

# Instruction manual

**Operating & Maintenance**  
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**Vibratory roller**  
**CC1300**

**Engine**  
**Kubota V2203-M-E3B**

**Serial number**  
**10000334x0A012586 - A026753**



Translation of original instruction



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## Introduction

### The machine

Dynapac CC1300 is a self-propelled vibratory tandem roller in the 4 metric tonnes class featuring 1300 mm wide drums. The machine is equipped with drive, brakes, and vibration on both drums.

### Intended use

CC1300 has primarily been designed for the compaction of asphalt, but has excellent compaction capacity for reinforcement layers and bearing courses. The roller is mainly intended for compacting asphalt on streets and minor roads in towns. It has sufficient capacity to follow a small asphalt paver.

### Signal symbols and meaning



**WARNING ! Indicates potential hazardous situation/procedure which, if not avoided, could result in death or serious injury.**



**CAUTION ! Indicates potential hazardous situation/procedure which, if not avoided, could result in minor or moderate injury, damage to the machine or property.**

### 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.**

CALIFORNIA

### **Proposition 65**

Decal and location of decal shown in section Machine description.

 **WARNING:** Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to [www.P65warnings.ca.gov/diesel](http://www.P65warnings.ca.gov/diesel).

### **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.

Do not spray with high-pressure cleaner directly onto gaskets and bearing spacings in steering hitch and drum, and electronics.

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, where maintenance after every 10 and 50 hours of operation can be performed by the machine operator. Other maintenance intervals must be carried out by accredited (Dynapac) service personnel.



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

Specific maintenance and checks on diesel engines must be performed by engine supplier authorized personnel.

### **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 regulations and directives applicable for this machine.

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



**Safety - General instructions**

(Also read the safety manual)



- **The operator must be familiar with the contents of the OPERATION section before starting the roller.**
- **Ensure that all instructions in the MAINTENANCE section are followed.**
- **Only the operator is allowed to be on the roller. Remain seated at all times when operating the roller.**
- **Never use the roller if it is in need of adjustment or repair.**
- **Only ascend and descend the roller when it is stationary. Use the intended footsteps, grips and rails. Always use the three-point grip (both feet and one hand, or one foot and both hands) when ascending or descending the machine. Never jump down from the machine.**
- **Dynapac always recommends mounted ROPS (Roll Over Protective Structure), or a ROPS-approved cab and seat belt usage.**
- **Drive slowly in sharp bends.**
- **Avoid driving across slopes. Drive straight up or straight down the slope.**
- **Never operate with the drum outside the edge, the substrate might not have full bearing strength or the edge is close to a slope. Avoid operating close to edges and ditches and the like as well as on poor ground conditions that jeopardizes the bearing strength and capacity to support the roller.**
- **Make sure that there are no obstacles in the direction of travel, on the ground, in front of or behind the roller, or overhead.**
- **Drive particularly carefully on uneven ground.**
- **Keep the roller clean. Clean any dirt or grease that accumulates on the footsteps or operator platform to avoid slipping risk. Keep all signs and decals clean and legible.**
- **Safety measures before refueling:**
  - **Stop the engine**
  - **Do not smoke.**
  - **No naked flames in the vicinity of the roller.**
  - **Earth the filling equipment nozzle by keeping it in contact to the tank opening to avoid sparks.**
- **Before repairs or service:**
  - **Chock the drums/wheels.**
  - **Lock the articulation if necessary.**
  - **Place blocks under overhanging equipment, such as strike-off blade, edge cutter/compactor and chip spreader.**

- **Hearing protection is recommended if the noise level exceeds 80 dB(A). The noise level can vary depending on the equipment on the machine and the surface the machine is being used on.**
- **Modifications to the roller, including the use of any attachment/equipment, not approved by Dynapac that might compromise safety (including visibility) are not allowed. Any modifications are only to be made after written approval has been given by Dynapac.**
- **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.**
- **For your own protection always wear:**
  - working boots with steel toecaps
  - ear protectors
  - reflecting clothing/high visibility jacket**Also wear:**
  - helmet if no cab or FOPS, or if required by worksite management
  - working gloves if no cab and for work outside operator's platform.
- **If the machine seems to be responding abnormally during travel, stop and check it.**



### Safety - when operating



**Prevent persons from entering or remaining in the risk zone, 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 risk zone, however he/she must be attentive and operate the machine only when the person is fully visible or has given a clear indication of where he or she is.**



**Avoid driving across a slope. Drive straight up and down sloping ground.**

### Work driving



**Dynapac always recommends mounted ROPS (Roll Over Protective Structure) and seat belt usage.**

**On machines with foldable ROPS, make sure that the ROPS is correctly mounted in the upright position during all operation.**

Avoid operating close to edges and ditches and the like as well as on poor ground conditions that jeopardizes the bearing strength and capacity to support the roller. Pay attention to potential obstacles above the machine, such as overhead cables and the branches of trees etc.

Pay particular attention to the stability of the substrate when compacting close to edges and holes. Do not compact with a large overlap from the previous track in order to maintain roller stability. Consider other compaction methods such as remote-control or a walk-behind roller close to steep slopes or where the bearing strength of the substrate is unknown.

### Driving near edges



***Never operate with the drum outside the edge, the substrate might not have full bearing strength or the edge is close to a slope.***



***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.***

### 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  $-15^{\circ}\text{C}$  to  $+40^{\circ}\text{C}$  ( $5^{\circ}\text{F}$  -  $105^{\circ}\text{F}$ ).



The maximum ambient temperature for biological hydraulic fluid is  $+35^{\circ}\text{C}$  ( $95^{\circ}\text{F}$ ).

#### Higher ambient temperatures, above $+40^{\circ}\text{C}$ ( $104^{\circ}\text{F}$ )

For operation of the machine at higher ambient temperatures, however maximum  $+50^{\circ}\text{C}$  ( $122^{\circ}\text{F}$ ), 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 S2V100 or similar.

#### 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.

#### 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.

#### high pressure cleaning

Do not spray water directly onto electrical components or the instrument panels.

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.

Do not spray with high-pressure cleaner directly onto gaskets and bearing spacings in steering hitch and drum, and electronics.



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

### Fire fighting

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

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

### Roll Over Protective Structure (ROPS)



***Never carry out any welding or drilling in the Roll Over Protective Structure (ROPS).***



***Never repair a damaged ROPS structure, it must be replaced with a new one.***

### 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.

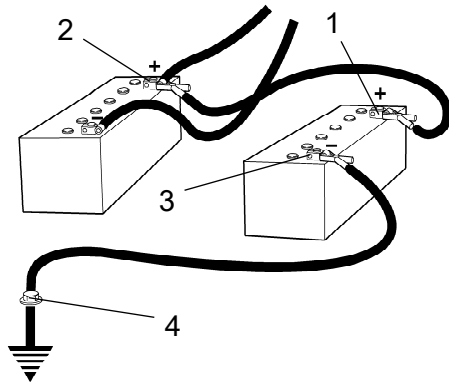


Do not use a quick-charger for charging the battery. This may shorten battery life.

### 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 lifting 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/s<sup>2</sup> as specified in Directive 2002/44/EC. (Limit is 1.15 m/s<sup>2</sup>)

Measured hand/arm vibrations also were below the action level of 2.5 m/s<sup>2</sup> specified in the same directive. (Limit is 5 m/s<sup>2</sup>)

### 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, with the vibration switched on, on soft polymer material and with the operator's seat in the transport position.**

Guaranteed sound power level, L <sub>wA</sub>	105	dB (A)
Sound pressure level at the operator's ear (platform), L <sub>pA</sub>	80 ±3	dB (A)

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

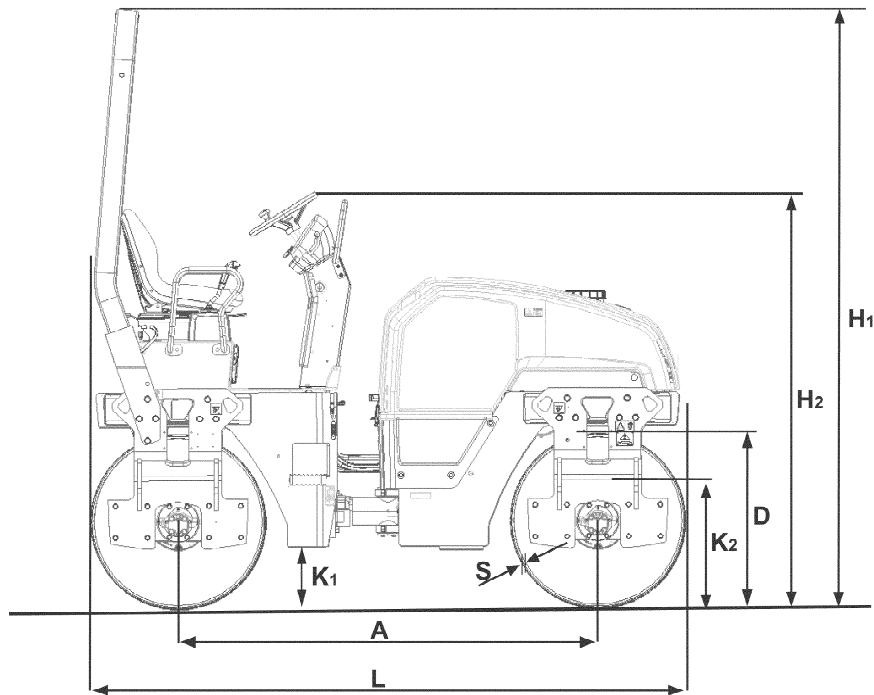


Max 20° or 36%

### Slopes

The recommended max slope angle is for a machine that runs straight on hard, flat surface.

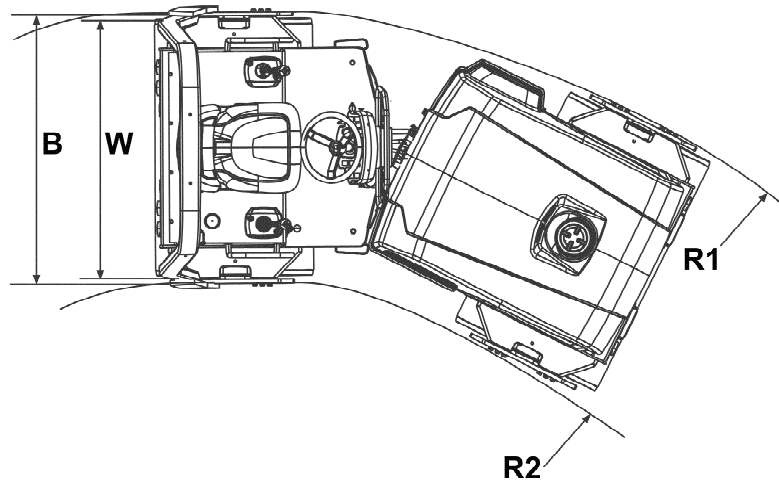
Unstable ground, vibration on, speed and steering the machine can all cause the machine to topple at smaller angles than specified here.

**Dimensions, side view**


	Dimensions	mm	in
A	Wheel base	1925	76
D	Diameter, drum	802	32
H <sub>1</sub>	Height, with ROPS	2750	108
H <sub>2</sub>	Height, without ROPS	1940	76
K <sub>1</sub>		260	10
K <sub>2</sub>		600	24
L	Length	2725	107
S	Thickness, drum amplitude, Nominal	16	0.6



## Dimensions, top view



	Dimensions	mm	in
B	Machine width	1450	57
B (without ROPS)	Machine width	1400	55
R <sub>1</sub>	Turning radius, outer	4240	167
R <sub>2</sub>	Turning radius, inner	2940	116
W	Drum width	1300	51

### Weights and volumes

#### Weights

Weight CECE, Standard equipped roller	3900 kg	8,600 lbs
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#### Fluid volumes

Fuel tank	50 liters	52.9 qts
Water tank	200 liters	211.4 qts

### Working capacity

#### Compaction data

Static linear load	14,5 kg/cm	81.2 psi
Amplitude	0,5 mm	0.019 in
Vibration frequency	52 Hz	3,120 vpm
Centrifugal force	33 kN	7,425 lb

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

#### Propulsion

Speed range	0-10	km/h	0-6.2	mph
Climbing capacity (theoretical)	36	%		

### General

#### Engine

Manufacturer/Model	Kubota V2203-M-E3B		
Power (SAE J1995)	33,3 kW		45 hp
Engine speed	2600 rpm		

#### Electrical system

Battery	12V 74Ah
Alternator	12V 60A
Fuses	See the Electrical system section - fuses

### Tightening torque

Tightening torque in Nm 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
<b>M6</b>	8,4	9,4	12	13,4	14,6	16,3
<b>M8</b>	21	23	28	32	34	38
<b>M10</b>	40	45	56	62	68	76
<b>M12</b>	70	78	98	110	117	131
<b>M14</b>	110	123	156	174	187	208
<b>M16</b>	169	190	240	270	290	320
<b>M20</b>	330	370	470	520	560	620
<b>M22</b>	446	497	626	699	752	839
<b>M24</b>	570	640	800	900	960	1080
<b>M30</b>	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
<b>M6</b>	12,0	15,0	14,6	18,3
<b>M8</b>	28	36	34	43
<b>M10</b>	56	70	68	86
<b>M12</b>	98	124	117	147
<b>M14</b>	156	196	187	234
<b>M16</b>	240	304	290	360
<b>M20</b>	470	585	560	698
<b>M22</b>	626	786	752	944
<b>M24</b>	800	1010	960	1215
<b>M30</b>	1580	1990	1900	2360



ROPS-bolts which are to be torque tightened must be dry.

**ROPS - bolts**

Bolt dimensions :	M16 (PN 4700902889)
Strength class :	10.9
Tightening torque :	192 Nm, torque class 2 (Dacromet treated)

**Hydraulic system**

<b>Opening pressure</b>	<b>MPa</b>
Drive system	35,0
Supply system	2,2
Vibration system	20,0
Control systems	18,0
Brake release	1,5

## **Machine description**

### **Diesel engine**

The machine is equipped with a water-cooled, straight four cylinder, four-stroke, turbocharged diesel engine.

### **Electrical system**

The machine has the following control units (ECU, Electronic Control Unit) and electronic units.

- Main ECU (for the machine)

### **Propulsion system/Transmission**

The propulsion system is a hydrostatic system with a hydraulic pump supplying two motors connected in parallel.

The motors drive the front and rear drums.

The speed of the machine is proportional to the deflection/angle of the control lever from neutral.

### **Brake system**

The brake system consists of a service brake, secondary brake and parking brake.

The service brake is hydrostatic and is activated by moving the control lever to neutral.

### **Secondary/Parking brake**

The secondary and parking brake system consists of sprung multiple disc brakes in the motors. The brakes are released with hydraulic pressure and are operated with a switch on the instrument panel.

### **Steering system**

The steering system is a hydrostatic system.

The control valve on the steering column distributes the flow to the control cylinder, which actuates the articulation.

The steering angle is proportional to the deflection of the steering wheel.

### **ROPS**

ROPS is the abbreviation for "Roll Over Protective Structure".

If any part of the cab's or the ROPS structure's protective construction displays plastic deformation or cracks, the cab or the ROPS structure must be replaced immediately.

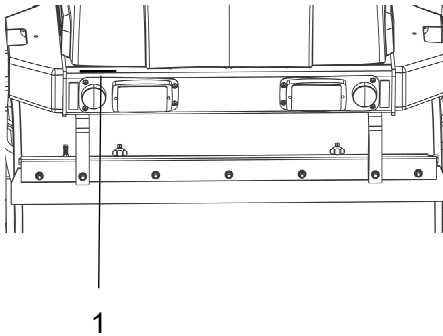
Never perform unauthorized modifications on the ROPS structure without first having discussed the

modification with Dynapac's production unit. Dynapac determines whether the modification could result in the approval according to the ROPS standards becoming invalid.

### Identification

#### Product identification number on the frame

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



**Fig. PIN Front frame**  
1. Serial number

100	00123	V	x	A	123456
A	B	C	F		

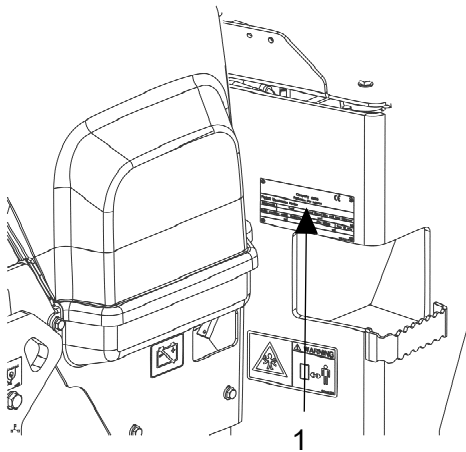
#### Explanation of 17PIN serial number

A= Manufacturer

B= Family/Model

C= Check letter

F= Serial number






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

**Machine plate**

The machine type plate (1) is affixed on the left front edge of the operator's platform.

The plate specifies the manufacturer's name and address, the type of machine, the PIN number (serial number), service weight, engine power and year of manufacture. If the machine is delivered outside of the EU, the plate may not have a CE marking and the year of manufacture.

