DYNAPAC
Part of the Atlas Copco Group

# Instruction manual

## ICG333HF-2EN1.pdf
**Operation & Maintenance**

**Vibratory roller**
**CG333HF**

**Engine**
**Deutz BF4M 2011 / TD2011 L04W**

**Serial number**
***86120400* -**
**10000329x0A000001 -**


Translation of original instructions

*Subject to changes*
*Printed in Sweden*

# Table of Contents

# Introduction

## Warning symbols

***WARNING ! Marks a danger or a hazardous procedure that can result in life threatening or serious injury if the warning is ignored.***

CAUTION ! Marks a danger or hazardous procedure that can result in damage to the machine or property if the warning is ignored.

## The machine

Dynapac CG333HF is a self-propelled vibratory tandem roller in 9 metric tonnes class featuring pivotal steering and 1680 mm (66 in) wide split drums. The machine is equipped with drive, brakes, vibration and timer for water sprinkler on both drums. Propulsion and braking are applied to all drum halves.

The comfort cab can be flush, i.e. the same width as the machine, or built out on the right side for optimum view of both drums.

## Intended use

CG333HF is mainly designed to be used for thin and thick asphalt layers with regards to dual vibration amplitudes that are optimized for this purpose. It is also possible to compact granular soil material, such as sand and gravel.

## Safety information

***It is recommended to at least train operators in handling and daily maintenance of the machine in accordance with the instruction manual. Passengers are not allowed on the machine, and you must sit in the seat when operating the machine.***

***The safety manual supplied with the machine must be read by all roller operators. Always follow the safety instructions. Do not remove the manual from the machine.***

***We recommend that the operator reads the safety instructions in this manual carefully. Always follow the safety instructions. Ensure that this manual is always easily accessible.***

***Read the entire manual before starting the machine and before carrying out any maintenance.***

***Replace immediately the instruction manuals if lost, damaged or unreadable.***

***Ensure good ventilation (extraction of air by fan) where the engine is run indoors.***

## General

This manual contains instructions for machine operation and maintenance.

The machine must be correctly maintained for maximal performance.

The machine should be kept clean so that any leakages, loose bolts and loose connections are discovered at as early a point in time as possible.

Inspect the machine every day, before starting. Inspect the entire machine so that any leakages or other faults are detected.

Check the ground under the machine. Leakages are more easily detected on the ground than on the machine itself.

THINK ENVIRONMENT ! Do not release oil, fuel and other environmentally hazardous substances into the environment. Always send used filters, drain oil and fuel remnants to environmentally correct disposal.

This manual contains instructions for periodic maintenance normally carried out by the operator.

Additional instructions for the engine can be found in the manufactuer's engine manual.

## CE marking and Declaration of conformity

(Applies to machines marketed in EU/EEC)

This machine is CE marked. This shows that on delivery it complies with the basic health and safety directives applicable for the machine in accordance with machinery directive 2006/42/EC and that it also complies with other directives applicable for this machine.

A "Declaration of conformity" is supplied with this machine, which specifies the applicable directives and supplements, as well as the harmonized standards and other regulations that are applied.

# Safety - General instructions

**(Also read the safety manual)**

1. **The operator must be familiar with the contents of the OPERATION section before starting the roller.**
2. **Ensure that all instructions in the MAINTENANCE section are followed.**
3. **Only trained and/or experienced operators are to operate the roller. Passengers are not permitted on the roller. Remain seated at all times when operating the roller.**
4. **Never use the roller if it is in need of adjustment or repair.**
5. **Only mount and dismount the roller when it is stationary. Use the intended grips and rails. Always use the three-point grip (both feet and one hand, or one foot and both hands) when mounting or dismounting the machine. Never jump down from the machine.**
6. **The ROPS (Roll Over Protective Structure) should always be used when the machine is operated on unsafe ground.**
7. **Drive slowly in sharp bends.**
8. **Avoid driving across slopes. Drive straight up or straight down the slope.**
9. **When driving close to edges, ditches or holes, make sure that at least 2/3 of the drum width is on previously compacted material (solid surface).**
10. **Make sure that there are no obstacles in the direction of travel, on the ground, in front of or behind the roller, or overhead.**
11. **Drive particularly carefully on uneven ground.**
12. **Use the safety equipment provided. The seat belt must be worn on machines fitted with ROPS.**
13. **Keep the roller clean. Clean any dirt or grease that accumulates on the operator platform immediately. Keep all signs and decals clean and legible.**
14. **Safety measures before refueling:**
    **- Shut off the engine**
    **- Do not smoke**
    **- No naked flame in the vicinity of the machine**
    **- Ground the filling device nozzle to the tank to avoid sparks**
15. **Before repairs or service:**
    **- Chock the drums/wheels and under the strike-off blade.**
    **- Lock the articulation if necessary**

16. **Hearing protection is recommended if the noise level exceeds 85 dB(A). The noise level can vary depending on the equipment on the machine and the surface the machine is being used on.**

17. **Do not make any changes or modifications to the roller that could affect safety. Changes are only to be made after written approval has been given by Dynapac.**

18. **Avoid using the roller before the hydraulic fluid has reached its normal working temperature. Braking distances can be longer than normal when the fluid is cold. See instructions in the STOP section.**

19. **For your own protection always wear:**
    **- helmet**
    **- working boots with steel toecaps**
    **- ear protectors**
    **- reflecting clothing/high visibility jacket**
    **- working gloves**

# Safety - when operating

***Prevent persons from entering or remaining in the danger area, i.e. a distance of at least 7 m (23 ft) in all directions from operating machines. The operator may allow a person to remain in the danger area, but should then observe caution and operate the machine only when the person is visible or has given clear indications of where he or she is.***

***Where possible, avoid driving across slopes. Drive instead straight up and down sloping ground.***

## Slopes

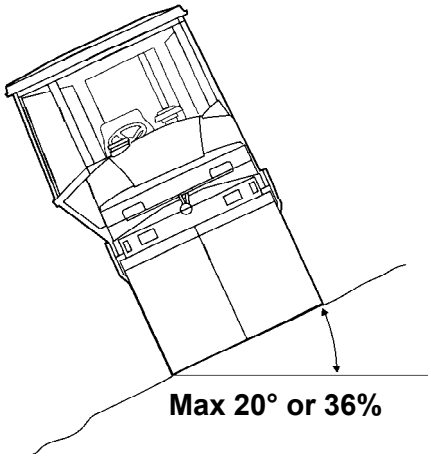



*Fig. Operating on slopes*

This angle has been measured on a hard, flat surface with the machine stationary.

The steering angle was zero, the vibration was switched OFF and all tanks were full.

Always take into consideration that loose ground, steering the drums, vibration on, machine speed across the ground and raising the center of gravity can all cause the machine to topple at smaller slope angles than those specified here.

When driving on steep slopes the fuel tank must be at least half full to ensure the supply of diesel to the engine.

***To exit the cab in an emergency, release the hammer on the rear right post and break the rear window.***

***It is recommended that ROPS (Roll Over Protective Structure), or a ROPS approved cab, is always used when driving on slopes or unsafe ground. Always wear the seat belt.***

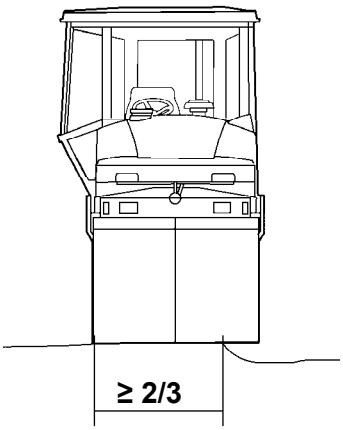



*Fig. Position of drum when driving near an edge*

## Driving near edges

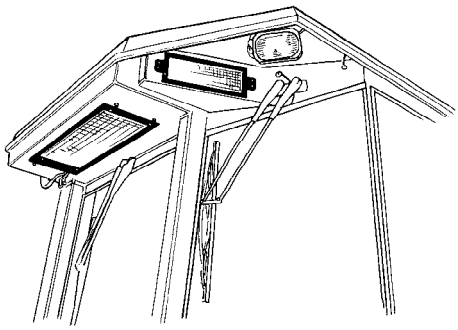
When driving near an edge, minimum 2/3 of the drum width must be on solid ground.

***When using off-set drums, only one drum may move into the position shown in the picture. The other drum must be in contact with the ground across its full width.***

***Keep in mind that the machine's center of gravity moves outwards when steering. For example, the center of gravity moves to the right when you steer to the left.***

# Safety (Optional)

## Air conditioning (Optional)



***The system contains pressurized refrigerant. It is forbidden to release refrigerants into the atmosphere.***

***Work on the refrigerant circuit is only to be carried out by authorized companies.***

***The cooling system is pressurized. Incorrect handling can result in serious personal injury. Do not disconnect or undo the hose couplings.***

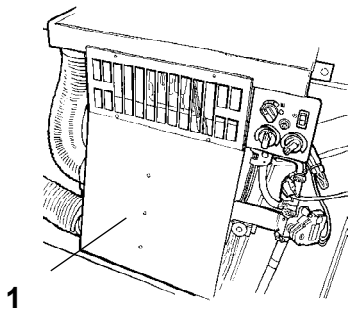



***Fig. Air conditioning***
***1. Cooling system in the cab***

The system must be refilled with an approved refrigerant by authorized personnel when necessary. Refer to the technical specifications.

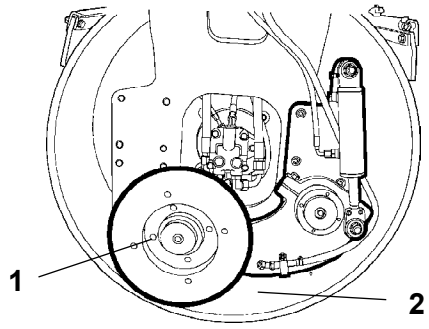



*Fig. Edge cutter/edge roller*
*1. Transport position*
*2. Operation position*

## Edge cutter/edge roller (Optional)

***The operator must make sure that nobody is in the area of operation while the machine is in use.***

***The edge cutter consists of rotating components and there is a risk of being crushed.***

The tool is to be returned to the transport position (1) immediately after use.

## Chip spreader (Optional)

***The machine must not be transported with chip in the chip spreader. The weight for the chip spreader is noted on the sign plate of the unit. This weight is not included in the machine weight noted on the lift plate.***

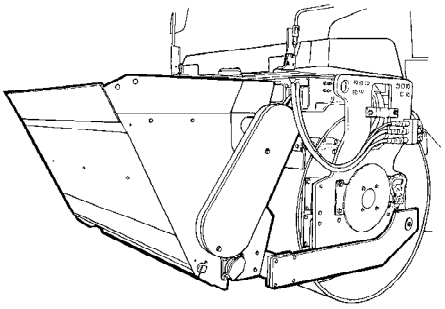


*Fig. Chip spreader*

***The operator must make sure that nobody is in the area of operation while the machine is in use.***

***Risk of personal injury or being crushed. The chip spreader contains rotating components.***

The chip spreader must be reset in transport mode after it has been used.

## Working lights - Xenon

***Warning, high voltage!***

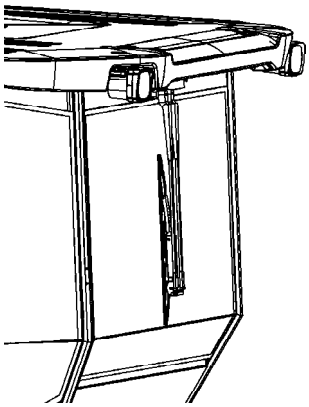


*Figure. Xenon lighting on cab*

The working lights of the Xenon type have a secondary high-voltage source.

Work on the lighting should only be conducted by an authorized electrician and with the primary voltage disconnected.

Contact a Dynapac dealer!

***Warning, environmentally hazardous waste!***

Working lights of the Xenon type include a discharge lamp that contains mercury (Hg).

A defective lamp is to be considered as hazardous waste and shall be disposed off as per local directives.

# Special instructions

## Standard lubricants and other recommended oils and fluids

Before leaving the factory, the systems and components are filled with the oils and fluids specified in the lubricant specification. These are suitable for ambient temperatures in the range -15°C to +40°C (5°F - 104°F).

The maximum temperature for biological hydraulic fluid is +35°C (95°F).

## Higher ambient temperatures, above +40°C (104°F)

For operation of the machine at higher ambient temperatures, however maximum +50°C (122°F), the following recommendations apply:

The diesel engine can be run at this temperature using normal oil. However, the following fluids must be used for other components:

Hydraulic system - mineral oil Shell Tellus T100 or similar.

## Temperatures

The temperature limits apply to standard versions of rollers.

Rollers equipped with additional equipment, such as noise suppression, may need to be more carefully monitored in the higher temperature ranges.

## Lower ambient temperature - Freeze risk

Make sure that the watering system is empty/drained of water (sprinkler, hoses, tank/s) or that anti-freeze has been added, to prevent the system freezing.

## High pressure cleaning

Do not spray directly onto electrical components.

Do not use high pressure cleaning for dashboard/display.

The Electrical Drive Control and the computer box may not be washed with high pressure cleaning and not at all with water. Clean them with a dry wiper.

Detergent that can destroy electrical parts, or which is conductive, must not be used.

Place a plastic bag over the fuel filler cap and secure with a rubber band. This is to avoid high pressure water entering the vent hole in the filler cap. This could cause malfunctions, such as the blocking of filters.

Never aim the water jet directly at the fuel tank cap. This is particularly important when using a high-pressure cleaner.

## Fire fighting

If the machine catches fire, use an ABE-class powder fire extinguisher.

A BE-class carbon dioxide fire extinguisher can also be used.

## Roll Over Protective Structure (ROPS), ROPS approved cab

***If the machine is fitted with a Roll Over Protective Structure (ROPS, or ROPS approved cab) never carry out any welding or drilling in the structure or cab.***

***Never attempt to repair a damaged ROPS structure or cab. These must be replaced with new ROPS structure or cabs.***

## Battery handling

***When removing batteries, always disconnect the negative cable first.***

***When fitting batteries, always connect the positive cable first.***

Dispose of old batteries in an environmentally friendly way. Batteries contain toxic lead.

Do not use a quick-charger for charging the battery. This may shorten battery life.

## Jump starting

***Do not connect the negative cable to the negative terminal on the dead battery. A spark can ignite the oxy-hydrogen gas formed around the battery.***

***Check that the battery used for jump starting has the same voltage as the dead battery.***

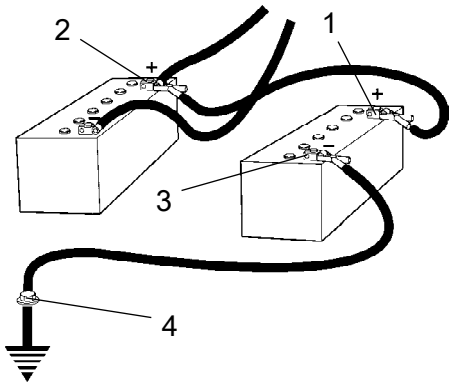



***Fig. Jump starting***

Turn the ignition and all power consuming equipment off. Switch off the engine on the machine which is providing jump start power.

First connect the jump start battery's positive terminal (1) to the flat battery's positive terminal (2).Then connect the jump start battery's negative terminal (3) to, for example, a bolt (4) or the lifjting eye on the machine with the flat battery.

Start the engine on the power providing machine. Let it run for a while. Now try to start the other machine. Disconnect the cables in the reverse order.

# Technical specifications

## Vibrations - Operator station

**(ISO 2631)**

| |
|---|
| **The vibration levels are measured in accordance with the operational cycle described in EU directive 2000/14/EC on machines equipped for the EU market, with vibration switched on, on soft polymer material and with the operator's seat in the transport position.** |
| Measured whole-body vibrations are below the action value of 0.5 m/s² as specified in Directive 2002/44/EC. (Limit is 1.15 m/s²) |
| Measured hand/arm vibrations also were below the action level of 2.5 m/s² specified in the same directive. (Limit is 5 m/s²) |

## Noise level

**The noise level is measured in accordance with the operational cycle described in EU directive 2000/14/EC on machines equipped for the EU market, on soft polymer material with vibration switched on and the operator's seat in the transport position.**

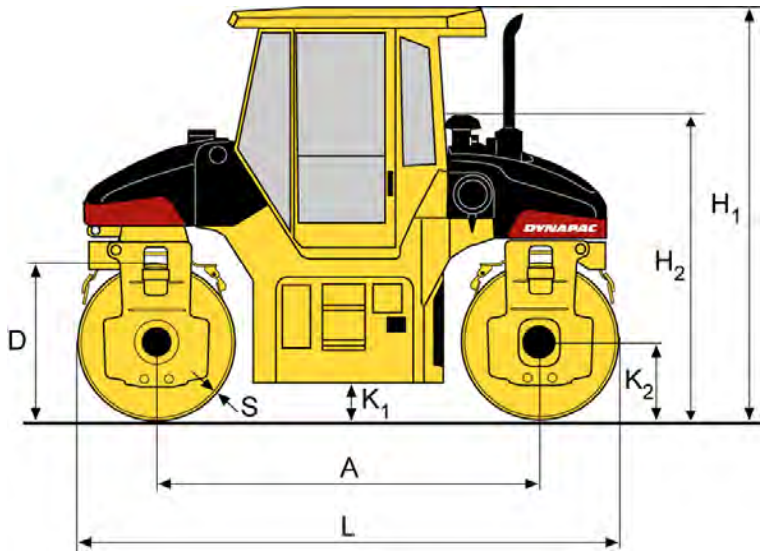
| | |
|---|---|
| Guaranteed sound power level, $L_{wA}$ | 106 dB (A) |
| Sound pressure level at the operator's ear (cab), $L_{pA}$ | 79 ±3 dB (A) |

**During operation the above values may differ because of the actual operational conditions.**

## Electrical system

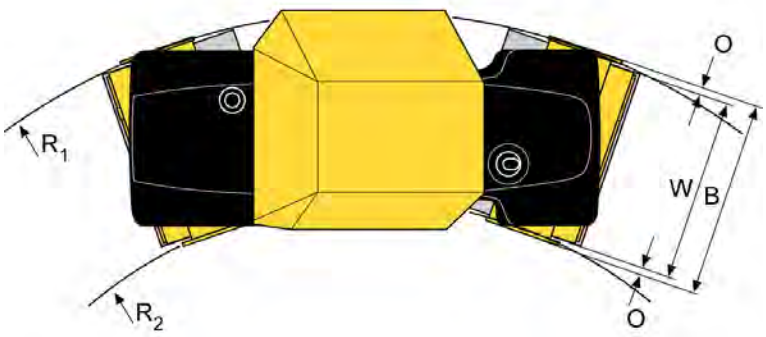
**Machines are EMC tested in accordance with EN 13309:2000 'Construction machinery'**

## Dimensions, side view




| Dimensions | mm | in |
|---|---|---|
| A | 2950 | 116 |
| D | 1120 | 44 |
| $H_1$ | 2950 | 116 |
| $H_2$ | 2120 | 83 |
| $K_1$ | 270 | 10.6 |
| $K_2$ | 870 | 34.3 |
| L | 4070 | 160 |
| S | 17 | 0.7 |

## Dimensions, top view




| Dimensions | mm | in |
|---|---|---|
| B | 1805 | 71.1 |
| O | 65 | 2.6 |
| R1: Without displacement | 5430 | 213.8 |
| R2: Without displacement | 3750 | 147.7 |
| W | 1680 | 66 |
| Off-set distance | 900 | 35.4 |

## Weights and volumes

### Weights

| | | | | |
|---|---|---|---|---|
| Service weight (EN500) | 8600 | kg | 18.960 | lbs |
| Service weight with cab | 8600 | kg | 18.960 | lbs |

### Fluid volumes

| | | | | |
|---|---|---|---|---|
| Fuel tank | 100 | liters | 26.4 | gal |
| Water tanks | | | | |
| - front | 350 | liters | 92.5 | gal |
| - rear | 385 | liters | 101.5 | gal |

## Working capacity

### Compaction data

| | | | | |
|---|---|---|---|---|
| Static linear load, front | 25,6 | kg/cm | 143.4 | pli |
| Static linear load, rear | 25,6 | kg/cm | 143.4 | pli |
| Amplitude, high | 0,5 | mm | 0.020 | in |
| Amplitude, low | 0,2 | mm | 0.008 | in |
| Vibration frequency, high amplitude | 54 | Hz | 3 240 | vpm |
| Vibration frequency, low amplitude | 71 | Hz | 4 260 | vpm |
| Centrifugal force, high amplitude | 82 | kN | 18 450 | lb |
| Centrifugal force, low amplitude | 60 | kN | 13 500 | lb |

**Note: The frequency is measured at high revs. The amplitude is measured as the real value and not the nominal.**

### Propulsion

| | | | | |
|---|---|---|---|---|
| Speed range | 0-12 | km/h | 0-7.5 | mph |
| Gradeability (theoretical) | 38 | % | | |

## General

### Engine

| | | |
|---|---|---|
| Manufacturer/Model | Deutz BF4M 2011 / TD2011 L04W | |
| Power (SAE J1995) | 62 kW / 65kW | 84 hp / 88 hp |
| Engine speed | 2700 rpm / 2600 rpm | |

### Electrical system

| | |
|---|---|
| Battery | 12V 170Ah |
| Alternator | 12V 80A |
| Fuses | See the Electrical system section - fuses |

## Hydraulic system

| Opening pressure | MPa | PSI |
|---|---|---|
| Drive system | 42.0 | 6090 |
| Supply system | 2.4 | 350 |
| Vibration system | 35.0 | 5080 |
| Control systems | 20.0 | 2900 |
| Brake release | 1.8 | 260 |

## Automatic Climate Control (ACC) (Optional)

The system described in this manual is type ACC (Automatic Climate Control), i.e. a system which maintains the set temperature in the cab provided the windows and doors are kept closed.

