

Instruction manual

ICC522VHF-1EN1.pdf
Operation & Maintenance

Vibratory roller
CC522VHF

Engine
Cummins 4B TAA 3.9-C

Serial number
***51720523* -**



Dynapac CC522VHF is a 12-ton class vibratory roller, with articulated steering and featuring drive, brakes and vibration on both drums.

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Introduction

Warning symbols



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



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

Safety information



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.



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

CALIFORNIA

Proposition 65 Warning

Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects, and other reproductive harm.

General

This manual contains instructions for machine operation and maintenance.

The machine must be correctly maintained for

maximal performance.

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

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

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



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

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



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

Safety - General instructions

(Also read the safety manual)



1. The operator must be familiar with the contents of the OPERATION section before starting the roller.
2. Ensure that all instructions in the MAINTENANCE section are followed.
3. Only trained and/or experienced operators are to operate the roller. Passengers are not permitted on the roller. Remain seated at all times when operating the roller.
4. Never use the roller if it is in need of adjustment or repair.
5. Board and leave the roller only when it is stationary. Use the grips and railings provided. Always use the three-point grip (both feet and one hand or one foot and both hands) when boarding or disembarking the machine.
6. The ROPS (Roll Over Protective Structure) should always be used when the machine is operated on unsafe ground.
7. Drive slowly in sharp bends.
8. Avoid driving across slopes. Drive straight up or straight down the slope.
9. When driving close to edges or holes, make sure that at least 2/3 of the drum width is on previously compacted materials.
10. Make sure that there are no obstacles in the direction of travel, on the ground, in front of or behind the roller, or overhead.
11. Drive particularly carefully on uneven ground.
12. Use the safety equipment provided. The seat belt must be worn on machines fitted with ROPS.
13. Keep the roller clean. Clean any dirt or grease that accumulates on the operator platform immediately. Keep all signs and decals clean and legible.
14. Safety measures before refueling:
 - Shut off the engine
 - Do not smoke
 - No naked flame in the vicinity of the machine
 - Ground the filling device nozzle to the tank to avoid sparks
15. Before repairs or service:
 - Chock the drums/wheels and under the strike-off blade.
 - Lock the articulation if necessary
16. Hearing protection is recommended if the noise level exceeds 85 dB(A). The noise level can vary depending on what type of material the machine is being used on.

- 17. Do not make any changes or modifications to the roller that could affect safety. Changes are only to be made after written approval has been given by Dynapac.**
- 18. Avoid using the roller before the hydraulic fluid has reached its normal working temperature. Braking distances can be longer than normal when the fluid is cold. Refer to the operating instruction in the STOP section.**

Safety - when operating

Driving near edges

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

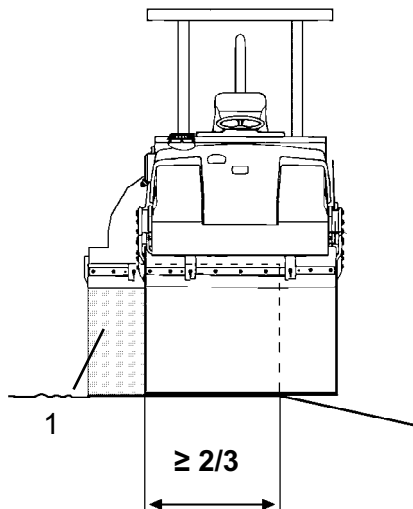


Fig. Position of drums when driving near an edge
1. Pivotal steering



When using pivotal steering, only one drum should be allowed to move into the position shown in the picture. The other drum must be in contact with the ground across its full width.



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



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

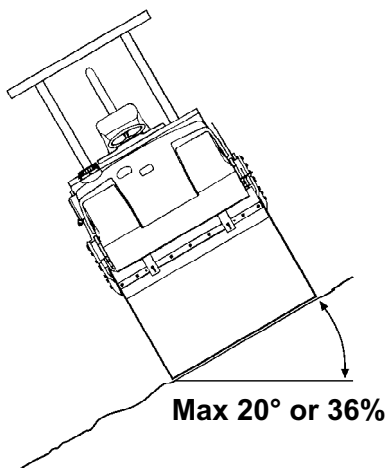


Fig. Operating on slopes

Slopes

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

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

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



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



It is recommended that ROPS (Roll Over Protective Structure) is always used when driving on slopes or unsafe ground.

Safety (Optional)**Edge cutter/edge roller (Optional)**

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



A decal located on the front fork warns of the danger of rotating components and the risk of being crushed.

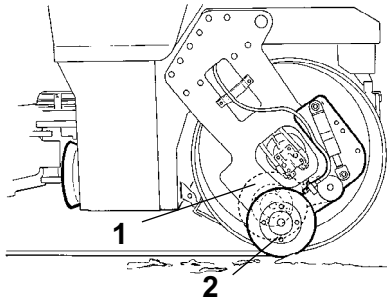


Fig. Edge cutter/edge roller
1. Transport position
2. Operation position



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

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 -10°C to +40°C (14°F - 104°F).



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

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

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

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

Hydraulic system - mineral oil Shell Tellus TX100 or similar.

Temperatures

The temperature limits apply to standard versions of rollers.

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

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.



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

Fire fighting

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

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

Protective structure (ROPS), protective cab

Never carry out any welding or drilling operations of any kind on the protective structure (ROPS, Roll Over Protective Structure) or the protective cab.



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

Battery handling

When removing the battery, always disconnect the negative cable first.



When fitting the battery, 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.

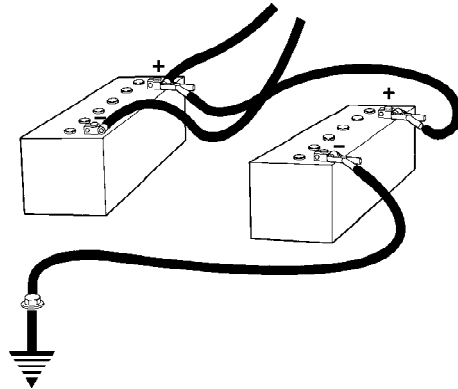


Fig. Jump starting

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 to the dead battery's positive terminal. Then connect the jump start battery's negative terminal to, for example, a bolt or engine hoisting hook on the machine with the dead 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 -
Noise/Vibrations/Electrical****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 ² as specified in Directive 2002/44/EC. (Limit is 1.15 m/s ²)

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

Noise level

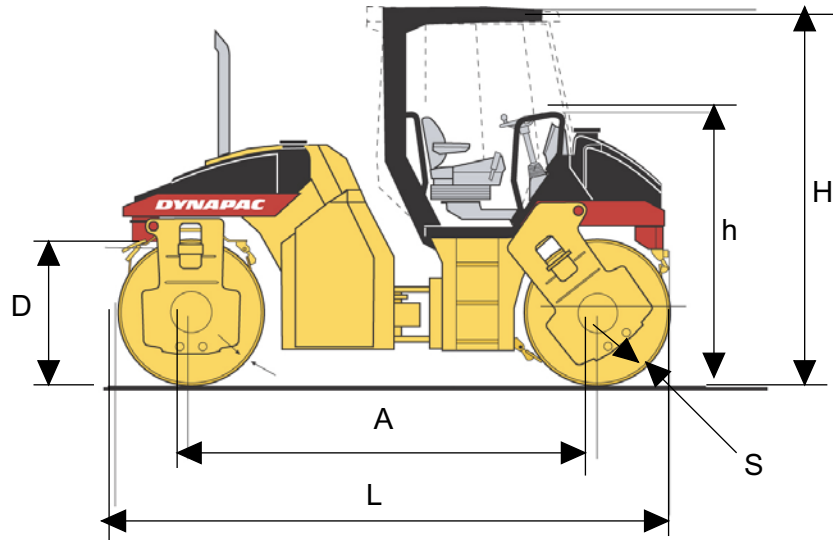
The noise level is measured in accordance with the operational cycle described in EU directive 2000/14/EC on machines equipped for the EU market, on soft polymer material with vibration switched on and the operator's seat in the transport position.

Guaranteed sound power level, L_{wA} 109 dB (A)

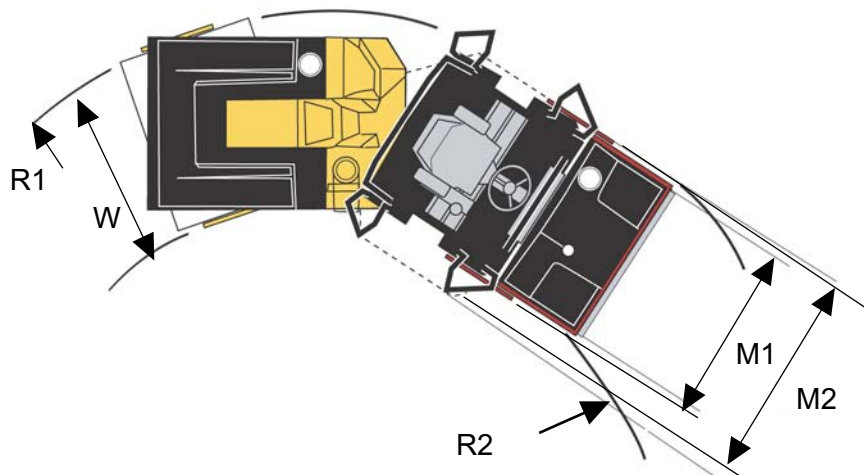
Sound pressure level at the operator's ear (platform), L_{pA} xx dB (A)

Electrical system

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

Technical specifications - Dimensions**Dimensions, side view**

Dimensions	mm	in
A	3690	145
D	1400	55
h	2240	88
H	3040	120
L	5090	200
S	19	0.75

Dimensions, top view

Dimensions	mm	in
M1	2090	82
M2	2115	83
R1: With offset drums	6305	248
R2: With offset drums	4090	161
R1: Without offset drums	7345	247
R2: Without offset drums	5395	189
W	1950	57

Technical specifications - Weights and volumes**Weights**

Service weight without ROPS	11390 kg	25.110 lbs
Service weight with ROPS (EN500)	11920 kg	26.279 lbs

Fluid volumes

Drum	14 liters	14.8 qts
Hydraulic reservoir	40 liters	42.3 qts
Fuel tank	200 liters	52.8 gal
Emulsion tank	- liters/tank	-
Water tank, front	567 liters/tank	149.8 gal
Water tank, rear	620 liters/tank	163.8 gal
Diesel engine	7,9 liters	8.4 qts

Technical specifications - Working capacity**Compaction data**

Static linear load, front	30,2 kg/cm	169.1 pli
Static linear load, rear	30,6 kg/cm	171,4 pli
Amplitude, high	0,59 mm	0.023 in
Amplitude, low	0,24 mm	0.009 in
Vibration frequency, high amplitude	49 Hz	2940 vpm
Vibration frequency, low amplitude	62 Hz	3720 vpm
Centrifugal force, high amplitude	111 kN	24,950 lb
Centrifugal force, low amplitude	72 kN	16,186 lb

Propulsion

Speed range	0-12	km/h	0-7.5	mph
Climbing capacity (theoretical)	34	%		

Technical specifications - General**Engine**

Manufacturer/Model	Cummins 4BTAA 3.9-C	
Power (SAE J1995)	93 kW	125 hp
Engine speed	2200 rpm	

Electrical system

Battery	12V 170Ah	
Alternator	12V 95A	
Fuses	See the Electrical system section - fuses	

Tightening torque

Tightening torque in Nm for oiled, bright galvanized bolts tightened using a torque wrench.

STRENGTH CLASS

M - thread	8.8	10.9	12.9
M6	8,4	12	14,6
M8	21	28	34
M10	40	56	68
M12	70	98	117
M16	169	240	290
M20	330	470	560
M24	570	800	960
M30	1130	1580	1900
M36	1960	2800	-

ROPS - bolts

Bolt dimensions :	M24 (PN 903792)
Strength class :	10.9
Tightening torque :	800 Nm (Dacromet treated)



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

Hydraulic system

Opening pressure	MPa	Psi
Drive system	42.0	6,100
Supply system	2,4	350
Vibration system	35.0	5,100
Control systems	20.0	2,900
Brake release	1.5	220

Machine plate - Identification

Product identification number on the frame

The machine PIN (Product Identification Number) (1) is punched on the right edge of the front frame.

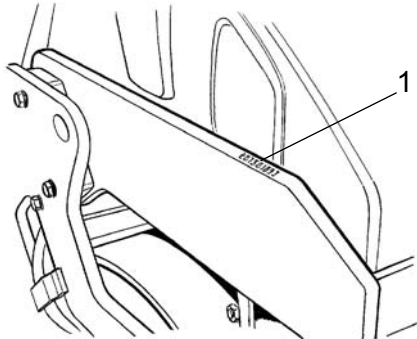
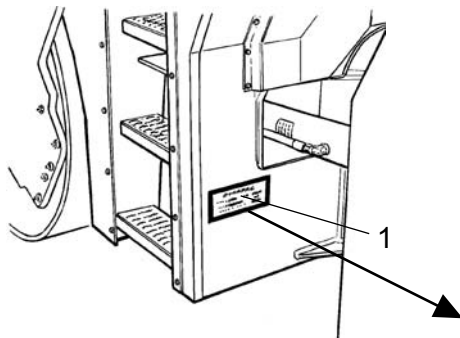


Fig. 1. PIN Front frame

Machine plate

The machine type plate (1) is attached to the front left side of the frame, beside the steering joint.

