-hydraulically controlled for the front axle (and for rear axle with 4WD). | |
| Speed ranges: | Electro-hydraulic change: | |
| | 2WD | 4WD |
| - speed range I, slow | 0–10 km/h | 0–6.5 km/h |
| - speed range II, fast | 0–20 km/h | 0–13 km/h |
| - reverse | 0–10 km/h | 0–6.5 km/h |
| Pump output/rev: | 25 $cm^3$/r | |

### 6.1.6 Work hydraulics

Fixed-supply open system

| | |
|---|---|
| Work hydraulics pump: | Gear pump |
| Directional control valves: | 1-stem (engine hydr.) |
| Engine stem control: | Electric ON/OFF control |
| Pump rev displacement: | 19.7 $cm^3$/r |
| Pump output: | 47 l/min (2,400 rpm) |
| System max. pressure: | 200 bar (relief valve opening pressure) |

### 6.1.7 Steering hydraulics

Hydrostatically boosted rear-wheel steering with load sensing, orbitrol system

| | |
|---|---|
| Steering pump: | Gear pump 8 $cm^3$/r |
| Steering valve: | Danfoss |
| Steering cylinders: | 1 pc |
| Pump output: | max. 15 $dm^3$/min |
| Max. pressure | 8 MPa (80 bar) |

### 6.1.8 Brakes

The vehicle brake is an automatic braking function created by the hydraulic drive power train. The machine brakes automatically when pressure is lifted from the drive pedal.

The parking brake is provided by the spring-load plate-compressor brakes (negative brakes) submerged in oil and integrated in the front wheel hub motors.

The parking brake is always engaged when the engine is not running. The parking brake can also be engaged with a separate electric switch.

### 6.1.9 Axles

Rigid suspension to the front and rear body.

The front and rear body rotate with respect to each other.

### 6.1.10 Tyres

| | | |
|---|---|---|
| Standard front tyres: | 31 x 11.50 - 15 | Tyre pressure 0.9–2.0 bar |
| Broad grass front tyre: | 31 x 13.5 - 15 | Tyre pressure 0.9–2.0 bar |
| Rear tyres: | 175/13 | Tyre pressure 1.2–2.0 bar |

Tyre pressures may vary depending on use.

A general pressure guideline is 1.6–1.8 bar both front and back, unless otherwise stated on the tool.

### 6.1.11 Electrical system

| | |
|---|---|
| Voltage: | 12 V |
| Starter: | 2.2 kW |
| AC alternator: | 65 A, 12 V |
| Battery: | 75 Ah, 12 V |
| Earthing: | Negative (–) |
| Fuses: | |
| - Main fuses | 50 A, 2 pcs |
| - Device fuses | 3–20 A, 19 pcs |
| Headlight bulb: | H4/12V 60/55W |
| Working light bulb: | H3, 12V/55W |
| Parking light bulb: | 12V/5W |
| Turn signal bulb: | P21W/12V/21W |
| Brake light bulb: | P21W/12V/21W |
| Beacon bulb: | 12V/55W |

### 6.1.12 Air conditioning (Accessory)

| | |
|---|---|
| Coolant (R 134) fill: | 0.9 kg |

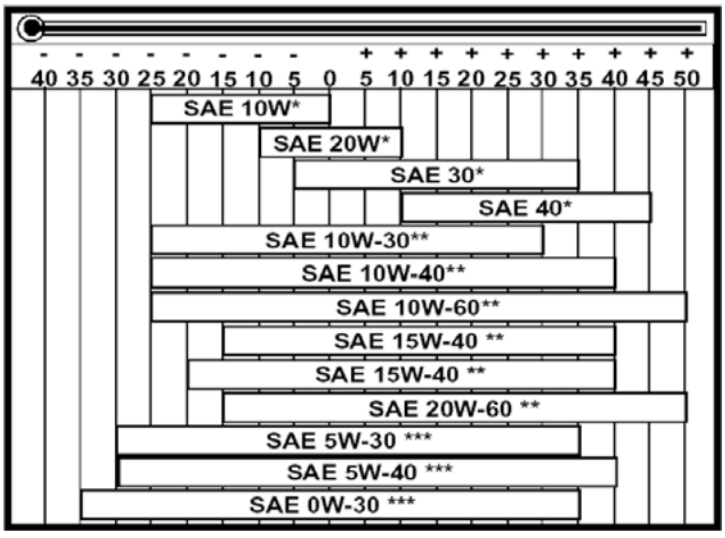
### 6.1.13 Volumes

| | |
|---|---|
| Fuel tank | 35 l |
| Hydraulic oil system | 55 l |
| Engine oil | 5 l |
| Windscreen washer tank | 1.5 l |
| Cooling system | 9 l |
| Air conditioning coolant | 0.9 kg |

### 6.1.14 Viscosity comparison table:

Engine oil viscosity options at different operating temperatures.
* Single-grade, mineral-based
** Semi-synthetic
*** Synthetic

Figure 79.