Coolant designation: HFC-R134:A

Coolant weight when full: 1600 gram (3.53 lbs)

## Tightening torque

Tightening torque in Nm (lbf.ft) for oiled or dry bolts tightened with a torque wrench.

**Metric coarse screw thread, bright galvanized (fzb):**

**STRENGTH CLASS:**

| M - thread | 8.8, Oiled | 8.8, Dry | 10.9, Oiled | 10.9, Dry | 12.9, Oiled | 12.9, Dry |
|---|---|---|---|---|---|---|
| **M6** | 8,4 | 9,4 | 12 | 13,4 | 14,6 | 16,3 |
| **M8** | 21 | 23 | 28 | 32 | 34 | 38 |
| **M10** | 40 | 45 | 56 | 62 | 68 | 76 |
| **M12** | 70 | 78 | 98 | 110 | 117 | 131 |
| **M14** | 110 | 123 | 156 | 174 | 187 | 208 |
| **M16** | 169 | 190 | 240 | 270 | 290 | 320 |
| **M20** | 330 | 370 | 470 | 520 | 560 | 620 |
| **M22** | 446 | 497 | 626 | 699 | 752 | 839 |
| **M24** | 570 | 640 | 800 | 900 | 960 | 1080 |
| **M30** | 1130 | 1260 | 1580 | 1770 | 1900 | 2100 |

**Metric coarse thread, zinc-treated (Dacromet/GEOMET):**

**STRENGTH CLASS:**

| M - thread | 10.9, Oiled | 10.9, Dry | 12.9, Oiled | 12.9, Dry |
|---|---|---|---|---|
| **M6** | 12,0 | 15,0 | 14,6 | 18,3 |
| **M8** | 28 | 36 | 34 | 43 |
| **M10** | 56 | 70 | 68 | 86 |
| **M12** | 98 | 124 | 117 | 147 |
| **M14** | 156 | 196 | 187 | 234 |
| **M16** | 240 | 304 | 290 | 360 |
| **M20** | 470 | 585 | 560 | 698 |
| **M22** | 626 | 786 | 752 | 944 |
| **M24** | 800 | 1010 | 960 | 1215 |
| **M30** | 1580 | 1990 | 1900 | 2360 |

# Machine description

## Identification

### Product identification number on the frame

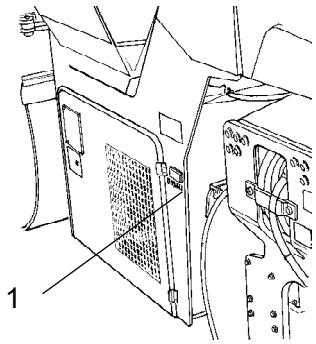



*Fig. 1. PIN Frame right side*

The machine PIN (product identification number) (1) is punched on the front right side of the frame.

### Machine plate

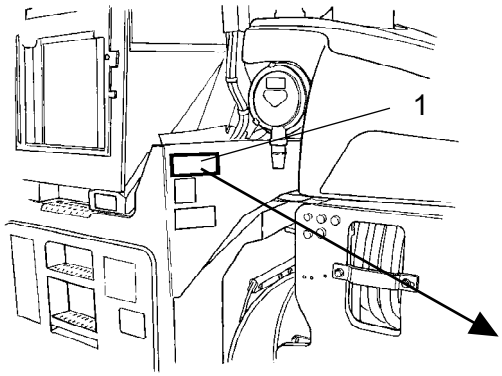
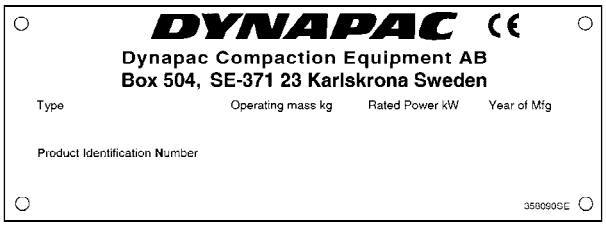



*Fig. Operator platform*
*1. Machine plate*

The machine type plate (1) is affixed on the rear left side of the frame.

The plate specifies the manufacturer's name and address, the type of machine, the PIN product identification number (serial number), service weight, engine power and year of manufacture. (on machines supplied to outside the EU, there are no CE markings and in some cases no year of manufacture.)




**Please state the machine's PIN when ordering spares.**

| | | | | | |
|---|---|---|---|---|---|
| 100 | 00123 | V | 0 | A | 123456 |
| A | B | C | D | E | F |

## Explanation of 17PIN serial number

A= Manufacturer

B= Family/Model

C= Check letter

D= No coding

E= Production unit

F= Serial number

## Engine plates

The engine type plate (1) is attached to the top of the engine.

The plate specifies the type of engine, its serial number and the engine specification.

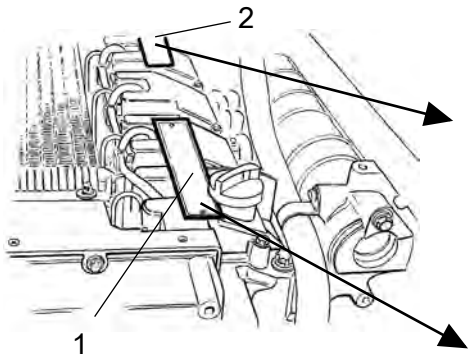
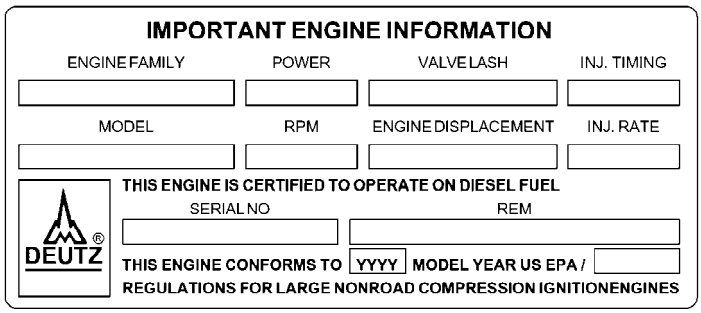
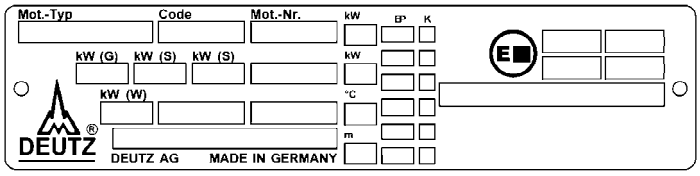



*Fig. Engine*
*1. Type plate*
*2. EPA plate (USA)*




Please specify the engine serial number when ordering spares. Refer also to the engine manual.



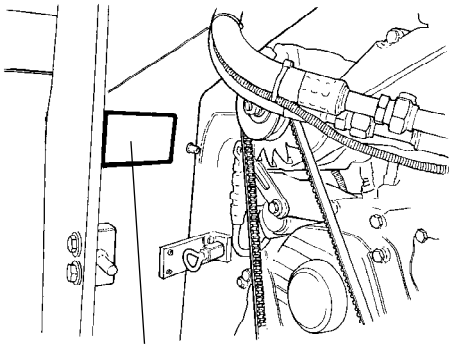



***Fig. Right engine compartment***
***1. Engine plate***

An engine plate is also mounte on the frame inside the right engine cover. Placed nearby the alternator.

# Decals

## Location - decals

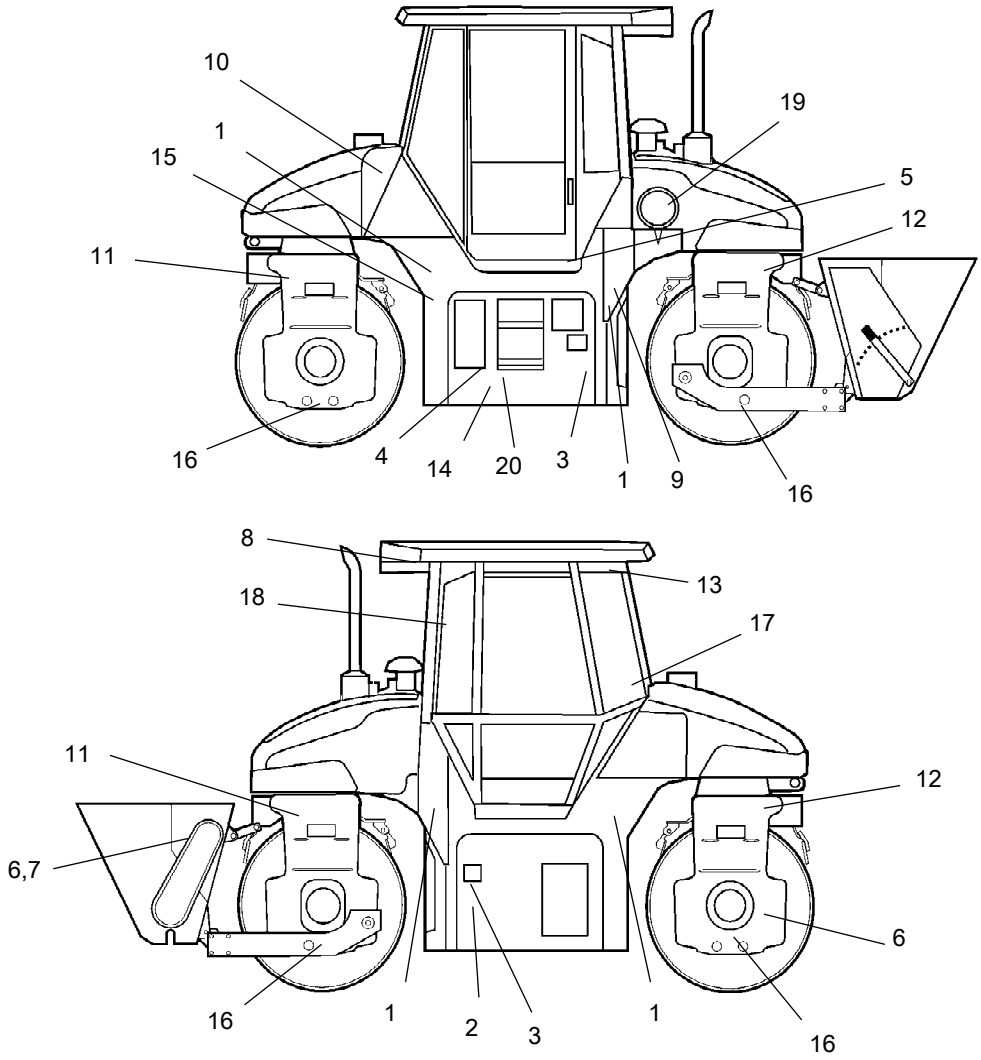



*Fig. Location, decals and signs*

1. Warning, Crush zone
2. Warning, Rotating engine components
3. Warning, Hot surfaces
4. Warning, Brake release
5. Warning, Instruction manual
6. Warning, Rotating components (Edge cutter, Chip spreader)*
7. Warning, Crush zone (Chip spreader)*
8. Warning, Toxic gas (ACC)*
9. Noise power level
10. Diesel fuel
11. Lifting point
12. Hoisting plate
13. Handbook compartment
14. Hydraulic fluid
15. Battery isolator switch
16. Securing point
17. Warning sign
18. Emergency exit
19. Warning, Starting gas)
20. Shut off valve (Brake release)

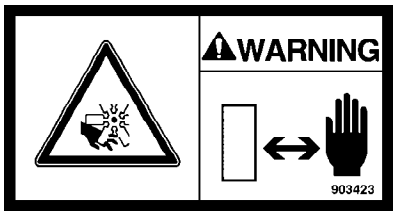
* Option

## Safety decals

Always make sure that all safety decals are completely legible, and remove dirt or order new decals if they have become illegible. Use the part number specified on each decal.

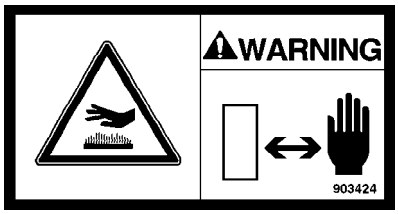

**903422**
**Warning - Crush zone, drum.**

**Maintain a safe distance from the crush zone.**



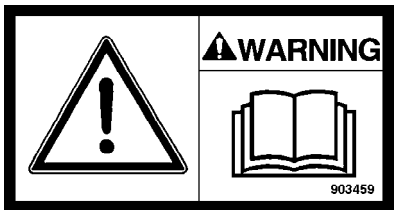

**903423**
**Warning - Rotating engine components.**

**Keep your hands at a safe distance from the danger zone.**



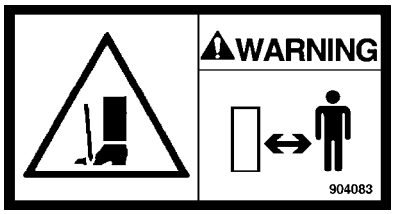

**903424**
**Warning - Hot surfaces in the engine compartment.**

**Keep your hands at a safe distance from the danger zone.**




**903459**
**Warning - Instruction manual**

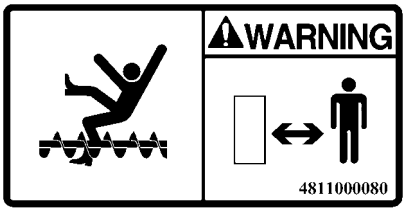
**The operator must read the safety, operation and maintenance instructions before operating the machine.**




**904083**
**Warning - Edge cutter (option)**

**Warning of rotating parts.**

**Maintain a safe distance from the crush zone.**




**4811000080**
**Warning - Chip spreader (optional)**

**The spreader has rotating components.**

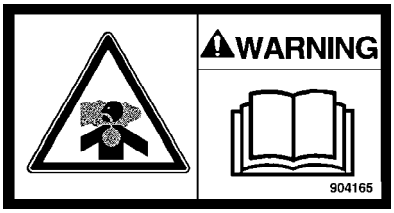
Never insert your hands or any objects when the spreader is in operation.

Always stop the roller motor before carrying out adjustments or maintenance on the spreader.