The plate specifies the manufacturers name and address, the type of machine, the PIN, Product Identification Number (serial number), operating weight, engine power and year of manufacture. (On machines supplied to outside the EU, there are no CE markings and in some cases no year of manufacture.)



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



Please state the machine's PIN when ordering spares.

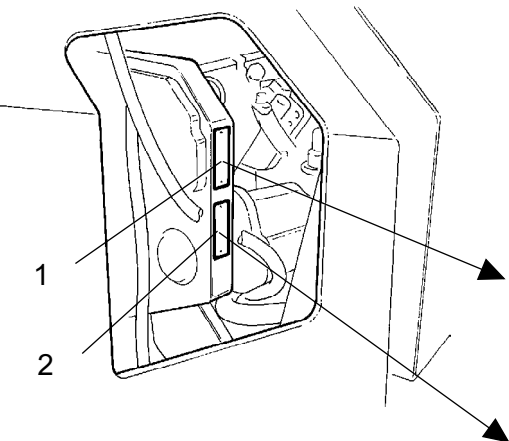


Fig. Engine
1. Type plate
2. EPA plate (USA)

Engine plates

The engine plate (1) is affixed to the left side of the engine under the injection pump. Remove the metal cover at the top on the left of the engine compartment to access the plate. 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.

 Cummins Engine Company, Inc. Columbus, Indiana 47202-3005	C.I.D./L 275/4.5		GPL 8204	Engine Serial No. xxxxxxxx	
	Family 4CEYL0275AAC			Cust. Spec. SO 41506	
	e 11*07/68ge*2002/68*0230*00			Engine Model B4.5-C	
	Valve lash		Inch 010 Int. 020 Exh.	Timing-TDC B4.5-C	
● Warning: Injury may result and warranty is voided if fuel rate, rpm or altitude exceed published maximum values for this model and application.	cold		MM 254 Int. 506 Exh.	Fuel rate at rated HP 83 mm ³ /st	
	Date of MFG.		Firing Order 1-3-4-2	FR 91170 Low idle RPM 900 ± 300	
	Made in Great Britain. XX-XX-XX		Rated HP/KW 90/74	at 2200 RPM	

IMPORTANT ENGINE INFORMATION

This engine conforms to YYYY U.S. EPA and California regulations for heavy duty non-road compression ignition diesel cycle engines as applicable.

THIS ENGINE IS CERTIFIED TO OPERATE ON DIESEL FUEL

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Machine description- Decals

Location - decals

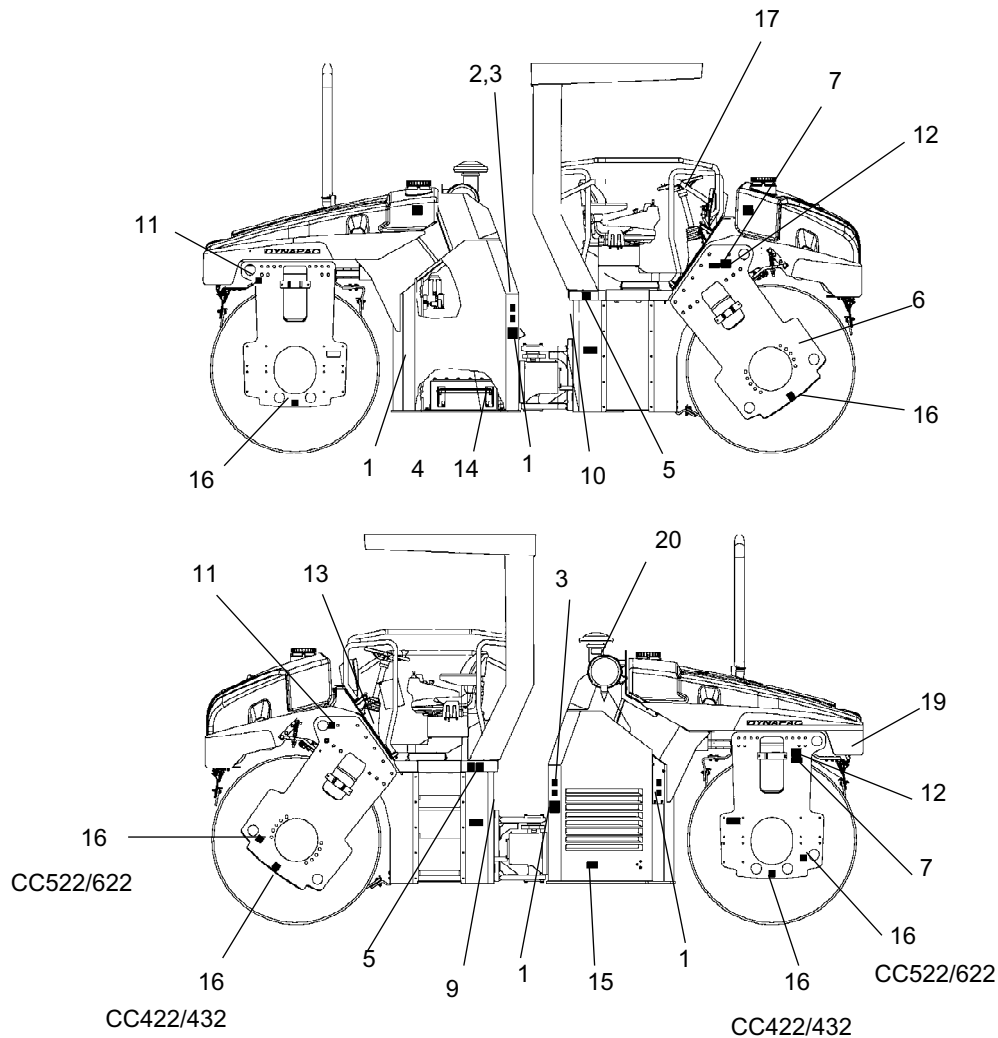
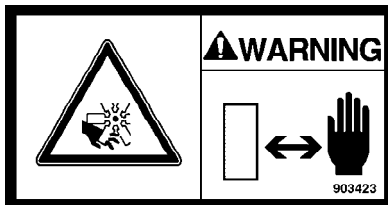
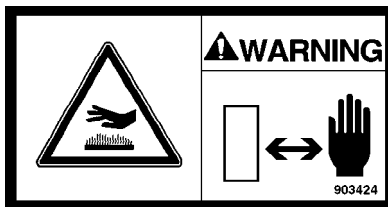
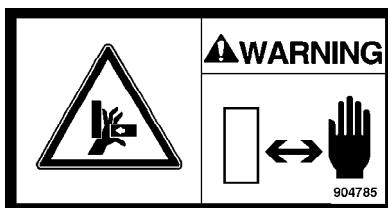
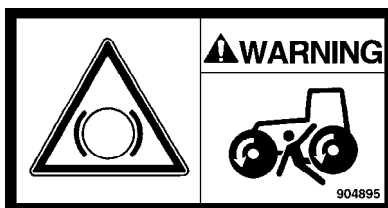
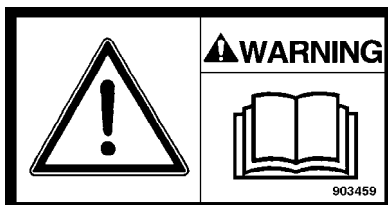
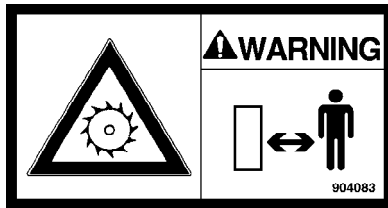


Fig. Location, decals and signs

- | | |
|--|---------------------------|
| 1. Warning, Crush zone | 11. Lifting point |
| 2. Warning, Rotating engine components | 12. Hoisting plate |
| 3. Warning, Hot surfaces | 13. Handbook compartment |
| 4. Warning, Brake release | 14. Hydraulic fluid |
| 5. Warning, Instruction manual | 15. Battery disconnect |
| 6. Warning, Edge cutter | 16. Tie down point |
| 7. Warning, Locking | 17. Warning sign |
| 8. Warning, Toxic gas | 18. Emergency exit |
| 9. - | 19. Warning, Crush zone |
| 10. Diesel fuel | 20. Warning, Starting gas |


Safety decals
903422
- Crush zone, articulation/drum.
Maintain a safe distance from the crush zone.
(Two crush zones on machines fitted with pivotal steering)

903423
- Warning of rotating engine components.
Keep your hands at a safe distance from the danger zone.

903424
- Warning of hot surfaces in the engine compartment.
Keep your hands at a safe distance from the danger zone.

904785
- Crush zone, drum.
Maintain a safe distance from the crush zone.

904895
- Brake disengagement
Study the towing chapter before disengaging the brakes.
Danger of being crushed.

903459
- Instruction manual
The operator must read the safety, operation and maintenance instructions before operating the machine.

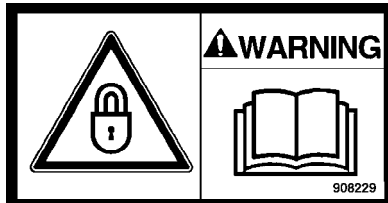


904083

- Edge cutter (option)

Warning of rotating parts.

Maintain a safe distance from the crush zone.



908229

- Locking

The articulation must be locked when lifting.

Read the instruction manual.

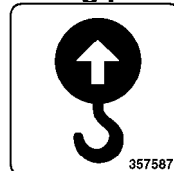
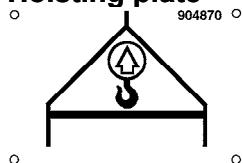
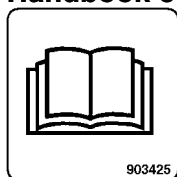
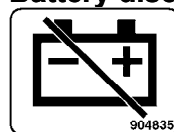
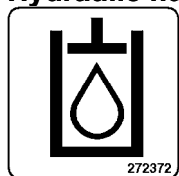
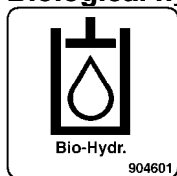
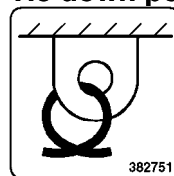


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- Starting gas

Starting gas is not to be used.

Info decals
Diesel fuel

Lifting point

Hoisting plate

Handbook compartment

Battery disconnect

Hydraulic fluid

Biological hydraulic fluid

Tie down point


Machine description - Instruments/Controls

Locations - Instruments and controls

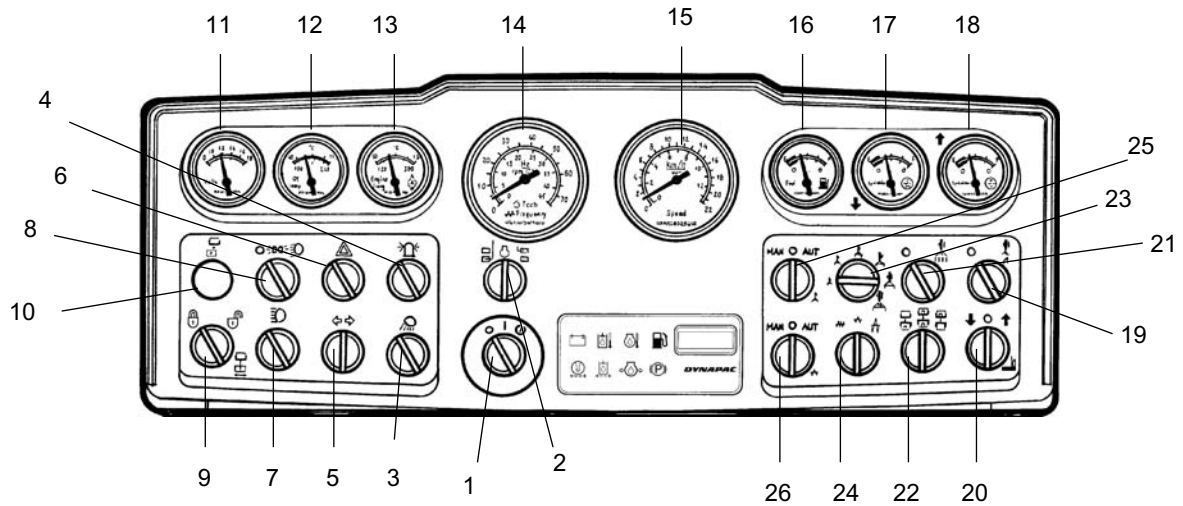


Fig. Instruments and control panel

- | | | | |
|-----|---|-----|---------------------------------|
| 1. | Starter switch | 15. | * Speedometer |
| 2. | * Rpm/Frequency selector | 16. | Fuel gauge |
| 3. | * Working lights | 17. | * Level gauge, rear water tank |
| 4. | * Hazard beacon | 18. | * Level gauge, front water tank |
| 5. | * Direction indicator switch | 19. | * Sprinkler, edge cutter |
| 6. | * Hazard warning lights | 20. | * Edge cutter, Up/Down |
| 7. | * Main beam switch | 21. | **Sprinkler, tires |
| 8. | * Parking/dipped beam switch | 22. | Vibration, front/rear drum |
| 9. | * Changeover switch, pivotal steering, On/Off | 23. | * Sprinkler timer |
| 10. | * Control lamp, drum position | 24. | Amplitude selector, High/Low |
| 11. | * Voltmeter | 25. | Manual/Automatic sprinkler |
| 12. | * Hydraulic fluid temperature | 26. | Manual/Automatic vibration |
| 13. | * Engine oil temperature | | |
| 14. | * Engine speed/Vibration frequency | | |