					
Dynapac Compaction Equipment AB Box 504, SE-371 23 Karlskrona Sweden					
Product Identification Number		XXXXXXXXXXXXXXXXXX			
Designation	Type	Rated Power	Max axle load front / rear		
XXXXXX	XXXXXX	XXX kW	XXXXXXXX kg		
Gross machinery mass	Operating mass	Max ballast	[Date of Mfg]		
XXXX kg	XXXX kg	XXXX kg	XXXX		
Made in Sweden					
<small>4017 0001 03</small>					

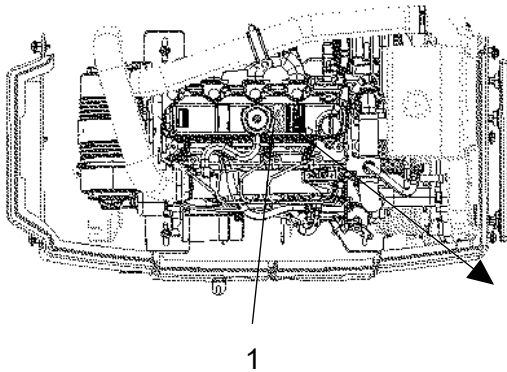
**Please state the machine's PIN (serial number) when ordering parts.**

**Engine plates**

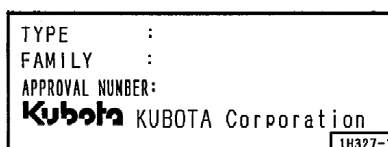
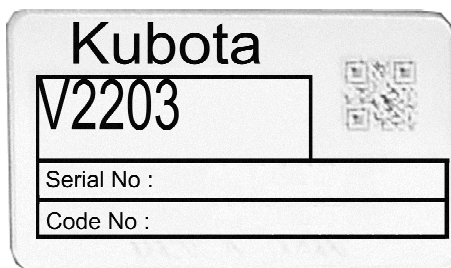
The engine's type plate (1) is located on top of the cylinder head cover.


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

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



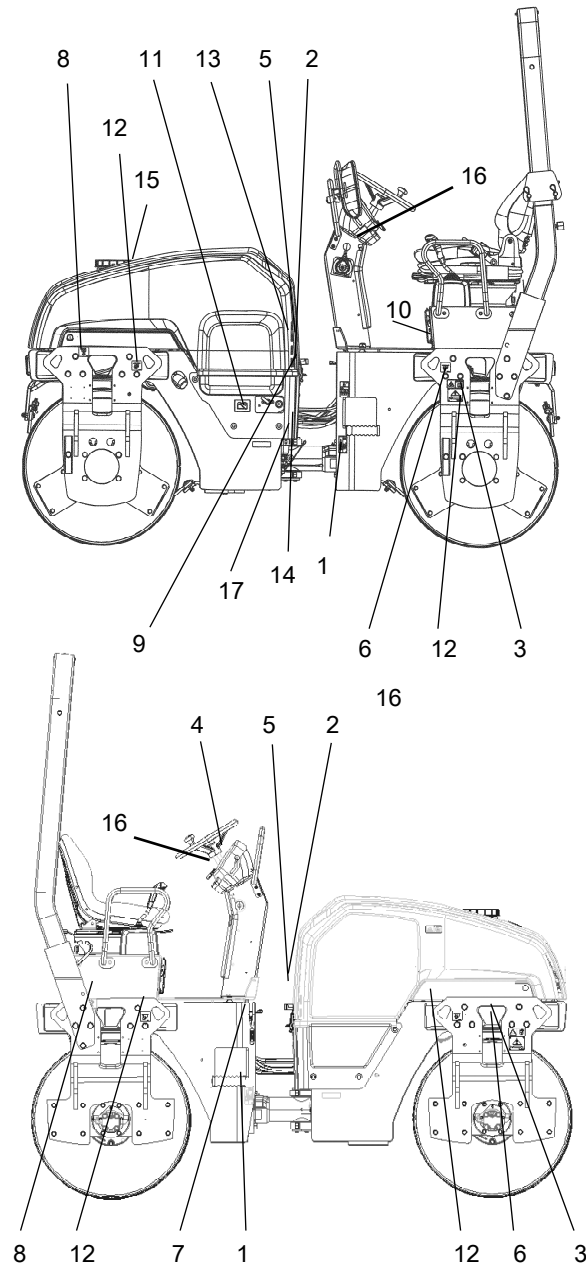
**Fig. Engine**  
**1. Type plate**



EMISSION CONTROL INFORMATION 	
THIS ENGINE MEETS 2008 Int. Tier4 EMISSION REGULATIONS FOR U. S. EPA AND CALIFORNIA NONROAD CI ENGINES.	
<b>Kubota</b> KUBOTA Corporation	
MODEL :	ENGINE DISP. :
FAMILY :	ECS :
POWER :	CATEGORY :
VALVE CLEARANCE (COLD) :	
INJ. TIMING :	
LOW SULFUR DIESEL OR ULTRA LOW SULFUR DIESEL FUEL ONLY	
CONTACT KUBOTA FOR FUEL SETTING.	J1H247-2



## Location - decals

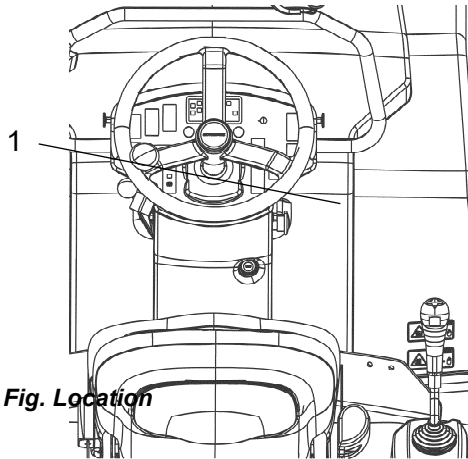


**Fig. Location, decals and signs**

1.	Warning, Crush zone	4700903422	8.	Lifting point	4700357587
2.	Warning, Rotating engine components	4700903423	9.	Hydraulic fluid	4700272372
3.	Warning, Locking	4700908229	10.	Manual compartment	4700903425
4.	Warning, Instruction manual	4700903459	11.	Battery disconnecter	4700904835
5.	Warning, Hot surfaces	4700903424	12.	Fixing point	4700382751
6.	Lifting plate	4700904870	13.	Sound power level	4700791292
7.	Diesel fuel	4700991658	14.	Hydraulic fluid level	4700272373
			15.	Warning, Starting gas	4700791642
			16.	Starting instructions	4812115918
			17.	Warning, Locked during transport	4812125363

### Location - decals, CALIFORNIA

Proposition 65

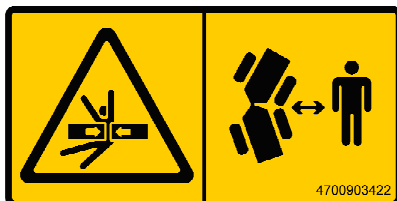


- |    |                                       |            |
|----|---------------------------------------|------------|
| 1. | Warning, CALIFORNIA<br>Proposition 65 | 4812129673 |
|----|---------------------------------------|------------|

### Safety decals

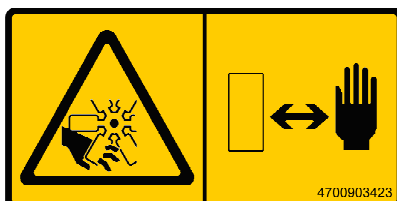
Always make sure that all safety decals are completely legible, and remove dirt or order new decals if they have become illegible. Use the part number specified on each decal.

If a part is replaced and this part have a decal, make sure to also order the decal.



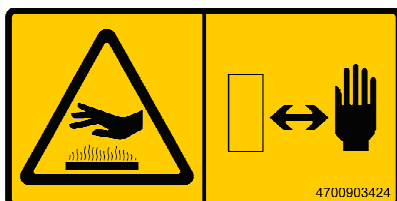
**4700903422**  
**Warning - Crush zone, articulation/drum.**

**Maintain a safe distance from the crush zone.**  
*(Two crush zones on machines fitted with pivotal steering)*



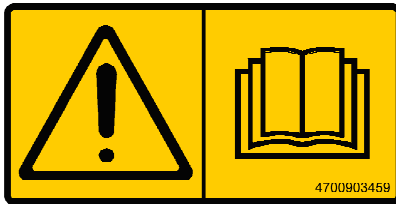
**4700903423**  
**Warning - Rotating engine components.**

**Keep your hands at a safe distance.**



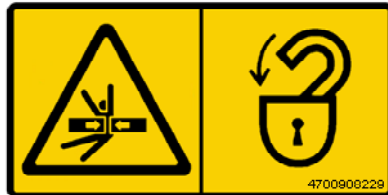
**4700903424**  
**Warning - Hot surfaces in the engine compartment.**

**Keep your hands at a safe distance.**



**4700903459**  
Warning - Instruction manual

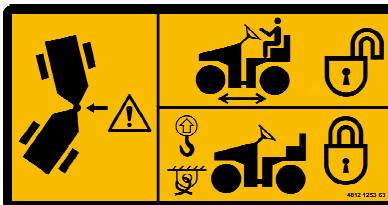
The operator must read the safety, operation and maintenance instructions before operating the machine.



**4700908229**  
Warning - Risk of crushing

The articulation must be locked when lifting.

Read the instruction manual.



**4812125363**  
Warning - Locking

The articulation must be locked during transport and lifting,

but be open during operation.

Read the instruction manual.



**4700791642**  
Warning - Starting gas

Starting gas is not to be used.

4812129673  
Warning

CALIFORNIA - Proposition 65



# WARNING

Breathing diesel engine exhaust exposes you to chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

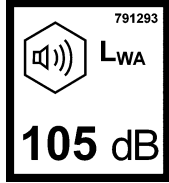
- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to  
[www.P65warnings.ca.gov/diesel](http://www.P65warnings.ca.gov/diesel)

4812129673

Info decals

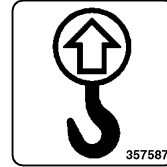
Noise power level



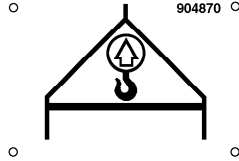
Diesel fuel



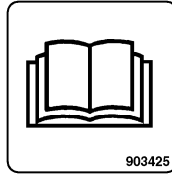
Lifting point



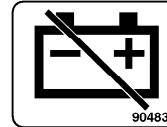
Hoisting plate



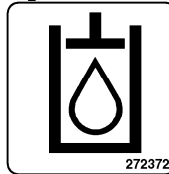
Handbook compartment



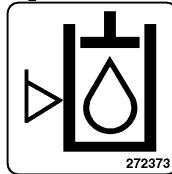
Master switch



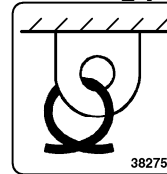
Hydraulic fluid



Hydraulic fluid level



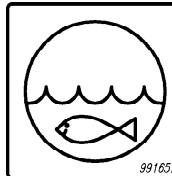
Securing point



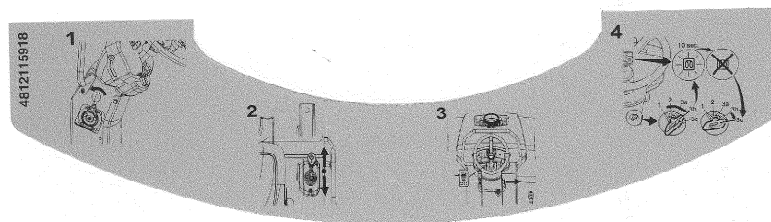
Biological hydraulic fluid,  
PANOLIN



Water



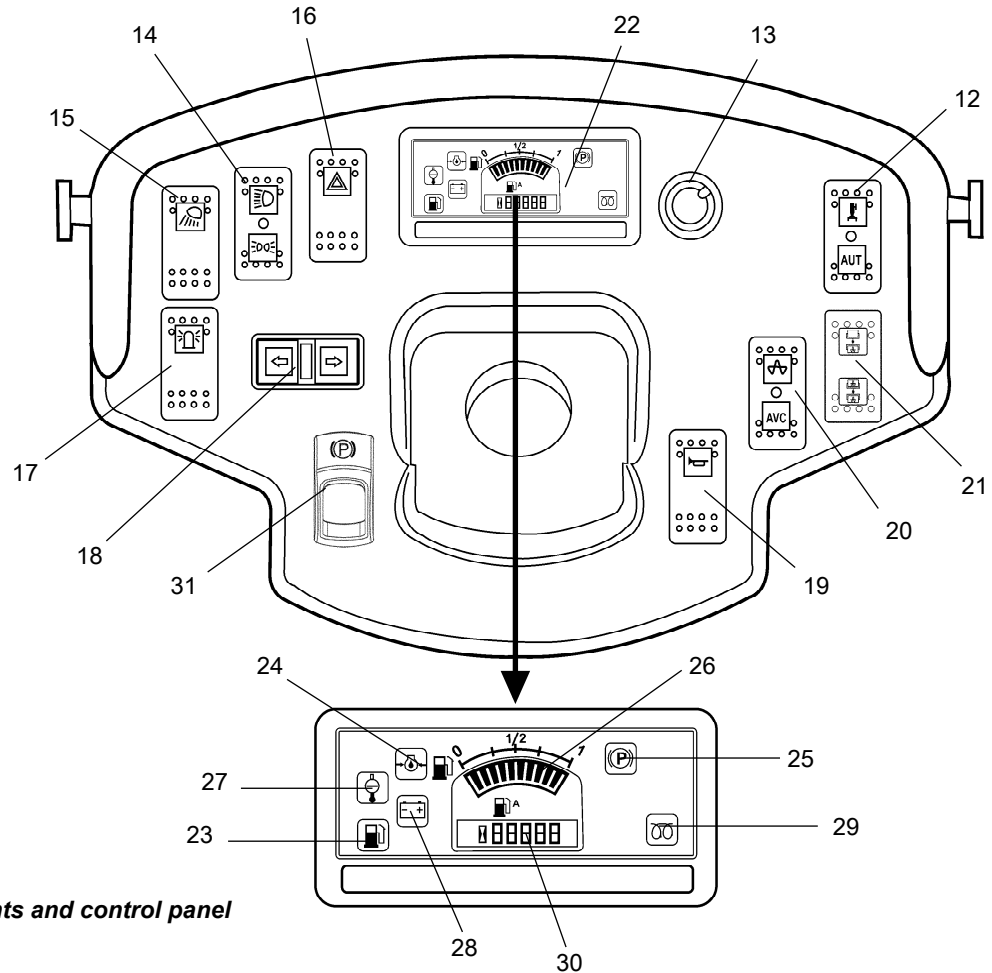
Starting instructions





**Instruments/Controls**

**Locations - Instruments and controls**



**Fig. Instruments and control panel**

- |     |                                      |     |                           |
|-----|--------------------------------------|-----|---------------------------|
| 12. | Manual/automatic sprinkler           | 23. | Low fuel level            |
| 13. | * Sprinkler timer                    | 24. | Oil pressure, engine      |
| 14. | * Driving lights                     | 25. | Parking brake lamp        |
| 15. | Working lights                       | 26. | Fuel level                |
| 16. | * Hazard warning lights              | 27. | Water temperature, engine |
| 17. | * Hazard beacon                      | 28. | Battery/charging          |
| 18. | * Direction indicators               | 29. | Glow plug                 |
| 19. | Horn                                 | 30. | Hourmeter                 |
| 20. | Vibration manual/automatic           | 31. | Parking brake On/Off      |
| 21. | * Vibration selector Front/rear drum |     |                           |
| 22. | Control panel                        |     |                           |
- \* = Option

Locations - Control panel and controls

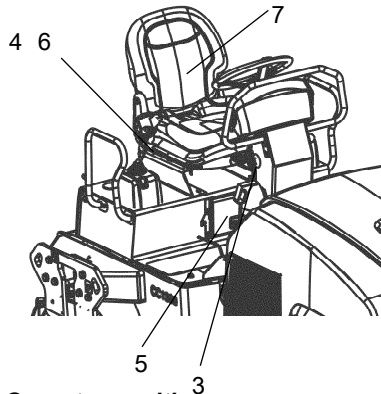


Fig. Operator position

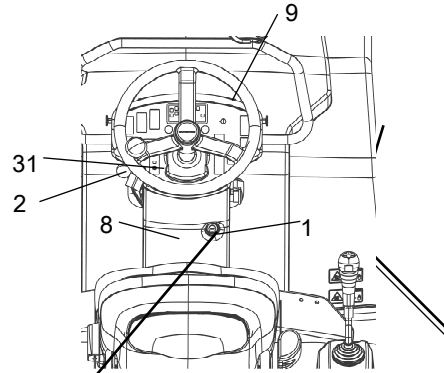
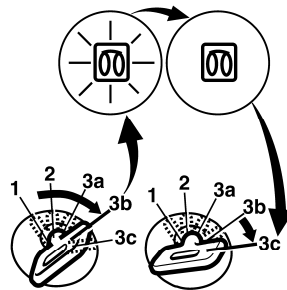









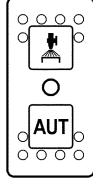
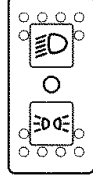
Fig. Operator's station



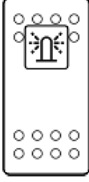

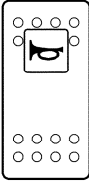
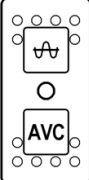
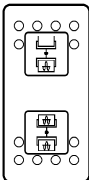









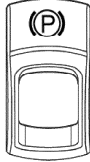
- 1 Starter switch
- 2 Throttle control
- 3 Emergency stop
- 4 Vibration On/Off
- 5 Handbook compartment
- 6 Forward/reverse lever
- 7 Seat switch
- 8 Fuse box
- 9 Instrument cover