**903422**
**Warning - Crush zone, chip spreader (optional)**

**Risk of personal injury or being crushed.**

**Keep well clear of the spreader's working area**




**904165**
**Warning - Toxic gas (accessory, ACC)**

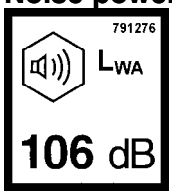
**Read the instruction manual.**


**791642**
**Warning - Starting gas**

**Starting gas is not to be used.**

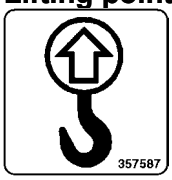
## Info decals

**Noise power level**

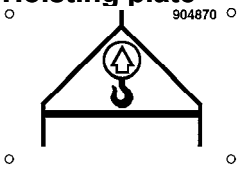



**Diesel fuel**

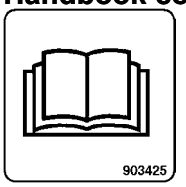

**Lifting point**



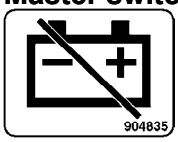

**Hoisting plate**



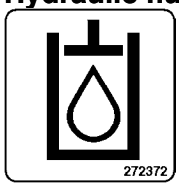

**Handbook compartment**



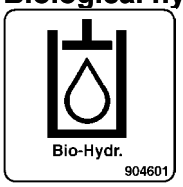

**Master switch**



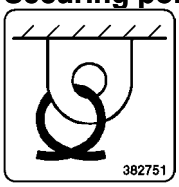

**Hydraulic fluid**



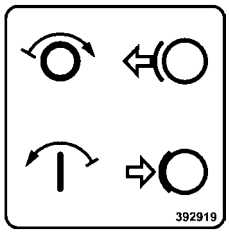

**Biological hydraulic fluid**



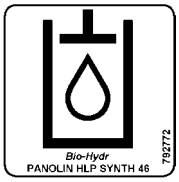

**Securing point**




**Shut off valve**




**Biological hydraulic fluid, PANOLIN**





**Emergency exit**

# Instruments/Controls

## Locations - Instruments and controls

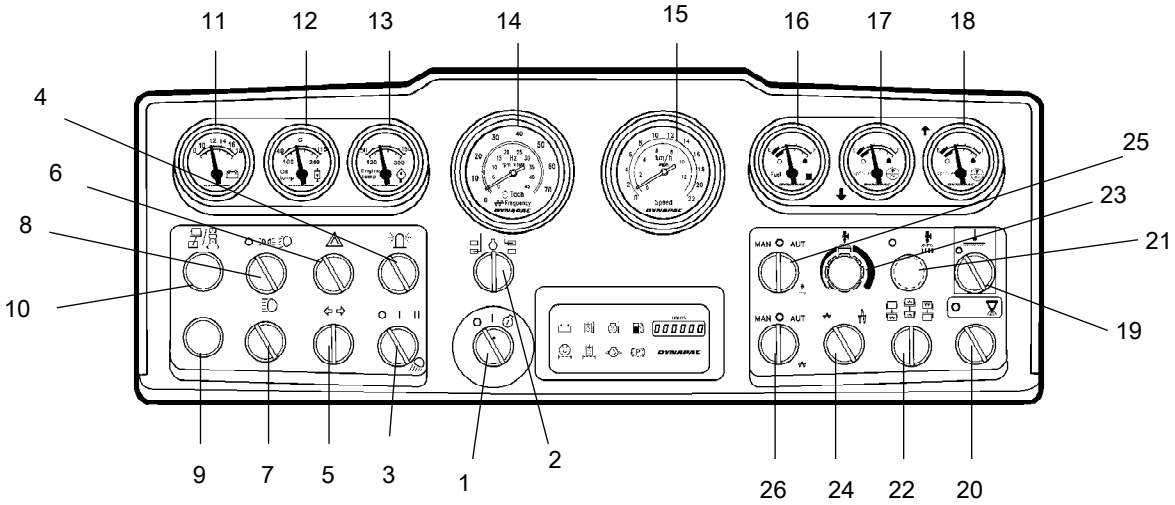



***Fig. Instruments and control panel***

1. Starter switch
2. Rpm/Frequency selector
3. Working lights, cab/front/rear on the machine
4. * Hazard beacon
5. * Direction indicator switch
6. * Hazard warning lights
7. * Main beam switch
8. * Parking/dipped beam switch
9. Central warning lamp (error codes)
10. Control lamp, off-set position, steering limit
11. Voltmeter
12. Hydraulic fluid temperature
13. Engine oil temperature
14. Engine speed/Vibration frequency
15. Speedometer
16. Fuel gauge
17. Level gauge, rear water tank
18. Level gauge, front water tank
19. * Asphalt temp. meter, On/Off
20. * Chip spreader
21. -
22. Vibration, both/front/rear drum
23. Sprinkler timer
24. Amplitude selector, High/Low
25. Manual/Automatic sprinkler (AWC)
26. Manual/Automatic vibration (AVC)

* = optional equipment

## Locations - Control panel and controls

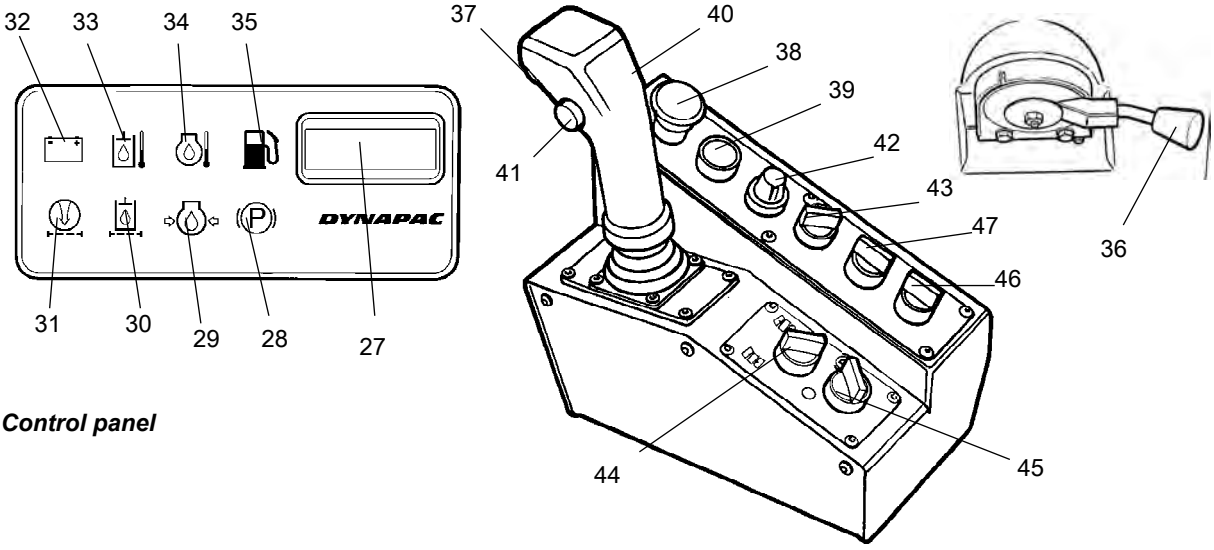
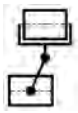


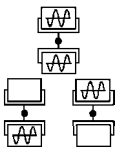

*Fig. Control panel*

| | | |
|---|---|---|
| 27. | | Hourmeter |
| 28. | | Brake warning lamp |
| 29. | | Warning lamp, engine oil pressure |
| 30. | | Warning lamp, hydraulic filter |
| 31. | | Warning lamp, air filter |
| 32. | | Warning lamp, battery charging |
| 33. | | Warning lamp, hydraulic temperature |
| 34. | | Warning lamp, engine temperature |
| 35. | | Warning lamp, fuel level |
| 36. | | Engine speed control |
| 37. | | Alignment (off-set), buttons |
| 38. | | Emergency stop |
| 39. | | Horn |
| 40. | | Forward/Reverse lever |
| 41. | | Vibration On/Off |
| 42. | | Speed limiter |
| 43. | | Transport/Work mode |
| 44. | | Steering both drums (synchro)/front drum |
| 45. | | Parking brake On/Off |
| 46. | * | Sprinkler, edge cutter |
| 47. | * | Edge cutter, Up/Down |

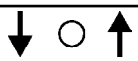
## Function descriptions

| No | Designation | Symbol | Function |
|---|---|---|---|
| 1 | Starter switch |  | The electric circuit is broken. |
| | |  | All instruments and electric controls are supplied with power. Pre-heating, hold until lamp goes out. |
| | |  | Starter motor activation. |
| 2 | Engine speed |  | The current engine speed is shown in this position on the instrument above (14). |
| | Vibration frequency measurement, switch | | In the left position, frequency is measured on the rear rear drum. |
| | | | In the right position, frequency is measured on the front drum. |
| 3 | Working lights, switch |  | When turning to the right to position I, the working lights in the cab are lit. |

| No | Designation | Symbol | Function |
|---|---|---|---|
| | | | Turning to position II lights the frame and cab working lights. |
| 4 | Hazard beacon, switch |  | Turn to the right to switch on the hazard beacon. |
| 5 | Direction indicator, switch |  | Turn to the left to switch on the left direction indicators, to the right to switch on the right direction indicators. The direction indicators are off in the middle position. |
| 6 | Hazard warning lights, switch |  | Turn the switch to the right to turn on the hazard warning lights. |
| 7 | Main/dipped beam switch with control lamp |  | In the right position, the switch lights and the main beam is on.<br>In the left position, the dipped beam is on. |
| 8 | Driving lights, switch |  | Lights off. |
| | |  | Parking lights on |
| | |  | Front dipped lights on |
| 9 | Central warning lamp | | Indicates error codes. Explanation of error codes according to error code list. |
| 10 | Control lamp, drum position |  | The lamp indicates that the sides of the drums are not aligned (off-set). The lamp flashes when the drums are close to their outer positions. |
| 11 | Voltmeter |  | Shows electrical system voltage.<br>Normal range is 12-15 volts. |
| 12 | Temperature gauge, hydraulic fluid |  | Shows hydraulic fluid temperature.<br>Normal temperature range is 65°-80°C (149°-176°F).<br>Stop the engine if the gauge shows a temperature of more than 85°C (185°F). Locate the fault. |
| 13 | Temperature gauge, engine oil |  | Shows the engine oil temperature.<br>Normal temperature is around 95°C (194°F).<br>Stop the engine if the gauge shows a temperature of more than 120°C (248°F). Locate the fault. |
| 14 | Engine speed / Frequency meter |  | The inner scale shows current engine speed.<br>The outer scale shows vibration frequency for the rear or front drum. |
| 15 | Speedometer |  | The outer scale shows speed in km/h.<br>The inner scale shows speed in mph. |
| 16 | Fuel gauge |  | Shows level in the fuel tank. |
| 17 | Water gauge |  | Shows level in the rear water tank. |
| 18 | Water gauge |  | Shows level in the front water tank. |
| 19 | Asphalt temperature gauge, off/on (option) | | The temperature is read at the instrument on the instrument panel. |
| 20 | Chip spreader (option) | | |

| No | Designation | Symbol | Function |
|---|---|---|---|
| 21 | - | | - |
| 22 | Vibration, front/rear drum, switch |  | In the left position, vibration is activated for the rear drum.<br>In the middle position, vibration is activated for both drums.<br>In the right position, vibration is activated for the front drum. May only be regulated when the vibrations are switched off. |
| 23 | Sprinkler timer, switch |  | The switch has six different timer positions which controls the amount of water supplied to the drums.<br>The left mode supplies least water and the right mode most. |
| 24 | Amplitude / Frequency selector, switch |  | The left position gives low amplitude / high frequency. |
| | |  | The right position gives high amplitude / low frequency. |
| 25 | Watering, switch | MAN<br>O<br>AUTO | In the left position, the drums are continually watered.<br>In the middle position, watering is off. |
| | |  | In the right position, watering is automatically switched on/off via the forward/reverse lever when the direction of travel is changed. |
| 26 | Vibration setting, switch | MAN<br>O<br>AUTO | In the left position, the vibration is switched on or off by the switch (41).<br>In the middle position, the vibration system is off. |
| | |  | In the right position, vibration is automatically switched on or off via the forward/reverse lever, controlled via speed. |
| 27 | Hourmeter | | Diesel engine operating time is shown in hours. |
| 28 | Parking warning lamp |  | The lamp lights when the parking brake knob is activated and the brakes are applied. |
| 29 | Warning lamp, oil pressure |  | The lamp comes on if the engine oil pressure is too low.<br>Stop the engine immediately and locate the fault. |
| 30 | Warning lamp, hydraulic filter |  | If the lamp comes on while the engine is running at full speed, the hydraulic filter must be changed. |
| 31 | Warning lamp, air filter |  | If the lamp comes on while the engine is running at full speed, the air filter must be cleaned or replaced. |
| 32 | Warning lamp, battery charging |  | If the lamp comes on while the engine is running, the alternator is not charging.<br>Stop the engine and locate the fault. |
| 33 | Warning lamp, hydraulic fluid temperature |  | If the lamp comes on, the hydraulic fluid is too hot.<br>Do not drive the roller. Cool the fluid by allowing the engine to idle and locate the fault. |
| 34 | Warning light, engine oil temperature |  | If the lamp comes on, the engine is too hot. Stop the engine immediately and locate the fault.<br>Refer also to the engine manual. |

| No | Designation | Symbol | Function |
|---|---|---|---|
| 35 | Warning lamp, low fuel level |  | When the lamp comes on, there is only a small amount of fuel left.<br>Refuel as soon as possible. |
| 36 | Engins speed control, engine | | In the right position, the engine idles.<br>In the left position, the engine runs at maximum speed. |
| 37 | Off-set, buttons |  | By pressing the left button, the front drum is positioned to the left.<br>By pressing both buttons at the same time, the drums are reset to the neutral position.<br>By pressing the right button, the front drum is positioned to the right. |
| 38 | Emergency stop | | When pressed, the diesel engine is stopped and the ECU reset. |
| 39 | Horn, switch |  | Press to sound the horn. |
| 40 | Forward/Reverse lever | | The lever must be in neutral to start the diesel engine. The engine cannot be started if the forward/reverse lever is in any other position.<br>The forward/reverse lever controls both the roller's driving direction and speed. When the lever is moved forward, the roller moves forward etc.<br>The roller's speed is proportional to the distance the lever is from the neutral position. The further the lever is from the neutral position, the higher the speed. If you are using working mode and quickly (panic) move the F/R lever toward neutral, the machine switches to transport mode for rapid braking. Automatic application of brakes, 2 sec. delay, when the control is in neutral. |
| 41 | Vibration On/Off, switch |  | Press once and release to switch the vibration on, press again to switch the vibration off.<br>The above only applies when switch 26 is in the left position. |
| 42. | Speed limiter |  | The speed (0-12 km/h) is adjusted infinitely variably by turning the potentiometer. Left position gives the lowest speed. |
| | |  | Right position gives the highest speed. |
| 43. | Transport / Working mode | | In left position (transport mode), it is not possible to switch on vibration or off-set driving. The speed ramps allow rapid starting and short braking distances.<br>In the right position (working mode), the vibrations and off-set can be engaged. The machine works with gentle speed ramps in order not to leave marks on the ground. |
| 44. | Steering, both drums/front drum | | In left position, steering on both front and rear drums is obtained (simulated articulated joint). In right position, steering on front drum only is obtained. |
| 45. | Parking brake, On/Off |  | In left position, the parking brake is switched off and in right position it is switched on. **Always use the Parking brake when stationary on sloping surfaces.** |
| 46 | Sprinkler, edge cutter, switch |  | In the left position, watering is off. |
| | |  | In the right position, the edge cutter disc is watered. |

| No | Designation | Symbol | Function |
|---|---|---|---|
| 47 | Edge cutter, Up/Down switch |  | In the left position, the edge cutter moves downwards.<br>In the middle position, the edge cutter is stationary.<br>In the right position, the edge cutter moves upwards. |

## Locations - Instruments and controls, cab

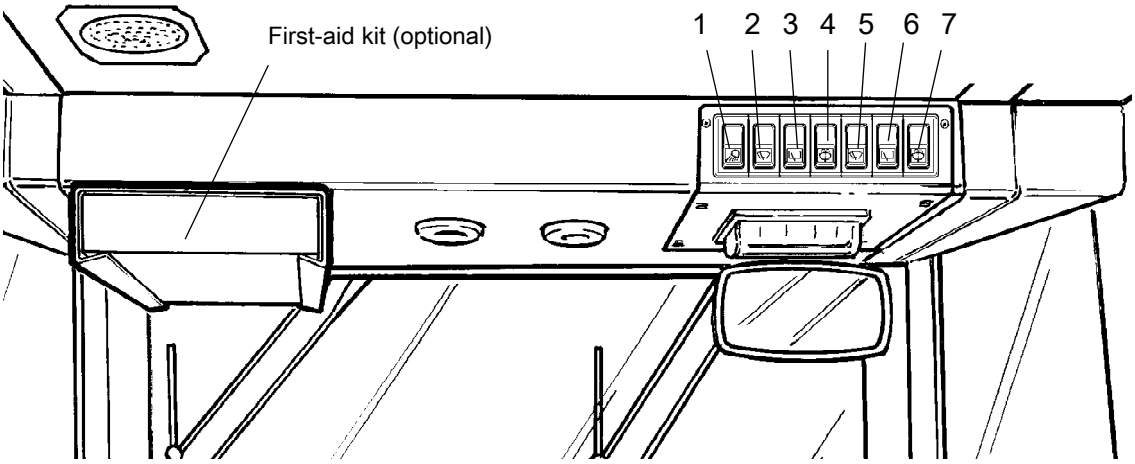



*Fig. Cab roof, front*

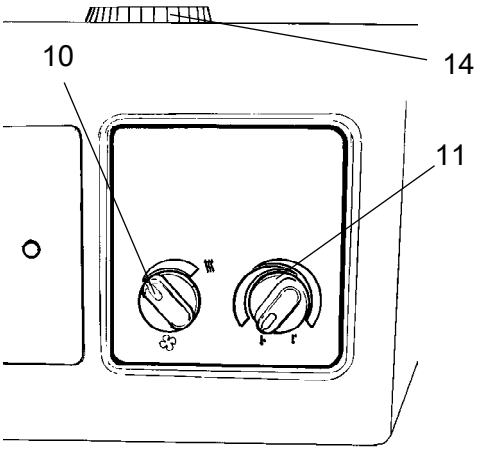



*Fig. Cab rear, with heater*

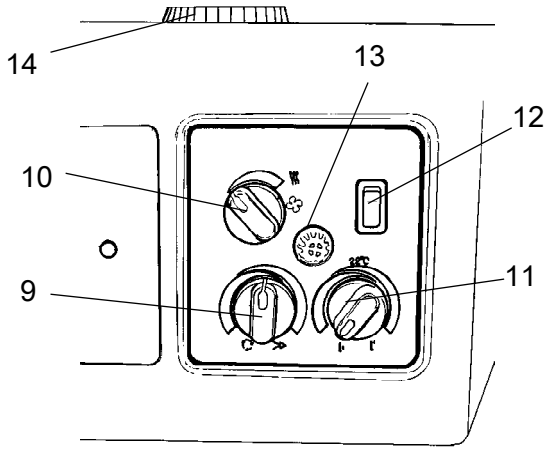



*Fig. Cab rear, with ACC (optional)*

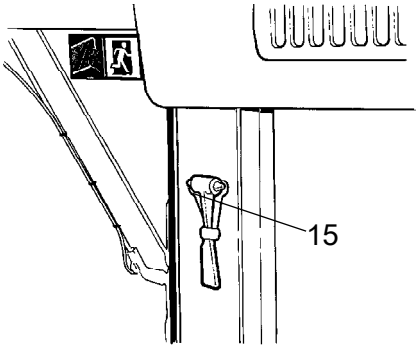
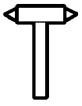



*Fig. Rear right cab post*

## Function description of instruments and controls in the cab

| No | Designation | Symbol | Function |
|---|---|---|---|
| 1 | Working lights, switch |  | Press to switch on the working lights on the front drum. |
| 2 | Front wiper, switch |  | Press to operate the front screen wiper. |
| 3 | Rear wiper, switch |  | Press to operate the rear screen wiper. |
| 4 | Front and rear window screen washers, switch |  | Press the upper edge to activate the front screen washers.<br>Press the lower edge to activate the rear screen washers. |
| 5 | Front side window wiper, switch |  | Press to operate the front side window wiper. |
| 6 | Rear side window wiper, switch |  | Press to operate the rear side window wiper. |
| 7 | Side window washers, switch |  | Press the upper edge to activate the front side window washers.<br>Press the lower edge to activate the rear side screen washers. |
| 8 | Fuse box |  | Contains fuses for the electrical system in the cab. |
| 9 | Cab air recirculation, switch |  | In the left position, the maximum volume of air is recirculated.<br>In the right position, the volume recirculated is minimal. |
| 10 | Ventilation fan, switch |  | In the left position, the fan is off.<br>Turning the knob to the right increases the volume of air entering the cab. |
| 11 | Heater control |  | Turn to the right to increase heating.<br>Turn to the left to reduce heating. |
| 12 | Air conditioning, switch |  | Starts and stops the air conditioning. |
| 13 | Temperature sensor | | Registers the temperature in the cab. Do not cover. |
| 14 | Defroster nozzle | | Turn the nozzle to direct the flow of air. |
| 15 | Hammer for emergency exit |  | To escape from the cab in an emergency, release the hammer and break the **REAR** window. |

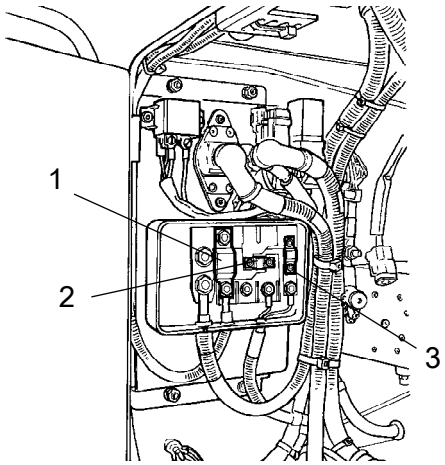



*Fig. Fuses, left engine compartment*
*1. Main fuse, cab (100A)*
*2. Main fuse, lights (50A)*
*3. Main fuse, standard (30A)*

## Electrical system

The fuses in the engine compartment are located inside the battery isolation switch.