* = Optional

** = Standard on combi roller

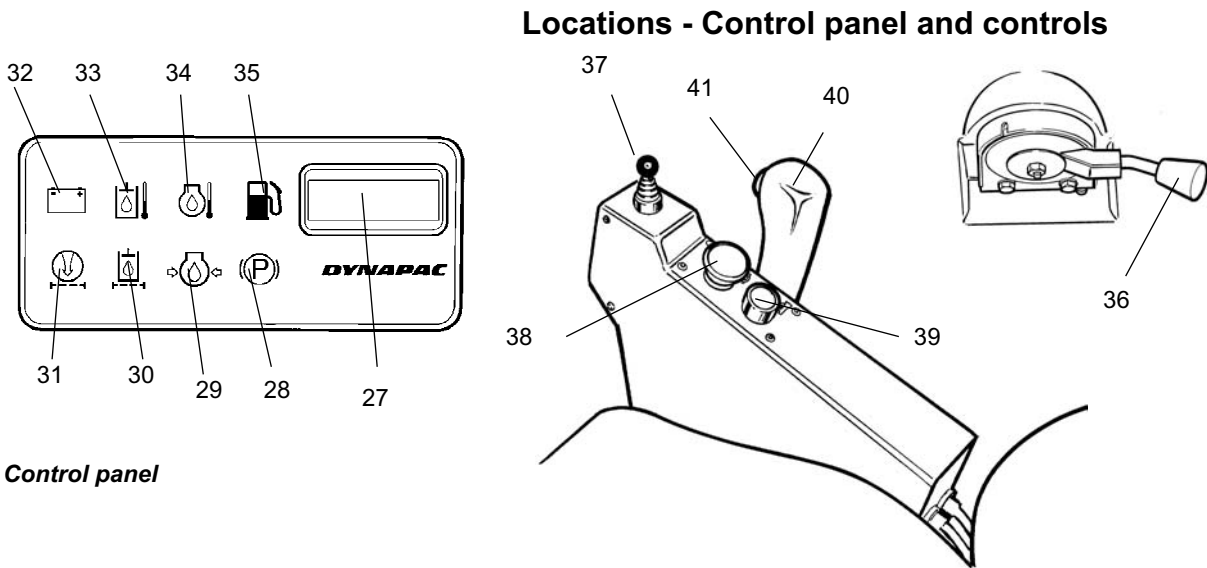


Fig. Control panel

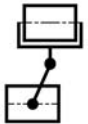
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|-----|-------------------------------------|-----|---------------------------------------|
| 27. | Hourmeter | 34. | Warning light, engine oil temperature |
| 28. | Brake warning lamp | 35. | Warning lamp, fuel level |
| 29. | Warning lamp, engine oil pressure | 36. | Engine speed control |
| 30. | Warning lamp, hydraulic filter | 37. | Joystick, pivotal steering |
| 31. | Warning lamp, air filter | 38. | Emergency/Parking brake knob |
| 32. | Warning lamp, charging | 39. | Horn |
| 33. | Warning lamp, hydraulic temperature | 40. | Forward/Reverse lever |
| | | 41. | Vibration On/Off |

Function descriptions

No	Designation	Symbol	Function
1	Starter switch	○ ○	The electric circuit is broken. All instruments and electric controls are supplied with power. Starter motor activation.
2	Engine speed	○	The current engine speed is shown in this position
	Vibration frequency measurement, switch		In the left position, frequency is measured on the rear rear drum. In the right position, frequency is measured on the front drum.
3	Rear working lights, switch	☹	Turn to the right to switch on the working lights.

No	Designation	Symbol	Function
4	Hazard beacon, switch		Turn to the right to switch on the hazard beacon.
5	Direction indicator, switch		Turn to the left to switch on the left direction indicators etc. The direction indicators are off in the middle position.
6	Hazard warning lights, switch		Turn the switch to the right to turn on the hazard warning lights.
7	Main/dipped beam switch with control lamp		In the right position, the switch lights and the main beam is on. In the left position, the dipped beam is on.
8	Forward working lights, switch	  	Lights off. Parking lights on Front working lights on
9	Pivotal steering, On/Off, switch		In the left position, the pivotal steering is switched off In the right position, the the pivotal steering is switched on
10	Control lamp, drum position		The lamp indicates that the sides of the drums are not aligned.
11	Voltmeter		Shows electrical system voltage. Normal range is 12-15 volts.
12	Temperature gauge, hydraulic fluid		Shows hydraulic fluid temperature. Normal temperature range is 65°-80°C (149°-176°F). Stop the engine if the gauge shows a temperature of more than 85°C (185°F). Locate the fault.
13	Temperature gauge, engine oil		Shows the engine oil temperature. Normal temperature is around 95°C (194°F). Stop the engine if the gauge shows a temperature of more than 120°C (248°F). Locate the fault.
14	Engine speed / Frequency meter		The inner scale shows current engine speed. The outer scale shows vibration frequency for the rear or front drum.
15	Speedometer		The outer scale shows speed in km/h. The inner scale shows speed in mph.
16	Fuel gauge		Shows level in the fuel tank.
17	Water gauge		Shows level in the rear water tank.
18	Water gauge		Shows level in the front water tank.
19	Sprinkler, edge cutter, switch		In the left position, watering is off. In the right position, the edge cutter disc is watered.

No	Designation	Symbol	Function
20	Edge cutter, Up/Down switch		In the left position, the edge cutter moves downwards. In the middle position, the edge cutter is stationary. In the right position, the edge cutter moves upwards.
21	Sprinkler, tire, switch (Combo versions only)		In the left position, the watering is off. In the right position, the tires are watered.
22	Vibration, front/rear drum, switch Do NOT turn this switch on when the switch (41) is on.		In the left position, vibration is activated for the rear drum. In the middle position, vibration is activated for both drums. In the right position, vibration is activated for the front drum.
23	Sprinkler timer, switch		The switch has six different timer positions which controls the amount of water supplied to the drums. The left mode supplies least water and the right mode most.
24	Amplitude / Frequency selector, switch		The left position gives low amplitude / high frequency. The right position gives high amplitude / low frequency.
25	Watering, switch		In the left position, the drums are continually watered. In the middle position, watering is off. In the right position, watering is automatically switched on/off via the forward/reverse lever when the direction of travel is changed.
26	Vibration setting, switch		In the left position, the vibration is switched on or off by the switch (41). In the middle position, the vibration system is off. In the right position, vibration is automatically switched on or off via the forward/reverse lever.
27	Hourmeter		Engine running time is shown in hours.
28	Brake warning lamp		The lamp come on when the parking or emergency brake knob is depressed and the brakes are applied.
29	Warning lamp, oil pressure		The lamp comes on if the engine oil pressure is too low. Stop the engine immediately and locate the fault.
30	Warning lamp, hydraulic filter		If the lamp comes on while the engine is running at full speed, the hydraulic filter must be changed.
31	Warning lamp, air filter		If the lamp comes on while the engine is running at full speed, the air filter must be cleaned or replaced.
32	Warning lamp, battery charging		If the lamp comes on while the engine is running, the alternator is not charging. Stop the engine and locate the fault.
33	Warning lamp, hydraulic fluid temperature		If the lamp comes on, the hydraulic fluid is too hot. Do not drive the roller. Cool the fluid by allowing the engine to idle and locate the fault.

No	Designation	Symbol	Function
34	Warning light, engine oil temperature		If the lamp comes on, the engine is too hot. Stop the engine immediately and locate the fault. Refer also to the engine manual.
35	Warning lamp, low fuel level		When the lamp comes on, there is only a small amount of fuel left. Refuel as soon as possible.
36	Engines speed control, engine		In the right position, the engine idles. In the left position, the engine runs at maximum speed.
37	Pivotal steering, joystick		In the left position, the front drum is positioned to the left of the rear drum. In the middle position, the drums are aligned. In the right position, the front drum is positioned to the right of the rear drum.
38	Emergency brake / Parking brake		Press to activate the emergency brakes. When the machine is stationary, the parking brake is activated. Both brakes are released when pulled out.
39	Horn, switch		Press to sound the horn.
40	Forward/Reverse lever		The lever must be in neutral to start the engine. The engine cannot be started if the forward/reverse lever is in any other position. The forward/reverse lever controls both the roller's driving direction and speed. When the lever is moved forward, the roller moves forward. The roller's speed is proportional to the distance the lever is from the neutral position. The further the lever is from the neutral position, the higher the speed.
41	Vibration On/Off, switch		Press once and release to switch the vibration on, press again to switch the vibration off. The above only applies when switch 26 is in the left position.

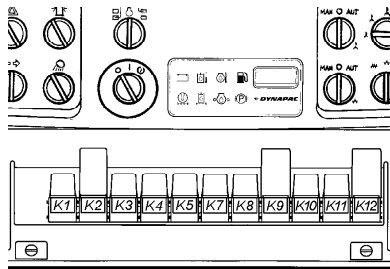
Machine description - Electrical system
Relays


Fig. Instrument panel

- | | |
|-----|----------------------|
| K1 | Lights relay |
| K2 | Direction indicators |
| K3 | Brake lights |
| K4 | Reverseing alarm |
| K7 | Horn |
| K8 | Sprinkler |
| K9 | Main relay |
| K10 | AVC |
| K11 | Neutral switch |
| K12 | VBS relay |

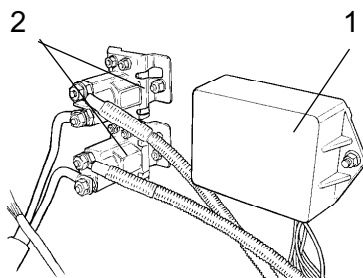


Fig. Engine compartment, left side
1. Control unit for preheating
2. Relay for heating

Behind the left engine compartment door, on the wall facing the rear drum, are the control unit and relays for preheating the engine.

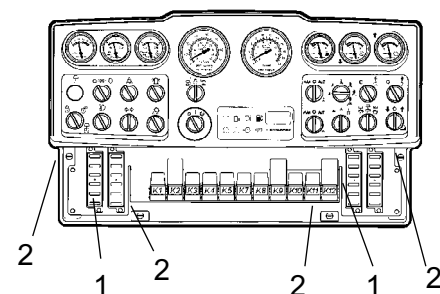


Fig. Instrument panel
1. Fuse box
2. Quick-fit screws

Fuses

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

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

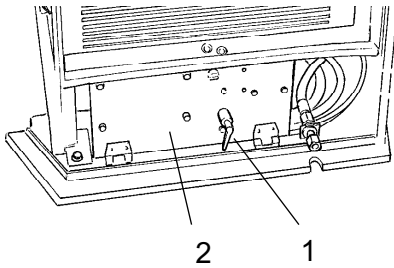


Fig. Battery bay
1. Battery isolation switch
2. Main fuse panel

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

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



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

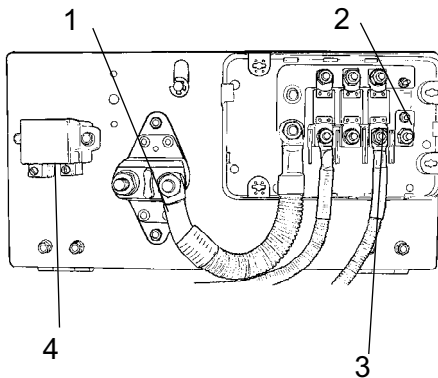
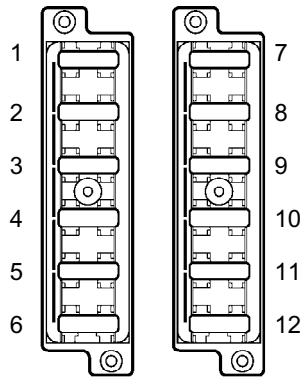


Fig. Main fuse panel
1. Battery isolation switch
2. Main fuse, Cab/standard electricity (100A)
3. Preheating, engine (125A)
4. Starter relay

The main fuse panel is located behind the left engine compartment door.

The main fuses and the starter relay are easily accessible when the door is folded forward.

Fuses


**Fig. Fuse box,
left and right side.**

The figure shows the position of the fuses.

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

Fuse boxes, left side			Fuse boxes, right side		
1.	Vacant		1.	Brake valve, starter relay	7.5A
2.	Direction indicators, main fuse	10A	2.	Vibration relay, VBS	10A
3.	Left position lights, brake lights	7.5A	3.	Indicator panel	3A
4.	Right position lights	5A	4.	Horn	7.5A
5.	Left direction indicators, side repeaters	5A	5.	Vibration, AVC relay	7.5A
6.	Right direction indicators, side repeaters	5A	6.	Hazard beacon	10A
7.	Driving lights/Working lights right	10A/20A	7.	Sprinkler pump front	7.5A
8.	Driving lights/Working lights left	10A/20A	8.	Sprinkler pump rear	7.5A
9.	Left front headlight	7.5A	9.	Sprinkler system, main fuse	15A
10.	Right front headlight	7.5A	10.	Steering, offset up/down	15A
11.	Edge cutter, sprinkler, up/down	7.5A	11.	Reversing alarm	7.5A
12.	Vacant		12.	Instruments, voltmeter, temperature gauge, speedometer, rpm/frequency meter	7.5A

Operation - Starting

Before starting

Master switch - Switching on

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

The master switch is located in the engine compartment. Turn the key (1) to the on position. The entire roller is now supplied with power.