## Function description

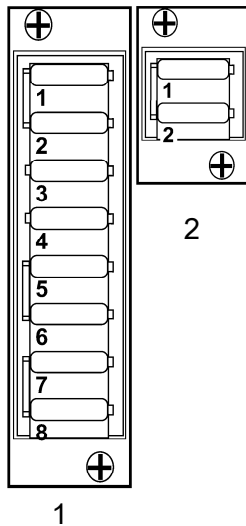
No	Designation	Symbol	Function
1.	Starter switch	 	<p>Positions 1-2: Shut off position, key can be removed.</p> <p>Position 3a: All instruments and electric controls are supplied with power.</p> <p>Position 3b: Glowing. Hold the starter switch in this position until the lamp goes out. The starter motor is activated in the next position.</p> <p>Position 3c: Starter motor activation.</p>
2.	Throttle control		<p>In forward position, the engine idles. In backward position, the engine runs at full speed.</p>
3.	Emergency stop		<p>When pressed, the emergency stop is activated. The engine switches off and the brakes are activated. Brace yourself for a sudden stop.</p>
4.	Vibration On/Off. Switch		<p>Press once and release to switch vibration on. Press again to switch the vibration off.</p>
5.	Handbook compartment		<p>Pull up and open the top of the compartment for access to handbooks.</p>
6.	Forward/Reverse lever		<p>The engine can only be started when the lever is in neutral. The engine will not start if the forward/reverse lever is not in the neutral position. Direction of travel and speed of the roller is regulated with the forward/reverse lever. Move the lever forward to drive the roller forwards, etc. The speed of the roller is proportional to the distance of the lever from the neutral position. The further the lever is from the neutral position, the higher the speed.</p>
7.	Seat switch		<p>Remain seated at all times when operating the roller. If the operator stands up during operation, a buzzer sounds. After 4 seconds the brakes are activated and the engine stops.</p>
8.	Fuse box (on control column)		<p>Contains fuses for the electrical system. See under the heading 'Electrical system' for a description of fuse functions.</p>
9.	Instrument cover		<p>Lowered over the instrument plate to protect the instruments from the weather and sabotage. Lockable</p>
12.	Sprinkler, switch (Optional)		<p>Upper position = switching on of flow of water to drum. Intermediate position = Sprinkling switched off Lower position = switching on of water to drum via forward/reverse lever. The flow of water can be controlled by means of the sprinkler timer (13).</p>
13.	Sprinkler timer (Optional)		<p>Variable adjustment of water flow from 0-100%. Only works when AUTO (12) is pressed in.</p>
14.	Driving lights, switch (Optional)		<p>Upper position = Traffic lighting goes on Intermediate position = Lighting switched off Lower position = Parking light goes on</p>

No	Designation	Symbol	Function
15.	Working lights, switch		When depressed, the working lights are on
16.	Hazard warning lights, switch (Optional)		Where depressed, the hazard warning lights are on
17.	Hazard beacon, switch		Where depressed, the hazard beacon is on
18.	Direction indicators, switch (Optional)		When depressed to the left, the left direction indicators are on etc. In the middle position the function is shut off.
19.	Horn, switch		Press to sound the horn.
20.	Vibration MAN/AUTO, switch		In the upper position, the vibration is switched on/off with the switch on the forward/reverse lever. The function is activated with the switch. In the intermediate position the vibration system is completely switched off. In the lower position the vibration is switched on or off automatically via the forward/reverse lever.
21.	Vibration selector, switch (Optional)		Upper position = Vibration switch off on front drum Lower position = Vibration on both drums.
22.	Control panel		
23.	Warning lamp, low fuel level		The lamp comes on when the fuel level in the tank is low.
24.	Warning lamp, oil pressure		This lamp lights if the lubricating pressure in the engine is too low. Stop the engine immediately and locate the fault.
25.	Warning lamp, parking brake		The lamp lights when the parking brake is activated.
26.	Fuel level		Shows the fuel level in the diesel tank.

No	Designation	Symbol	Function
27.	Warning lamp, water temperature		The light comes on if the water temperature is too high.
28.	Warning lamp, battery charging		If the lamp lights while the engine is running the alternator is not charging. Stop the engine and locate the fault.
29.	Warning lamp, glow plug		The lamp must go out before the starter switch is moved to position 3c for activation of the starter motor.
30.	Hourmeter		Shows the number of hours the engine has run.
31.	Parking brake On/Off, switch		<p>To activate the brakes, press the top of the switch to change the position of the lever.</p> <p>To disengage the brakes, press down the red part at the same time as the switch, and change the position of the lever.</p> <p>NOTE: When starting the machine, the parking brake must be activated.</p> <p><b>Always use the parking brake when the machine is stationary on a sloping surface.</b></p>

## Electrical system

### Fuses on machine equipped with Sauer-Danfoss ECU



The figure shows the position of the fuses.

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

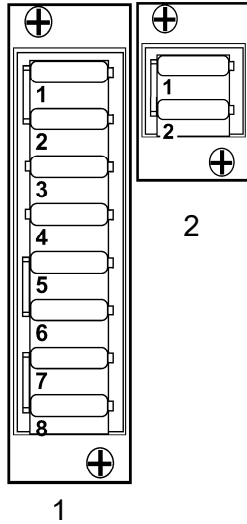
**Fig. Fuse boxes**  
 1. Upper  
 2. Lower

Fuse box, Upper		Fuse box, Lower	
F1.1 ECU, Interlock, Instrument panel, Sprinkler, Vibration	20A	F2.1	Spare
F1.2 Alternator, Horn, Fuel pump	10A	F2.2	Flow divider, Sprinkler combi wheel 10A
F1.3	Spare		
F1.4	Spare		
F1.5	Rotating beacon 10A		
F1.6	Direction indicators, Power socket 12V 10A		
F1.7	Traffic lights, Working lights 15A		
F1.8	Brake light, Traffic lights, Working lights rear 15A		

## Fuses on machine equipped with HY-TTC 71 ECU

The figure shows the position of the fuses.

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



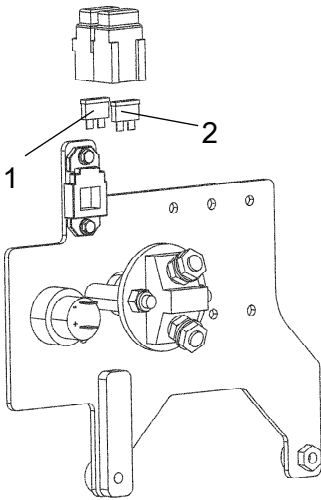
**Fig. Fuse boxes**  
 1. Upper  
 2. Lower

Fuse box, Upper		Fuse box, Lower	
F1.1	ECU, Interlock, Instrument panel, Sprinkle, Vibration	20A	F2.1 Spare
F1.2	ECU, Horn, Fuel pump	10A	F2.2 Flow divider, Sprinkler combi wheel
3.	Spare		10A
F1.4	Rotating beacon, sprinkler	15A	
F1.5	ECU memory	0,5A	
F1.6	Direction indicators, Power socket 12V	10A	
F1.7	Traffic lights, Working lights	15A	
F1.8	Brake light, Traffic lights, Working lights	15A	

**Fuses at battery master disconnect switch**

The figure shows the position of the fuses.

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



- |    |    |   |     |
|----|----|---|-----|
| 1. | F3 | Main fuse                               | 30A |
| 2. | F4 | Glow plug, Starter relay, Stop solenoid | 40A |

**Fig. Battery disconnecter**

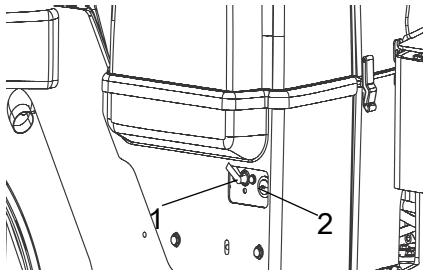
## Operation

### Before starting

#### Master switch - Switching on

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

The battery disconnecter is on the left side in the engine compartment.  
Turn the key (1) to switched on position. The roller is now supplied with power.



**Fig. Engine compartment**  
1. Battery disconnecter  
2. Power socket, 12 V



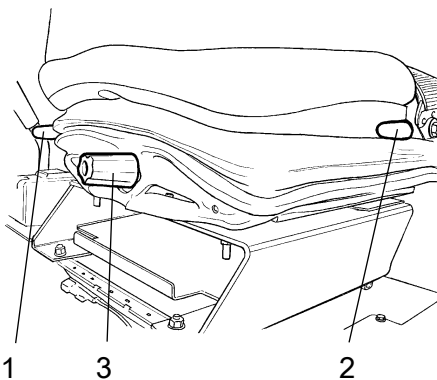
**The engine hood must be unlocked during operation, unless the battery disconnecter is freely accessible from the outside, so that the battery voltage can be quickly disconnected if necessary.**

#### Driver seat (Std) - Adjustment

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.

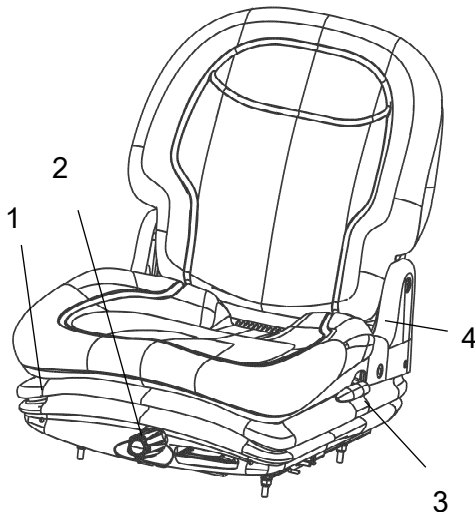
- Length adjustment (1)
- Backrest adjustment (2)
- Weight adjustment (3)



**Fig. Driver seat**  
1. Handle - Length adjustment  
2. Handle - Backrest angle  
3. Handle - Weight adjustment



**Always check that the seat is in locked position before starting.**



**Fig. Driver seat**  
 1. Lock lever - Length adjustment  
 2. Weight adjustment  
 3. Back support angle  
 4. Seat belt

## Driver seat (Option) - Adjustment

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)
- Weight adjustment (2)
- Back support angle (3)



**Always make sure that the seat is secure before beginning operation.**

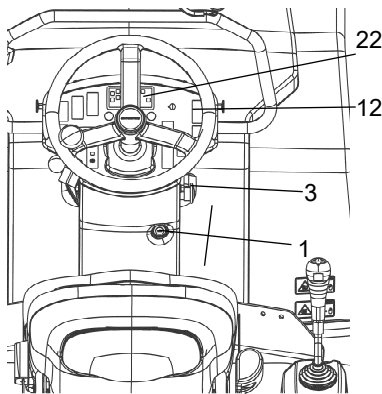


**Do not forget to use the seat belt (4).**

## Instruments and lamps - Checking



**Make sure that the emergency stop is pulled out and the parking brake is activated. When the forward/reverse lever is in neutral, the automatic brake function is engaged.**



**Figure. Instrument panel**  
 1. Starter switch  
 3. Emergency stop  
 12. Switch, watering  
 22. Warning panel

Turn the switch (1) to position 3a.

Check that the warning lamps in the warning panel (22) come on.

Set the sprinkler switch (12) to the operating position and check that the system is functioning.



### Interlock

The roller is equipped with Interlock.

Roller equipped with **Sauer-Danfoss** ECU:

The diesel engine will switch off after 4 seconds if the operator gets off the seat when going forwards/backwards.

If the lever is in neutral when the operator gets off the seat a buzzer will go on until the parking brake button is activated.

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

The diesel engine will switch off immediately if for any reason the forward/reverse lever is moved out of neutral when the operator is not sitting down and the parking brake button has not been activated.

Roller equipped with **HY-TTC 71** ECU:

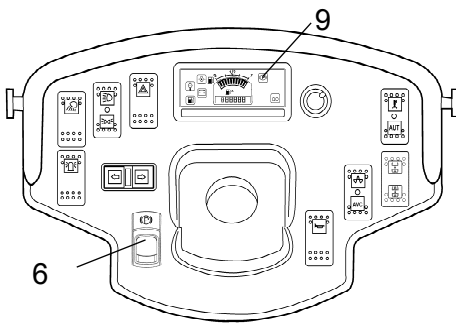
If the operator is leaving the seat with the diesel engine running, travel lever in neutral position and parking brake disengaged, the buzzer will set and the diesel engine will shut down after four seconds.

During these four seconds the diesel engine shut down can be rescinded either by engaging the parking brake or to be seated.

If the operator is not seated and move the travel lever out of neutral position, the buzzer will set and the diesel engine will shut down instantly.



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



**Fig. Instrument panel**  
**6. Parking brake**  
**9. Brake warning lamp**

### Parking brake - Check



**Make sure that the parking brake (6) is activated. The roller can start to roll when the engine is started on sloping ground, if the parking brake is not applied.**

### Operator position

If a ROPS (Roll Over Protective Structure) is fitted to the roller, always wear the seat belt (1) and wear a protective helmet.



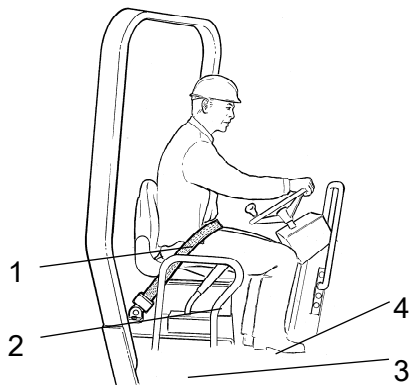
**Always replace the seat belt (1) if it shows signs of wear or has been subjected to excessive strain.**



**Check that the platform's rubber elements (3) are in good condition. If the elements are worn this will have a negative effect on comfort.**



**Ensure that the anti-slip (4) on the platform is in good condition. Replace where anti-slip friction is poor.**



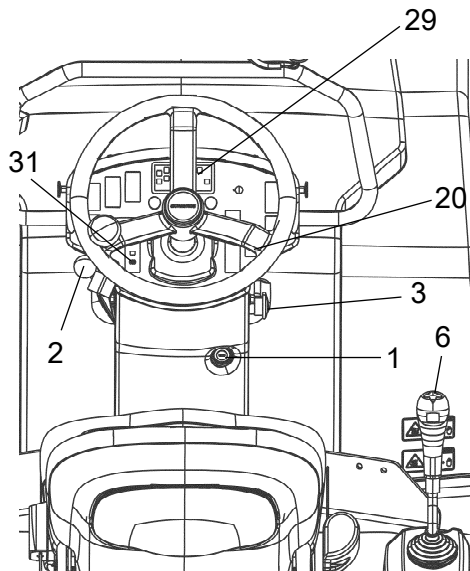
**Fig. Driver seat**  
**1. Seat belt**  
**2. Safety rails**  
**3. Rubber element**  
**4. Anti-slip**

## Starting

### Starting the engine



**The operator must remain seated when starting.**



**Figure. Control panel**

- 1. Starter switch**
- 2. Throttle control**
- 3. Emergency stop**
- 6. Forward/Reverse lever**
- 20. Vibration switch man/auto**
- 29. Glow lamp**
- 31. Parking brake**

Make sure that the emergency stop (3) is pulled out and the parking brake (31) is activated.

Set the forward/reverse lever (6) in neutral. The engine can only be started when the lever is in neutral.

Set the vibration switch (20) for manual/automatic vibration in (position O).



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

At high ambient temperatures, set the throttle control (2) to the position just over idling.

Set the throttle control (2) to full speed when starting a cold engine. Preheating: Turn key to position II. When the glow lamp (29) goes off: Turn the starter switch (1) to the right. As soon as the engine starts, release the starter switch and reduce the engine speed to just over idling (because high revs can damage a cold engine). As soon as the engine is running smoothly, reduce the revs down to idling.

Warm up the engine at idling speed for a few minutes, although longer if ambient temperature is below +10°C (50°F).

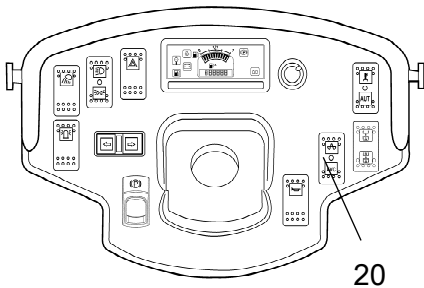


Fig. Instrument panel  
20. Vibration switch

Check while warming the engine that the warning lamps for the oil pressure (24) and charging (28) go out.

The parking brake lamp (25) will remain on for as long as the parking brake switch is activated.



**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.**

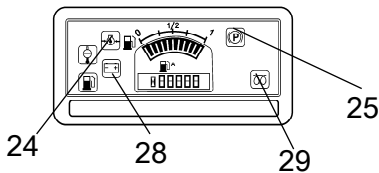



Fig. Control panel  
24. Oil pressure lamp  
25. Brake lamp  
28. Charging lamp  
29. Glow lamp



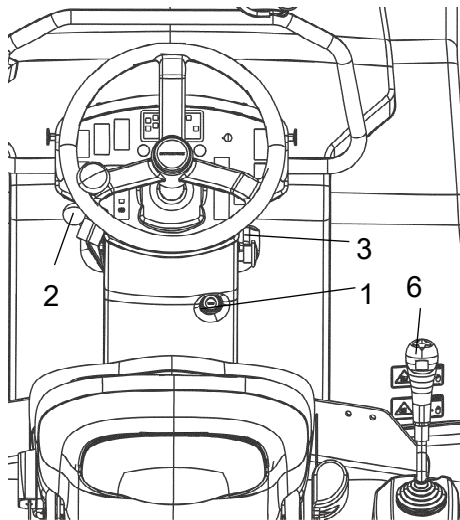
**Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.**

## Driving

### Operating the roller

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

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



**Figure. Instrument panel**

- 1. Starter switch**
- 2. Throttle control**
- 3. Emergency stop**
- 6. Forward/reverse lever**

Release the parking brake and check that the parking brake lamp goes off.