The machine is equipped with a 12V electrical system and an AC alternator.

***Connect the correct polarities (ground) to the battery. The cable between the battery and the alternator must not be disconnected when the engine is running.***

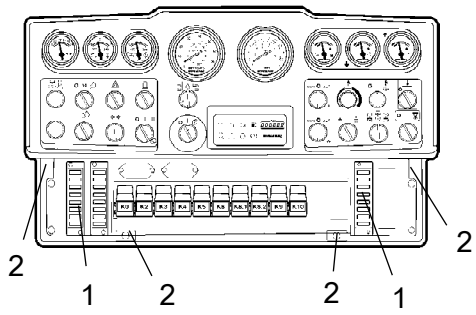



*Fig. Instrument panel*
*1. Fuse box*
*2. Quick-fit screws*

### Fuses

The electrical regulation and control system is protected by 24 fuses, located under the instrument panel and in the engine compartment.

The four fuse boxes (1) are located behind the lower instrument plate, which is opened by turning the four quick-fit screws (2) a 1/4 turn counter-clockwise.

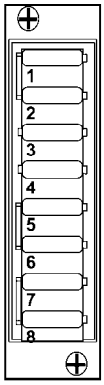



*Fig. Fuse box*

## Fuses

The figure shows the position of the fuses.

There are two fuse boxes on the left side of the panel's lower edge (F1 & F2) and one on the right side (F3).

The table below gives fuse amperage and function. All fuses are flat pin fuses.

| | | | | | |
|---|---|---|---|---|---|
| | **Fuse box, left (F1)** | | | | |
| 1. | Control unit (ECU) (F1.1) | 10A | 5. | Vibration (F1.5) | 5A |
| 2. | Start, Fuel solenoid (F1.2) | 5A | 6. | Signal horn (F1.6) | 5A |
| 3. | Indicator panel (F1.3 | 3A | 7. | Reversing alarm (F1.7) | 3A |
| 4. | Forward/Reverse lever box (F1.4) | 5A | 8. | 12V outlet, relay cab fan+ACC (F1.8) | 10A |
| | **Fuse box, left (F2)** | | | | |
| 1 | Sprinkler pump, front | 7.5A | 5 | Edge cutter / Gravel spreader | 7.5A |
| 2 | Sprinkler pump, rear | 7.5A | 6 | Working lights, cab | 20A |
| 3 | Main fuse, sprinkler | 15A | 7 | Working lights, frame | 20A |
| 4 | Instrument | 5A | 8 | Hazard beacon | 7.5A |
| | **Fuse box, right (F3)** | | | | |
| 1 | Dipped/Main beam, left front | 7.5A | 5 | Direction indicators, main fuse | 10A |
| 2 | Dipped/Main beam, right front | 7.5A | 6 | Direction indicators, left front & left rear | 20A |
| 3 | Position lights, left front & left rear / Brake lights | 7.5A | 7 | Direction indicators, right front & right rear | 20A |
| 4 | Position lights, right front & right rear | 5A | 8 | Reserve | |

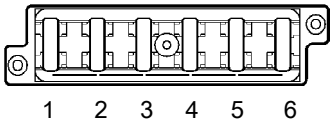



*Fig. Cab roof fuse box*

1. AC condensor 20A
2. Radio 10A
3. Lighting 15A
4. AC fan 25A
5. Rear screen wiper/washers 15A
6. Front screen wiper/washers 15A

## Fuses in cab

The electrical system in the cab has a separate fuse box located on the front right side of the cab roof.

The figure shows fuse amperage and function.

All fuses are flat pin fuses.

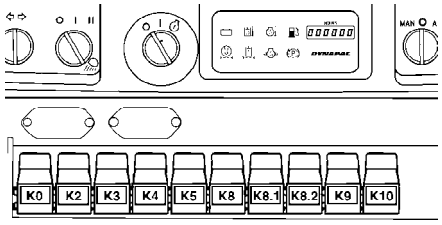



*Fig. Instrument panel*

## Relays in panel

| | |
|---|---|
| *K0* | *Frequency converter (tachograph)* |
| *K2* | *Main relay* |
| *K3* | *Fuel cut off valve* |
| *K4* | *Horn* |
| *K5* | *Sprinkler* |
| *K8* | *Main relay, lights* |
| *K8.1* | *Working lights, cab* |
| *K8.2* | *Working lights, frame* |
| *K9* | *Direction indicators* |
| *K10* | *Brake lights* |

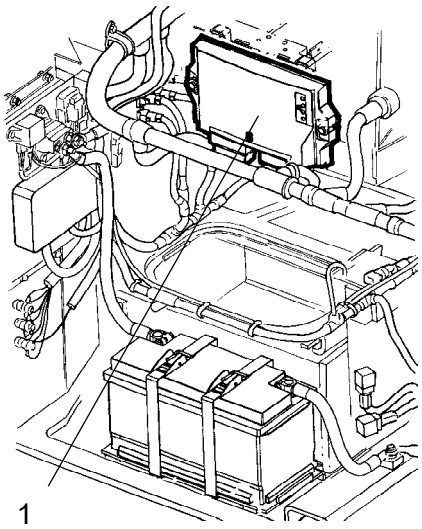



*Fig. Control unit, left engine compartment*
*1. Control unit (ECU)*

The control unit (the ECU) in the engine compartment is located under the platform inside the left engine compartment door.

This control unit looks after the electrical drive control, including vibration, steering, start-stop.

Signals any faults in the system with error codes, see error code list for troubleshooting.

## Fault indicating on the control unit (ECU)

| | Example of sequence | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | On | Off | On | Off | On | Off | On | Off |
| Time in seconds | 1.2 s | 0.7 s | 0.2 s | 0.7 s | 0.2 s | 0.7 s | 0.2 s | 0.7 s |
| Signal | - | | • | | • | | • | |
| | Long | | Short | | Short | | Short | |
| | 2 seconds between each sequence | | | | | | | |

## Error code list

| *Error code | Type of fault | System reaction | Comments |
|---|---|---|---|
| — • • • | Fault on Joystick, F/R lever | The speed reduces and the machine stops. Limp home device | Cable break/no contact, recalibration, outside limiting values. Check cables 401-1, 722, 909-1 and potentiometer. |
| • • — — | Fault on potentiometer for speed | The speed is reduced: 33% of max speed | Cable break, recalibration, outside limiting values. Check cables 401-2, 721, 909-2 and potentiometer. |

| *Error code | Type of fault | System reaction | Comments |
|---|---|---|---|
| ● — ● — | The machine can be moved even though the parking brake is on. | The speed is reduced: 33% of max speed | Cable break, recalibration, outside limiting values. Check cables 401-2, 721, 909-2 and potentiometer. |
| — — ● ● | Fault on neutral position switch in F/R lever | | Cable break/no contact, switch has moved. Check cables 205-6, 312. |
| — — — — | Angle sensor, rear syncro mode | Only front drum steering is possible | Cable break/no contact at sensor, recalibration. Switch to front mode. |
| — — — ● | Front angle sensor in syncro mode | Only front drum steering is possible | Cable break/no contact, recalibration. Switch to front mode. |
| ● ● ● — | No revs on diesel engine | | Cable break/no contact. Check cable 802. |
| — ● — ● | Fault on EDC valve | | Cable break/no contact |
| — ● ● — | Not possible to steer offset (rear drum) | | Cable break/no contact |
| ● ● ● ● | Incorrect value from motor temperature sensor | The cooling fan is running at full speed | Outside a limiting value (lower), cable break. |
| ● — — — | Fault on sprinkler potentiometer | The sprinkler pump is running all the time | Cable break/no contact, or outside limiting values. Check cables 402-3, 735. |
| ● — — ● | Diesel engine revs too low for vibration | Vibration switches off. | Not possible to vibrate between 1,100 - 2,000 rpm |
| ● — ● ● | Signal lost from temperature sensor | | Cable break/no contact on cable 806-2 |
| | Diesel engine revs too high | Brake is activated | Overspeed protection at 3,400 rpm releases at 3,200 rpm |
| | Interlock not working | Alarm goes on, and the diesel engine stops. | Self-indicating, machine stops |
| | Offset does not return to neutral/blocked | 0-position indicating lamp on instrument panel | Self-indicating |

# Operation

## Before starting

### Master switch - Switching on

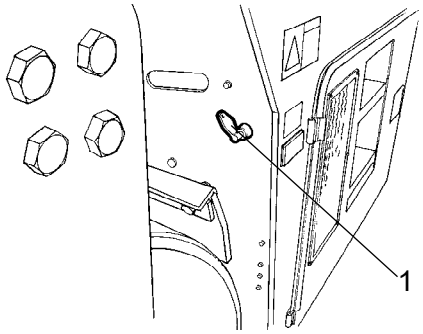



*Fig. Step side (left engine door)*
*1. Master switch*

Remember to carry out daily maintenance. Refer to the maintenance instructions.

The battery isolation switch is located on the step side's front engine compartment wall. Turn the key (1) clockwise to the on position. The entire roller is now supplied with power.

### Control unit, operator's seat - Adjusting

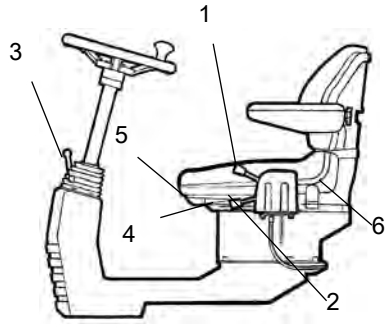



*Fig. Operator position*
*1. Locking lever - transverse travel*
*2. Locking lever - rotation*
*3. Locking lever - steering column angle*
*4. Locking lever - length adjustment*
*5. Lever - backrest inclination*
*6. Lever - weight adjustment*

The control unit has three adjustment options, transverse travel, rotation and steering column angle.

For transverse travel, raise the inner lever (1), which releases the catch.

For rotation, lift the outer lever (2).
Ensure that the control unit locks in position before operating the machine.

Release locking lever (3) to adjust the steering column. Lock in the new position.

The seat can be adjusted as follows: - Length adjustment (4)
- Backrest inclination (5)
- Weight adjustment (6)

***Adjust all settings when the machine is stationary.***

***Always ensure that the seat is in locked position before operating the roller.***

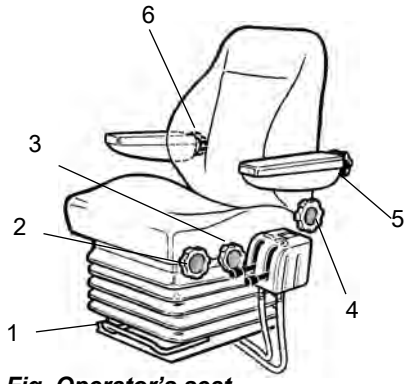



***Fig. Operator's seat***
***1. Lever - length adjustment***
***2. Wheel - height adjustment***
***3. Wheel - seat cushion inclination***
***4. Wheel - backrest inclination***
***5. Wheel - armrest inclination***
***6. Wheel - lumbar support adjustment***

## Operator's seat in cab - Adjusting

The control unit has three adjustment options, transverse travel, rotation and steering column angle.

Adjust the operator's seat so that the position is comfortable and so that the controls are within easy reach.

The seat can be adjusted as follows:
- Length adjustment (1)
- Height adjustment (2)
- Seat-cushion inclination (3)
- Backrest inclination (4)
- Armrest inclination (5)
- Lumbar support adjustment (6)

***Always ensure that the seat is locked in position before operating the roller.***

## Interlock

The roller is equipped with Interlock.

The engine switches off 7 seconds after the operator rises from the seat.

The engine stops whether the forward/reverse lever is in the neutral or the drive position.

The engine does not stop if the parking brake is activated.

***Sit down for all operations!***

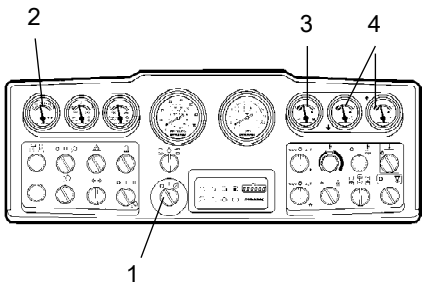



*Fig. Instrument panel*
*1. Starter switch*
*2. Voltmeter*
*3. Fuel gauge*
*4. Water level gauge*

## Instruments and lamps - Checking

Turn the starter switch (1) to the middle position. All warning lamps should come on for about 5 seconds and the buzzer should sound. Make sure that the warning lamps remain on throughout this period.

Check that the voltmeter (2) reads at least 12 volts, and that the other gauges (3, 4) show readings.

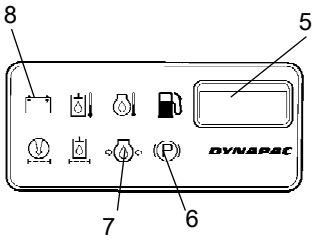



*Fig. Control panel*
*5. Hourmeter*
*6. Brake lamp*
*7. Oil pressure lamp*
*8. Charging lamp*

Check that the warning lamps for charging (8), oil pressure (7) and the parking brake (6) come on.

The hourmeter (5) registers and shows the total number of hours the engine has run.

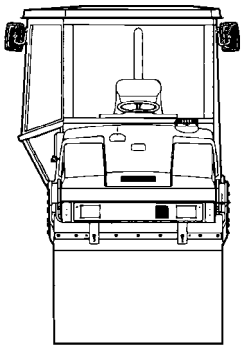


*Fig. View*

## View

Before starting, make sure that the view forwards and backwards is unobstructed.

All cab windows should be clean and the rear view mirrors should be correctly adjusted.

The machine can be equipped with working mirrors (accessory). These must be folded in during transport.

### Operator position

Always wear the seat belt (1) provided and wear a protective helmet.

***Replace the seat belt (1) if it shows signs of wear or has been subjected to high levels of force.***

Check that rubber elements (4) on the cab are intact. Worn elements will impair comfort.

***Make sure that the cab door is closed when in motion.***

## Starting

### Starting the engine

Set the forward/reverse lever (1) in neutral. The engine can only be started when the lever is in neutral.

Set the engine speed control (2) to idling.

Set the vibration switch (6) for manual/automatic vibration in the mid position (position 0).

Make sure that the emergency stop (3) is disengaged, otherwise the engine will not start.

Turn the starter switch (5) to the right to the first position. A lamp in the knob comes on. When the lamp goes out, turn the knob to the start position and release immediately the engine starts. This particularly important when starting the machine from cold.

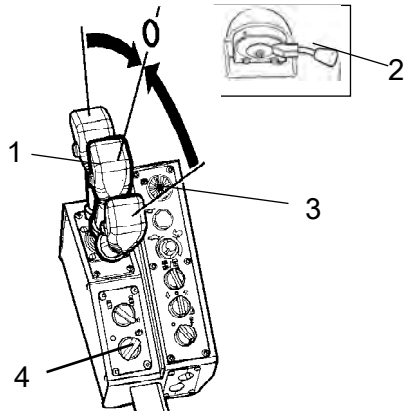



***Fig. Control panel***
***1. Forward/Reverse lever***
***2. Engine speed control***
***3. Emergency stop***
***4. Parking brake***

Do not run the starter motor for too long. If the engine does not start immediately, wait a minute or so before trying again.

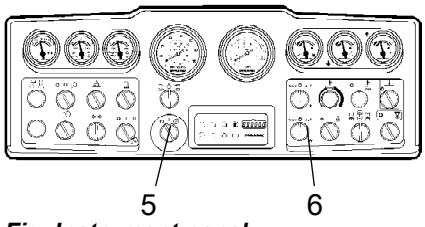



*Fig. Instrument panel*
*5. Starter switch*
*6. Vibration switch*

***Ensue that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

Let the engine idle for a few minutes to warm, longer if the ambient temperature is below +10°C (50°F).

Release the parking brake (4) before driving.

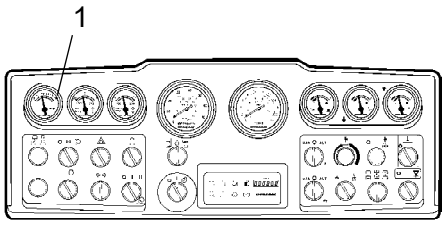



*Fig. Instrument panel*
*1. Voltmeter*

Whilst the engine is warming up, check that the warning lamps for oil pressure (3) and charging (2) are not on and that the voltmeter (1) shows 13-14 volts.

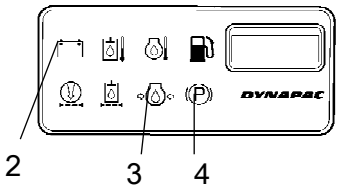



*Fig. Kontrollpanel*
*2. Charging lamp*
*3. Oil pressure lamp*
*4. Brake lamp*

The warning lamp (4) should remain on.

***When starting and driving a machine that is cold, remember that the hydraulic fluid is also cold and that braking distances can be longer than normal until the machine reaches the working temperature.***

***During all transport, make sure that side-displaced drums are in neutral. Drive in transport mode.***

## Driving

### Operating the roller, Transport mode

***Under no circumstances is the machine to be operated from the ground. The operator must be seated inside the machine during all operation.***

In transport mode, it is not possible to vibrate or to drive with off-set drums.

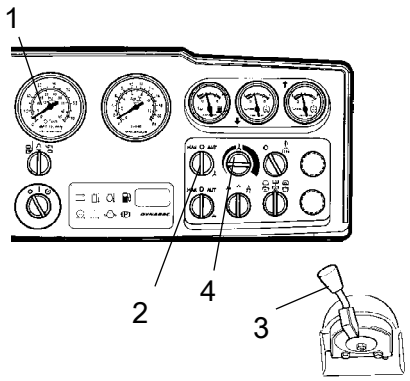



*Fig. Instrument panel*
*1. Tachometer*
*2. Switch, sprinkler*
*3. Engine speed control*
*4. Sprinkler timer*

Turn the engine speed control (3) and lock it in the working position.

Check that the steering is working correctly by turning the steering wheel once to the right and once to the left while the roller is stationary.

When compacting asphalt, remember to turn on the sprinkler system (2). Use the sprinkler timer (4) to obtain the correct amount of water.

***Make sure that the area in front of and behind the roller is clear.***

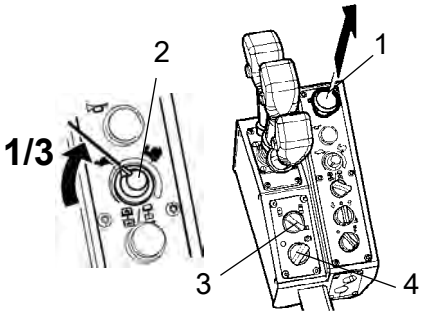



*Fig. Control panel*
*1. Emergency stop*
*2. Speed limiter*
*3. Steering both drums/front drum*

Set the speed limiter (2) to 1/3 speed.

Select steering method (3). Steering with both drums, left position, or only with front drum, right position.