The engine hood must be unlocked when operating, so that the battery can be quickly disconnected if necessary.

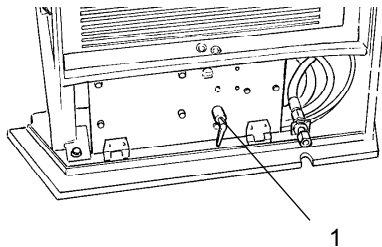


Fig. Engine compartment
1. Battery isolation switch

Control unit, operator's seat - Adjusting

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

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

For rotation, lift the outer lever (2).

Ensure that the control unit locks in position before operating the machine.

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

The seat can be adjusted as follows: - Length adjustment (4)

- Backrest inclination (5)
- Weight adjustment (6)



Adjust all settings when the machine is stationary.

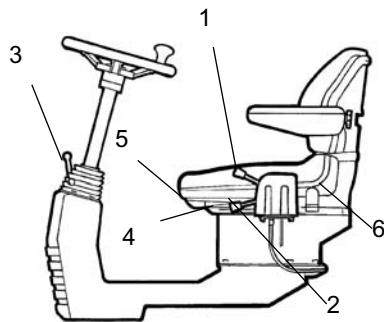


Fig. Operator position
1. Locking lever - transverse travel
2. Locking lever - rotation
3. Locking lever - steering column angle
4. Locking lever - length adjustment
5. Lever - backrest inclination
6. Lever - weight adjustment

Parking brake - Check


Make sure that the emergency/parking brake knob (1) really is in the depressed position. The roller can start to roll when the engine is started on sloping ground, if the parking brake is not applied.

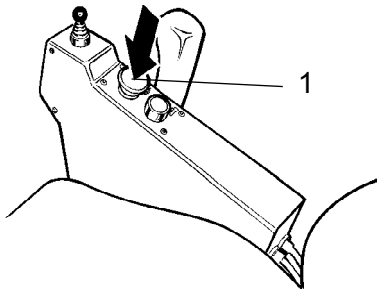


Fig. Control panel
1. Parking brake control

Instruments and lamps - Checking

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

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

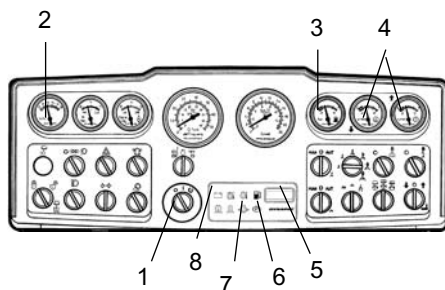


Fig. Instrument panel
1. Starter switch
2. Voltmeter
3. Fuel gauge
4. Water level gauge

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

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

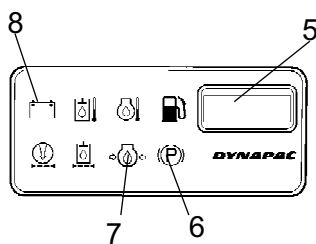


Fig. Control panel
5. Hourmeter
6. Brake lamp
7. Oil pressure lamp
8. Charging lamp

Interlock

The roller is equipped with Interlock.

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

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

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



Sit down for all operations!

Operator position

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



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



The safety railings (2) around the operator station are adjustable, and can be set in the inner and the outer positions. Retract the railings when driving close to walls or other obstacles.

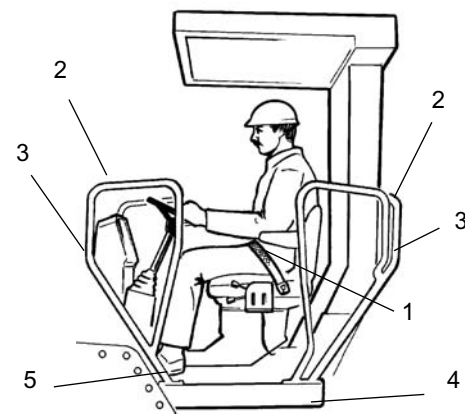


Fig. Operator position

- 1. Seat belt**
- 2. Safety railing**
- 3. Locking knob**
- 4. Rubber element**
- 5. Anti-slip**

Release the locking knob (3), set the railings in the required position and relock in position.



Check that the rubber elements (4) on the platform are intact. Worn elements will reduce comfort.



Ensure that the anti-slip (5) on the platform is in good condition. Replace where anti-slip friction is poor.



If the machine is fitted with a cab, make sure that the door is closed when in motion.

Starting

Starting the engine

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

Set the engine speed control (2) to idling.

Set the vibration switch (4) for manual/automatic vibration in the mid position (position 0).

Turn the starter switch (3) to the right to the first position. A lamp in the knob comes on. When the lamp goes out, turn the knob to the start position and release immediately the engine starts. This particularly important when starting the machine from cold.



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

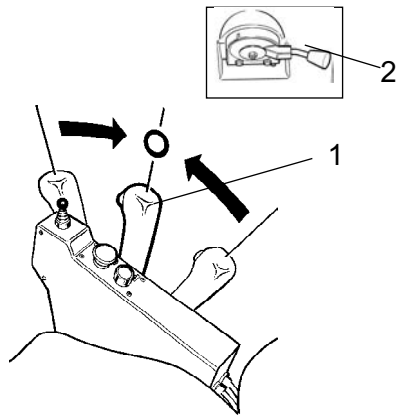


Fig. Control panel
1. Forward/Reverse lever
2. Engine speed control

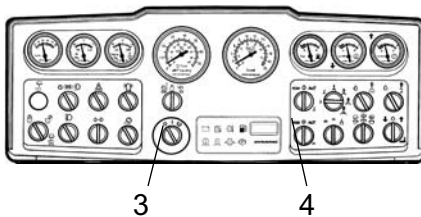


Fig. Instrument panel
3. Starter switch
4. Vibration switch

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



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

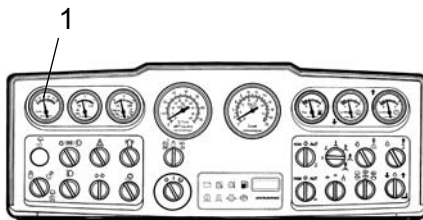


Fig. Instrument panel
1. Voltmeter

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

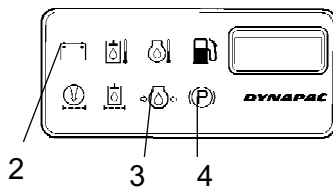


Fig. Instrument panel
2. Charging lamp
3. Oil pressure lamp
4. Brake lamp

The warning lamp (4) should remain on.



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



During all transportat, make sure that side-displaced drums are in neutral.

Operation

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.

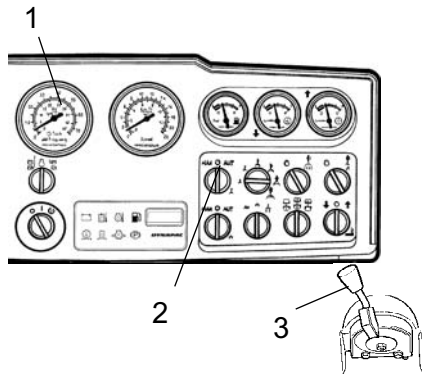


Fig. Instrument panel

1. Tachometer
2. Switch, sprinkler
3. Engine speed control

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

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

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



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



Pull up the emergency/parking brake knob (1) and check that the parking brake warning lamp is off. Be prepared that the roller may begin to roll, if it is on a slope.

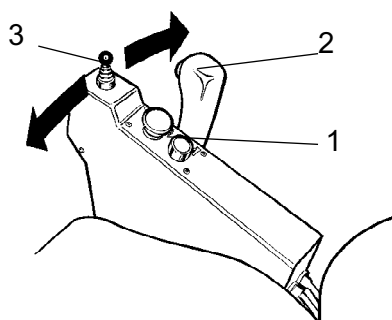


Fig. Control panel

1. Parking brake control
2. Forward/Reverse lever
3. Pivotal steering, joystick (optional)

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

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



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



Test the emergency brake by depressing the emergency/parking brake knob (1) while the roller is moving forwards slowly.

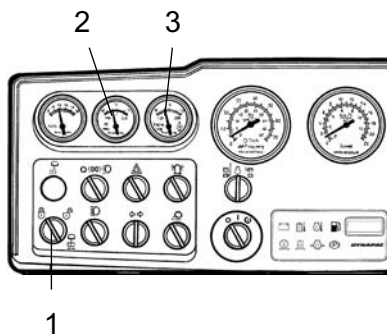


Fig. Instrument panel

1. Pivotal steering, On/Off
2. Hydraulic fluid temperature
3. Engine oil temperature

Pivotal steering (Optional)

Turn the switch (1) to the unlocked position to activate the pivotal steering. Use the joystick on the control panel to operate the pivotal steering.

Check from time to time while driving that gauges (2) and (3) show normal readings.

Where abnormal values are shown or where the buzzer sounds, stop the roller immediately and switch off the engine. Check and remedy any faults. Refer also to the maintenance instructions and the engine manual.

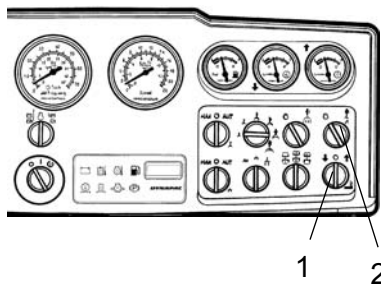


Fig. Changeover switch

1. Edge cutter/roller, Up/Down
2. Sprinkler, edge cutter/roller

Edge cutting (Optional)

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

A bypass valve prevents the hydraulic system being overloaded.

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

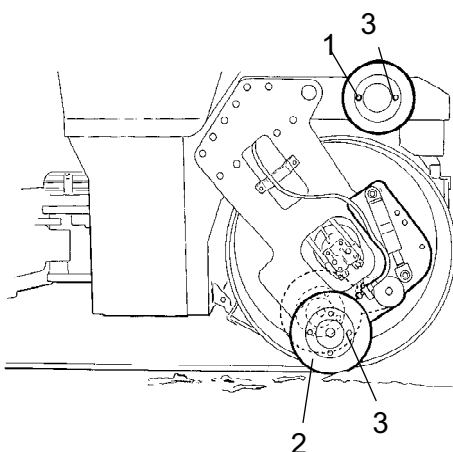


Fig. Changing the tool

1. Edge roller
2. Edge cutter
3. Bolted joint

The operator can choose to use one of two tools, the edge cutter or the edge roller. The edge cutter (1) in the figure is shown in the transport position. It can easily be replaced with the edge roller (2) by undoing the bolted joint (3).

Operation - Vibration

Manual/Automatic vibration

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

In the manual position, the operator activates vibration using the switch (41) on the forward/reverse lever.

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.

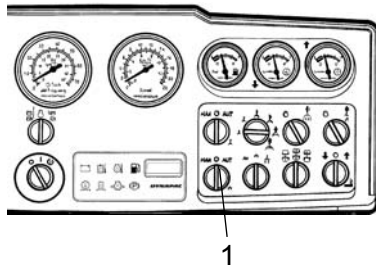


Fig. Instrument panel
1. Man/Auto switch

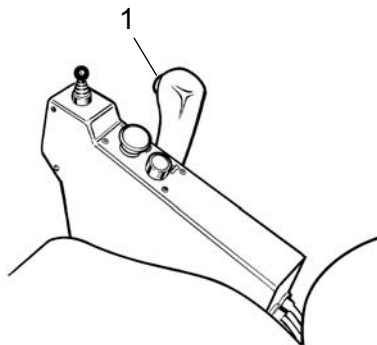


Fig. Control panel
1. Vibration On/Off switch

Manual vibration - Switching on



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

Engage and disengage vibration using the switch (1) on the front of the forward/reverse lever.

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

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

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

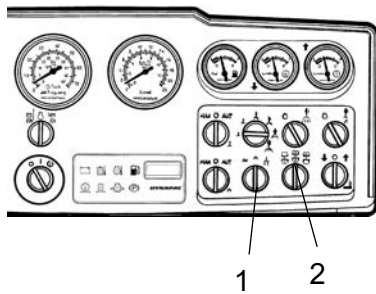


Fig. Instrument panel
1. High/Low switch
2. Drum switch

Amplitude/frequency - Changeover



The amplitude setting must not be change when vibration is in operation
Switch the vibration off and wait until vibration stops before changing amplitude.

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

Turn the knob to the left for low amplitude/high frequency and to the right for high amplitude/low frequency.

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

- The left position activates vibration on the rear drum.
- The middle position activates vibration on both drums.
- The right position activates vibration on the front drum.

Operating - Stopping

Braking

Emergency brake

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

A disc brake in each drum motor acts as an emergency brake when in motion and as a parking brake when stationary.