Turn the throttle control (2) in backward 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 (12).

## Interlock/Emergency stop/Parking brake - Check



**The interlock, emergency stop and parking brake must be checked daily before operating. A function check of the interlock and emergency stop requires a restart.**



**The interlock function is checked by the operator standing up from the seat when the roller is moving very slowly forwards/backwards. (Check in both directions). Hold the steering wheel firmly and brace yourself for a sudden stop. A buzzer goes on and after 4 seconds the engine switches off and the brakes are activated.**



**Check the function of the emergency stop by pressing the emergency stop when the roller is moving slowly forwards/backwards. (Check in both directions). Hold the steering wheel firmly and brace yourself for a sudden stop. The engine switches off and the brakes are activated.**



**Check the function of the parking brake by activating the parking brake when the roller is moving very slowly forwards/backwards. (Check in both directions). Hold the steering wheel and brace yourself for a sudden stop when the brakes are activated. The engine does not switch off.**

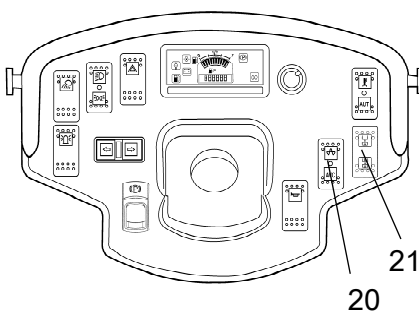
## Vibration

### Manual/Automatic vibration

Manual or automatic vibration activation/deactivation is selected using switch (20).

In the manual position, the operator must activate the vibration using the switch on underside of the forward/reverse lever grip.

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



**Fig. Instrument panel**  
**20. Man/Auto switch**  
**21. Switch, Vibration selector**

## Vibration on one drum (Optional)

The switch (21) is used to select vibration with the rear drum only, or with two drums.

When the vibration is on, the operator must activate vibration via the switch (20) on the forward/reverse lever.

In the lower position the vibration is activated on both drums.


In the upper position the vibration on the front drum is switched off.

## Braking

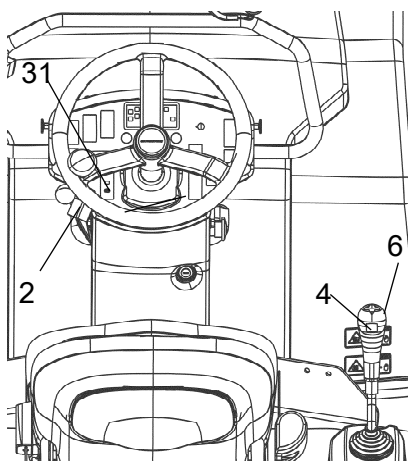
### Normal braking

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

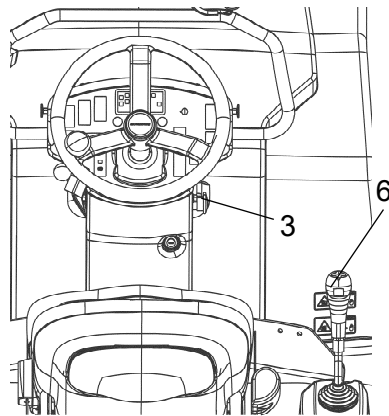
Move the forward/reverse lever (6) to the neutral position to stop the roller.

 **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.**

 **Never leave the operator platform without activating the parking brake (31).**



**Figure. Control panel**  
2. Throttle control  
4. Vibration On/off  
6. Forward/reverse lever  
31. Parking brake



**Fig. Control panel**  
**3. Emergency stop**  
**6. Forward/Reverse lever**

### Emergency braking

Braking is normally activated using the forward/reverse lever (6). The hydrostatic transmission brakes the roller when the lever is moved to the neutral position.

There is a brake in each drive motor that acts as an emergency brake during operation.



**To brake in an emergency situation, push in the emergency stop (3), hold the steering wheel firmly and be prepared for a sudden stop. The diesel engine stops.**

After emergency braking, reset the forward/reverse lever (6) to neutral position, pull out the emergency stop and activate the parking brake. Restart the engine.

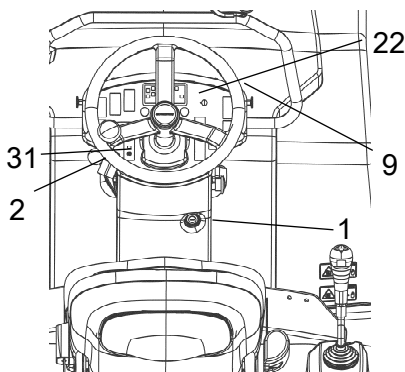
### Switching off

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

Activate the parking brake (31).

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 switched off position. At the end of the shift, fold over the instrument cover (9) and lock.



**Figure. Instrument panel**  
**1. Starter switch**  
**2. Throttle control**  
**9. Instrument cover**  
**22. Panel for warning lamps**  
**31. Parking brake**



## Parking

### Chocking the drums



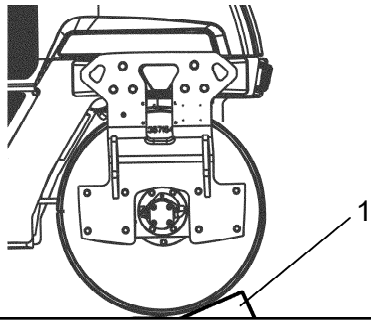
**Never disembark from the roller when the diesel engine is running, without first activating the parking brake.**



**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.**



**Remember that there is a risk of freezing during the winter. Empty the water tank. Fill antifreeze in the engine's cooling system. See also maintenance instructions.**

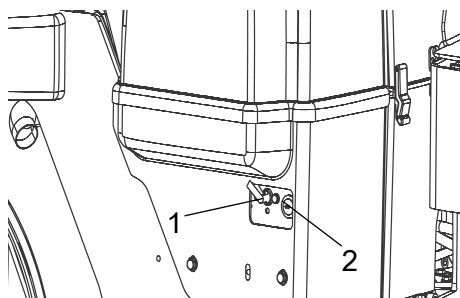


**Fig. Drum part**  
**1. Chocks**

### Battery disconnecter

Before leaving the roller at the end of the shift, switch off the battery disconnecter (1) and remove the key.

This will prevent battery discharging and will also make it difficult for unauthorized persons to start and operate the machine. Lock also the engine cover.

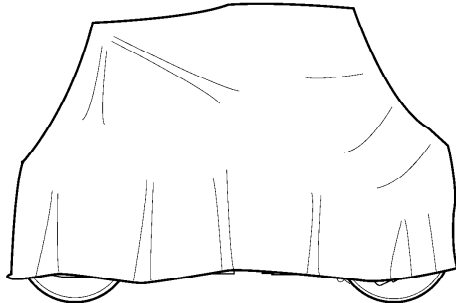


**Fig. Battery bay**  
**1. Battery disconnecter**  
**2. Power socket, 12 V**



### Long-term parking

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



**Fig. Roller weather protection**

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

\* Dismantle the battery/batteries from the machine, clean the outside and maintenance charge.

#### 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.

#### 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.')

#### Water tank

Empty the water tank completely to avoid fouling.

### **Steering cylinder, hinges, etc.**

Lubricate the steering joint bearings and both bearings on 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.

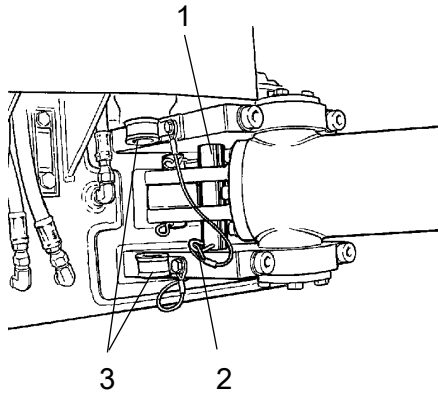
\* Cover the entire roller with a tarpaulin. A gap must be left between the tarpaulin and the ground.

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

## Miscellaneous

### Lifting

#### Locking the articulation



**Fig. Left side of steering joint**

- 1. Lock bar
- 2. Lock pin
- 3. Holder



**Before lifting the roller the steering joint must be locked to prevent it turning.**

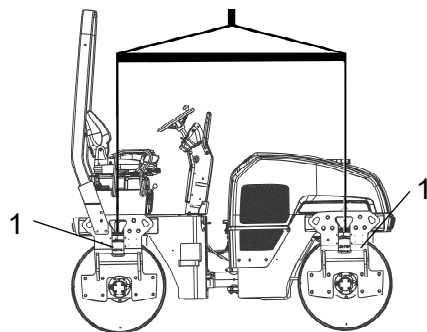
Turn the steering wheel to the straight ahead position.  
Switch off the machine and activate the parking brake.

Pull down the galvanized lock bar (1) from its holder (3), and place it from underneath in the hole on the lower steering joint bracket. Press the bar through until the upper end is visible in the hole on the upper steering joint bracket.

Secure the bar with the lock pin (2).

Weight: refer to the hoisting plate on the roller

#### Lifting the roller



**Fig. Lifting the roller**

- 1. Lifting plate



**The weight of the machine is shown on the lifting plate (1). See also Technical specifications.**

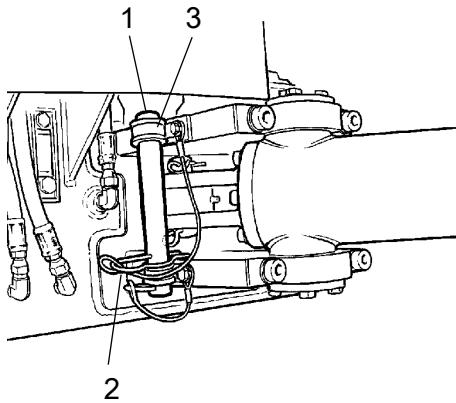


Lifting equipment such as chains, steel wires, straps and lifting hooks must be dimensioned in accordance with the relevant safety regulations for the lifting equipment.



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

## Unlocking the articulation



**Fig. Left side of steering joint**  
1. Lock bar  
2. Lock pin  
3. Holder



Remember to refit the lock bar (1) in its holder after operation.

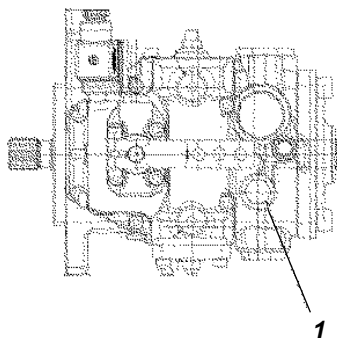
## Towing/Recovering

The roller can be moved up to 300 meters (330 yards) using the instructions below.

### Short distance towing with switched off engine



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



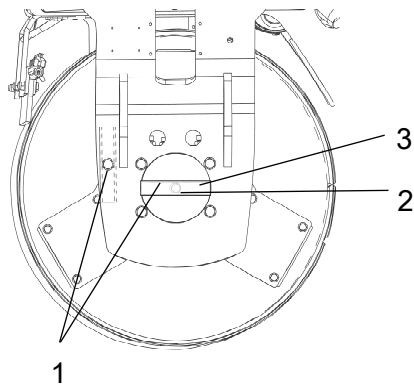
**Fig. Propulsion pump**  
1. By-pass screw

Open the hood and make sure that the propulsion pump is accessible.

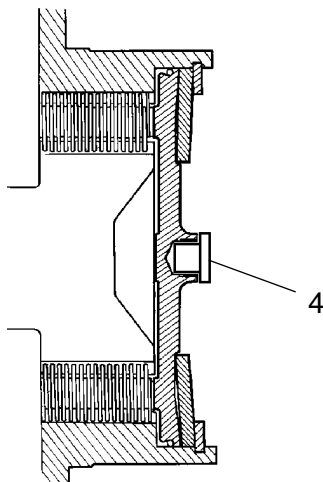
On the pump there is a by-pass screw (1), which should be unscrewed counterclockwise (maximum two turns) to set the system (ports A and B) in by-pass mode.

This function enables a machine to be moved without the drive shaft on the propulsion pump rotating.

When resetting the by-pass screw (1) tightened clockwise (maximum two turns).



**Fig. Left side of drum**  
**1. Brake tool**  
**2. Fastening screw**  
**3. Disengagement nut**



**Fig. Brake housing**  
**4. Center plug**

### Release the brakes



**Activate the parking brake, and stop the engine. Block the drum with a chock to prevent movement; the roller can start rolling when the brakes are released.**



**The disc brake in each drive motor must be disengaged mechanically, according to below following instructions, before the roller can be towed.**

Remove the center plug (4) using a screwdriver.

Screw off the brake tool (1) from its threaded fixing hole. Then fix the brake tool (1) in the center hole by tightening the screw (2) until it bottoms in the hole. Tighten the nut (3) against the brake tool until it stops, indicating that the brakes is now disengaged.

### Disengaging the brakes

Screw out the nut again after towing. This returns the brakes to their normal mode. Screw off the brake tool and fit it back into its fixing holes. Refit the center plug (4) to counteract the information of rust inside the threaded hole.

## Towing the roller

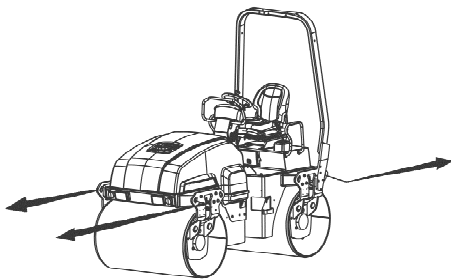


Fig. Towing



**The roller must be counter-braked during towing/recovery. Always use a towbar. There is no braking capacity on the roller now.**



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

When towing/retrieving a machine, the towing device must be connected to both lifting holes. The pulling force shall act longitudinally on the machine as shown in the figure. Maximum total pulling force 130 kN (29225 lbf).



Reverse the towing preparations.

## Transport

Tie-down and secure the machine according to the Cargo Securing Certificate for the specific machine if this is available and applicable.

If not, tie down and secure the machine according to the cargo securing rules that are valid for the country where the transport takes place.



**Never lash over the machine's articulated joint, nor over the machine's operator platform.**

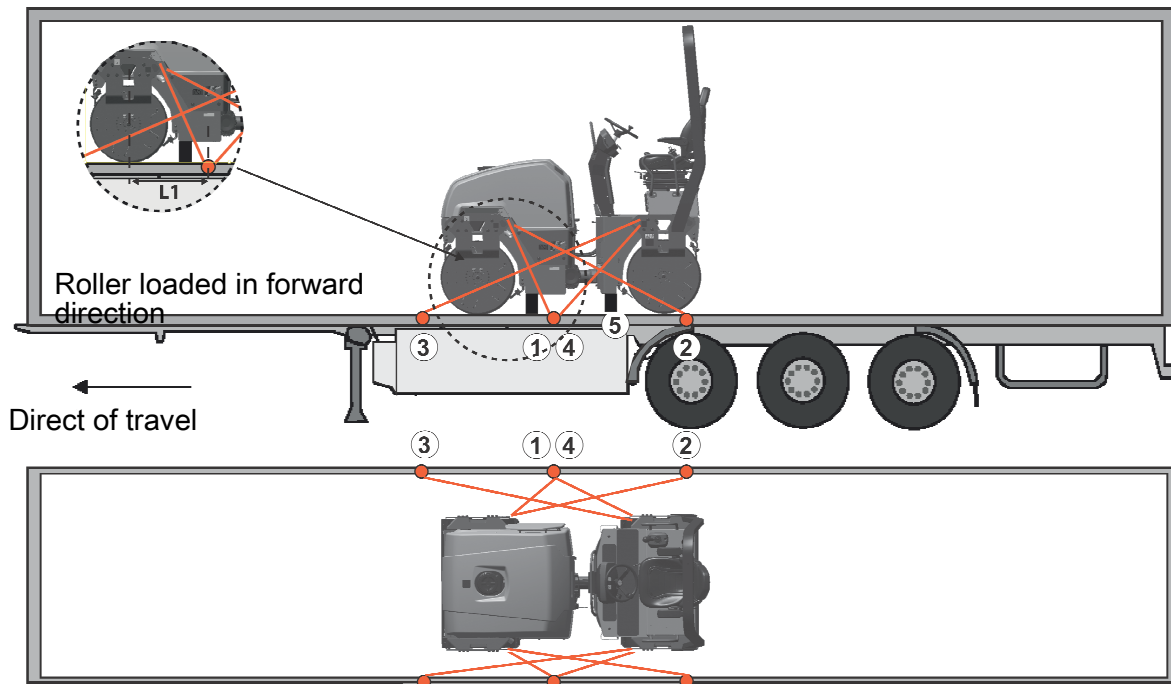
Before securing the machine ensure that :

- the parking brake is applied and in good working condition
- the articulated joint is in closed position
- the machine is centered laterally on the platform
- the lashings are in good condition and fulfills the corresponding rules for transport securing.



### Securing CC1300 for loading

Securing the CC1300 vibratory roller from Dynapac for transport.