***Turn the parking brake knob (4) to position O and check that the parking brake warning lamp is now off.***

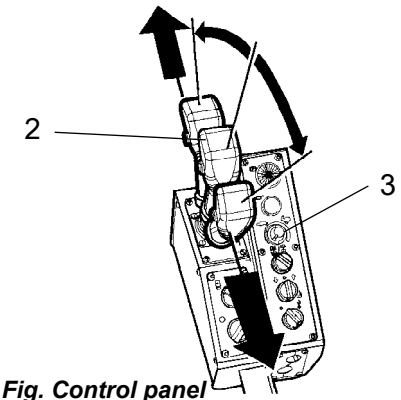



*Fig. Control panel*
*2. Forward/Reverse lever*
*3. Speed limiter*

Carefully move the forward/reverse lever (2) forwards or backwards, depending on which direction of travel is required.

Speed increases as the lever is moved away from the neutral position.

Increasing or decreasing maximum speed is achieved by turning the speed limiter (3) to the left or right.

The speed should always be controlled using the forward/reverse lever and never by changing the engine speed.

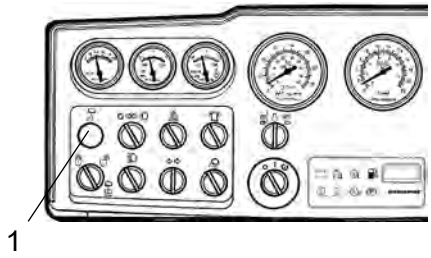



*Fig. Instrument panel*
*1. Drum position lamp*

## Drum position

The drum position lamp (1) lights when the rear drum is not in the straight ahead position (neutral).

The lamp flashes when the drums are approaching their outer positions.

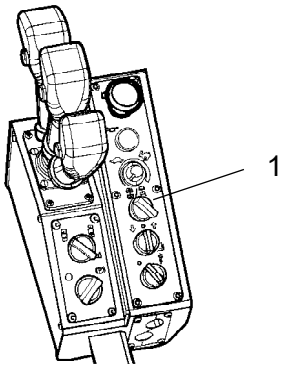



*Fig. Control panel*
*1. Switch, transport/work mode*

## Switching to work mode.

Working mode is activated with the switch (1) in the right position on the control box

It is now possible to activate the vibrations and off-set.

We recommend that inexperienced operators test run the machine on an open area before attempting precision operation.

To reset to transport mode, turn the switch to the left position.

## Operating the roller, Working mode

***Under no circumstances is the machine to be operated from the ground. The operator must be seated inside the machine during all operation.***

Check that the steering is working correctly by turning the steering wheel once to the right and once to the left while the roller is stationary.

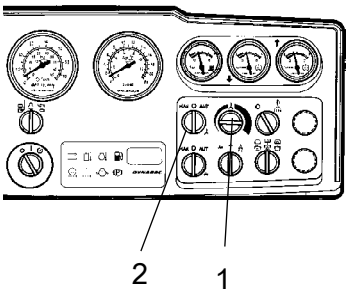



*Fig. Instrument panel*
*1. Potentiometer/Sprinkler timer*
*2. Switch, sprinkler*

When compacting asphalt, remember to turn on the sprinkler system (2).

When setting automatic sprinkler (sprinkler timer), infinitely variable setting of the water flow is obtained with the potentiometer (1) on a scale of 0-100%.

Automatic switching off of the water flow at 0.5 km/h, reactivated at increased speeds (for example when changing direction).

***Make sure that the area in front of and behind the roller is clear.***

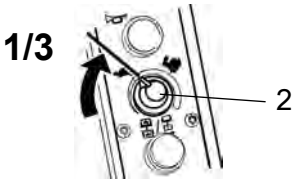



*Fig. Control panel*
*2. Speed limiter*

Set the speed limiter (2) to 1/3 speed.

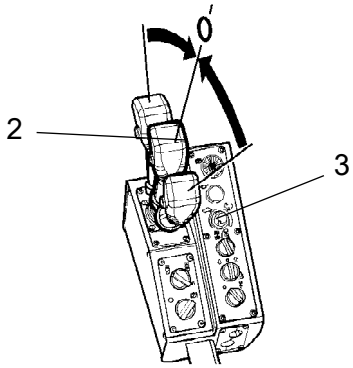



*Fig. Control panel*
*2. Forward/Reverse lever*
*3. Speed limiter*

Carefully move the forward/reverse lever (2) forwards or backwards, depending on which direction of travel is required.

Speed increases as the lever is moved away from the neutral position.

Increasing or decreasing maximum speed is achieved by turning the speed limiter (3) to the left or right.

In working mode, gentle acceleration or retardation can be obtained. There are 3 different acceleration/retardation ramps depending on the speed at which the machine is being driven.

If the control lever is moved quickly (forwards/backwards) toward/past neutral, the system switches to emergency ramp, for example in the event of panic, in order to shorten the braking distance. The emergency ramp is much acute than the ramp in transport mode.

Activate work mode again by moving the control lever to neutral and turn the transport/work mode switch to left position.

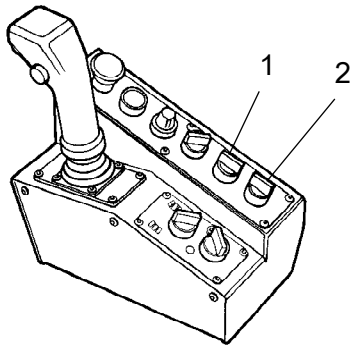



*Fig. Changeover switch*
*1. Edge cutter/roller, Up/Down*
*2. Sprinkler, edge cutter/roller*

## Edge cutting (Optional)

***Ensure that nobody remains within the edge cutter's working range.***

If the engine is running and the changeover switch (1) is turned to the left, the edge cutter is lowered to the asphalt surface by a hydraulic cylinder. Turn the changeover switch to the right to lift the tool back into its original position.

A bypass valve prevents the hydraulic system being overloaded.

There is a separate sprinkler system which the operator should use to avoid asphalt sticking to the edge cutter/roller. The system is operated using a switch (2). The water is drawn from the front water tank, which is also used for the front drum sprinkler system.

***Always ensure that the edge cutter is folded up during transport or when the tool is not going to be used.***

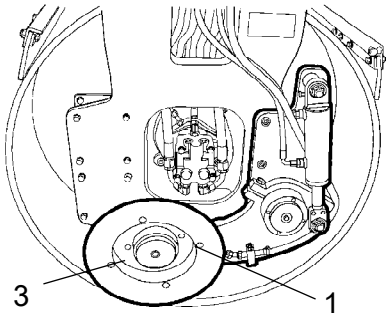



*Fig. Changing tools*
*1. Edge cutter*
*3. Bolted joint*

The operator can chose to use one of two tools, the edge cutter or the edge roller. The edge cutter (1) in the figure is shown in the transport position.

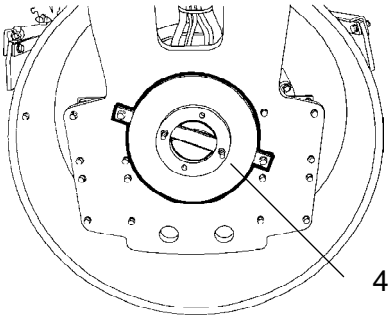



*Fig. Tool location*
*4. Edge roller*

The edge cutter can easily be replaced with the edge roller (4) by undoing the bolted joint (3).

## Vibration

### Manual/Automatic vibration

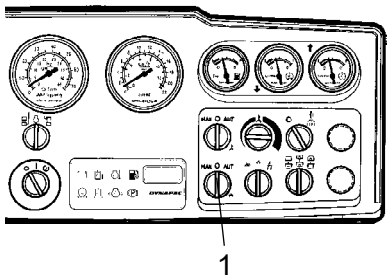



*Fig. Instrument panel*
*1. Man/Auto switch*

Manual or automatic vibration activation/deactivation (AVC) is selected using switch (1).

In manual mode, the operator must activate vibration via the switch (2) on the forward/reverse lever.

In automatic mode, vibration is activated when the pre-set speed is reached. Vibration is automatically deactivated when the lowest pre-set speed is reached.

Activation of vibration for the first time, as well as disconnection of automatic vibration, are performed with the switch (2) on the forward/reverse lever.

### Manual vibration - Switching on

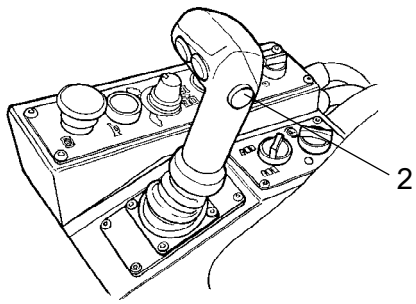



*Fig. Control panel*
*2. Switch, vibration On/Off*

**!** Never activate vibration when the roller is stationary. This can damage both the surface and the machine.

With the machine set in working mode, the vibrations can be activated on the control lever.

Engage and disengage vibration using the switch (2) on the side of the control lever.

Always switch off vibration before the roller comes to a standstill.

When compacting thin layers of asphalt maximum 50 mm thick, the best result is achived using a low amplitude and high frequency vibration.

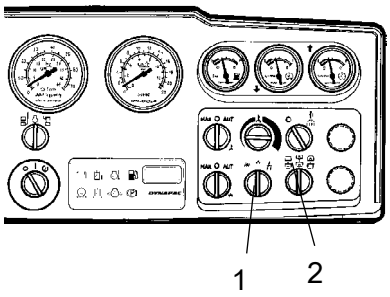



*Fig. Instrument panel*
*1. High/Low switch*
*2. Drum switch*

### Amplitude/frequency - Changeover

Resetting the amplitude may not be performed when vibration is in operation.
Switch the vibration first off and wait until vibration stops before resetting amplitude.

There are two drum vibration settings. Switch between the settings using switch (1).

Turn the knob to the left for low amplitude/high frequency and to the right for high amplitude/low frequency. In the center position, the vibration is switched off.

Switch (2) allows you to select vibration on both drums or on the front or rear drum only.

- The left position activates vibration on the rear drum.

- The middle position activates vibration on both drums.

- The right position activates vibration on the front drum.

## Braking

### Emergency braking

Braking is normally activated using the forward/reverse lever. The hydrostatic transmission retards and slows the roller when the lever is moved towards the neutral position.

A disc brake in each drum motor acts as a brake when parking. Activated with the parking brake control (4), in right position.

***For emergency braking, press the emergency stop (3), hold the steering wheel firmly and be prepared for a sudden stop. The engine stops.***

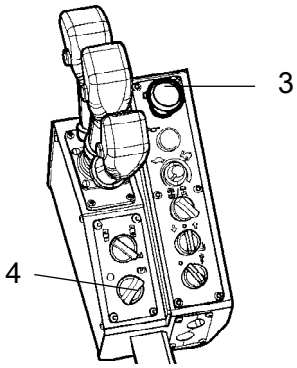



*Fig. Control panel*
*3. Emergency stop*
*4. Parking brake*

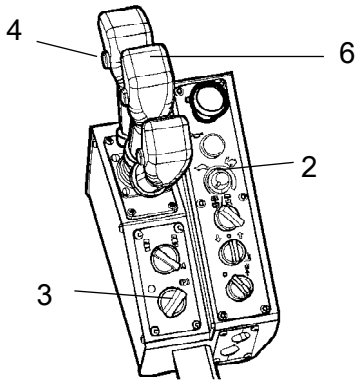



*Fig. Control panel*
*2. Engine speed control*
*3. Parking brake*
*4. Vibration button*
*6. Forward/reverse lever*

## Normal braking

Press the switch (4) to switch off the vibration.

Move the forward/reverse lever (6) to the neutral position to stop the roller.

Always turn the parking brake (3) to right position, even for brief stops when on sloping ground.

Turn the engine speed control (2) back to idling. Allow the engine to idle for a few minutes to cool down.

***When starting and driving a machine that is cold, remember that the hydraulic fluid is also cold and that braking distances can be longer than normal until the machine reaches the working temperature.***

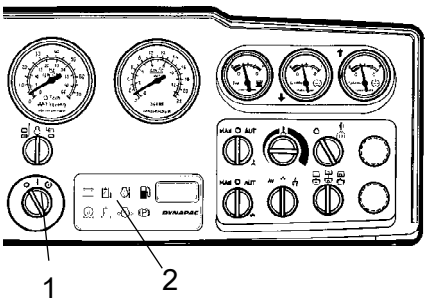



*Fig. Instrument panel*
*1. Starter switch*
*2. Warning lamps panel*

## Switching off

Check instruments and warning lamps to see if any faults are indicated. Switch off all lights and other electrical functions.

Turn the starter switch (1) to the left to the shut off position.

# Parking

## Chocking the drums

***Never disembark from the machine when the diesel engine is running, unless the parking brake is activated.***

***Make sure that the roller is parked in a safe place with respect to other road users. Chock the drums if the roller is parked on sloping ground.***

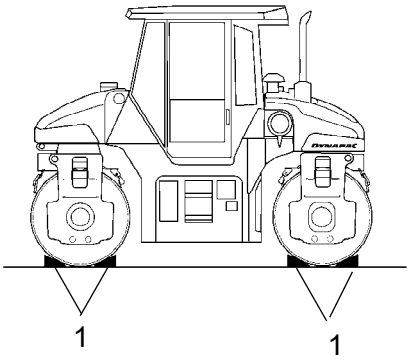



***Fig. Positioning***
***1. Chocks***

Keep in mind that there is a risk of freezing during the winter. Drain the water tanks, pumps and water lines.

## Master switch

Before leaving the roller for the day, turn the master switch (1) counter-clockwise to the disconnected position and remove the key.

This will prevent battery discharging and will also make it difficult for unauthorized persons to start and operate the machine. Also lock the engine compartment doors and the cab door.

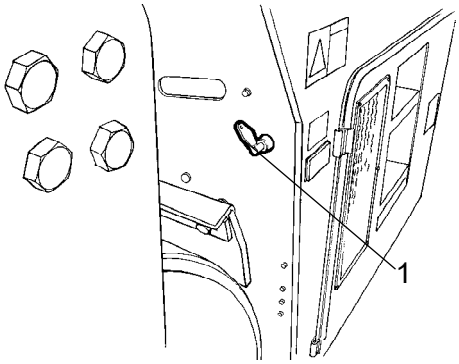



***Fig. Step side (left engine door)***
***1. Master switch***

## Long-term parking

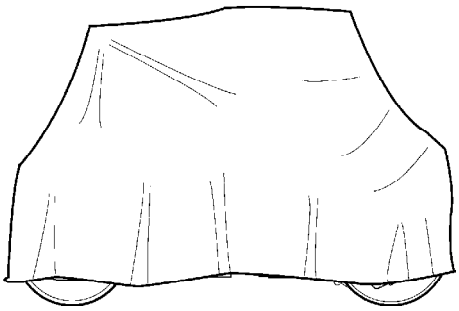


*Fig. Roller weather protection*

The following instructions should be followed when long term parking (more than one month).

These measures apply when parking for a period of up to 6 months.

Before re-commissioning the roller, the points marked with an asterisk * must be returned to the pre-storage state.

Wash the machine and touch up the paint finish to avoid rusting.

Treat exposed parts with anti-rust agent, lubricate the machine thoroughly and apply grease to unpainted surfaces.

### Engine

* Refer to the manufacturer’s instructions in the engine manual that is supplied with the roller.

### Battery

* Remove the battery from the machine. Clean the battery, check that the electrolyte level is correct (see under the heading 'Every 50 hours of operation') and trickle-charge the battery once a month.

### Air cleaner, exhaust pipe

* Cover the air cleaner (see under the heading 'Every 50 hours of operation' or 'Every 1000 hours of operation') or its opening with plastic or tape. Also cover the exhaust pipe opening. This is to avoid moisture entering the engine.

### Sprinkler system

* Drain the water tank completely (see under the heading ‘Every 2000 hours of operation’). Drain all hoses, filter housings and the water pump. Remove all sprinkler nozzles (see under the heading ‘Every 10 hours of operation’).

### Fuel tank

Fill the fuel tank completely full to prevent condensation.

### Hydraulic reservoir

Fill the hydraulic reservoir to the uppermost level mark (see under the heading ‘Every 10 hours of operation.’)

### Steering cylinder, hinges, etc.

Lubricate both bearings of the steering cylinder with grease (see under the heading "Every 50 hours of operation").

Grease the steering cylinder piston with conservation grease.

Grease the hinges on the doors to the engine compartment and the cab. Grease both ends of the forward/reverse control (bright parts) (see under the heading 'Every 500 hours of operation').

### Hoods, tarpaulin

* Lower the instrument cover over the instrument panel.

* Cover the entire roller with a tarpaulin. A gap must be left between the tarpaulin and the ground.

* If possible, store the roller indoors and ideally in a building where the temperature is constant.

# Miscellaneous

## Lifting

### Lifting the roller

Weight: refer to the hoisting plate on the roller

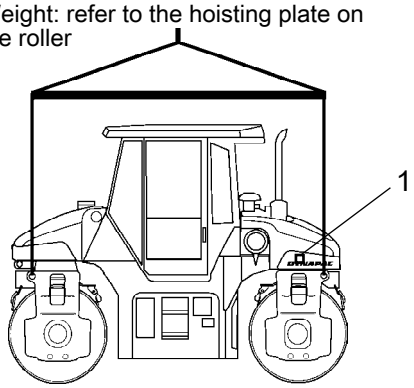



*Fig. Roller prepared for lifting*
*1. Hoisting plate*

***The machine's gross weight is specified on the hoisting plate (1). Refer also to the Technical specifications.***

Lifting gear such as chains, steel wires, straps, and lifting hooks must conform with current regulations.

***Stand well clear of the hoisted machine! Make sure that the lifting hooks are properly secured.***

## Towing/Recovering

## Towing

The roller can be moved up to 300 meters (1,000 ft) using the instructions below.

### Short distance towing with the engine running

***Activate the parking brake knob, and temporarily stop the diesel engine. Chock the drums to prevent the roller from moving***

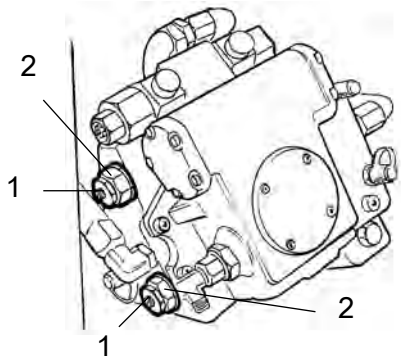



*Fig. Propulsion pump*
*1. Towing valve*
*2. Multifunction valve*

Open the left door to the engine compartment to access the propulsion pump.

Turn both towing valves (1) (middle hexagonal nuts) three turns counter clockwise, while holding the multifunction valve (2) (lowermost hexagonal nuts) in place. The valves are located on the left side of the propulsion pump.

Start the engine and allow it to idle.

Deactivate the parking brake knob and place the forward/reverse lever in the forward or reverse position. If the lever is in neutral, the brakes in the hydraulic motors are activated.

The roller can now be towed and can also be steered if the steering system is otherwise functioning.


*Fig. Brake disengagement valve*
*1. Valve*
*2. Pump arm*
*3. Knob*

## Short distance towing when the engine is inoperative.

***Chock the drums to prevent the roller from moving when the brakes are hydraulically disengaged.***

Open both towing valves as described earlier.

The brake disengagement pump is located behind the left door of the engine compartment.

Make sure that the valve (1) is closed, this is done by tightening clockwise with the knob (3). Pump with the pump arm (2) until the brakes are disengaged.

Ensure that the valve is reset into open position after finished towing. This is done by turning the knob counter clockwise to full extracted position.