To brake, press the emergency/parking brake knob (1), hold the steering wheel firmly and be prepared for a sudden stop.

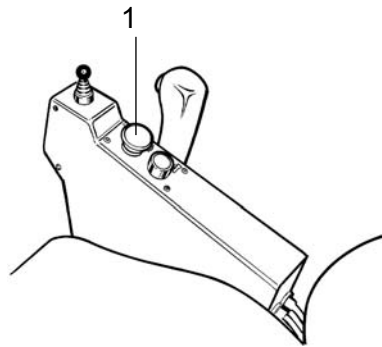


Fig. Control panel
1. Emergency brake/parking brake knob

After braking, return the forward/reverse lever to the neutral position and pull up the emergency/parking brake knob.

Normal braking

Press the switch (1) to switch off the vibration.

Move the forward/reverse lever (2) to the neutral position to stop the roller.

Even when stopping briefly, always depress the emergency/parking brake knob (3) when stopping on sloping ground.

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



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

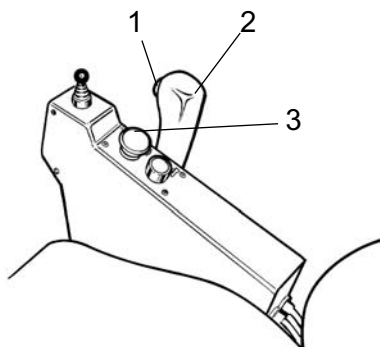


Fig. Control panel
1. Vibration On/Off switch
2. Forward/Reverse lever
3. Emergency/parking brake knob

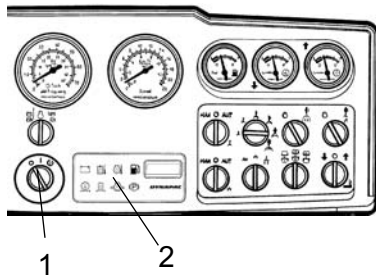


Fig. Instrument panel
 1. Starter switch
 2. Warning lamps panel

Switching off

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

Turn the starter switch (1) to the left to the shut off position. On rollers without a cab, lower and lock the instrument cover.

Parking

Master switch

Before leaving the roller for the day, switch the master switch (1) to the disconnected position and remove the handle.

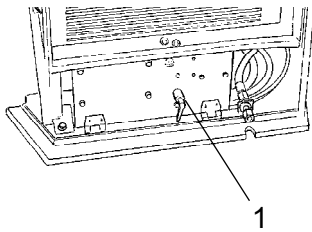


Fig. Engine compartment
 1. Battery isolation switch

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

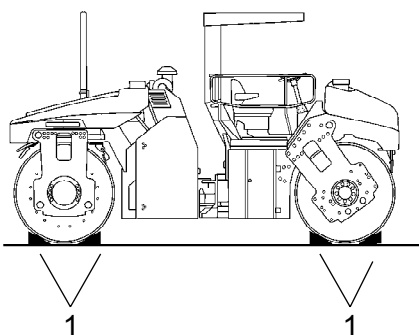


Fig. Positioning
 1. Chocks

Chocking the drums



Never disembark from the machine when the is engine running, unless the emergency/parking brake knob is depressed.



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. Drain the water tanks and water lines.

Long-term parking



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

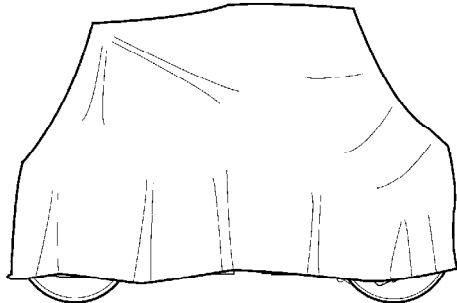


Fig. Roller weather protection

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.

Engine

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

Battery

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

Air cleaner, exhaust pipe

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

Sprinkler system

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

Fuel tank

Fill the fuel tank completely full to prevent condensation.

Hydraulic reservoir

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

Steering cylinder, hinges, etc.

Lubricate 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



Articulation must be locked to prevent inadvertent turning before lifting the roller.

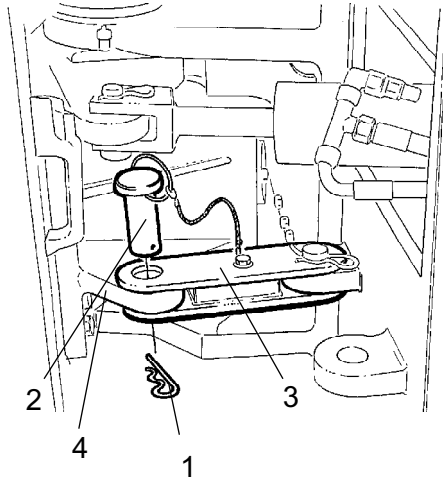


Fig. Articulation in the locked position

- 1. Locking pin
- 2. Locking dowel
- 3. Locking arm
- 4. Locking lug

Turn the steering wheel to the straight ahead position. Push in the emergency/parking brake knob.

Pull out the lowermost locking pin (1), which has a wire attached. Pull up the locking dowel (2) which also has a wire attached.

Fold out the locking arm (3) and secure it to the upper locking lug (4) on the rear machine frame.

Fit the locking dowel into the holes through the locking arm and locking lug. Lock the dowel in position with the locking pin (1).

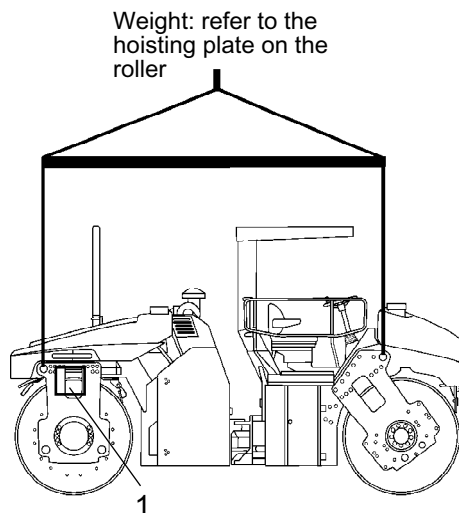


Fig. Roller prepared for lifting
1. Hoisting plate

Lifting the roller



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

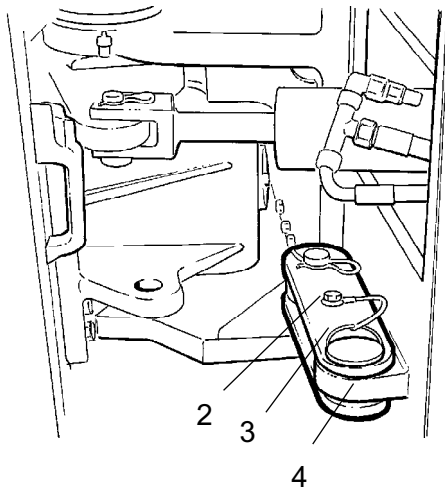


Fig. Articulation in the open position
 2. Locking dowel
 3. Locking arm
 4. Locking lug

Unlocking the articulation



Remember to unlock the articulation before operating.

Fold the locking arm (3) back and secure it in the locking lug (4) with the locking dowel (2). The locking lug (4) is located on the tractor frame.

Towing

The roller can be moved up to 300 meters (1000 ft) using the instructions below.

Short distance towing with the engine running



Depress the emergency/parking brake knob and temporarily shut off the engine. Chock the drums to prevent the machine from rolling.

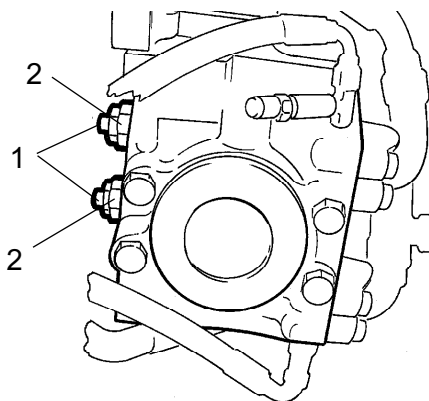


Fig. Propulsion pump
 1. Towing valve
 2. Multifunction valve

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

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

Start the engine and allow it to idle.

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

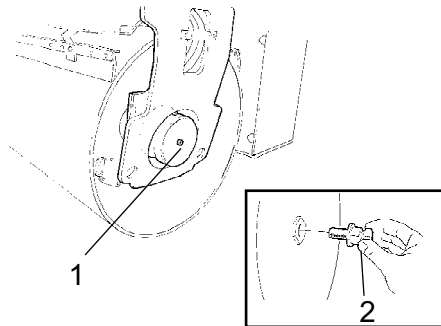


Fig. Drum propulsion motor
1. Plugs (x 3) for brake disengagement

Towing short distances where the engine is inoperative



Chock the drums to prevent the roller moving when the brakes are mechanically disengaged.

First, open both of the towing valves according to alternative 1 above.

Access brake disengagement by removing the center plug (1).

The two brake disengagement screws (M16x100) are securely fastened to the hydraulic reservoir. (In the engine compartment on the right side of the machine.)

Screw in the M16 screw and tighten the nut while holding the screw in place.

Towing the roller



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



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

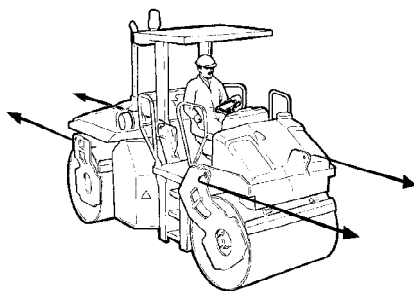


Fig. Towing

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

Pulling forces should act parallel to the machine's longitudinal axis, as illustrated. Maximum gross pulling force 190 kN (42.725 lbf).



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

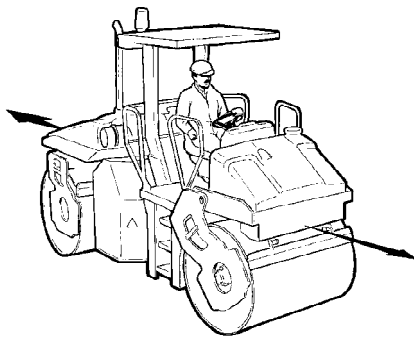


Fig. Trailer eye

Trailer eye

The roller can be fitted with a trailer eye.

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

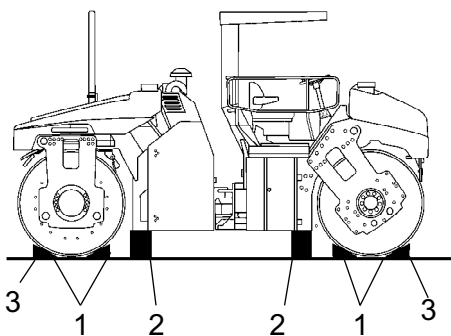


Fig. Positioning
 1. Chocks
 2. Blocks
 3. Straps

Roller prepared for transport



Lock the articulation before lifting and transporting. Follow the instructions under the relevant heading.

Chock the drums (1) and secure the chocks to the transport vehicle.

Block up under the drum frame (2), to avoid overload on the rubber suspension of the drum when lashing.

Clamp down the roller with lashing strap (3) at all four corners; decals indicate the fixing points.



Remember to return the articulation to its unlocked position before starting the roller.

Operating instructions - Summary

1. Follow the **SAFETY INSTRUCTIONS** specified in the **Safety Manual**.
2. Make sure that all instructions in the **MAINTENANCE** section are followed.
3. Turn the master switch to the **ON** position.
4. Move the forward/reverse lever to the **NEUTRAL** position.
5. Set the switch for Manual/Automatic vibration to the **0** position.
6. Set the engine speed control to **idle**.
7. Start the engine and allow it to warm up.
8. Set the engine speed control to the **operating position**.
9. Set the emergency/parking brake knob in the **pulled-out position**.



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



11. **Test the brakes. 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:**
 - **Push in the EMERGENCY/PARKING BRAKE KNOB**
 - **Hold the steering wheel firmly.**
 - **Brace yourself for a sudden stop.**
15. When parking:
 - Push in the emergency/parking brake knob.
 - 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.