- 1 - 2 = double lashings, i.e. one lashing with two parts secured to two different lashing mounts,
- 3 - 4 symmetrically located on the right and left sides.
- 5 = rubber

The lashings' permitted distance interval in meters		
(1 - 4: Double lashings, LC at least 1.7 tonnes (1700 daN), S <sub>TF</sub> 300 kg (300daN))		
Double L <sub>1</sub> - L <sub>2</sub>	Double L <sub>3</sub> - L <sub>4</sub>	
0,6 - 3,0	0,1 - 3,0	

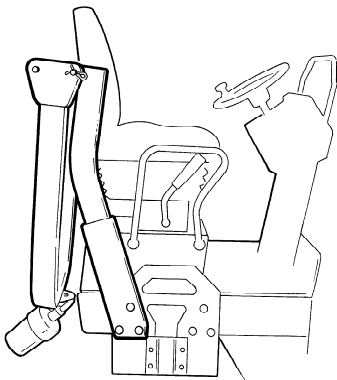
The distance  $L_1$  above is between points **D** and **E**. **D** is the projected point directly at right angles laterally in relation to the edge of the platform from the lashing mount **C** on the roller. **E** is the lashing mount at the edge of the platform.  $L_2 - L_3$  have a corresponding relationship.

**Load carrier**

- When loaded, the vibratory roller is centered laterally on the platform ( $\pm 5$  cm).
- The parking brake is applied and in good working condition, and the articulated joint lock is closed.
- The drum is placed on a rubber liner, so that the static friction between the surfaces is at least 0.6.
- The contact surfaces must be clean, wet or dry, and free from frost, ice and snow.
- The lashing mounts on the load carrier have LC/MSL at least 2 tonnes.

**Lashings**

- The lashings comprise a lashing strap or chain with a permitted load (LC/MSL) of at least 1.7 tonnes (1,700 daN) and a pre-tension  $S_{TF}$  of at least 300 kg (300 daN). The lashings are re-tightened as required.
- Each of lashings 1-4 is either a double or two single lashings. A double lashing runs in a sling through a lashing point or around a machine part and down into two different mounts on the platform.
- Lashings in the same direction are placed in different lashing mounts on the trailer. Lashings that are pulled in opposite directions may be placed in the same lashing mount, however.
- The lashings are as short as possible.
- The lashing hooks must not lose grip if the lashings become slack.
- The lashings are protected against sharp edges and corners.
- The lashings are located symmetrically in pairs on the right and left sides.



**Fig. Retractable ROPS**

**Retractable ROPS (Optional)**

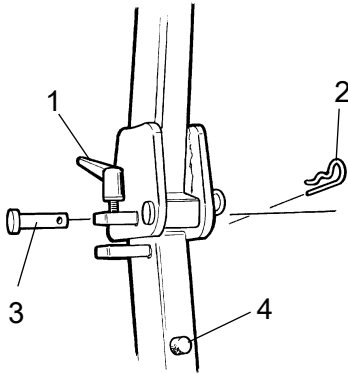
The machine can be equipped with retractable ROPS.



***Risk of crush injury when raising and lowering ROPS.***



***If the roller is equipped with a retractable ROPS, the machine must only be operated when it is lifted up and locked.***



**Fig. ROPS locking device**  
1. Tensioning screw  
2. Pin  
3. Stud  
4. Rubber buffer

To retract the ROPS, release the tensioning screw (1), and pull out the pin (2) and stud (3). Do the same on both sides. Lower the ROPS backwards if there is space.



**Remember to dismantle the rotating warning light before lowering the ROPS.**



**After lowering the ROPS, replace the pin and stud.**

To lift the ROPS proceed in the reverse order.



**Always make sure the ROPS is locked in raised position before operation.**

Grease the tensioning screw (1) and stud (3) periodically.



### 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 full speed.
7. Set the emergency stop in the pulled out position.
8. Start the engine and allow it to warm up.
9. Set the engine speed control to the operating position.



10. **Drive the roller. Operate the forward/reverse lever with care.**



11. **Check the brakes, drive slowly. Remember that the braking distance will be longer if the roller is cold.**
12. Use vibration only when the roller is in motion.
13. Check that the drums are thoroughly watered when watering is required.



14. **IN AN EMERGENCY:**
  - Press the **EMERGENCY STOP**
  - Hold the steering wheel firmly.
  - Brace yourself for a sudden stop. The engine stops.
15. Parking: - Stop the engine and chock the drums.
16. When lifting: - Refer to the relevant section in the Instruction Manual.
17. When towing: - Refer to the relevant section in the Instruction Manual.
18. 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 reported immediately to the transport company, as this is not covered by the product warranty.

### Warranty

The warranty is only valid if the stipulated 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 authorization.












### Maintenance - Lubricants and symbols

#### Fluid volumes

Hydraulic tank	45 liters	47.5 qts
Diesel engine	9,5 liters	10 qts
Drum	6 liters	6.3 qts
Coolant	8 liters	8.5 qts















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

	ENGINE OIL	Air temperature -15°C - +50°C (5°F-122°F)	<b>Dynapac Engine Oil 200</b>	P/N 4812161855 (5 liter) P/N 4812161856 (20 liter) P/N 4812161857 (209 liter)
	HYDRAULIC FLUID	Air temperature -15°C - +50°C (5°F-104°F)	<b>Dynapac Hydraulic 300</b>	P/N 4812161868 (20 liter) P/N 4812161869 (209 liter)
	BIOLOGICAL HYDRAULIC FLUID, PANOLIN	Air temperature over +50°C (104°F) 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.	Shell Tellus S2 V100  PANOLIN HLP Synth 46 (www.panolin.com)	
	DRUM OIL	Air temp. -15°C - +40°C (5°F-104°F)	<b>Dynapac Gear Oil 300</b>	P/N 4812161887 (5 liter) P/N 4812161888 (20 liter) P/N 4812161889 (209 liter)
	GREASE	Air temperature 0°C - over +40°C (32°F- over 104°F)	Shell Spirax AX 85W/140, API GL-5	<b>Dynapac Roller Grease</b> P/N 4812030096 (0.4 kg)
	FUEL	See engine manual.	-	-
	COOLANT	Anti-freeze protection down to about -37°C (-34.6°F)	<b>Dynapac Coolant 100</b> (mixed 50/50 with water)	P/N 4812161854 (20 liter)



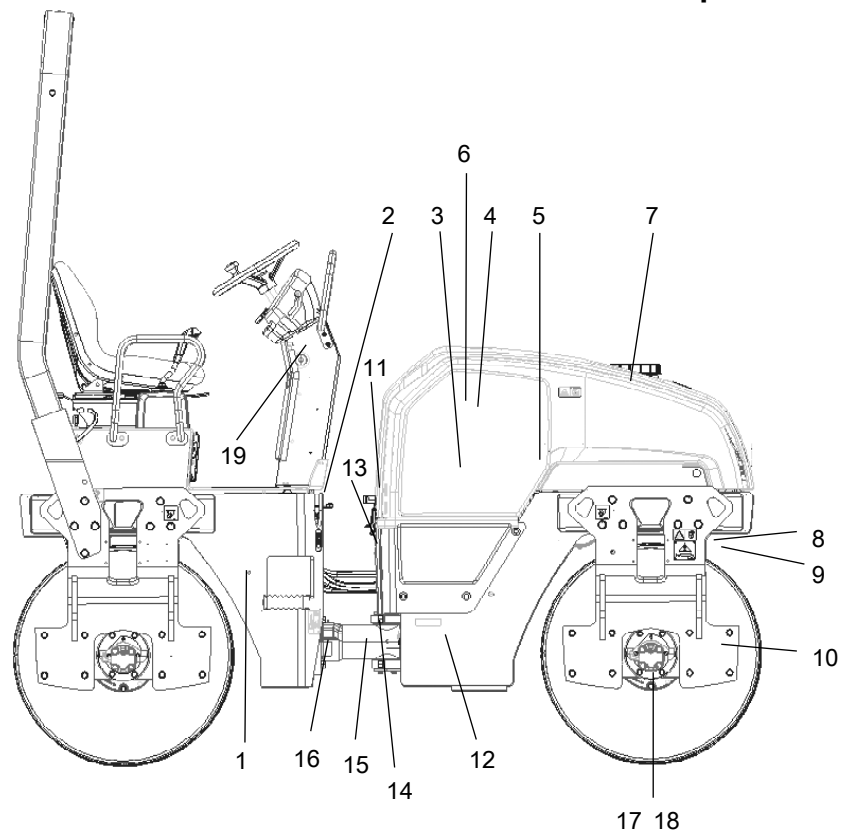
Other fuel and lubricants are required when operating in areas with extremely high or extremely low ambient temperatures. See the 'Special instructions' chapter, or consult Dynapac.

### 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

Maintenance - Maintenance schedule

Service and maintenance points





**Fig. Service and maintenance points**

- |                  |   |                               |
|------------------|---|-------------------------------|
| 1. Fuel tank     | 8. Sprinkler system                       | 15. Steering joint            |
| 2. Refueling     | 9. Scrapers                               | 16. Steering cylinder bracket |
| 3. Cooler        | 10. Shock absorbers and attachment screws | 17. Filler plugs/Drum         |
| 4. Air cleaner   | 11. Hydraulic fluid refilling             | 18. Oil level in drum         |
| 5. Battery       | 12. Hydraulic fluid tank                  | 19. Emergency stop            |
| 6. Diesel engine | 13. Hydraulic fluid filter                |                               |
| 7. Water tank    | 14. Hydraulic fluid level glass           |                               |

### 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.  
Specific maintenance and checks on diesel engines must be carried out by the engine supplier's certified personnel.

### 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
	<b>Before starting up for the first time on that day</b>	
3	Clean the outside of the cooler package	In dusty conditions when necessary
4	Check coolant level	
6	Check the engine oil level	Refer to the engine manual
14	Check the hydraulic reservoir level	
3	Check for free circulation of cooling air	
1	Fill the fuel tank	
7	Fill the water tank	
8	Check the sprinkler system/Drum	
9	Check the scraper setting/Drum	
22	Check the spring loaded scrapers	Optional
19	Test the brakes	

### After the FIRST 50 hours of operation

See Contents to find the page number of the sections referred to!

Pos. in fig	Action	Comment
6	Change the engine oil and oil filter	Refer to the engine manual
6	Change the fuel filter	Refer to the engine manual
13	Change the hydraulic fluid filter	
10	Check bolted joints	

### Every 50 hours of operation (Weekly)

See Contents to find the page number of the sections referred to!

Pos. in fig	Action	Comment
4	Check indicator for air cleaner Check that the air hoses are in good condition and that the connections are tight	
15	Grease the steering joint	
16	Grease the steering cylinder brackets	

### Every 250 / 750 / 1250 / 1750 hours of operation

See Contents to find the page number of the sections referred to!

Pos. in fig	Action	Comment
5	Check the battery condition	
6	Change the engine oil and oil filter	Refer to the engine manual

## Maintenance - Maintenance schedule

### Every 500 / 1500 hours of operation

See Contents to find the page number of the sections referred to!

Pos. in fig	Action	Comment
5	Check the condition of the battery	
6	Change engine oil and oil filter	Refer to the engine manual
18	Check the oil level in the drum	
10	Check rubber elements and bolted joints	
11	Check the hydraulic reservoir cover/breather	
6	Lubricate hinges and controls	
6	Check engine's V-belt	Refer to the engine manual
3	Check coolant freezing point	Change the coolant every other year
4	Change air filter elements	
6	Change the engine's fuel filter	Refer to the engine manual
6	Change the fuel pre-filter	Refer to the engine manual

### Every 1000 hours of operation

See Contents to find the page number of the sections referred to!

Pos. in fig	Action	Comment
5	Check the condition of the battery	
6	Change engine oil and oil filter	Refer to the engine manual
18	Check the oil level in the drum	
10	Check the rubber elements and bolted joints	
11	Check the hydraulic reservoir cover/breather	
6	Lubricate hinges and controls	
6	Check the V-belt on the engine	Refer to the engine manual
3	Check coolant freezing point	Change the coolant every other year
4	Change air filter elements	
13	Change the hydraulic fluid filter	
12	Drain condensate from hydraulic tank	
6	Change the engine's fuel filter	Refer to the engine manual
6	Change the engine's pre-filter	Refer to the engine manual
6	Check the engine's toothed belt	Refer to the engine manual
6	Check engine's valve clearances	Refer to the engine manual

## Maintenance - Maintenance schedule

### Every 2000 hours of operation

See Contents to find the page numbers of the sections referred to!

Pos. in fig	Action	Comment
5	Check the battery condition	
6	Change the engine oil and oil filter	Refer to the engine manual
18	Check the oil level in the drum	
10	Check rubber elements and bolted joints	
11	Check the hydraulic reservoir cover/breather	
6	Lubricate hinges and controls	
6	Check engine's V-belt	
3	Check coolant freezing point	Change the coolant every other year
4	Change air filter elements	
13	Change the hydraulic fluid filter	
12	Drain condensate from hydraulic tank	
6	Change the engine's fuel filter	Refer to the engine manual
6	Change the engine's pre-filter	Refer to the engine manual
6	Check the engine's toothed belt	Refer to the engine manual
6	Check engine's valve clearances	Refer to the engine manual
12	Change the hydraulic fluid	
18	Change the oil in the drums	
7	Drain and clean the water tank	
23	Drain and clean the emulsions tank	
1	Drain and clean the fuel tank	
	Check the condition of the articulation	



## Service - Checklist

Pos	Action	Every 10 hours of operation (Daily)	After the FIRST 50 hours of operation (Weekly)	Every 50 hours of operation	Every 750 hours of operation	Every 1000 hours of operation	Every 1250 hours of operation	Every 1500 hours of operation	Every 1750 hours of operation	Every 2000 hours of operation	Every 24th month	NOTE
3	Clean the outside of the radiator core	<input type="checkbox"/>										In duty environments, as necessary
4	Check coolant level	<input type="checkbox"/>										Refer to the engine manual
6	Check the engine oil level	<input type="checkbox"/>										
14	Check fluid level in hydraulic reservoir	<input type="checkbox"/>										
3	Check for free circulation of cooling air	<input type="checkbox"/>										
1	Refuel	<input type="checkbox"/>										
7	Fill the water tank	<input type="checkbox"/>										
8/21	Check the sprinkler system	<input type="checkbox"/>										
9/22	Check the scraper setting	<input type="checkbox"/>										
19	Test the brakes	<input type="checkbox"/>										
22	Check spring loaded scrapers	<input type="checkbox"/>										Option
6	Replace the engine's fuel filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Refer to the engine manual
6	Change the engine's pre-filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Refer to the engine manual
13	Change the hydraulic fluid filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
10	Check rubber elements and bolted joints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Clean/Change the air cleaner filter element	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Check that hoses and couplings are not leaking	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
15	Grease the steering joint	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
16	Grease the steering cylinder brackets	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Change the engine oil and oil filter	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Refer to the engine manual
5	Check the battery condition	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
18	Check the oil level / Change oil in the drums	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
11	Check the hydraulic reservoir cover/breather	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Lubricate controls and joints	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Check engine's V-belt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Refer to the engine manual
3	Check coolant freezing point/Change coolant	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
12	Drain the condensate from hydraulic reservoir	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Check the engine's toothed belt	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Refer to the engine manual
6	Check engine's valve clearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Refer to the engine manual
12	Change the hydraulic fluid	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	Drain and clean the water tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
23	Drain and clean the emulsions tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
1	Drain and clean the fuel tank	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Check the condition of the articulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Check     Change



### Maintenance, 10h

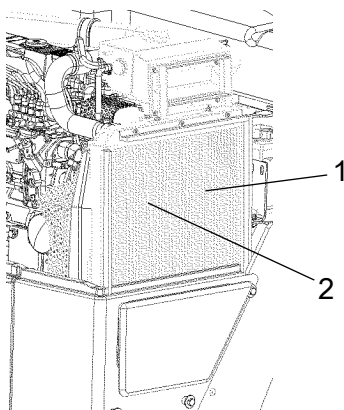
Every 10 hours of operation (Daily)



***Park the roller on a level surface.  
The engine must be switched off and the parking brake activated when checking or adjusting the roller, unless otherwise specified.***



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



**Fig. Engine compartment**  
1. Water cooler  
2. Hydraulic fluid cooler

### Coolers

#### Checking - Cleaning

Make sure that the air flow through the coolers (1) and (2) 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.



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



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



### Check - Coolant system

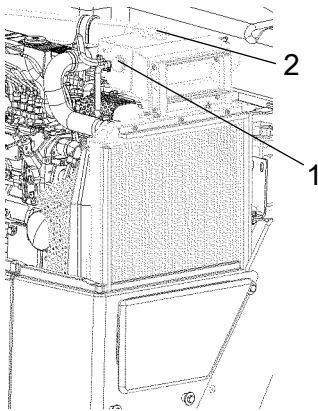
Check that all hoses/hose connectors are intact and tight. Fill with coolant as specified in the lubricants specification.



**Take great care when opening the radiator cap while the engine is hot. Wear protective gloves and goggles.**



Also check the freezing point. Change the coolant every other year.