## Towing the roller

***When towing/recovering, the roller must be braked by the towing vehicle. A towing bar must be used as the roller has no brakes.***

The roller must be towed slowly, max. 3 km/h (2 mph) and only towed short distances, max. 300 m (1000 ft).

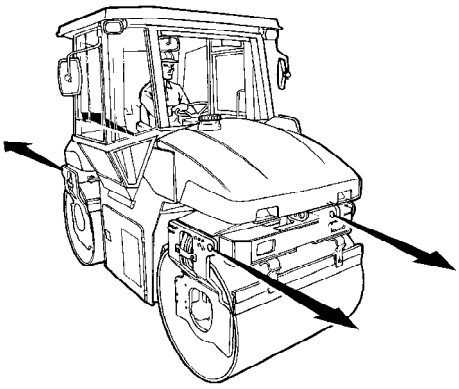


*Fig. Towing*

When towing/recovering a machine, the towing device must be connected to both lifting holes.

Pulling forces should act parallel to the machine's longitudinal axis, as illustrated. Maximum gross pulling force 130 kN (29.225 lbf).

Reverse the towing preparations made to the hydraulic pump and/or the motor.

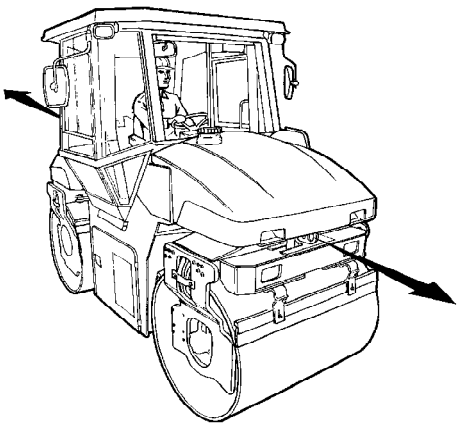


*Fig. Trailer eye*

### Trailer eye

The roller is fitted with trailer eyes front and rear.

The trailer eye is not designed to be used for towing/recovering. It is designed for trailers and other towed objects weighing no more than 4,000 kg (8,850 lbs).

## Transport

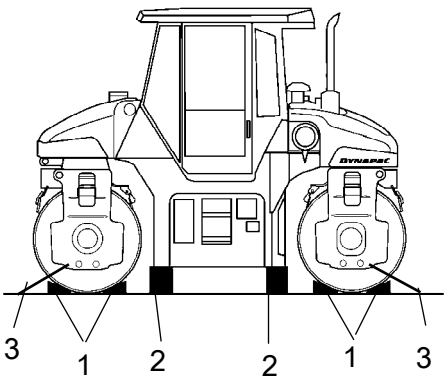



*Fig. Positioning*
*1. Chocks*
*2. Blocks*
*3. Straps*

### Roller prepared for transport

Make sure that the machine has aligned drum position (neutral).

Tighten down the machine to the platform of the transport vehicle, tie-down points are marked with decals.

Block the drums and chock up the frame to avoid any damage of the drums shock absorbers.

# Operating instructions - Summary

1. **Follow the SAFETY INSTRUCTIONS specified in the Safety Manual.**

2. Make sure that all instructions in the MAINTENANCE section are followed.

3. Turn the master switch to the ON position.

4. Move the forward/reverse lever to the NEUTRAL position.

5. Set the switch for Manual/Automatic vibration to the 0 position.

6. Set the engine speed control to idle.

7. Ställ nödstoppet i uppdraget läge.

8. Start the engine and allow it to warm up.

9. Set the engine speed control to the operating position.

10. Disengage the parking brake.

11. **Drive the roller. Operate the forward/reverse controls with care.**

12. **Test the brakes. Remember that the braking distance will be longer if the hydraulic fluid is cold.**

13. Use vibration only when the roller is in motion.

14. Check that the drums are thoroughly watered when watering is required.

15. **IN AN EMERGENCY:**
    **- Press the EMERGENCY STOP**
    **- Hold the steering wheel firmly.**
    **- Brace yourself for a sudden stop.**

16. When parking:
    - Set the parking bake knob in the parking position.
    - Stop the engine and chock the drums.

17. When lifting: - Refer to the relevant section in the Instruction Manual.

18. When towing: - Refer to the relevant section in the Instruction Manual.

19. When transporting: - Refer to the relevant section in the Instruction Manual.

19. When recovering - Refer to the relevant section in the Instruction Manual.

# Preventive maintenance

Complete maintenance is necessary for the machine to function satisfactorily and at the lowest possible cost.

The Maintenance section includes the periodic maintenance that must be carried out on the machine.

The recommended maintenance intervals assume that the machine is used in a normal environment and working conditions.

## Acceptance and delivery inspection

The machine is tested and adjusted before it leaves the factory.

On arrival, before delivery to the customer, delivery inspection must be conducted as per the check list in the warranty document.

Any transport damage must be immediately reported to the transport company.

## Warranty

The warranty is only valid if the stiplulated delivery inspection and the separate service inspection have been completed as per the warranty document, and when the machine has been registered for starting under the warranty.

The warranty is not valid if damage has been caused by inadequate service, incorrect use of the machine, the use of lubricants and hydraulic fluids other than those specified in the manual, or if any other adjustments have been made without the requisite authorisation.

# Maintenance - Lubricants and symbols

## Fluid volumes

| | | |
|---|---|---|
| Drum, front | | |
| - Drum | 9 liters | 9.5 qts |
| - Gear box (x2) | 1,3 (x2) liters | 1.4 (x2) qts |
| Drum, rear | | |
| - Drum | 9 liters | 9.5 qts |
| - Gear box (x2) | 1,3 (x2) liters | 1.4 (x2) qts |
| Hydraulic reservoir | 38 liters | 40.2 qts |
| Diesel engine | | |
| - oil (BF4M 2011) | 18 liters | 19 qts |
| - oil (TD2011 L04W) | 10 liters | 10.6 qts |
| - coolant (TD2011 L04W) | 9,5 liters | 10 qts |

Always use high-quality lubricants and the amounts recommended. Too much grease or oil can cause overheating, resulting in rapid wear.

Other fuel and lubricants are required when operating in areas with extremely high or extremely low ambient temperatures. See the 'Special instructions' chapter, or consult Dynapac.

| | | |
|---|---|---|
| | **ENGINE OIL** | Air temperature -15°C - +50°C (5°F-122°F)<br>Shell Rimula R4 L 15W-40, API CH-4 or equivalent. |
| | **HYDRAULIC FLUID** | Air temperature -15°C - +40°C (5°F-104°F)<br>Shell Tellus T68 or equivalent.<br>Air temperature above +40°C (104°F)<br>Shell Tellus T100 or equivalent. |
| Bio-Hydr. | **BIOLOGICAL HYDRAULIC FLUID** | BP BIOHYD SE-S 46<br>When it leaves the factory, the machine may be filled with biologically degradable fluid. The same type of fluid must be used when changing or topping up. |
| | **BIOLOGICAL HYDRAULIC FLUID, PANOLIN** | PANOLIN HLP Synth 46<br>When it leaves the factory, the machine may be filled with biologically degradable fluid. The same type of fluid must be used when changing or topping up. (www.panolin.com) |

| | | |
|---|---|---|
|  | **DRUM OIL** | Air temp. -15°C - +40°C (5°F-104°F)<br>Mobil SHC 629 |
|  | **GREASE** | SKF LGHB2 (NLGI-Klass 2) or equivalent for the articulated joint.<br>Shell Retinax LX2 or equivalent for other grease points. |
|  | **FUEL** | See engine manual. |
|  | **TRANSMISSION OIL** | Air temperature -15°C - +40°C (5°F-104°F)<br>Shell Spirax A 80W/90, API GL-5 or equivalent.<br>Air temperature 0°C (32°F) - above +40°C (104°F)<br>Shell Spirax AX 85W/140, API GL-5 or equivalent. |
|  | **COOLANT** | GlycoShell or equivalent, (mixed 50/50 with water).<br>Anti-freeze protection down to about -37°C (-34.6°F). |

## Maintenance symbols

| | | | |
|---|---|---|---|
|  | Engine, oil level |  | Air filter |
|  | Engine, oil filter |  | Battery |
|  | Hydraulic reservoir, level |  | Sprinkler |
|  | Hydraulic fluid, filter |  | Sprinkler water |
|  | Drum, oil level |  | Recycling |
|  | Lubricating oil |  | Fuel filter |
|  | Coolant level | | |

# Maintenance - Maintenance schedule

## Service and maintenance points

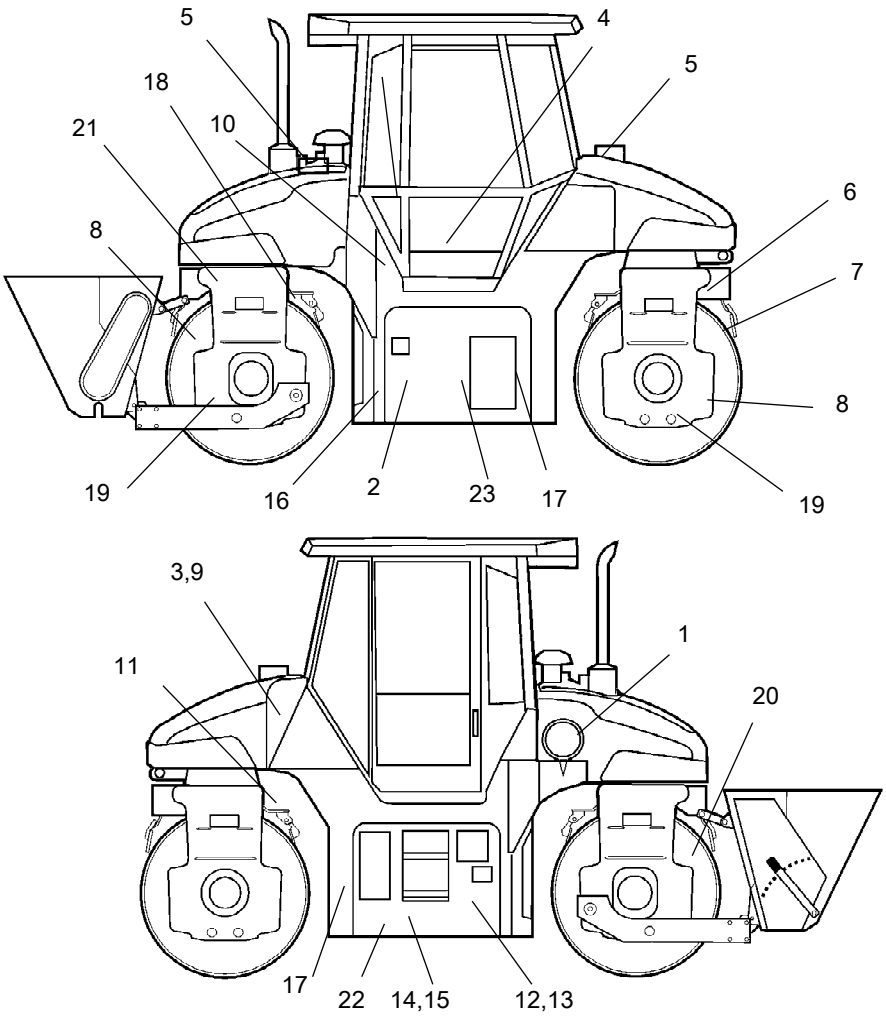



*Fig. Service and maintenance points*

1. Air cleaner
2. Engine oil
3. Refueling point
4. Seat bearing
5. Water tanks, filling
6. Watering system
7. Scrapers
8. Drums
9. Fuel tank
10. Coolant reservoir
11. Steering cylinder
12. Hydraulic filter
13. Hydraulic fluid level
14. Hydraulic fluid, filling
15. Hydraulic reservoir
16. Engine
17. Hinges
18. Pivot cylinder
19. Rubber element
20. Drums, lubrication
21. Pivot bearing
22. Battery
23. Cooler

## General

Periodic maintenance should be carried out after the number of hours specified. Use the daily, weekly etc. periods where number of hours cannot be used.

Remove all dirt before filling, when checking oils and fuel and when lubricating using oil or grease.

The manufacturer's instructions found in the engine manual also apply.

## Every 10 hours of operation (Daily)

Refer to the contents to find the page number of the sections referred to !

| Pos. in fig | Action | Comment |
|---|---|---|
| | **Before starting up for the first time on that day** | |
| 2 | Check the engine oil level | Refer to the engine manual |
| 13 | Check the hydraulic reservoir level | |
| 9 | Refuel | |
| 10 | Check the coolant reserevoir level | Only valid for Deutz TD2011 L04W |
| 5 | Fill the water tanks | |
| 6 | Check the sprinkler system | |
| 6 | Emergency watering | |
| 7 | Check the scraper setting | |
| | Test the brakes | |

## After the FIRST 50 hours of operation

Refer to the contents to find the page number of the sections referred to !

| Pos. in fig | Action | Comment |
|---|---|---|
| 12 | Change the hydraulic fluid filter | |

## Every 50 hours of operation (Weekly)

Refer to the contents to find the page number of the sections referred to !

| Pos. in fig | Action | Comment |
|---|---|---|
| 11,18 | Grease the steering cylinder and pivot cylinder. | |
| 1 | Inspect/clean the filter element in the air cleaner | Replace as required |
| 22 | Check the voltage level of the battery | |
| | Inspect the air conditioning | Optional |
| | Inspect/lubricate the edge cutter | Optional |

## Every 250 hours of operation (Monthly)

Refer to the contents to find the page number of the sections referred to !

| Pos. in fig | Action | Comment |
|---|---|---|
| | Check the sliding cab windows | |
| | Inspect the air conditioning | Optional |

## Every 500 hours of operation (Every three months)

Refer to the contents to find the page number of the sections referred to !

| Pos. in fig | Action | Comment |
|---|---|---|
| 8 | Check the oil level in drums and gear boxes. | |
| 21 | Lubricate the pivot bearings | |
| 19 | Check rubber elements and bolted joints | |
| 14 | Check the hydraulic reservoir cover/breather | |
| 4 | Grease the chair bearing | |
| | Grease the steering chain | |
| 17 | Lubricate hinges and controls | |
| 2 | Change the engine oil and oil filter | Refer to the engine manual |
| 16 | Check the engine V belt tension | Refer to the engine manual |
| 16 | Change the engine pre-filter | |
| 16 | Clean the engine cooling flanges | Or as necessary. Refer to the engine manual. |
| 23 | Clean the hydraulic fluid cooler | Or as necessary. |
| 22 | Check battery and battery connections | |

## Every 1000 hours of operation (Every six months)

Refer to the contents to find the page number of the sections referred to !

| Pos. in fig | Action | Comment |
|---|---|---|
| 16 | Check/Adjust the diesel engine's valve clearances | Refer to the engine manual |
| 16 | Check/Adjust the diesel engine's toothed belt/V-belt | Refer to the engine manual |
| 16 | Replace the fuel filter and clean the fuel pump | Refer to the engine manual |
| 12 | Change the hydraulic fluid filter | |
| 1 | Replace the main filter in the air cleaner | |
| | Replace the air cleaner filter in the cab | Optional |

## Every 2000 hours of operation (Yearly)

Refer to the contents to find the page number of the sections referred to !

| Pos. in fig | Action | Comment |
|---|---|---|
| 15 | Change the hydraulic fluid | |
| 8 | Change the oil in the drums and drum gear boxes | |
| 9 | Drain and clean the fuel tank | |
| 5 | Drain and clean the water tanks | |
| 10 | Check the condition of the articulation | |
| | Overhaul the air conditioning | Optional |

## Every 3000/5000/6000/12000 hours of operation

See the specific service plan for the diesel engine!

The positive drive belt is replaced every 3000 hours of operation or max 5 years.

# Maintenance - 10h

***Park the roller on a level surface.***
***When checking and making adjustments to the roller, switch the engine off and ensure the parking brake knob is switched on, unless otherwise specified.***

***Ensue that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

## Hydraulic reservoir, Level check - Filling

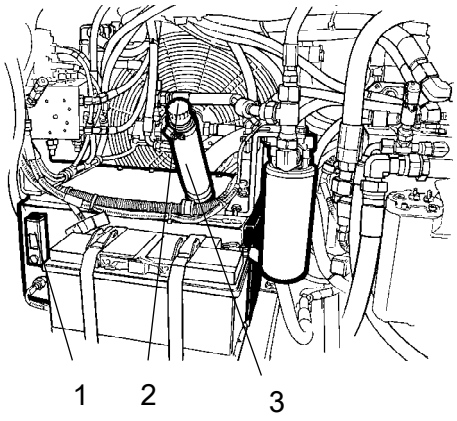



***Fig. Hydraulic reservoir***
***1. Oil sight glass***
***2. Filler cap***
***3. Filler hose***

Open the left door of the engine compartment.

Make sure that the oil level is between the max/min marks.

Top off with the type of hydraulic fluid specified in the lubricants specification, if the level is too low.

## Fuel tank - Refueling

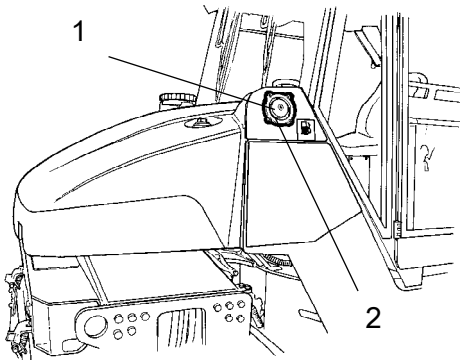



*Fig. Fuel tank*
*1. Tank cap*
*2. Filler pipe*

***Never refuel while the engine is running. Do not smoke and avoid spilling fuel.***

Refuel the tank every day before starting work, or fill the tank at end of work. Unscrew the lockable tank cap (1) and fill fuel up to the lower edge of the filler pipe.

The tank holds 100 liters (26.4 gal) of fuel. Refer to the engine manual for information on diesel grade.

## Coolant level - Check

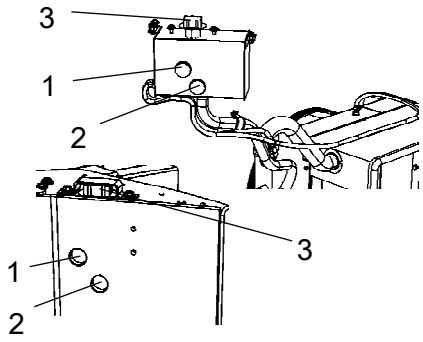



*Fig. Coolant reservoir*
*1. Max. level*
*2. Min. level*
*3. Filler cap*

Check that level of the coolant is between the max. and min. marks.

***Take great caution if the radiator cap must be opened while the engine is hot. Wear protective gloves and goggles.***

Fill with a mixture of 50% water and 50% anti freeze. See the lubrication specifications in these instructions and in the engine manual.

Flush the system every other year and change the coolant. Make sure also that the air flow through the cooler is unobstructed.

## Water tanks - Filling

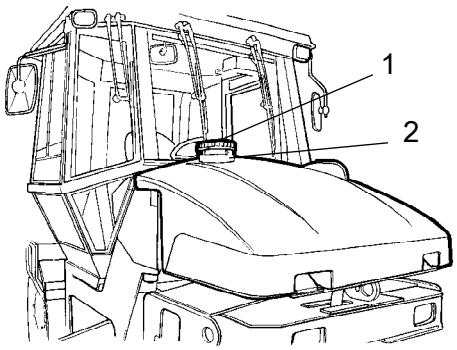



*Fig. Front water tank*
*1. Tank cap*
*2. Strainer*

Unscrew the tank cap (1) and fill with clean water. Do not remove the strainer (2).