Maintenance - Lubricants and symbols

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

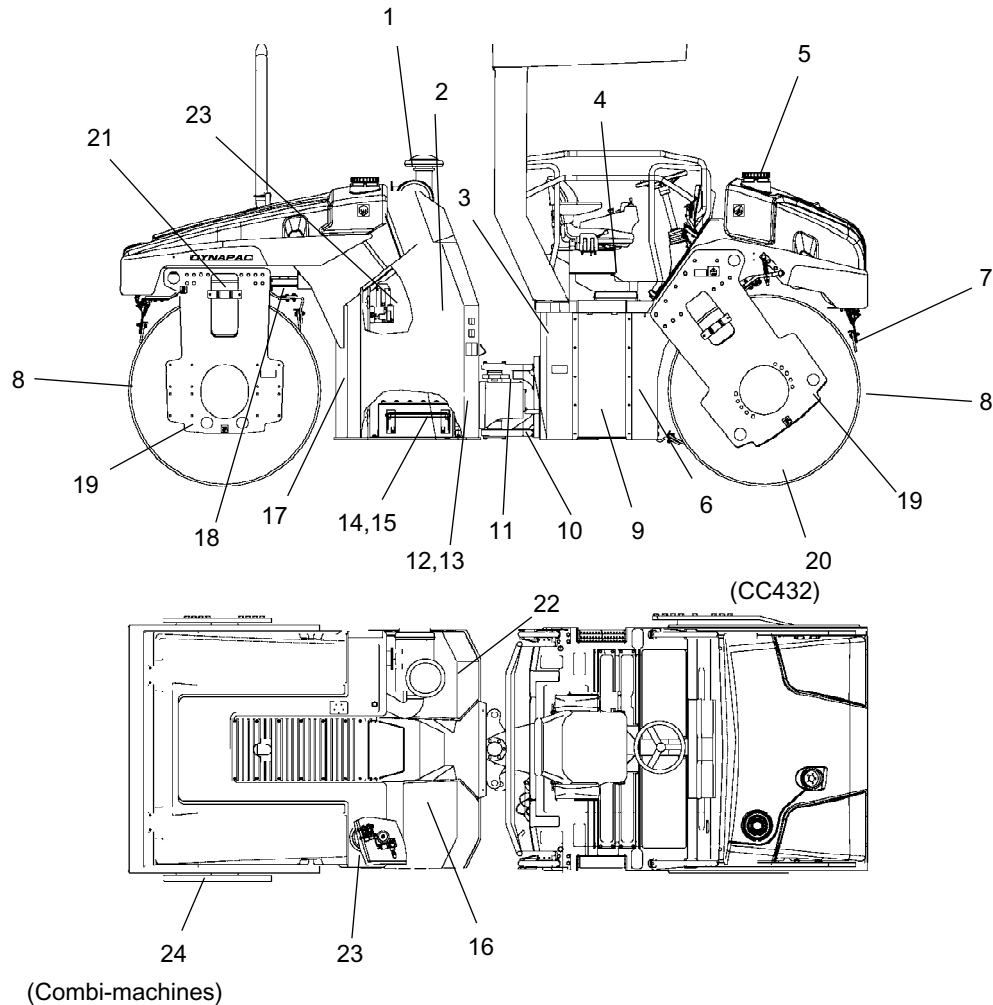
	ENGINE OIL	Air temperature -10°C-+40°C (14°F-104°F) Shell Rimula TX SAE 15W/40 or equivalent API CF-4/SG (CD/CE)
	HYDRAULIC FLUID	Air temp. -10°C-+40°C (14°F-104°F) Shell Tellus TX68 or equivalent. Air temp. above +40°C (104°F) Shell Tellus TX100 or equivalent
	BIOLOGICAL HYDRAULIC FLUID	BP BIOHYD SE-S 46 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.
	DRUM OIL	Air temp. -15°C-+40°C (5°F-104°F) Mobil SHC 629 or equivalent
	GREASE	SKF LGHB2 (NLGI-Klass 2) or equivalent for the articulated joint. Shell Retinax LX2 or equivalent for other grease points.
	FUEL	See engine manual.
	TRANSMISSION OIL	Ambient air temperature -15°C - +40°C Shell spirax SAE 80W/90, HD API, GL-5
	COOLANT	Glycoshell or equivalent. (mixed 50/50 with water) Prevents freezing to around -41°C. (-106°F)



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
	Coolant level		Pump gear, oil level
	Air pressure		Sprinkler, tires

Maintenance - Maintenance schedule
Service and maintenance points

Fig. Service and maintenance points

- | | | |
|-------------------------|------------------------------|----------------------------|
| 1. Air cleaner | 9. Fuel tank | 17. Hinges |
| 2. Engine oil | 10. Steering joint | 18. Pivot cylinder |
| 3. Refueling point | 11. Steering cylinder | 19. Rubber element |
| 4. Seat bearing | 12. Hydraulic filter | 20. Pump gear |
| 5. Water tanks, filling | 13. Hydraulic fluid level | 21. Pivot bearing |
| 6. Watering system | 14. Hydraulic fluid, filling | 22. Battery |
| 7. Scrapers | 15. Hydraulic reservoir | 23. Hydraulic fluid cooler |
| 8. Drums | 16. Engine | 24. Tires (Combi) |

General

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



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



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

Every 10 hours of operation (Daily)

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

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

After the FIRST 50 hours of operation

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

Pos. in fig	Action	Comment
2	Change the engine oil and oil filter	Refer to the engine manual
16	Change the fuel filter	Refer to the engine manual
12	Change the hydraulic fluid filter	

Every 50 hours of operation (Weekly)

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

Pos. in fig	Action	Comment
10	Grease the steering joint	
11	Grease the steering cylinder brackets	
18	Grease the operating cylinder for pivotal steering	Optional
1	Inspect/clean the filter element in the air cleaner	Replace as required
	Inspect/lubricate the edge cutter	Optional

Every 250 hours of operation (Monthly)

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

Pos. in fig	Action	Comment
23	Clean the hydraulic fluid cooler/water cooler	Or when required
22	Check the electrolyte level in the battery.	Refer to the engine manual

Every 500 hours of operation (Every three months)

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

Pos. in fig	Action	Comment
8	Check the oil level in the drums	
21	Lubricate the pivot bearings	Optional
19	Check rubber elements and bolted joints	
14	Check the hydraulic reservoir cover/breather	
4	Grease the chair bearing	
	Grease the steering chain	
17	Lubricate hinges and controls	
2	Change the engine oil and oil filter	Refer to the engine manual
16	Change the engine fuel filter	Refer to the engine manual
16	Change the engine pre-filter	

Every 1000 hours of operation (Every six months)

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

Pos. in fig	Action	Comment
16	Check engine valve clearances	Refer to the engine manual
16	Check the engine belt drive system	Refer to the engine manual
20	Change the pump gear fluid	
12	Change the hydraulic fluid filter	
1	Replace the main filter in the air cleaner	
8	Change the oil in the drums	

Every 2000 hours of operation (Yearly)

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

Pos. in fig	Action	Comment
15	Change the hydraulic fluid	
8	Change the oil in the drums	
9	Drain and clean the fuel tank	
5	Drain and clean the water tanks	
	Lubricate the forward/reverse lever	
10	Check the condition of the articulation	

Maintenance - 10h



Park the roller on a level surface. When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.



Diesel engine - Check oil level

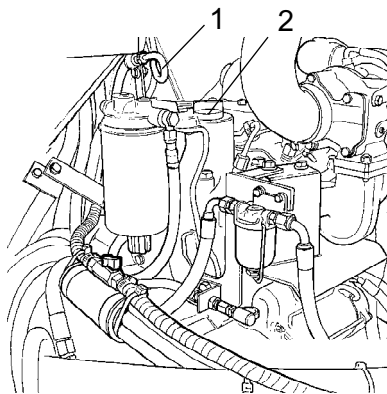


Fig. Engine compartment
1. Dipstick
2. Oil filler cap

The dipstick is accessed through the right door of the engine compartment.



Take care not to touch any hot parts of the engine or the radiator when removing the dipstick. Risk of burns.

The dipstick is located on the engine's short side above the hydraulic pumps.

Pull up the dipstick (1) and check that the oil level is between the upper and lower marks.

For further details, refer to the engine's instruction manual.



Fuel tank - Refueling



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

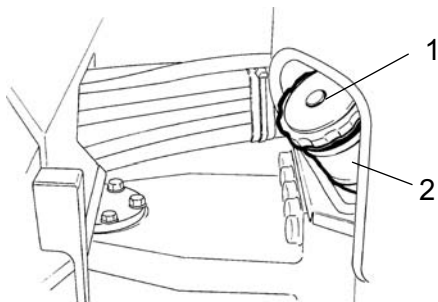


Fig. Fuel tank
1. Tank cap
2. Filler pipe

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

The tank holds 200 liters (52.8 gal) of fuel. Refer to the engine manual for information on diesel grade.



Coolant level - Check

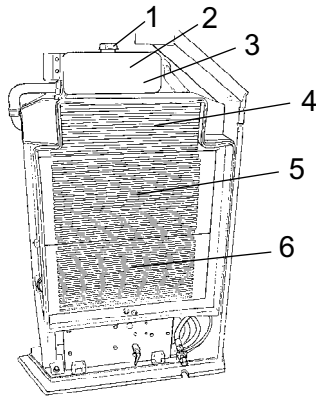


Fig. Radiator

- 1. Filler cap
- 2. Sight glass/max. level
- 3. Sight glass/min. level
- 4. Charge air cooler
- 5. Water cooler
- 6. Hydraulic fluid cooler

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



Observe great caution if the radiator cap has to be opened while the engine is hot. Wear protective gloves and goggles.

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



Flush the system every other year and change the coolant. Also check that the air has unobstructed passage through the radiator.



Water tanks - Filling

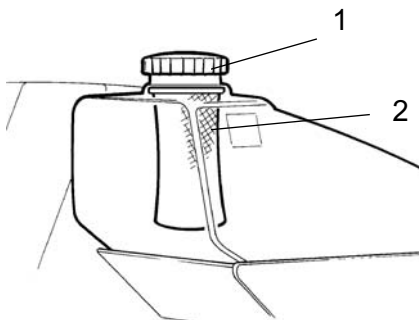


Fig. Rear water tank

- 1. Tank cap
- 2. Strainer



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

Fill both water tanks. They hold 365 liters (96.4 gal) each.

To make reaching the tank cap easier, there is a step above the battery behind the left door of the engine compartment and also a retractable step on the left front drum fork.



Only additive: A small amount of environmentally friendly antifreeze.



Sprinkler system/Drum Check

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

There is a pump system behind the cover on the right side of the machine.

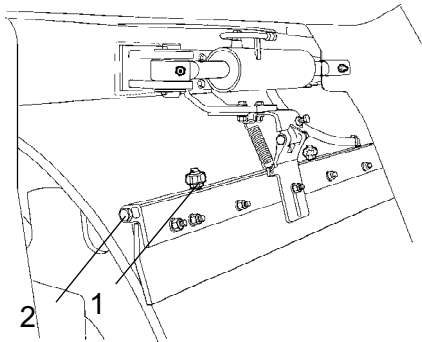


Fig. Rear drum
1. Nozzle
2. Drain plug

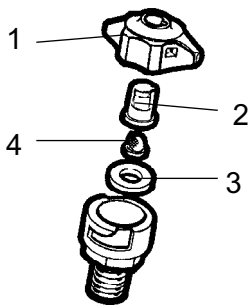


Fig. Nozzle
1. Sleeve
2. Nozzle
3. Seal
4. Fine filter

Sprinkler system/Drum Cleaning

Dismantle the blocked nozzle by hand.

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

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



Wear protective goggles when working with compressed air.

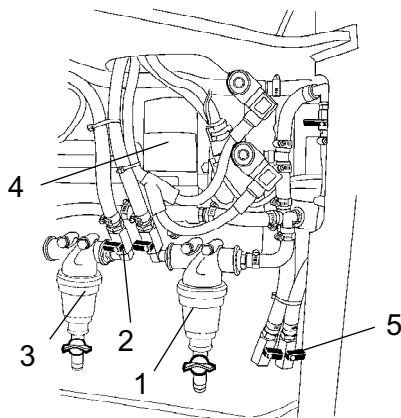


Fig. Pump system

- 1. Filter
- 2. Stop cocks
- 3. Filter housing
- 4. Water pump
- 5. Drain cocks

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

Clean the left filter (1) by closing the left stop cock (2) and the right filter by closing the right stop cock.

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.

Two drain cocks (5) are located on the right side of the pump system.

If draining is required, see the draining section under 2000 h.

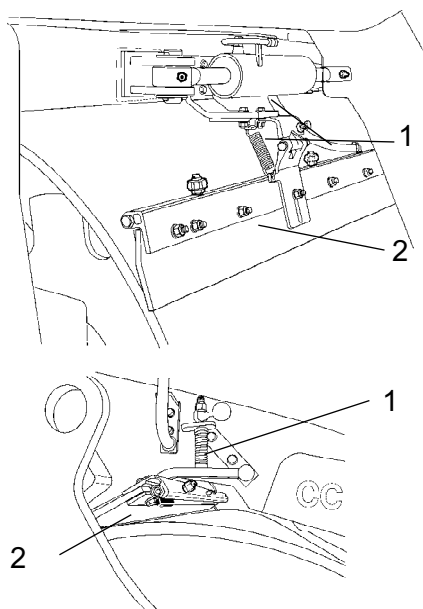


Fig. Spring loaded scrapers

- 1. Spring mechanism
- 2. Scraper blade

Scrapers, spring loaded Check

Make sure that the scrapers are undamaged.

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

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



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



Brakes - Check



Check the brakes by carrying out the following :

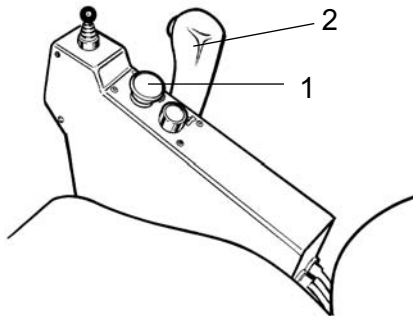


Fig. Control panel
1. Emergency/parking brake knob
2. Forward/reverse lever

Drive the roller **slowly** forwards.

Depress the emergency/parking brake knob (1). The warning lamp on the instrument panel should come on and the roller should stop.

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

Pull up the emergency/parking brake knob.

The roller is now ready for operation.