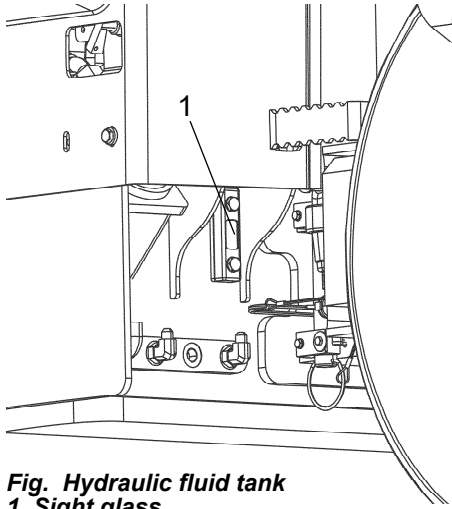


**Figure. Cooling water container**  
**1. Filler cap**  
**2. Level marking**

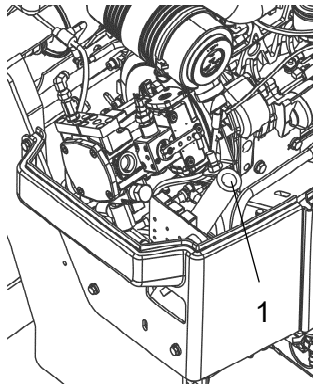


### Hydraulic reservoir, Level check - Filling

Check that the level is between the min and max markings. Top up with hydraulic fluid as per lubricant specifications if level is too low.

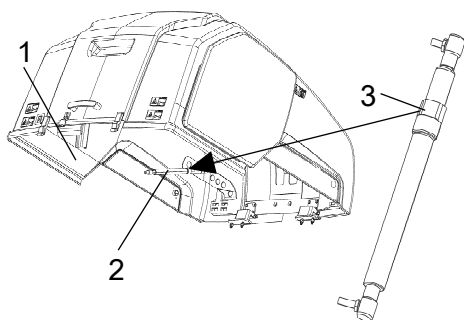


**Fig. Hydraulic fluid tank**  
**1. Sight glass**



**Fig. Engine compartment**  
**1. Hydraulic fluid refilling**

Open the engine hood and unscrew the filler cap, top up with hydraulic fluid (as per lubricant specification) if the level is too low.



### Lowering of engine hood

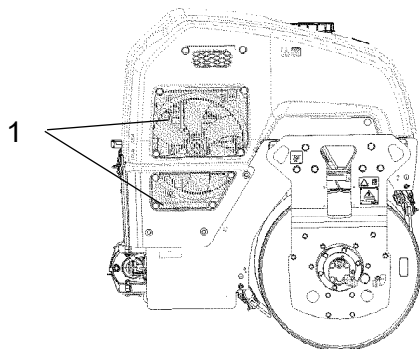
Stand on the **left** side of the engine hood. Press in the red button (3) and carefully lower the engine hood until the gas spring (2) goes into the slot. Release the red button (3) and then lower down the engine hood completely.

**Fig. Engine compartment**

- 1. Engine hood
- 2. Gas spring
- 3. Button

### Air circulation - Check

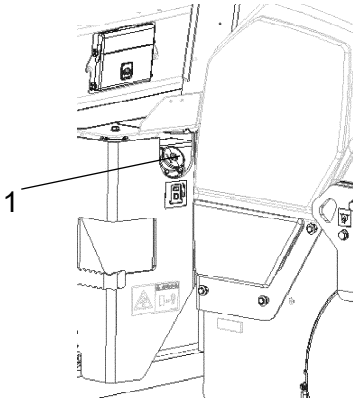
Check that the engine has free circulation of cooling air through the grille (1) in the engine compartment.



**Fig. Right drum side**  
1. Cooling air grille



### Fuel tank - Filling



**Fig. Fuel tank**  
**1. Filler cap**

Refuel every day before starting to work. Screw off the lockable tank cap (1) and fill diesel fuel to the lower edge of the filler pipe.



**Stop the diesel engine. Short-circuit (press) the filler gun against a non-insulated part of the roller before refuelling, and against the filler pipe while refuelling.**

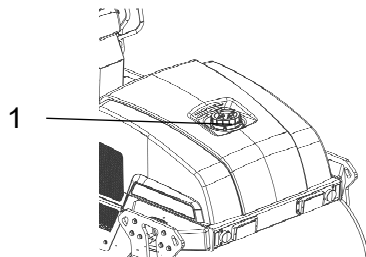


**Never refuel while the engine is running. Do not smoke and avoid spilling fuel.**

The fuel tank holds 50 liters.



### Water tank - Filling



**Fig. Water tank**  
**1. Tank cap**



**Unscrew the tank cap (1) and fill with clean water. Do not remove the strainer. See technical specifications for the tank volume.**



**Only additive: A small amount of environment-friendly antifreeze.**

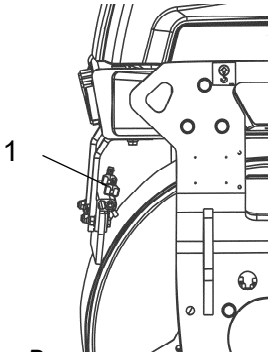


### Sprinkler system/Drum Checking - Cleaning

Start the sprinkler system and make sure that no nozzles (1) are clogged. If necessary, clean clogged nozzles and the coarse filter located by the water pump; see figures below.



***The sprinkler system should be drained if there is a risk of freezing.***



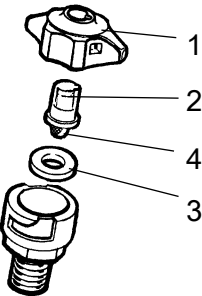
**Fig. Drum**  
1. Nozzle



Dismantle the blocked nozzle by hand. Blow the nozzle (2) and fine filter (4) clean with compressed air, or install replacement parts and clean the clogged parts later.



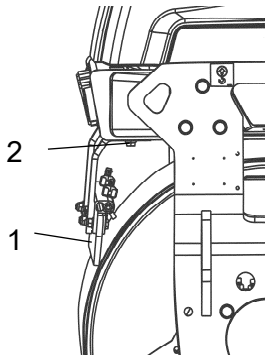
***Wear protective goggles when working with compressed air.***



**Fig. Nozzle**  
1. Sleeve  
2. Nozzle  
3. Gasket  
4. Strainer



### Scrapers, fixed Checking - Setting



**Fig. Drum**  
**1. Scraper blade**  
**2. Adjusting screws**

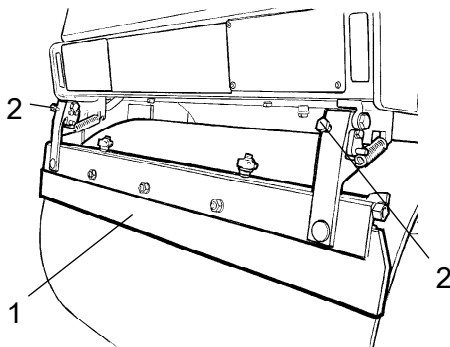
Make sure that the scrapers are undamaged. Adjust the scrapers so that they are 1-2 mm from the drum. For special asphalt compounds, it may be better if the scraper blades (1) lie lightly against the drums.

Asphalt remnants can accumulate on the scraper and affect the contact force. Clean as required.

Loosen the screws (2) to adjust the contact pressure of the scraper blade against the drum.

Remember to tighten all the screws after any adjustment.

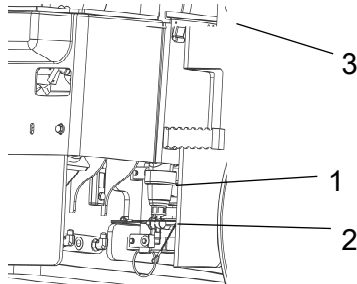
### Scrapers, spring-action (Optional) Checking - Adjustment



**Fig. Spring-action scrapers**  
**1. Scraper blade**  
**2. Adjusting screws**



The scrapers must be lifted from the drum during transport.



**Fig. Pump system**  
 1. Water filter  
 2. Stop cock  
 3. Water pump

When cleaning the coarse filter (1), open the cock (2) and loosen the filter housing.

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.

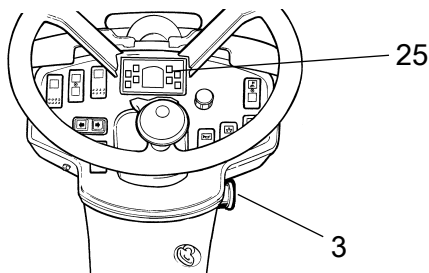
A drain cock is placed on the left side of the pump system area. This can be used to drain the tank and the pump system.



## Brakes - Check



**Check operation of the brakes as follows:**



**Figure. Instrument panel**  
 3. Emergency stop  
 25. Parking brake lamp

Run the roller very slowly forward. Hold the steering wheel firmly and brace yourself for a sudden stop.

Press in the emergency stop (3). The roller will stop abruptly and the engine will switch off.

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

Pull out the emergency stop (3). Start the engine.

The roller is now ready for operation.

**Refer also to the section in the manual on operation.**

## Maintenance - 50h

Every 50 hours of operation (Weekly)



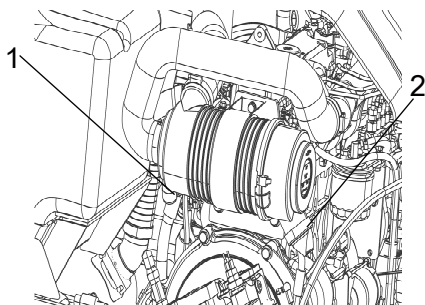
***Park the roller on a level surface. The engine must be switched off and the parking brake activated when checking or adjusting the roller, unless otherwise specified.***



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



### Air cleaner indicator



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

If the indicator (1) on the air cleaner turns red, replace the main filter (2) on the air cleaner. The dust pouch is emptied by pressing the rubber bellows with your fingers. Check also that the air hoses are in good condition.

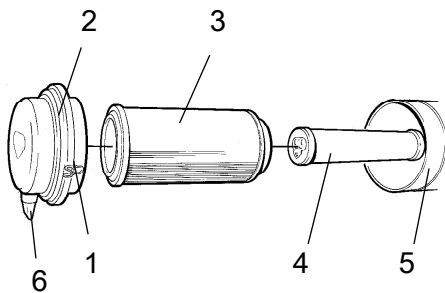
Clean the air cleaner when operated in extremely dusty environments.



### Air cleaner Check - Replacement of main filter



Replace the air cleaner's main filter when the indicator shows red. The indicator is mounted on the air cleaner's connecting pipe.



**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.

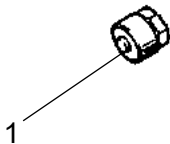
When refitting the cover, make sure that the dust valve is positioned downwards.

### Air filter indicator - Resetting

The air filter indicator is located on the filter, or in its immediate vicinity.

The air filter indicator must be reset after replacing the air filter.

Press the "button" (1) on the top of the indicator to reset.



**Fig. Indicator**  
 1. Button

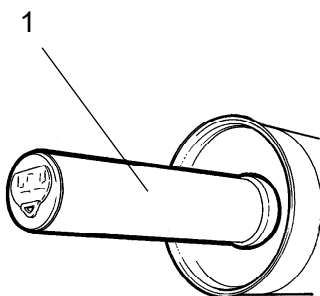


### Backup filter - Change

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.



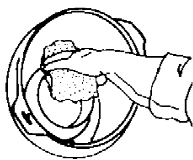
**Fig. Air filter**  
 1. Backup filter



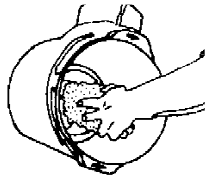
### Air cleaner - Cleaning

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.



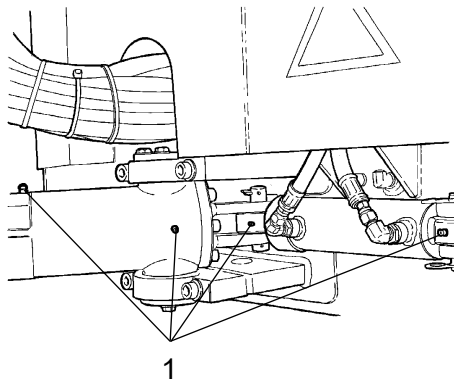
Check that the hose clamps between the filter housing and the suction hose are tight and that the hoses are intact. Inspect the entire hose system, all the way to the engine.



### Steering cylinder and steering joint - Lubrication



**Do not allow anyone to remain in the vicinity of the steering joint when the engine is running. Danger of crush injury when the steering is operated. Activate the parking brake before lubricating.**



**Fig. Main filter**  
**1. Grease nipples**

Turn the steering wheel fully to the left. All four grease nipples (1) can now be accessed from the right side of the machine.

Wipe the grease nipples (1). Grease each nipple with five strokes of the hand-operated grease gun. Make sure that grease penetrates into the bearing. If grease does not penetrate the bearings, it may be necessary to relieve the articulation joint with a jack while repeating the greasing process.



### Maintenance measures - 250 h

Every 250/750/1250/1750..... hours of operation (every 3 months)



**Park the roller on a level surface. The engine must be switched off and the parking brake activated when checking or adjusting the roller, unless otherwise specified.**



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



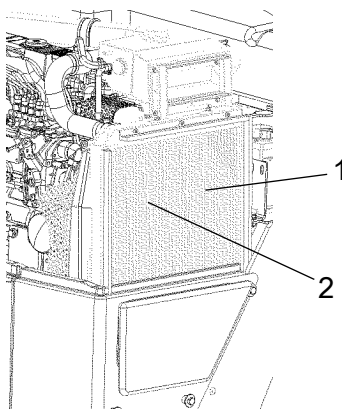
### Coolers Checking - Cleaning

Make sure that the air flow through the coolers (1) and (2) 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.



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



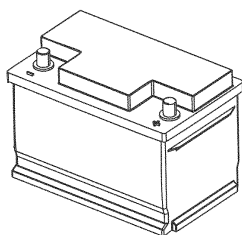
**Fig. Engine compartment**  
1. Water cooler  
2. Hydraulic fluid cooler



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

**Battery**  
**- Check condition**

The battery is sealed and maintenance-free.



**Fig. Battery**



***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.***

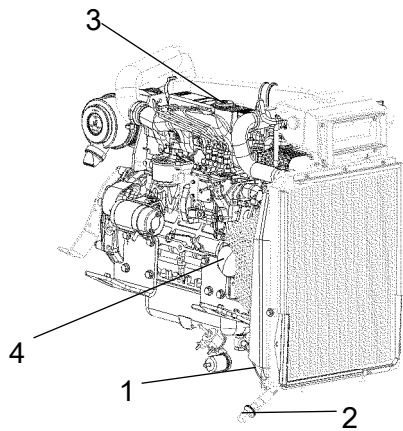


**When disconnecting the battery, always disconnect the negative cable first. When connecting the battery, always connect the positive cable first.**

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

Wipe the top of the battery.



**Engine oil and oil filter - Change**

**Fig. Engine compartment right side**

1. Drain hose
2. Drain plug
3. Filler cap
4. Oil filter

Run the engine until it is warm before draining the oil .



**Switch off the engine and push in the emergency stop.**



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

Set a container which can hold at least 8 liters (2 gal) under the drain plug (2).

Undo the oil filler cap (3), and undo the drain plug (2) in the end of the drain hose (1). Let all the engine oil flow out.



Deliver the drained oil to special waste handling.



Refer to the engine manual for detailed instructions when changing oil and filters.

Remove the oil filter (4) and fit a new filter.

Collect any spillage.

Fit the drain plug (2) to the end of the hose.

Fill with fresh engine oil. See under the heading lubricants, for the correct oil grade. Fit the filler cap (3) and check that the oil level is correct using the dipstick.

Start the engine and allow it to idle for a few minutes. During this time, check around the oil filter and drain plug for leaks.

Switch off the engine, wait for a minute or so and then check the oil level. Top up with more oil if necessary.



### Maintenance measures - 500 h

Every 500/1500..... hours of operation (every six months)



**Park the roller on a level surface. The engine must be switched off and the parking brake activated when checking or adjusting the roller, unless otherwise specified.**



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

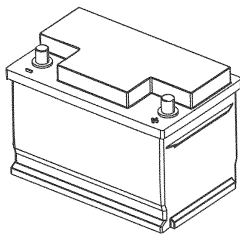


Fig. Battery

#### Battery - Check condition

The battery is sealed and maintenance-free.



**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.**



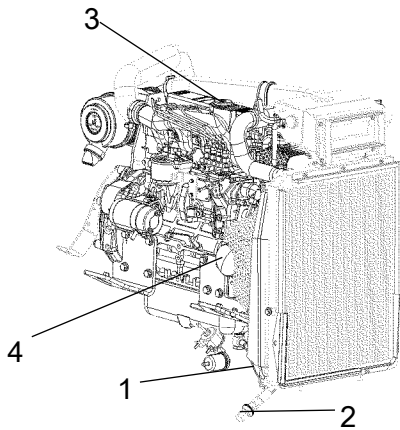
When disconnecting the battery, always disconnect the negative cable first. When connecting the battery, always connect the positive cable first.

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

Wipe the top of the battery.



## Engine oil and oil filter - Change



**Fig. Engine compartment right side**  
1. Drain hose  
2. Drain plug  
3. Filler cap  
4. Oil filter

Run the engine until it is warm before draining the oil .



**Switch off the engine and push in the emergency stop.**



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

Set a container which can hold at least 8 liters (2 gal) under the drain plug (2).

Undo the oil filler cap (3), and undo the drain plug (2) in the end of the drain hose (1). Let all the engine oil flow out.



Deliver the drained oil to special waste handling.



Refer to the engine manual for detailed instructions when changing oil and filters.