Fill both water tanks. The front tank holds 350 liters (92.6 gal) and the rear tank holds 397 liters (104.9 gal).

To make reaching the tank cap easier, fold out the step on the front right and rear right drum fork.

Only additive: A small amount of environmentally friendly antifreeze.

## Sprinkler system/Drum Check

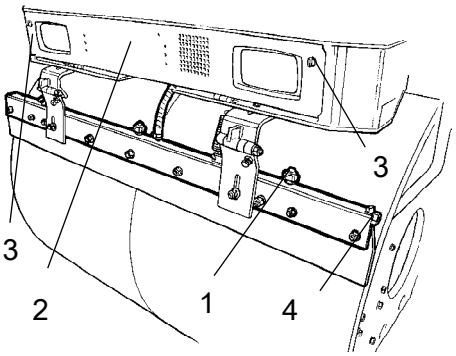



*Fig. Front drum*
*1. Nozzle*
*2. Pump system/cover*
*3. Quick-fit screws*
*4. Drain plug*

Start the sprinkler system and make sure that none of the nozzles (1) are blocked. If necessary, clean blocked nozzles and the coarse filter located near the water pump (2). See the illustrations.

There is a pump system, which is located underneath each water tank behind the cover (2), which is opened by turning the quick-fit screws (3) a 1/4 turn counter-clockwise. To close the cover, set the screws so that the screw slot is vertical and push in.

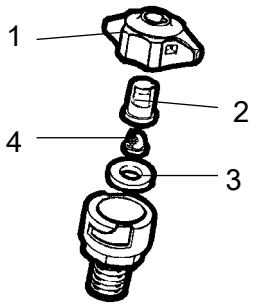



*Fig. Nozzle*
*1. Sleeve*
*2. Nozzle*
*3. Seal*
*4. Fine filter*

## Sprinkler system/Drum Cleaning

Dismantle the blocked nozzle by hand.

Blow the nozzle (2) and fine filter (4) clean using compressed air. Alternatively, fit replacement parts and clean the blocked parts at a later point in time.

After inspecting and carrying out any necessary cleaning, start the system and check that it works.

***Wear protective goggles when working with compressed air.***

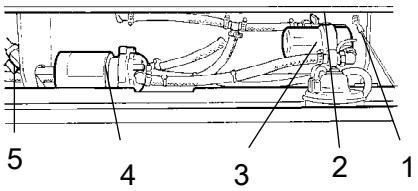



*Fig. Pump system*
*1. Coarse filter*
*2. Stop cock*
*3. Filter housing*
*4. Water pump*
*5. Drain cock*

When cleaning the coarse filter (1), close the stop cock (2) and undo the filter housing (3).

Clean the filter and filter housing. Check that the rubber gasket in the filter housing is intact.

After inspecting and carrying out any necessary cleaning, start the system and check that it works.

A drain cock (5) is located on the left side of the pump system area. This can be used to drain the tank and the pump system.

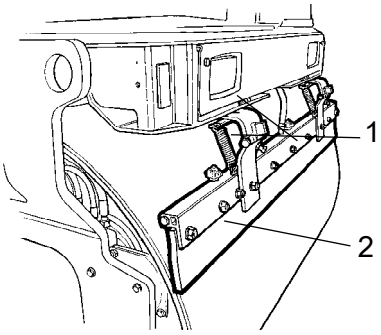



*Fig. Spring loaded scrapers*
*1. Spring mechanism*
*2. Scraper blade*

## Scrapers, spring loaded (Optional) Checking

Make sure that the scrapers are undamaged.

Spring-action scrapers need no adjustment as the spring force ensures the correct contact force.

Asphalt remnants can accumulate on the scraper and affect the contact force. Clean when necessary.

The scrapers must be retracted from the drum during transport driving.

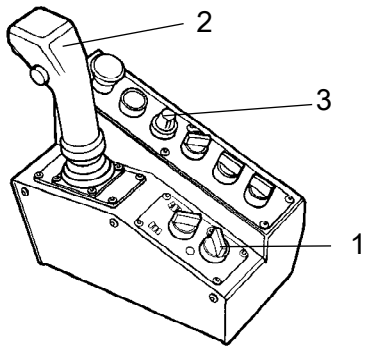



*Fig. Control panel*
*1. Parking brake knob*
*2. Forward/Reverse lever*
*3. Speed limiter*

## Brakes - Check

***Check the brakes by carrying out the following :***

Set the speed limiter (3) to 1/3 and activate the parking brake knob (1).

Move the forward/reverse lever (2) forwards or backwards.

The brake warning lamp on the instrument should now be lit and the roller should be stationary.

After testing the brakes, set the forward/reverse lever (2) in neutral.

Deactivate the parking brake knob (1).

# Maintenance - 50h

***Park the roller on a level surface.***
***When checking and making adjustments to the roller, switch the engine off and ensure the parking brake knob is switched on, unless otherwise specified.***

***Ensue that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

## Air cleaner

## Checking - Change the main air filter

Change the air cleaner main filter when the warning lamp on the control panel comes on when the engine is running at maximum speed.

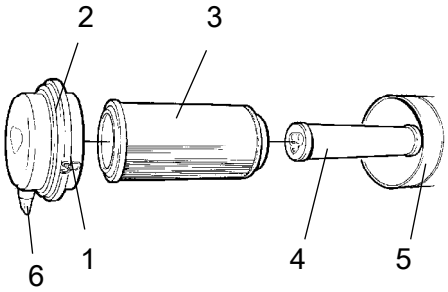



***Fig. Air cleaner***
***1. Clips***
***2. Cover***
***3. Main filter***
***4. Backup filter***
***5. Filter housing***
***6. Dust valve***

Release the clips (1), pull off the cover (2), and pull out the main filter (3).

Do not remove the backup filter (4).

Clean the air cleaner if necessary, see section Air cleaner - Cleaning.

When replacing the main filter (3), insert a new filter and refit the air cleaner in the reverse order.

Check the condition of the dust valve (6); replace if necessary.

When refitting the cover, make sure that the dust valve is positioned downwards.

## Backup filter - Change

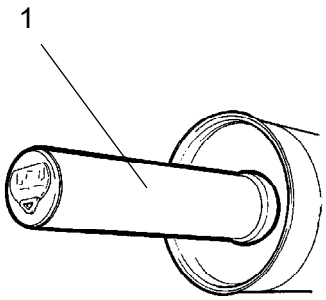



*Fig. Air filter*
*1. Backup filter*

Change the backup filter with a new filter after every third replacement of the main filter.

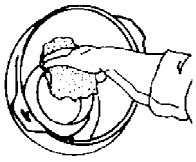
To change the backup filter (1), pull the old filter out of its holder, insert a new filter and reassemble the air cleaner in the reverse order.

Clean the air cleaner if necessary, see section Air cleaner - Cleaning.

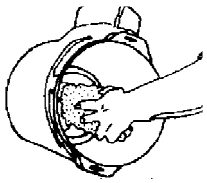
## Air cleaner - Cleaning

Wipe clean the inside of the cover (2) and the filter housing (5). See the previous illustration.

Wipe clean on both sides of the outlet pipe.



Inner edge of outlet pipe.



Outer edge of outlet pipe.

Wipe also both surfaces for the outlet pipe; see adjacent figure.

Check that the hose clamps between the filter housing and the suction hose are tight and that the hoses are intact. Inspect the entire hose system, all the way to the engine.

## Pivot cylinder/Steering cylinder - Lubrication

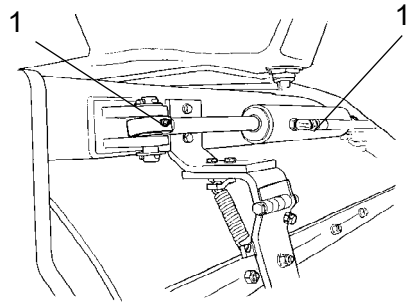



*Fig. Pivot cylinder*
*1. Grease nipples*

***Do not allow anyone to remain behind the drum while the engine is running. Danger of being crushed when the drum is moved.***

Turn the rear drum so that it is in the left turn position. The two grease nipples (1) on the cylinder can now be accessed from the right side of the machine.

Wipe the nipples clean and grease each nipple (1) with three strokes of the hand-operated grease gun.

Grease the steering cylinder on the front drum the same way.

## Battery
## Checking the electrolyte level

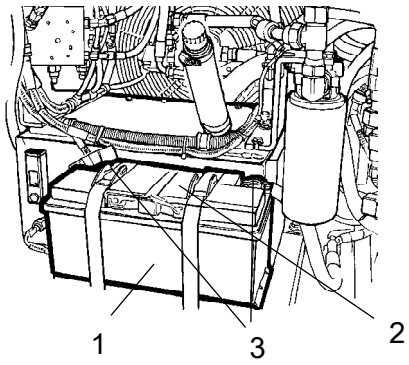



*Fig. Battery bay*
*1. Battery*
*2. Cell cap*
*3. Cable shoes*

***Make sure there is no open flame in the vicinity when checking the electrolyte level. Explosive gas is formed when the alternator charges the battery.***

Open the left door of the engine compartment.

***Wear safety goggles. The battery contains acid, which is corrosive. In the event of contact with the acid, rinse with water.***

When disconnecting the battery, always disconnect the negative cable first. When connecting the battery, always connect the positive cable first.

The cable shoes should be clean and tightened. Corroded cable shoes should be cleaned and greased with acid-proof Vaseline.

Discard used batteries wisely. Batteries contain lead, which is harmful to the environment.

***Before doing any electric welding on the machine, disconnect the battery ground cable and then all electrical connections to the alternator.***

## Air conditioning (Optional) - Inspection

***Never work under the roller when the engine is running. Park the roller on a level surface, chock the drums and depress the parking brake control.***

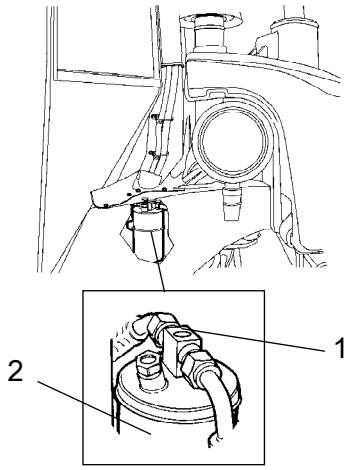



*Fig. Drying filter*
*1. Sight glass*
*2. Filter holder*

With the unit in operation, check using the sight glass (1) that bubbles are not visible on the drying filter.

***Always activate the parking brake knob.***

The filter is located in the left rear part of the frame under the cab. The sight glass can be seen through a hole in the frame. The drying filter can be reached through the left engine compartment.
If bubbles are visible in the sight glass this is a sign that the refrigerant level is too low. Shut off the unit, as it can be damaged if it is run with insufficient refrigerant. Fill with refrigerant.

## Air conditioning (Optional) - Cleaning

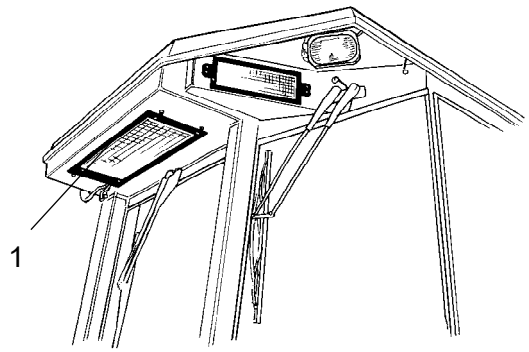



*Fig. Cab*
*1. Condensor element*

Where cooling capacity is markedly reduced, clean the condensor element (1) located on the rear edge of the cab. Also clean the cooling unit in the cab.

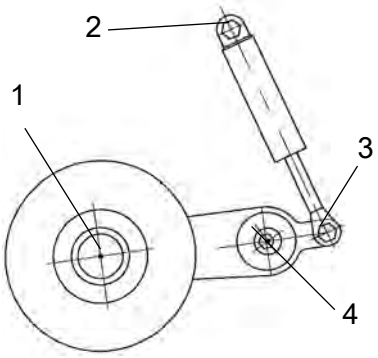



*Fig. Four grease points for lubricating edge cutters*

## Edge cutter (Optional) - Lubrication

***Refer to the operation section for information on how to operate the edge cutter.***

Grease the four points indicated in the figure.

Grease should always be used for lubrication, see the lubricant specifications.

Grease all bearing points with five strokes of a hand-operated grease gun.

# Maintenance - 250h

***Park the roller on a level surface.***
***When checking and making adjustments to the roller, switch the engine off and ensure the parking brake knob is switched on, unless otherwise specified.***

***Ensue that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

## Check the sliding cab windows.

Make sure that the sliding cab windows do not jam.

Lubricate the guide slots if necessary, so that the windows slide easily up and down, on door post plus right side on smooth cabs.

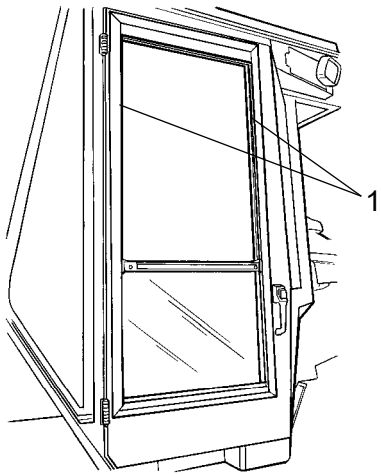



***Fig. Cab door***
***1. Guide slot***

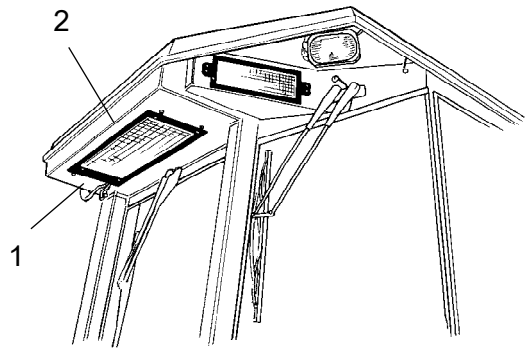



*Fig. Air conditioning*
*1. Refrigerant hoses*
*2. Condensor element*

## Air conditioning (Optional) - Inspection

Inspect refrigerant hoses and connections and make sure that there are no signs of an oil film that can indicate a refrigerant leakage.

# Maintenance - 500h

***Park the roller on a level surface.***
***When checking and making adjustments to the roller, switch the engine off and ensure the parking brake knob is switched on, unless otherwise specified.***

***Ensue that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

## Drum - oil level
## Inspection - filling

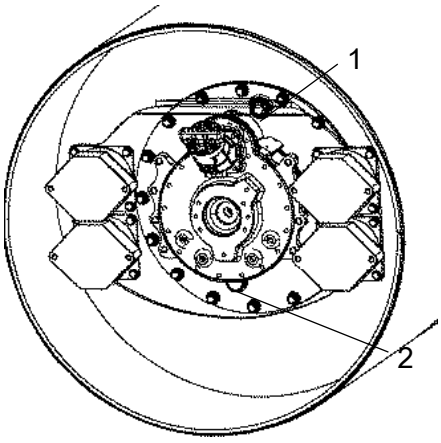



***Fig. Drum, vibration side***
***1. Filler plug***
***2. Sight glass***

Position the roller with the filler plug (1) at the highest point in its rotation.

Wipe clean around the sight glass (2).

Make sure that the oil level reaches half way in the sight glass. Top off with fresh oil if the level is low. Use oil as specified in the lubricants specification.

Inspection and refilling is only necessary to make on one side of the drum.

When removing the filler plug, wipe any metal accumulated on the plug magnet off.

Refit the plugs and check that they are tight by driving the roller and then rechecking.

Inspect both front and rear drum.

## Drum gearbox - Checking the oil level

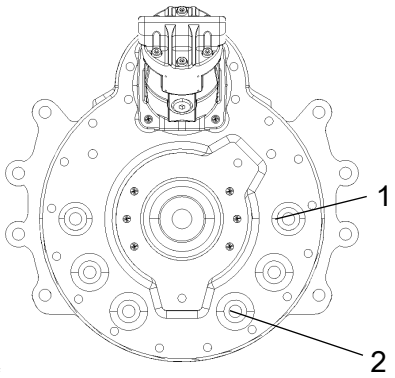


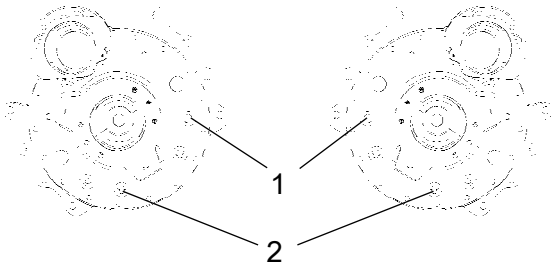

*Fig. Oil level check - drum gearbox*
*1. Level plug*
*2. Drain plug*

Wipe clean the area around the level plug (1) and then undo the plug.

Ensure that the oil level reaches up to the lower edge of the plug hole.

Top off with oil to the right level if the level is low. Use transmission oil according to the lubricant specification.

Clean and refit the plugs.




## Pivot bearing - Lubrication

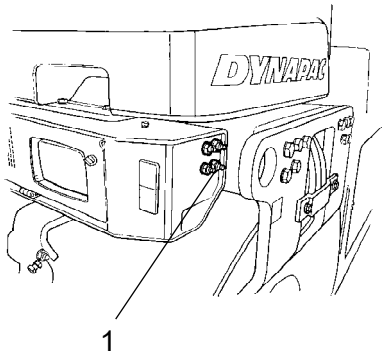



*Fig. Rear drum*
*1. Grease nipples x 4*

Grease each nipple (1) with five strokes of a hand-operated grease gun.

Use grease as specified in the lubricant specification.

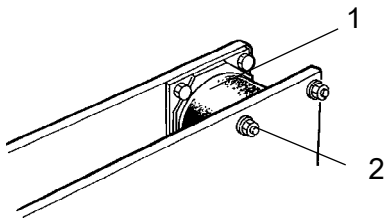



*Fig. Drum, vibration side*
*1. Rubber element*
*2. Attachment screws*

## Rubber elements and attachment screws Check

Check all rubber elements (1). Replace all elements where more than 25% of the elements on one side of the drum have cracks deeper than 10-15 mm (0.4-0.6 in).

Check using a knife blade or pointed object.

Check also that the attachment screws (2) are tightened.

## Hydraulic reservoir cap - Check

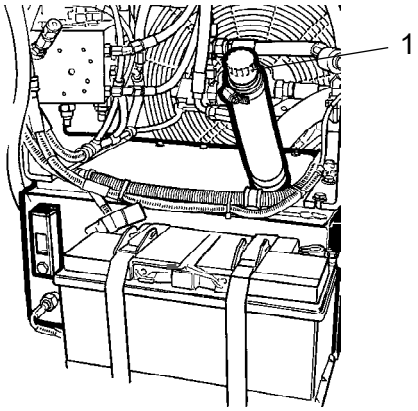



*Fig. Engine compartment, left side*
*1. Reservoir cap*

Open the right engine compartment door.

Unscrew and make sure that the reservoir cap is not clogged. Air must have unobstructed passage through the cap in both directions.