Emergency watering

If one of the water pumps stops, the remaining pump can keep the sprinkler system operating - but at reduced capacity.

To operate with only one pump, open the stop cock (1) on the water hose by the pump system. This stop cock should normally be closed.

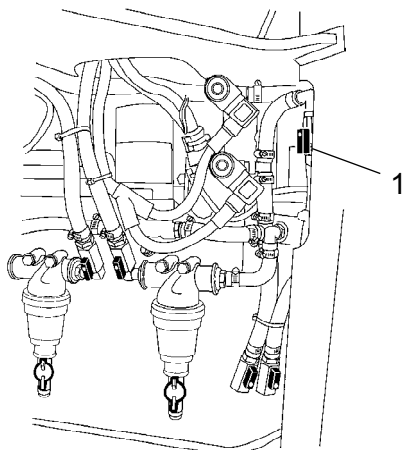


Fig. Engine compartment, right side
1. Stop cock



Hydraulic reservoir - Check fluid level

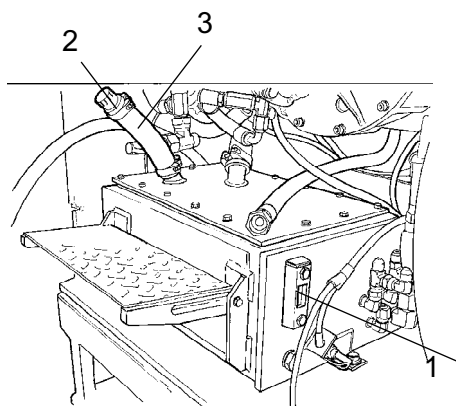


Fig. Hydraulic reservoir

- 1. Oil sight glass**
- 2. Filler hose**
- 3. Filler cap**

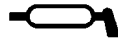
Open the right engine compartment door.

Place the roller on a level surface and check that the oil level in the sight glass (1) is between the max and min markings. Top up with the type of hydraulic fluid specified in the lubricant specification, if the level is too low.

Maintenance - 50h



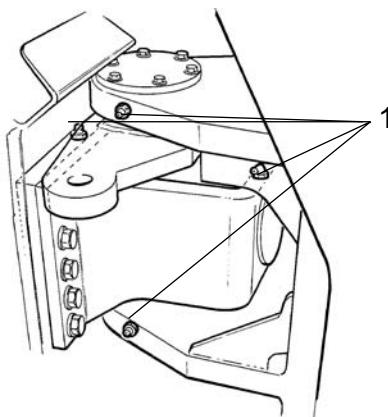
Park the roller on a level surface. When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.



Steering joint - Lubrication



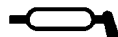
Do not allow anyone to remain in the vicinity of the steering joint when the engine is running. Risk of being crushed when the steering is operated. Press the emergency/parking brake knob before lubricating.



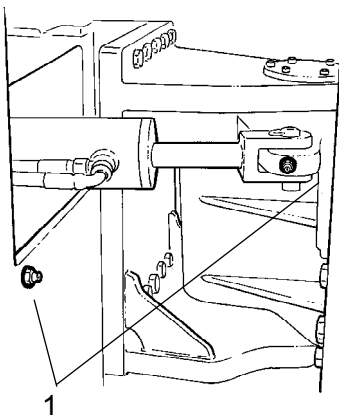
**Fig. Right side of articulation
1. Grease nipples**

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) clean. 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 pressure on the articulation joint with a jack and then repeat the greasing process.



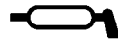
Steering cylinder - Lubrication



**Fig. Left side of articulation
1. Grease nipples**

Turn the steering wheel back to the straight ahead position. The two grease nipples (1) on the steering cylinder can now be accessed from the left side of the machine.

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



Pivot cylinder (Optional) - Lubrication



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

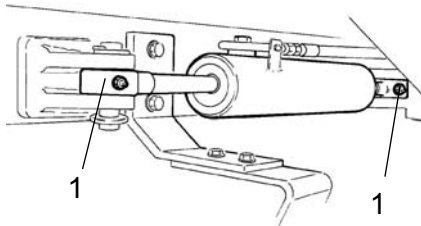


Fig. Pivot cylinder
1. Grease nipples

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

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



Air cleaner Checking - Cleaning



Replace or clean the air cleaner main filter if the warning lamp on the control panel comes on when the engine is running at maximum speed.

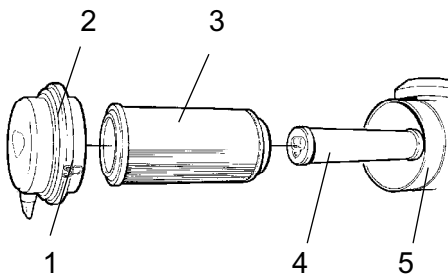


Fig. Air cleaner
1. Locking flaps
2. Cover
3. Main filter
4. Backup filter
5. Filter housing

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

Do not remove the backup filter (4).

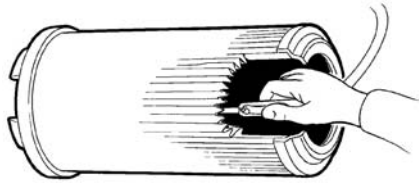


Fig. Main filter

Main filter

- Cleaning with compressed air

When cleaning the air filter, use compressed air with a maximum pressure of 5 bars. Blow air up and down along the paper pleats on the inside of the filter.

Hold the nozzle at least 2-3 cm (0.8-1.2 in) away from the paper pleats so that the paper is not torn by the air pressure.



Wear protective goggles when working with compressed air.

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



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.



Change the main filter after 5 cleanings or more frequently.

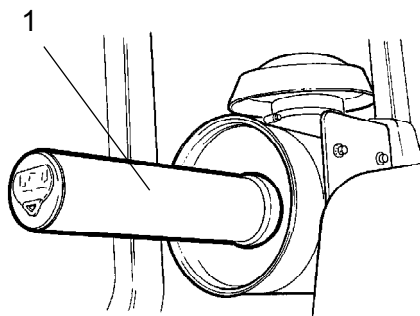


Fig. Air filter
1. Backup filter

Backup filter - Change

Change the backup filter with a new filter after every fifth replacement or cleaning of the main filter.

The back-up filter cannot be cleaned.

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.



Pump drive - Oil level, Check - Filling

Position the roller on a level surface.



When checking the oil level, switch the engine off and ensure that the parking brake is applied.

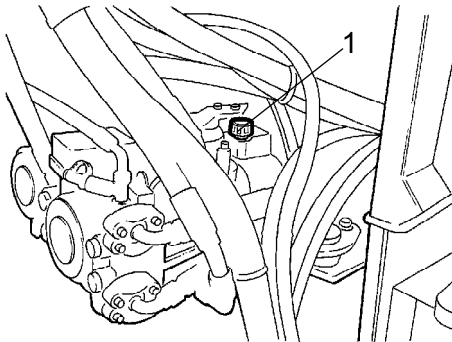


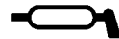
Fig. Pump gear
1. Dipstick

Open the right door of the engine compartment and unscrew the dipstick (1).

The oil level should be between the two marks on the lower edge of the dipstick.

Fill with transmission oil if required, see Lubricant Specification.

Ensure that the rubber gasket between the dipstick and the gear housing is in place, and screw in the dipstick.



Edge cutter (Optional) - Lubrication



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

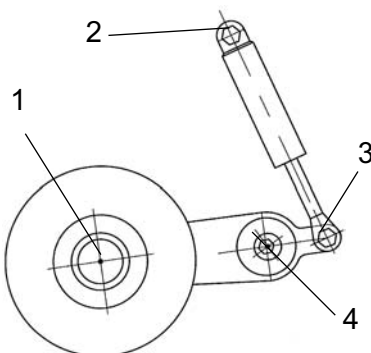


Fig. Four grease points for lubricating edge cutters

Grease the four points indicated in the figure.

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

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

Maintenance - 250h

***Park the roller on a level surface.
When checking and making adjustments, the
engine should be switched off and the
emergency/parking brake should be applied, if
not otherwise specified.***

**Hydraulic fluid cooler
Checking - Cleaning**

The water and hydraulic fluid coolers can be accessed when the left engine compartment door is opened.

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



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

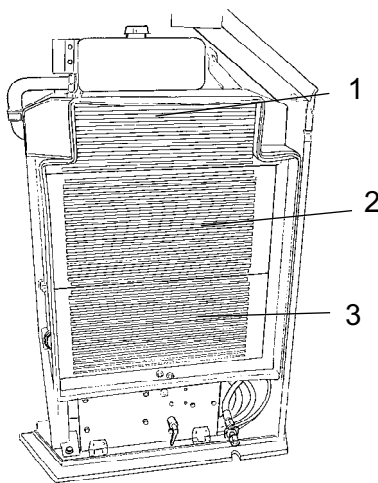


Fig. Coolers

- 1. Charge air cooler**
- 2. Water cooler**
- 3. Hydraulic fluid cooler**



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



Battery - Check electrolyte level

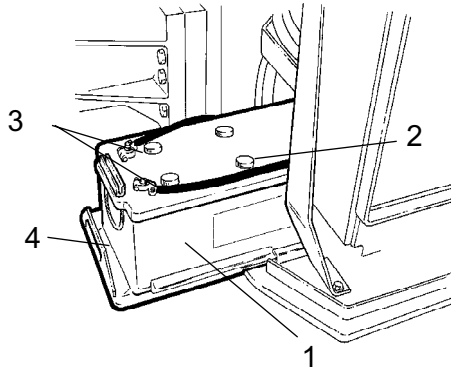


Fig. Battery bay
1. Battery
2. Cell cap
3. Cable shoes
4. Handle

Open the left door of the engine compartment.

Pull out the battery, which is located on the floor behind the radiator.



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



Make sure there are no naked flames in the vicinity when checking the electrolyte level. Explosive gas is formed when the alternator is charged.



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.

Maintenance - 500h



Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.



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



Drum - oil level Inspection - filling

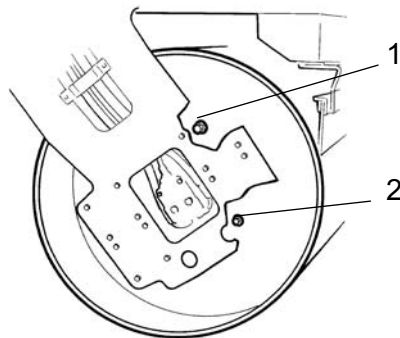


Fig. Drum, vibration side
1. Filler plug
2. Level plug

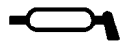
Position the roller with the filler plug (1), the large plug, at the highest point in its rotation.

Wipe clean around the level plug (2), the small plug, and remove the plug.

Make sure that the oil level is up to the lower edge of the hole. Top off with fresh oil if the level is low. Use oil as specified in the lubricants specification.

When removing the filler plug, wipe any metal accumulated on the plug magnet off. Make sure that plug seals are intact and replace with new seals if not.

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



Pivot bearing (Optional) - Lubrication

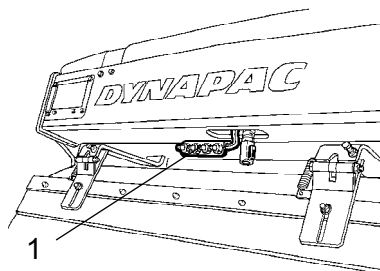


Fig. Rear frame
1. Grease nipples x 4

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

Use grease as specified in the lubricant specification.

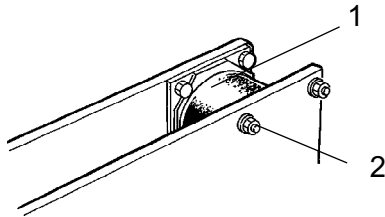


Fig. Drum, vibration side
1. Rubber element
2. Attachment screws

Rubber elements and attachment screws **Check**

Check all rubber elements (1). Replace all elements where more than 25% of the elements on one side of the drum have cracks deeper than 10-15 mm (0.39-0.59 in).

Check using a knife blade or pointed object.

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



Engine **Oil change**

The engine oil drain plug is located alongside the battery behind the left engine compartment door.

Run the engine warm before draining the oil.

Place a receptacle that holds at least 15 liters (4 gal) under the drain plug.



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

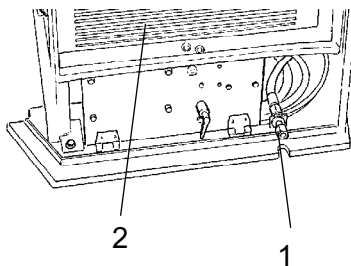


Fig. Engine compartment, left side
1. Oil drain
2. Radiator

Unscrew the oil drain plug (1). Allow all the oil to drain out and refit the plug.

Fill with fresh engine oil. Refer to the lubricants specification or the engine manual for information on the correct oil grade.

Check the dipstick to ensure that the engine oil level is correct. Refer to the engine manual for details.



Engine Replacing oil filter

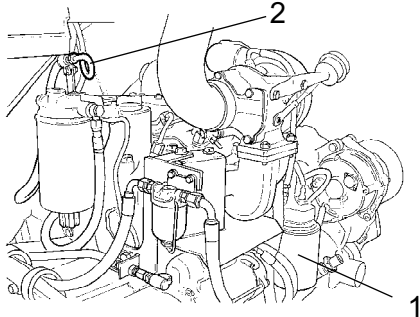


Fig. Engine compartment, right side
1. Oil filter
2. Dipstick

Check the dipstick (2) to ensure that the engine oil level is correct. Refer to the engine manual for details.