Remove the oil filter (4) and fit a new filter.

Collect any spillage.

Fit the drain plug (2) to the end of the hose.

Fill with fresh engine oil. See under the heading lubricants, for the correct oil grade. Fit the filler cap (3) and check that the oil level is correct using the dipstick.

Start the engine and allow it to idle for a few minutes. During this time, check around the oil filter and drain plug for leaks.

Switch off the engine, wait for a minute or so and then check the oil level. Top up with more oil if necessary.

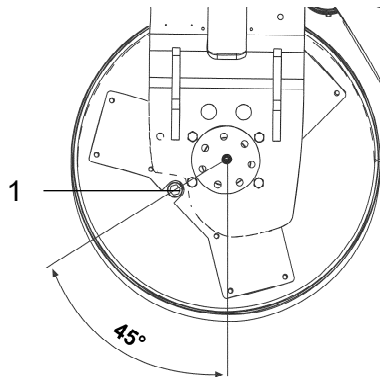


### Drum - oil level Inspection - filling

Run the roller slowly until the oil plug (1) is aligned with the semicircular recess in the drum suspension.

Unscrew the plug and check that the oil level reaches up to the bottom of the hole. Top up with new oil if necessary. Use oil as specified in the lubricants specification.

Clean the magnetic oil plug (1) from any metallic residue, and refit the plug.



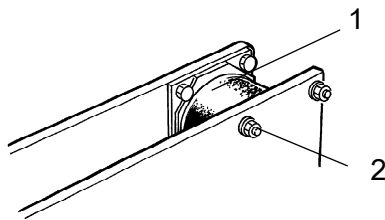
**Fig. Drum, drive side**  
1. Oil plug

### 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.



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



### Hydraulic reservoir cap - Check

Screw off the tank cap and check that it is not clogged. Air must have unobstructed passage through the cap in both directions.

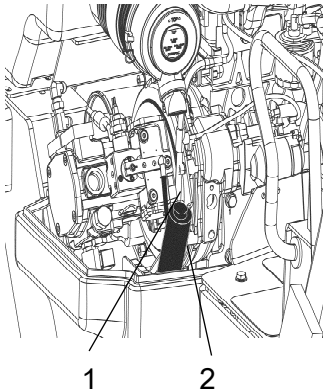
If clogged in either direction, clean with a little diesel oil and blow with compressed air until free passage is assured or replace the cap with a new one.



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



### Controls - Lubrication



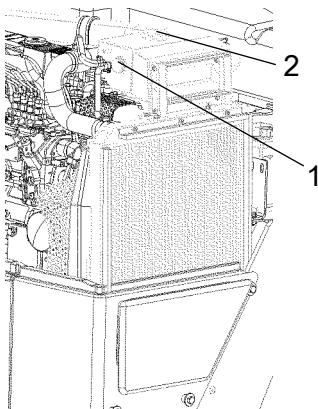
**Fig. Engine compartment**  
1. Forward/Reverse lever  
2. Hydraulic reservoir cap

Lubricate the forward/reverse lever in the engine compartment with a few drops of oil.

If the lever gets stiff after a prolonged period of use, remove the cover and lever and lubricate.



### Check - Coolant system



**Figure. Cooling water container**  
1. Filler cap  
2. Level marking

Check that all hoses/hose connectors are intact and tight. Fill with coolant as specified in the lubricants specification.



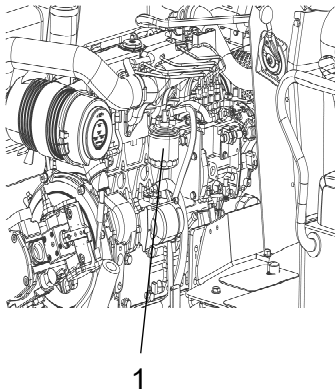
**Take great care when opening the radiator cap while the engine is hot. Wear protective gloves and goggles.**



Also check the freezing point. Change the coolant every other year.



## Replacing the fuel filter



**Fig. Engine compartment**  
**1. Fuel filter**



Place a container underneath to collect fuel that runs out when the filter is released.

Screw off the fuel filter (1). The filter is of the disposable type and cannot be cleaned. Hand in to a waste disposal station.



Refer to the engine manual for detailed instructions when replacing the fuel filter.

Start the engine and check that the fuel filter is tight.



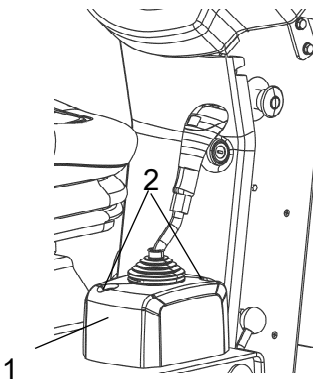
**Ensure good ventilation (air extraction) if the diesel engine is run indoors. Risk of carbon monoxide poisoning.**



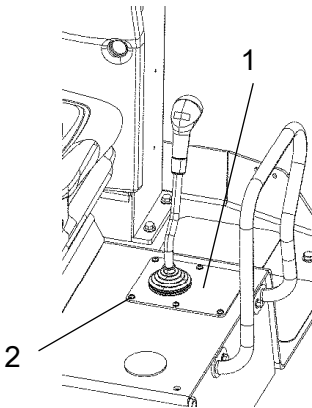
### Controls - Lubrication

Lubricate the forward/reverse lever mechanism.

Remove the cover/plate (1) by loosening the screws (2) on the top, and lubricate the mechanism under the cover/plate with oil.



**Fig. Forward/Reverse lever**  
1. Cover  
2. Attachment screws

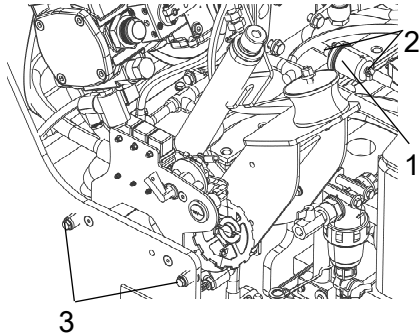


**Fig. Forward/Reverse lever**  
1. Plate  
2. Attachment screws





## Replacing the pre-filter



**Fig. Engine compartment**

- 1. Pre-filter**
- 2. Hose clamps**
- 3. Bolts**

Activate the parking brake.  
Switch off the engine and remove the plate on the left side of the frame (at battery disconnecter) by releasing the three bolts (3).  
Release the hose clamps (2) with a screwdriver.



Place a container underneath to collect fuel that runs out when the filter is released.

Remove the pre-filter (1) and hand in to a waste disposal station. This is a disposable filter and cannot be cleaned.

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

Start the engine and check that the pre-filter is tight.



**Ensure good ventilation (air extraction) if the diesel engine is run indoors. Risk of carbon monoxide poisoning.**



### Maintenance - 1000h

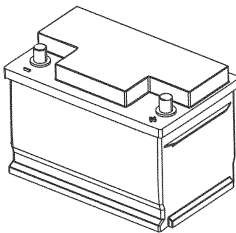
Performed after 1000 operating hours (each year)



***Park the roller on a level surface.  
The engine must be switched off and the parking brake activated when checking or adjusting the roller, unless otherwise specified.***



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



**Fig. Battery**

#### Battery

##### - Check condition

The battery is sealed and maintenance-free.



***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.***



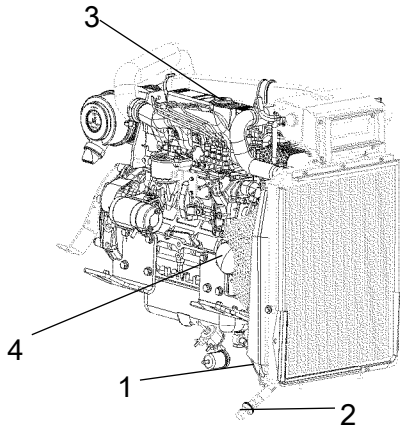
**When disconnecting the battery, always disconnect the negative cable first. When connecting the battery, always connect the positive cable first.**

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

Wipe the top of the battery.



## Engine oil and oil filter - Change



**Fig. Engine compartment right side**  
1. Drain hose  
2. Drain plug  
3. Filler cap  
4. Oil filter

Run the engine until it is warm before draining the oil .



**Switch off the engine and push in the emergency stop.**



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

Set a container which can hold at least 8 liters (2 gal) under the drain plug (2).

Undo the oil filler cap (3), and undo the drain plug (2) in the end of the drain hose (1). Let all the engine oil flow out.



Deliver the drained oil to special waste handling.



Refer to the engine manual for detailed instructions when changing oil and filters.

Remove the oil filter (4) and fit a new filter.

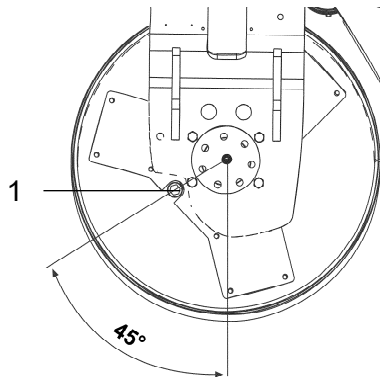
Collect any spillage.

Fit the drain plug (2) to the end of the hose.

Fill with fresh engine oil. See under the heading lubricants, for the correct oil grade. Fit the filler cap (3) and check that the oil level is correct using the dipstick.

Start the engine and allow it to idle for a few minutes. During this time, check around the oil filter and drain plug for leaks.

Switch off the engine, wait for a minute or so and then check the oil level. Top up with more oil if necessary.



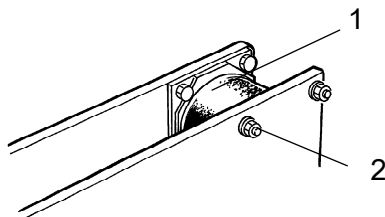
**Fig. Drum, drive side**  
1. Oil plug

### Drum - oil level Inspection - filling

Run the roller slowly until the oil plug (1) is aligned with the semicircular recess in the drum suspension.

Unscrew the plug and check that the oil level reaches up to the bottom of the hole. Top up with new oil if necessary. Use oil as specified in the lubricants specification.

Clean the magnetic oil plug (1) from any metallic residue, and refit the plug.



**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

Screw off the tank cap and check that it is not clogged. Air must have unobstructed passage through the cap in both directions.

If clogged in either direction, clean with a little diesel oil and blow with compressed air until free passage is assured or replace the cap with a new one.



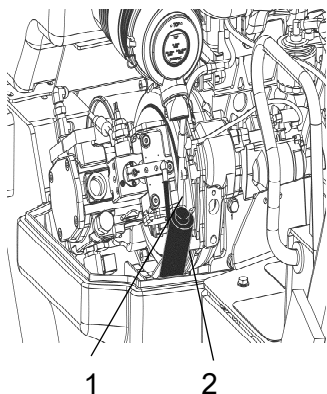
**Wear protective goggles when working with compressed air.**



### Controls - Lubrication

Lubricate the forward/reverse lever in the engine compartment with a few drops of oil.

If the lever gets stiff after a prolonged period of use, remove the cover and lever and lubricate.



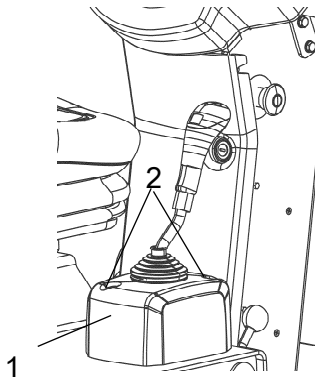
**Fig. Engine compartment**  
**1. Forward/Reverse lever**  
**2. Hydraulic reservoir cap**



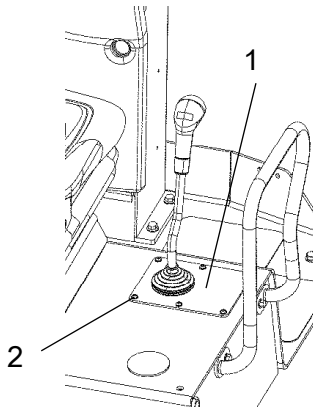
### Controls - Lubrication

Lubricate the forward/reverse lever mechanism.

Remove the cover/plate (1) by loosening the screws (2) on the top, and lubricate the mechanism under the cover/plate with oil.



**Fig. Forward/Reverse lever**  
**1. Cover**  
**2. Attachment screws**



**Fig. Forward/Reverse lever**  
**1. Plate**  
**2. Attachment screws**



### Check - Coolant system

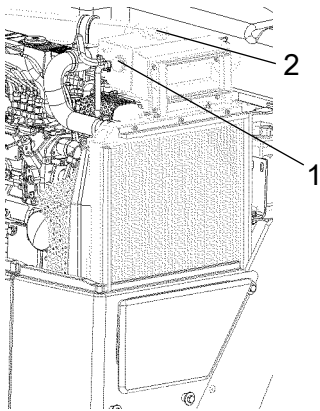
Check that all hoses/hose connectors are intact and tight. Fill with coolant as specified in the lubricants specification.



**Take great care when opening the radiator cap while the engine is hot. Wear protective gloves and goggles.**



Also check the freezing point. Change the coolant every other year.



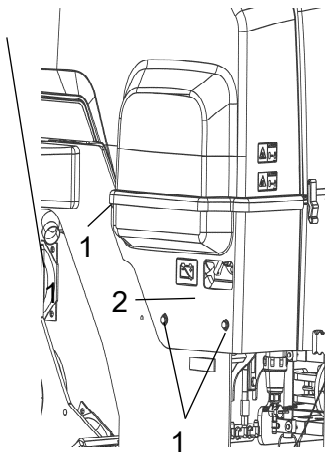
**Figure. Cooling water container**  
1. Filler cap  
2. Level marking



### Replacing the hydraulic oil filter

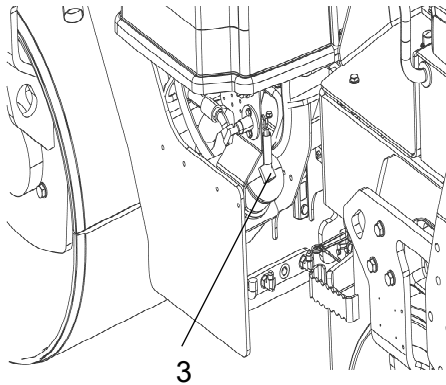
Unscrew the retaining screws (1) on each side of the roller.

Remove the protective cover (2).



**Fig. Engine compartment**  
1. Retaining screws  
2. Protective cover

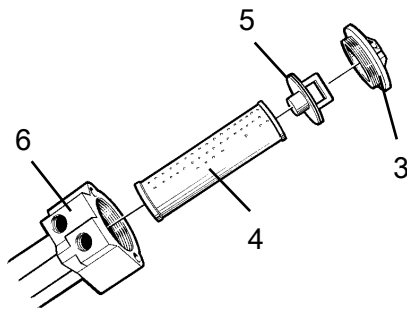




**Fig. Hydraulic oil filter**  
**3. Cap**

Loosen the red cap (3) and pull up the filter insert (4).

Refit the red cap temporarily to prevent dust and dirt getting into the tank.



**Fig. Hydraulic oil filter**  
**3. Cap**  
**4. Filter insert**  
**5. Handle**  
**6. Filter holder**

Release the filter insert (4) from the handle (5).



Remove the filter (4) and hand in to an environment-friendly waste disposal station. This is a disposable filter and cannot be cleaned.

Mount the new insert on the handle, refit the unit into the filter holder (6), and refit the red cover.

Start the engine and allow it to run at full revs for 30 seconds. Check that the filter cap (3) is tight.

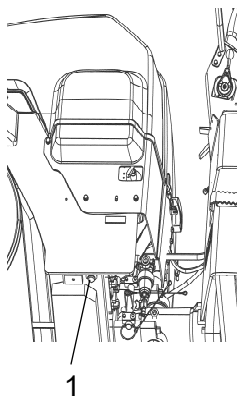


### Hydraulic fluid reservoir - Draining

Condensate in the hydraulic tank is drained via the plug (1). This should be done when the roller has stood still for some time, e.g. during the night.



Be very careful during draining. Do not drop the plug or else all the hydraulic fluid will flow out.



**Fig. Left frame side**  
**1. Drain plug**

Drain as follows:

Place a container under the plug (1). Loosen and allow any condensate to run out. Tighten the plug.



## Replacing the fuel filter

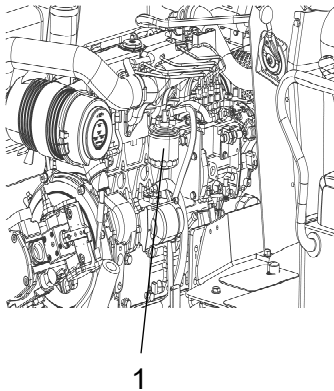


Place a container underneath to collect fuel that runs out when the filter is released.

Screw off the fuel filter (1). The filter is of the disposable type and cannot be cleaned. Hand in to a waste disposal station.



Refer to the engine manual for detailed instructions when replacing the fuel filter.



**Fig. Engine compartment**  
**1. Fuel filter**

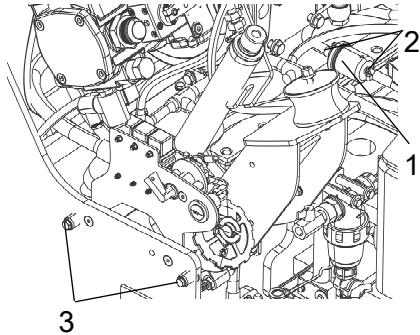
Start the engine and check that the fuel filter is tight.