If passage in either direction is blocked, clean the filter with a little diesel oil and blow through with compressed air until the block is removed, or replace the cap with a new one.

***Wear protective goggles when working with compressed air.***

## Seat bearing - Lubrication

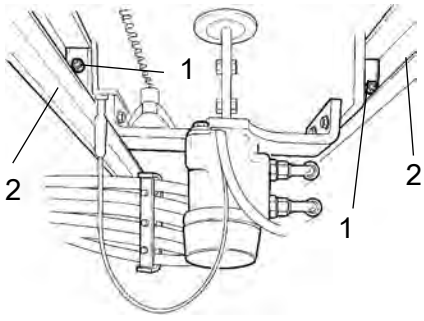



*Fig. Seat bearing, underside*
*1. Grease nipples*
*2. Slide rails*

Lubricate the seat slide rails (2) for transverse travel. There are four lubrication nipples (1), two accessible from each side. All are to receive five strokes from a hand-operated grease gun.

Also lubricate the seat locking mechanism, both for transverse travel and rotation. Use engine oil or drum oil.

If the seat starts to be stiff when adjusting, it should be lubricated more often.

## Seat bearing - Lubrication

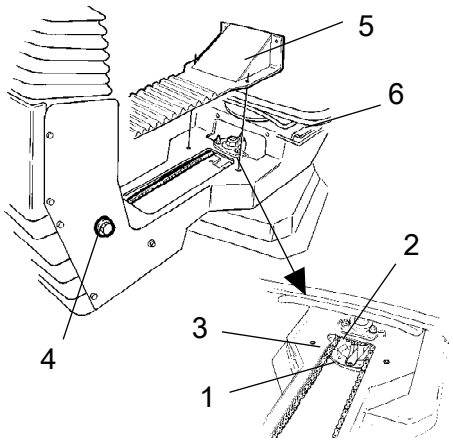



*Fig. Seat bearing*
*1. Lubrication nipple*
*2. Sprocket*
*3. Steering chain*
*4. Adjustment screw*
*5. Cover*
*6. Slide rails*

Keep in mind that the chain is a vital part of the steering mechanism.

Remove the cover (5) to access the lubrication nipple (1). Lubricate the operator seat slew bearing with three strokes of a hand-operated grease gun.

Also grease the seat slide rails (6).

Clean and grease the chain (3) between the seat and the steering column.

If the chain is slack on the sprocket (2), loosen the screws (4) and move the steering column forward. Tighten the screws and check chain tension.

If the seat starts to be stiff when adjusting, it should be lubricated more often than specified here.

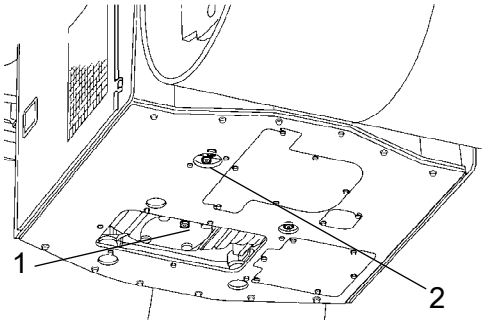



*Fig. Machine underside*
*1. Oil drain, diesel engine*
*2. Oil drain, radiator*

## Diesel engine/Radiator
## Oil change

The engine's and the radiator's oil drain plugs are located under the machine on the left-hand side, behind a service panel.

Drain the oil when the engine is warm. Place a receptacle that holds at least 18 liters (19 qts) under the drain plugs.

***Take great care when draining engine oil. Wear protective gloves and goggles.***

Remove the oil drain plugs (1) and (2). Allow all the oil to drain out and refit the plugs.

Deliver the drain oil for environmentally correct handling.

Fill with fresh engine oil, see Lubricant specification or the engine manual for the correct grade of oil.

Fill with 15 liters (16 qts) of engine oil before starting the machine. Run the engine until it is warm and then switch off.

Check the dipstick to ensure that the engine oil level is correct. Refer to the engine manual for details. Top up with oil if necessary to the max mark on the dipstick.

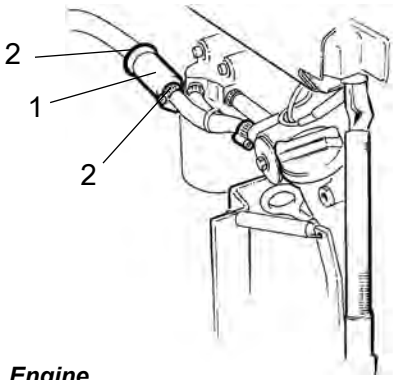



*Fig. Engine*
*1. Pre-filter*
*2. Hose clamps*

## Engine pre-filter
## Change

Loosen the hose clamps (2) using a screwdriver.

Remove the filter (1) and deliver to special waste handling. These are single-use filters and cannot be cleaned.

Fit a new pre-filter and tighten the hose clamps.

Start the engine and check that the pre-filter does not leak.

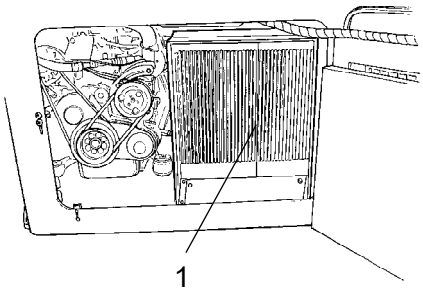



*Fig. Engine compartment, right side*
*1. Radiator*

## Radiator
## Check - Clean

Open the right door of the engine compartment to access the radiator.

Make sure that the air flow through the cooler is unobstructed. Dirty coolers are blown clean with compressed air or washed clean using a high-pressure water cleaner.

Blow air or direct water through the cooler in the opposite direction to that of the cooling air.

***Wear protective goggles when working with compressed air or high-pressure water jets.***

Take care when using a high-pressure water jet. Do not hold the nozzle too near the cooler.

# Maintenance - 1000h

***Park the roller on a level surface.***
***When checking and making adjustments to the roller, switch the engine off and ensure the parking brake knob is switched on, unless otherwise specified.***

***Ensue that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

## Hydraulic filter

### Change

Remove the filter (1) and deliver to special waste handling. This is a single-use filter and cannot be cleaned.

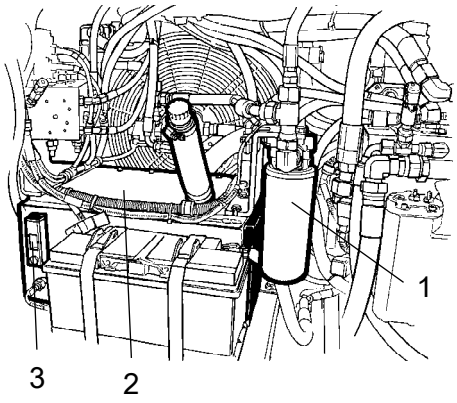



***Fig. Hydraulic reservoir***
***1. Hydraulic filter***
***2. Reservoir***
***3. Sight glass***

Thoroughly clean the filter holder sealing surface.

Apply a thin coat of fresh hydraulic fluid to the rubber gasket on the new filter.

Screw the filter on by hand, firstly until the filter gasket makes contact with the filter base. Then rotate a further ½ turn.

Check the hydraulic fluid level in the sight glass (3) and top off as required. See under the heading 'Every 10 hours of operation' for more information.

Start the engine and check that the filter does not leak.

## Air filter - Changing

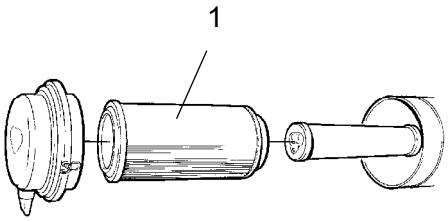



*Fig. Air cleaner*
*1. Main filter*

Replace the air cleaner main filter (1) even if it has not been cleaned five times See under the heading 'Every 50 hours of operation' for information on changing the filter.

If a blocked filter is not replaced, the exhaust fumes will be black and the engine will loose power. There is also a risk of severe damage to the engine.

## Air conditioning (Optional)
## Fresh air filter- Change

***Use a step ladder to reach the filter (1).***

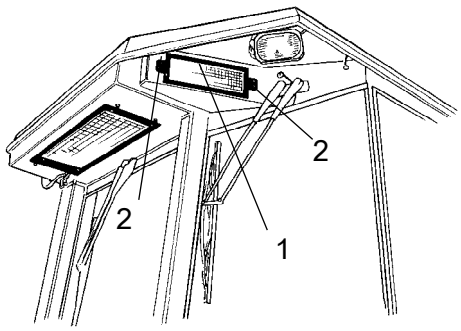



*Fig. Cab*
*1. Fresh air filter (x2)*
*2. Screws (x2)*

There are two fresh air filters (1), one on each side of the cab.

Undo the screws (2) and remove the complete holder. Remove the filter insert and replace with a new filter.

The filter may need to be changed more often if the machine is operated in a dusty environment.

# Maintenance - 2000h

***Park the roller on a level surface.***
***When checking and making adjustments to the roller, switch the engine off and ensure the parking brake knob is switched on, unless otherwise specified.***

***Ensue that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

## Hydraulic reservoir/Radiator
## Oil change

***Take great care when draining fluids and oils.***
***Wear protective gloves and goggles.***

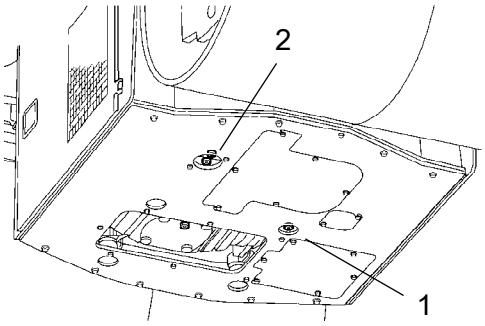



***Fig. Machine underside***
***1. Oil drain, hydraulic reservoir***
***2. Oil drain, radiator***

Place a receptacle that holds at least 38 liters (40.2 qts) under the drain plugs.

Remove the oil drain plugs (1) and (2). Allow all the oil to drain out and refit the plugs.

Deliver the drained fluid to environmentally correct handling.

Fill with fresh hydraulic fluid. Refer to the lubricants specification for grade information.

Change the hydraulic fluid filter as described under the heading 'Every 1000 hours of operation'.

Start the engine and operate the hydraulic functions. Check the level in the reservoir and top off as required.

## Drum - Changing the oil

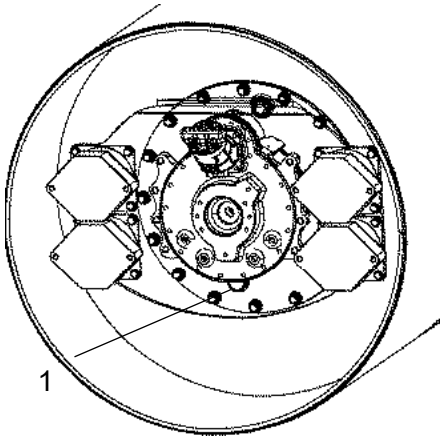



*Fig. Drum, vibration side*
*1. Drain plug*

Position the roller with the drain plug (1) straight down.

Place a receptacle that will hold at least 7 liters (7.5 qts) under the plug.

Remove the drain plug (1). Allow all the oil to drain out.

Drain on both drum halves while refilling only is necessary to do on one of the drum sides. (joint oil bath)

Deliver the drain oil to environmentally correct handling.

See under the heading 'Every 500 hours of operation' for filling oil.

Change the oil in both front and rear drum.

## Drum gearbox - Oil change

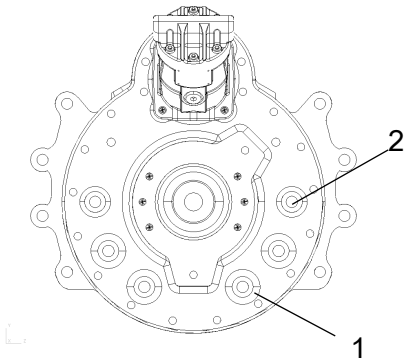



*Fig. Drum gearbox*
*1. Drain plug*
*2. Filler plug/Level plug*

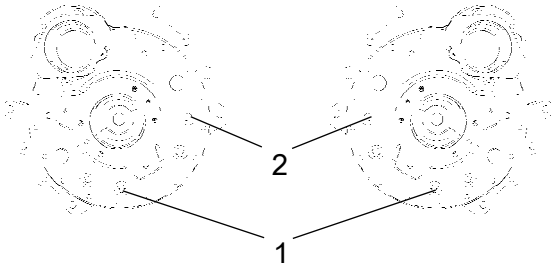
Place the roller on a level surface.

Wipe clean, unscrew the plugs (1, 2) and drain the oil into a suitable receptacle, capacity about 2 liters (0.5 gal.).

Refit the plug (1) and fill with oil up to refilling hole (2), according to "Drum gearbox - Checking the oil level".

Use transmission oil according to the lubricant specification.

Clean and refit the level plug/filler plug (2).



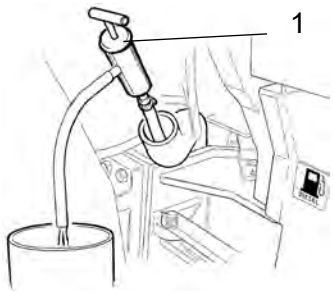



*Fig. Fuel tank*
*1. Oil drain pump*

## Fuel tank
## - Cleaning

It is easiest to clean the tank when it is almost empty.

Pump out any bottom sediment using a suitable pump, such as an oil drain pump.

Collect the fuel and sediment in a container and deliver to environmentally correct handling.

***Keep in mind fire risk when handling fuel.***

## Watering system
## - Draining

Keep in mind that there is a risk of freezing during the winter. Drain the tank, pump and lines or add antifreeze to the water.

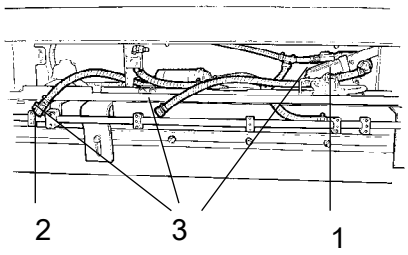



*Fig. Pump system*
*1. Filter housing*
*2. Drain cock*
*3. Quick connectors*

The easiest way to drain the tanks is to unscrew and remove the filter housing (1) and disconnect the hoses by releasing the quick connectors (3).

There is also a drain cock (red square) under each water tank.

Open the drain cock (2) to drain the water pump.

## Water tank - Cleaning

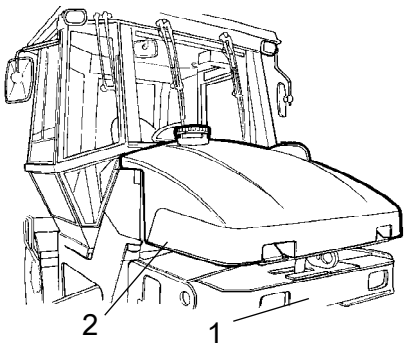



*Fig. Water tank*
*1. Pump system*
*2. Drain plug*

Clean the tanks with water and a suitable detergent for plastic surfaces.

Refit the filter housing (1) or the drain plug (2). Fill with water and check for leaks.

The water tanks are made of plastic (polyethylene) and are recyclable.

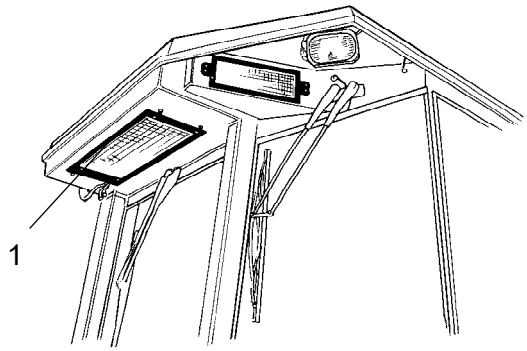



*Fig. Cab*
*1. Condensor element*

## Air conditioning (Optional) - Overhaul

Regular inspection and maintenance is necessary to ensure satisfactory long-term operation.

Clean all dust from the condenser element (1) using compressed air. Blow from above downwards.

The air jet can damage the element flanges if it is too powerful.

***Wear protective goggles when working with compressed air.***

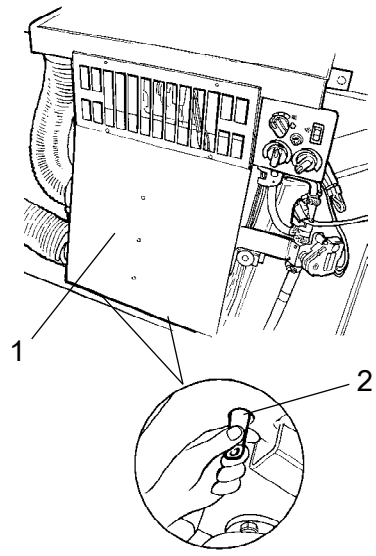



*Fig. Air conditioning*
*1. Cooling element*
*2. Drain valve (x2)*

Inspect the condenser element attachment.

Clean all dust from the cooling unit and the cooling element (1) using compressed air.

Check the system hoses for chafing. Make sure that drainage from the cooling unit is unobstructed so that condensation does not accumulate inside the unit.

Check the drainage by pinching the valves (2) located under the operator cab.

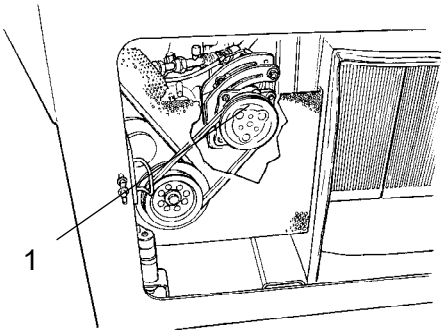



*Fig. Right side of the engine compartment*
*1. Compressor*

## Air conditioning (Optional) Compressor - Inspection

Inspect compressor attachment. It is fitted to the engine inside the right engine compartment door.

The unit should, if possible, be run at least five minutes every week, to ensure lubrication of the rubber gaskets in the system.

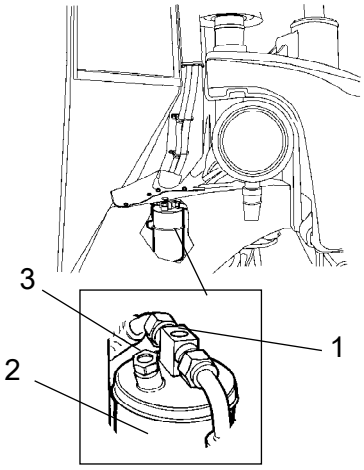



*Fig. Drying filter*
*1. Sight glass*
*2. Filter holder*
*3. Moisture indicator*

## Air conditioning (Optional) Drying filter - Inspection

With the unit in operation, check using the sight glass (1) that bubbles are not visible on the drying filter.

***Never work under the roller when the engine is running. Park the roller on a level surface, chock the wheels and depress the parking brake control.***

The filter is located in the left rear part of the frame under the cab. The sight glass can be seen through a hole in the frame. The drying filter can be reached through the left engine compartment.
If bubbles are visible through the sight glass this is a sign that the refrigerant level is too low. Shut off the unit, as it can be damaged if it is run with insufficient refrigerant. Fill with refrigerant.

Check the moisture indicator (3). It should be blue. If it is beige, the dryer cartridge should be changed by an authorized service company.

***The refrigerant circuit is only to be worked on by authorized companies.***

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