The oil filter (1) can be accessed most easily via the right engine compartment door.

See the engine manual for information about replacing the filter.



Hydraulic reservoir cap - Check

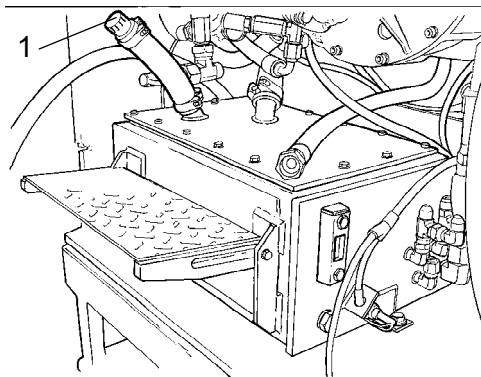


Fig. Engine compartment, right side
1. Reservoir cap

Open the right engine compartment door.

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

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



Wear protective goggles when working with compressed air.

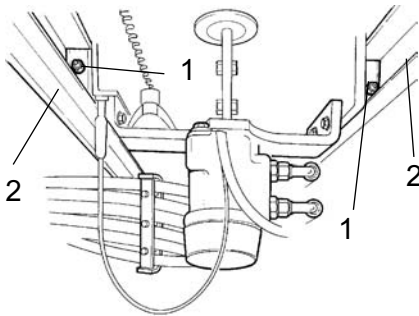


Fig. Seat bearing, underside
 1. Grease nipples
 2. Slide rails

Seat bearing - Lubrication

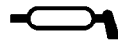
Remove both steps under the operator platform. For machines fitted with a cab, remove a step on one side and a cover plate on the other side.

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

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



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



Seat bearing - Lubrication



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

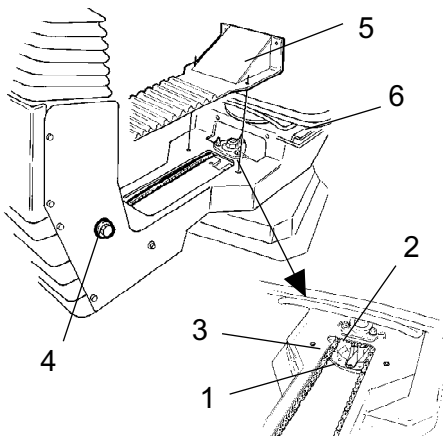


Fig. Seat bearing
 1. Lubrication nipple
 2. Sprocket
 3. Steering chain
 4. Adjustment screw
 5. Cover
 6. Slide rails

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

Also grease the seat slide rails (6).

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

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



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

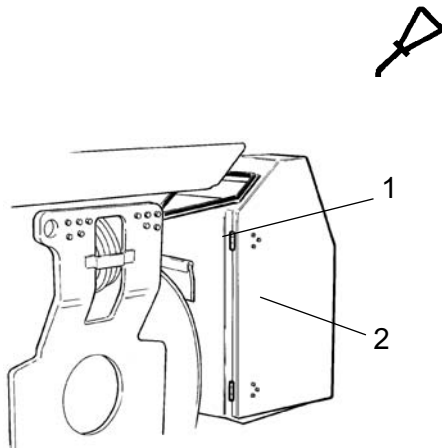


Fig. Engine compartment
1. Hinges
2. Control cables

Hinges, controls - Lubrication

Lubricate both hinges (1) on the engine compartment doors until the grease penetrates into the hinge.

If the machine has a cab, lubricate the cab door hinges in the same way.

Also lubricate the hinges on the front and rear lamp covers with a few drops of oil.

Lubricate the forward/reverse control cables alongside the hydraulic pump control arm. Apply a few drops of oil to the control sleeve opening.



The engine fuel filter - replacement/cleaning

Pre-filter, undo the screw (1) and remove the glass container (2).

Remove and clean the strainer (3) using a non-flammable agent. Install the strainer and the container.

Replace the fuel filter. See engine manual.

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

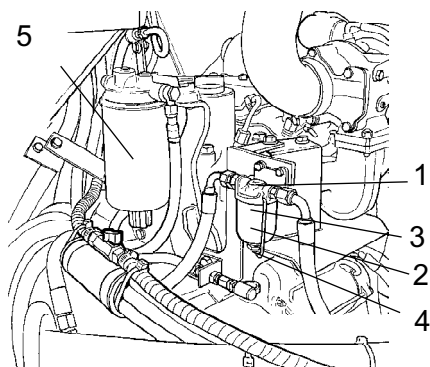


Fig. Engine
1. Pre-filter
2. Glass container
3. Strainer
4. Nut
5. Fuel filter

Maintenance - 1000h

Park the roller on a level surface. When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.



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

**Hydraulic filter
Change**

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

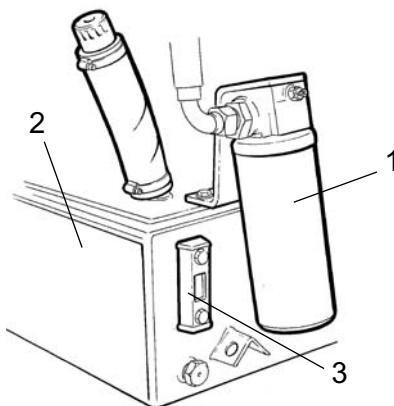


Fig. Hydraulic reservoir
1. Hydraulic filter
2. Reservoir
3. Sight glass

Thoroughly clean the filter holder sealing surface.

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

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

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

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



Air filter Change

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



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

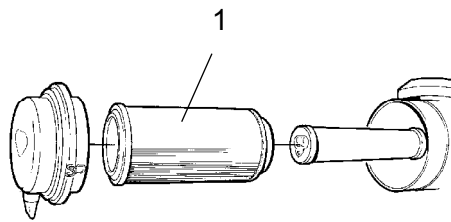


Fig. Air cleaner
1. Main filter



Pump drive - Oil change



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

Obtain a container for collecting the used fluid. The container should hold at least 1.5 liters.

Unscrew the drain plug (1) and the dipstick (see under the heading "Every 50 hours of operation") so that the fluid runs out more easily.

Wipe away any metal residue from the magnetic drain plug, reinstall the plug with a seal.

The gearbox holds 0.8 liters. See under the heading "Every 50 hours of operation" when filling.

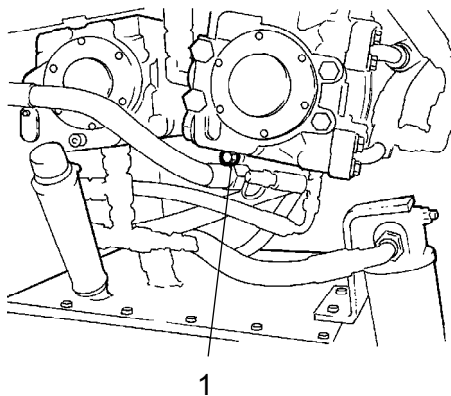


Fig. Pump gear
1. Drain plug



Drum - Oil change



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

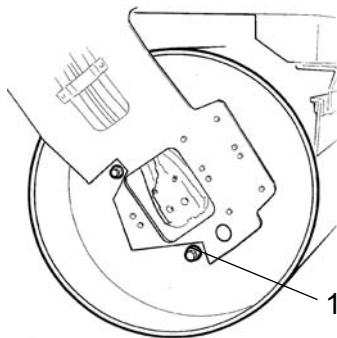


Fig. Drum, vibration side
1. Drain plug

Set the roller so that the drain plug (1), the large plug, is at the lowest position in its rotation.

Place a receptacle that holds at least 20 liters (5.3 gal) under the drain plug.

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



Deliver the drain oil to environmentally correct handling.

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

Maintenance - 2000h

***Park the roller on a level surface.
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.***



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

**Hydraulic reservoir
Fluid change**

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

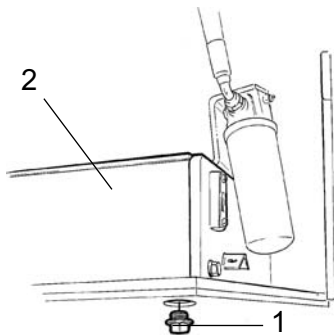


Fig. Engine compartment, right side
1. Drain plug
2. Hydraulic reservoir

Place a receptacle that holds at least 50 liters (13.2 gal) under the drain plug.

Unscrew the drain plug (1). Allow all the fluid to drain out and refit the plug.



Deliver the drained fluid to environmentally correct handling.

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

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

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



Drum - Oil change



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

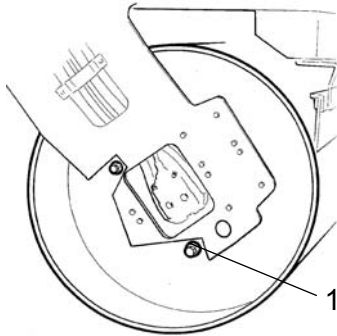


Fig. Drum, vibration side
1. Drain plug

Set the roller so that the drain plug (1), the large plug, is at the lowest position in its rotation.

Place a receptacle that holds at least 20 liters (5.3 gal) under the drain plug.

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



Deliver the drain oil to environmentally correct handling.

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



Fuel tank - Cleaning

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

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



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



Keep in mind fire risk when handling fuel.

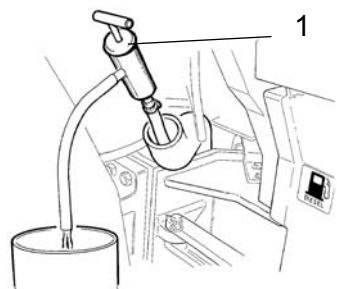


Fig. Fuel tank
1. Oil drain pump



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



Watering system - Draining



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

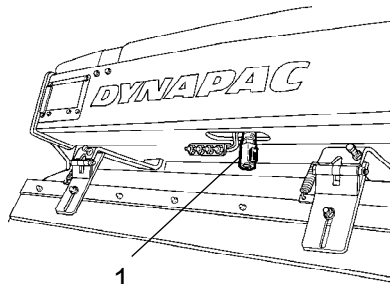


Fig. Water tank
1. Quick-release connector

Empty the tanks by opening the quick-release connectors (1) between tank and hose.

Empty the water system by opening the filter, drain cocks on the pump system and drain cocks by the sprinkler pipes, and by operating the sprinkler system for at least 30 sec. (Ideally 2 x 20 sec.)

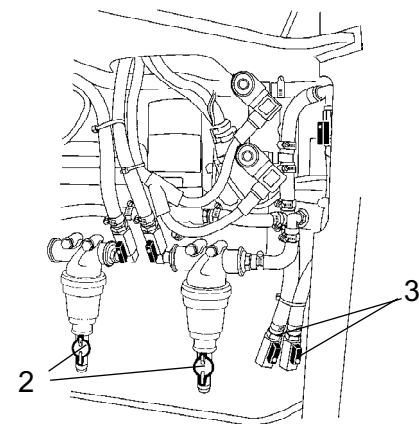


Fig. Pump system
2. Filter cocks
3. Drain cocks



Water tank - Cleaning

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

Reconnect the quick-release connector (1), fill with water and check for leaks.

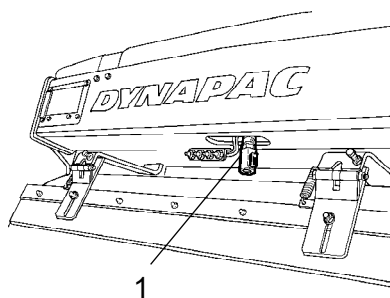
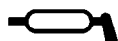


Fig. Water tank
1. Quick-release connector



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



Forward/Reverse lever - Lubrication

Remove the screws (1) and take off the plate (2).

Grease the contact surface on the cam disc (3).

Refit the plate (2) with the screws (1).

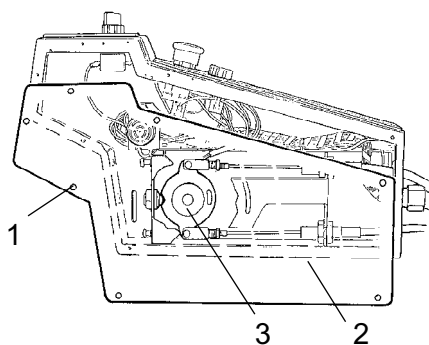


Fig. Forward/Reverse lever

- 1. Screw**
- 2. Plate**
- 3. Cam disc**

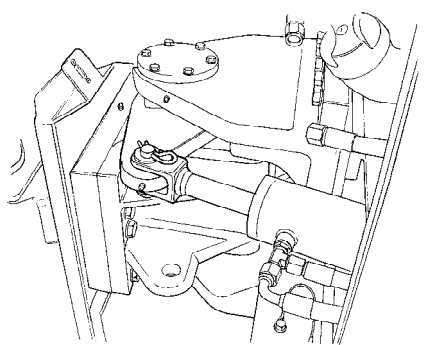


Fig. Steering joint

Steering joint - Check

Inspect the steering joint to detect any damage or cracks.

Check and tighten any loose bolts.

Check also for any stiffness or play in the steering joint.

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