## 6.2 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.

### 6.2.1 Problem, cause, corrective action

Table 7:

| 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. |
| | Is the parking brake engaged?<br>Engine hydraulics switch in the ON position.<br>Air or water in the fuel system? | Apply the parking brake.<br>Turn the switch to OFF.<br>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. |
| | Blown fuse? | Replace the fuse. |
| 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? | Remove 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: | Blown fuse? | Check/replace the fuse. |
| 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: | Blown fuse? | Check/replace the fuse. |
| The front lifter is not working: | Blown fuse? | Check/replace the fuse. |
| The rear lifter is not working: | Blown fuse? | Check/replace the fuse. |
| Front or rear cylinder hydraulics not working: | The operating switch is faulty or the fuse is blown. | Check and replace the blown fuse. If the fuse is intact, take the machine to an authorised service workshop. |

## 6.3 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.

Huomaa! Notera! Note!

**Timely and correct maintenance is a prerequisite for keeping your warranty in effect. The periodic maintenance item table; See 5.5.1 / p.45.**

Copy the table and mark all performed maintenance procedures in it. Give a copy to the customer when necessary or attach it to the machine's documentation.

Table 8:

| 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>PLEASE NOTE!<br>Perform the daily inspections and lubrication regularly to ensure a long and effective operating life for your machine. |

Table 9:

| 125 h service/every 125 h/min. once a week | Service done |
|---|---|
| Complete this service at 125-hour intervals, or at least once a week, together with the 10-hour service items.<br><br>When the machine's hour counter shows 125 hours, complete the 10 and 125 hour service and the items marked with O in the 125-hour column.<br>The work to be completed can be found in the maintenance table.<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 10:

| Hour counter reading: 250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 250 hours!<br>Complete the maintenance items for 10, 125 and 250 hours.<br><br>The work to be completed can be found in the maintenance table.<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 11:

| Hour counter reading: 375 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 375 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 12:

| 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, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<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 13:

| Hour counter reading: 625 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 625 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 14:

| 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, 125, and 250 hours.<br><br>The work to be completed can be found in the maintenance table.<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 15:

| Hour counter reading: 875 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 875 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 16:

| Hour counter reading: 1,000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,000 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>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 17:

| Hour counter reading: 1,125 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,125 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 18:

| Hour counter reading: 1,250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,250 hours!<br>Complete the service items for 10, 125, and 250 hours.<br><br>The work to be completed can be found in the maintenance table.<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 19:

| Hour counter reading: 1,375 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,375 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 20:

| Hour counter reading: 1,500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,500 hours!<br>Complete the service items for 10, 125, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<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 21:

| Hour counter reading: 1,625 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,625 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 22:

| Hour counter reading: 1,750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,750 hours!<br>Complete the service items for 10, 125, and 250 hours.<br><br>The work to be completed can be found in the maintenance table.<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 23:

| Hour counter reading: 1,875 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 1,875 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 24:

| Hour counter reading: 2,000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,000 hours!<br>Complete the service items for 10, 125, 250, 500, 1,000, and 2,000 hours.<br>The work to be completed can be found in the maintenance table.<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 25:

| Hour counter reading: 2,125 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,125 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 26:

| Hour counter reading: 2,250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,250 hours!<br>Complete the service items for 10, 125, 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 27:

| Hour counter reading: 2,375 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,375 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 28:

| Hour counter reading: 2,500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,500 hours!<br>Complete the service items for 10, 125, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<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 29:

| Hour counter reading: 2,625 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,625 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 30:

| Hour counter reading: 2,750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,750 hours!<br>Complete the service items for 10, 125, 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 31:

| Hour counter reading: 2,875 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 2,875 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 32:

| Hour counter reading: 3,000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,000 hours!<br>Complete the service items for 10, 125, 250, 500, and 1,000 hours.<br>The work to be completed can be found in the maintenance table.<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 33:

| Hour counter reading: 3,125 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,125 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 34:

| Hour counter reading: 3,250 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,250 hours!<br>Complete the service items for 10, 125, 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 35:

| Hour counter reading: 3,375 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,375 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 36:

| Hour counter reading: 3,500 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,500 hours!<br>Complete the service items for 10, 125, 250, and 500 hours.<br>The work to be completed can be found in the maintenance table.<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 37:

| Hour counter reading: 3,625 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,625 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 38:

| Hour counter reading: 3,750 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,750 hours!<br>Complete the service items for 10, 125, 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 39:

| Hour counter reading: 3,875 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 3,875 hours!<br>Complete the maintenance items for 10 and 125 hours.<br><br>The work to be completed can be found in the maintenance table.<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 40:

| Hour counter reading: 4,000 hours | Service done |
|---|---|
| Complete this service when the machine's hour counter reads 4,000 hours!<br>Complete the service items for 10, 125, 250, 500, 1,000, and 2,000 hours.<br>The work to be completed can be found in the maintenance table.<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: |

Huomaa! Notera! Note!

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

Huomaa! Notera! Note!

**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
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