**Ensure good ventilation (air extraction) if the diesel engine is run indoors. Risk of carbon monoxide poisoning.**



### Replacing the pre-filter



**Fig. Engine compartment**

1. Pre-filter
2. Hose clamps
3. Bolts

Activate the parking brake.  
Switch off the engine and remove the plate on the left side of the frame (at battery disconnecter) by releasing the three bolts (3).  
Release the hose clamps (2) with a screwdriver.



Place a container underneath to collect fuel that runs out when the filter is released.

Remove the pre-filter (1) and hand in to a waste disposal station. This is a disposable filter and cannot be cleaned.

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

Start the engine and check that the pre-filter is tight.



**Ensure good ventilation (air extraction) if the diesel engine is run indoors. Risk of carbon monoxide poisoning.**



**Maintenance - 2000h**

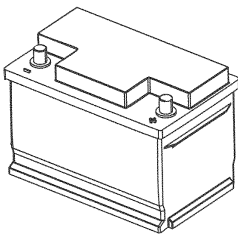
Performed after 2000 operating hours (every two years)



***Park the roller on a level surface. The engine must be switched off and the parking brake activated when checking or adjusting the roller, unless otherwise specified.***



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



**Fig. Battery**

**Battery**  
**- Check condition**

The battery is sealed and maintenance-free.



***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.***



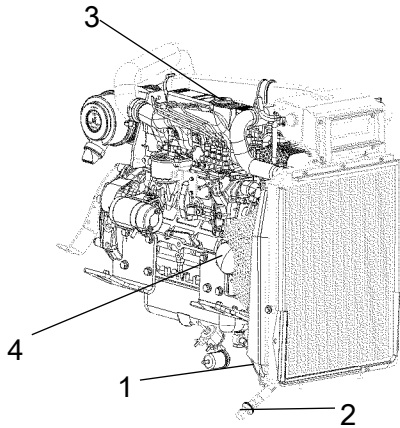
**When disconnecting the battery, always disconnect the negative cable first. When connecting the battery, always connect the positive cable first.**

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

Wipe the top of the battery.



## Engine oil and oil filter - Change



**Fig. Engine compartment right side**  
1. Drain hose  
2. Drain plug  
3. Filler cap  
4. Oil filter

Run the engine until it is warm before draining the oil .



**Switch off the engine and push in the emergency stop.**



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

Set a container which can hold at least 8 liters (2 gal) under the drain plug (2).

Undo the oil filler cap (3), and undo the drain plug (2) in the end of the drain hose (1). Let all the engine oil flow out.



Deliver the drained oil to special waste handling.



Refer to the engine manual for detailed instructions when changing oil and filters.

Remove the oil filter (4) and fit a new filter.

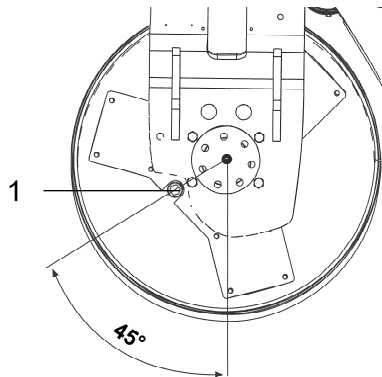
Collect any spillage.

Fit the drain plug (2) to the end of the hose.

Fill with fresh engine oil. See under the heading lubricants, for the correct oil grade. Fit the filler cap (3) and check that the oil level is correct using the dipstick.

Start the engine and allow it to idle for a few minutes. During this time, check around the oil filter and drain plug for leaks.

Switch off the engine, wait for a minute or so and then check the oil level. Top up with more oil if necessary.



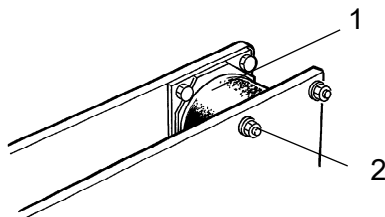
**Fig. Drum, drive side**  
1. Oil plug

## Drum - oil level Inspection - filling

Run the roller slowly until the oil plug (1) is aligned with the semicircular recess in the drum suspension.

Unscrew the plug and check that the oil level reaches up to the bottom of the hole. Top up with new oil if necessary. Use oil as specified in the lubricants specification.

Clean the magnetic oil plug (1) from any metallic residue, and refit the plug.



**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

Screw off the tank cap and check that it is not clogged. Air must have unobstructed passage through the cap in both directions.

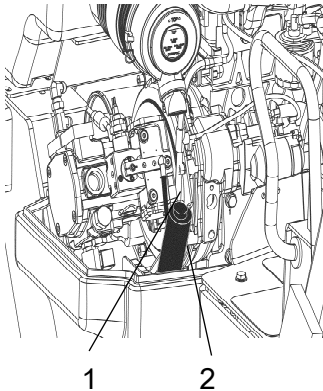
If clogged in either direction, clean with a little diesel oil and blow with compressed air until free passage is assured or replace the cap with a new one.



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



### Controls - Lubrication



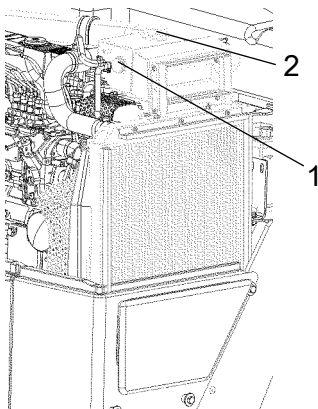
**Fig. Engine compartment**  
1. Forward/Reverse lever  
2. Hydraulic reservoir cap

Lubricate the forward/reverse lever in the engine compartment with a few drops of oil.

If the lever gets stiff after a prolonged period of use, remove the cover and lever and lubricate.



### Check - Coolant system



**Figure. Cooling water container**  
1. Filler cap  
2. Level marking

Check that all hoses/hose connectors are intact and tight. Fill with coolant as specified in the lubricants specification.



**Take great care when opening the radiator cap while the engine is hot. Wear protective gloves and goggles.**



Also check the freezing point. Change the coolant every other year.

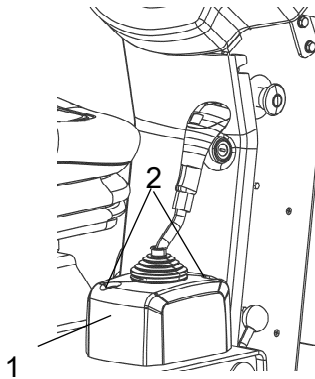




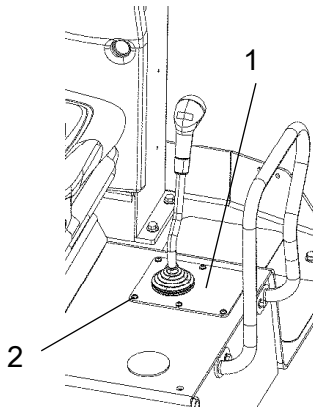
### Controls - Lubrication

Lubricate the forward/reverse lever mechanism.

Remove the cover/plate (1) by loosening the screws (2) on the top, and lubricate the mechanism under the cover/plate with oil.



**Fig. Forward/Reverse lever**  
**1. Cover**  
**2. Attachment screws**



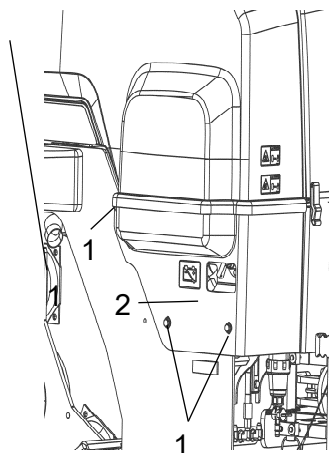
**Fig. Forward/Reverse lever**  
**1. Plate**  
**2. Attachment screws**



## Replacing the hydraulic oil filter

Unscrew the retaining screws (1) on each side of the roller.

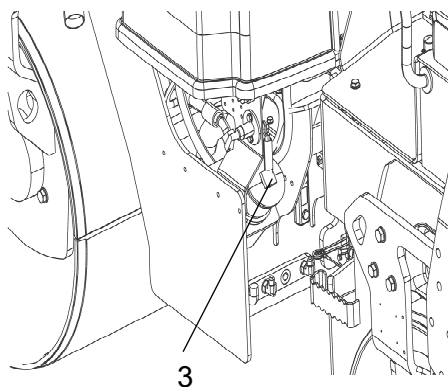
Remove the protective cover (2).



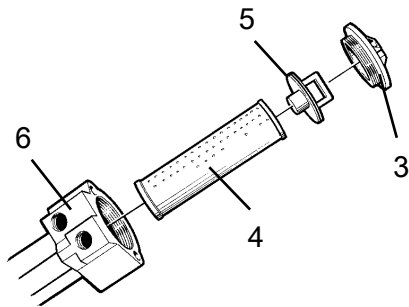
**Fig. Engine compartment**  
1. Retaining screws  
2. Protective cover

Loosen the red cap (3) and pull up the filter insert (4).

Refit the red cap temporarily to prevent dust and dirt getting into the tank.



**Fig. Hydraulic oil filter**  
3. Cap



**Fig. Hydraulic oil filter**

- 3. Cap
- 4. Filter insert
- 5. Handle
- 6. Filter holder

Release the filter insert (4) from the handle (5).



Remove the filter (4) and hand in to an environment-friendly waste disposal station. This is a disposable filter and cannot be cleaned.

Mount the new insert on the handle, refit the unit into the filter holder (6), and refit the red cover.

Start the engine and allow it to run at full revs for 30 seconds. Check that the filter cap (3) is tight.

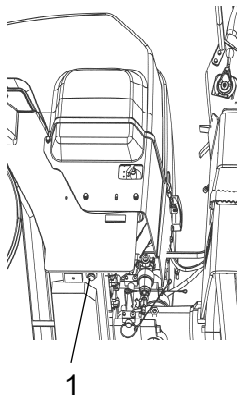


### Hydraulic fluid reservoir - Draining

Condensate in the hydraulic tank is drained via the plug (1). This should be done when the roller has stood still for some time, e.g. during the night.



Be very careful during draining. Do not drop the plug or else all the hydraulic fluid will flow out.



**Fig. Left frame side**  
1. Drain plug

Drain as follows:

Place a container under the plug (1). Loosen and allow any condensate to run out. Tighten the plug.



## Replacing the fuel filter

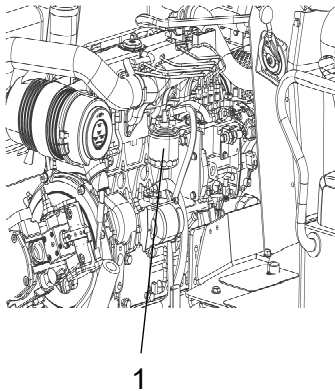


Place a container underneath to collect fuel that runs out when the filter is released.

Screw off the fuel filter (1). The filter is of the disposable type and cannot be cleaned. Hand in to a waste disposal station.



Refer to the engine manual for detailed instructions when replacing the fuel filter.



**Fig. Engine compartment**  
**1. Fuel filter**

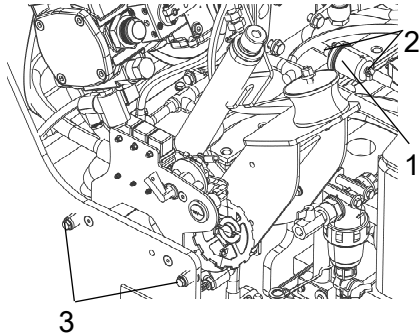
Start the engine and check that the fuel filter is tight.



**Ensure good ventilation (air extraction) if the diesel engine is run indoors. Risk of carbon monoxide poisoning.**



### Replacing the pre-filter



**Fig. Engine compartment**

1. Pre-filter
2. Hose clamps
3. Bolts

Activate the parking brake.  
Switch off the engine and remove the plate on the left side of the frame (at battery disconnecter) by releasing the three bolts (3).  
Release the hose clamps (2) with a screwdriver.



Place a container underneath to collect fuel that runs out when the filter is released.

Remove the pre-filter (1) and hand in to a waste disposal station. This is a disposable filter and cannot be cleaned.

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

Start the engine and check that the pre-filter is tight.



**Ensure good ventilation (air extraction) if the diesel engine is run indoors. Risk of carbon monoxide poisoning.**



## Hydraulic tank - Changing the fluid

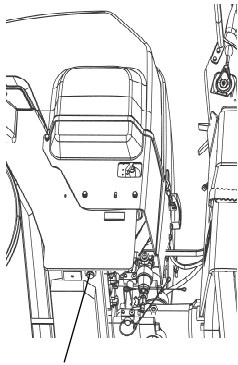


Fig. Left frame side  
1. Drain plug



**Risk of burn injuries when draining hot oil. Protect your hands.**



Place a container under the plug. It should hold at least 40 liters. Save the oil and dispose of it in an approved manner.

Unscrew the drain plug (1) and allow all the oil to run out. Wipe and replace the drain plug.



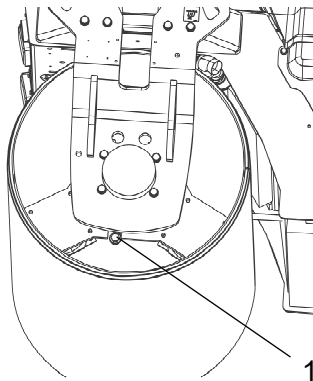
Fill with fresh hydraulic fluid of the grade indicated in the Lubricant specification.

Replace the hydraulic fluid filter. See under the heading 'Every 1000 hours of operation'.

Start the diesel engine and run the various hydraulic functions. Check the fluid level in the tank, and top up if necessary.



## Drum - Oil change



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



**Take great care when draining the fluid. Wear protective gloves and goggles.**

Place the roller on a level surface and drive it slowly until the drain plug (1) is straight down.



**Switch off the engine and activate the parking brake.**

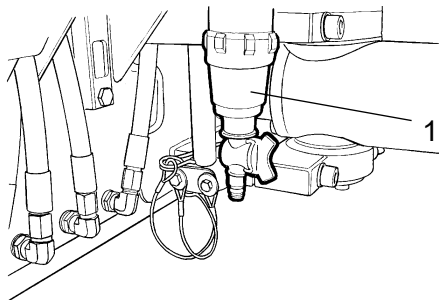


Place a receptacle that will hold at least 7 liters (7.4 quarts) under the plug. Collect the oil and dispose of it properly.

Remove the plug and allow all the oil to run out. See under the heading 'Every 500 hours of operation' for filling oil.



## Water tank - Draining



**Fig. Pump system**  
**1. Water filter**



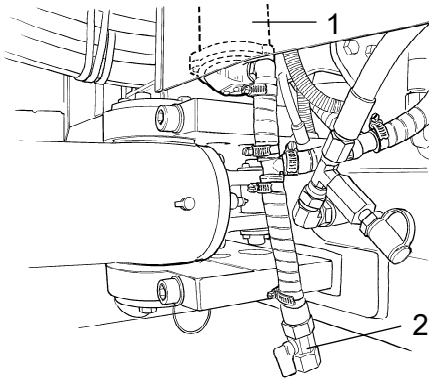
**Remember that there is a risk of freezing during the winter. Empty the tank, pump and lines.**

The easiest way to empty the water tank is to open the drain cock on the water filter (1). (There is also a drain plug under the water tank).



### Water pump - Draining

The water pump (1) is emptied by opening the drain cock (2).



**Fig. Pump system**  
1. Water pump  
2. Drain cock

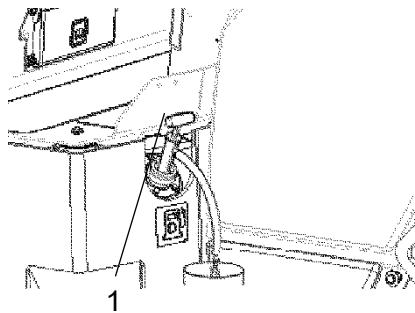


### Fuel tank - Cleaning

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. Save the oil in a container and dispose of it in an approved manner.



**Fig. Fuel tank**  
1. Fuel tank



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

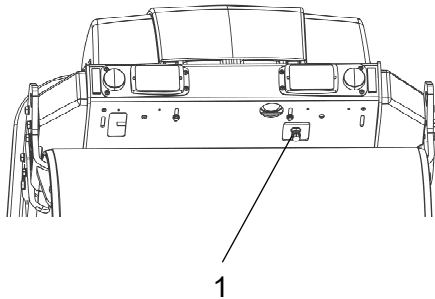


The fuel tank is made of plastic (polyethylene) and is recyclable.





### Water tank - Cleaning



**Fig. Water tank**  
**1. Drain plug**

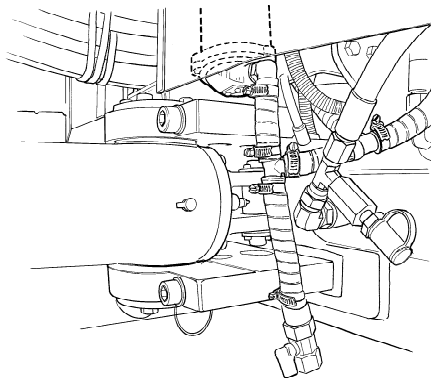
Clean the tanks with water and a suitable detergent for plastic surfaces.

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



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

### Steering joint - Check



**Fig. Steering joint**

Check the steering joint for any damage or cracks.

Check and tighten any loose bolts.

Check also for any stiffness and play.

