

Instructions manual

ICA250-IN5EN1.pdf

Driving & Maintenance

**Vibratory roller
CA250**

**Engine
Cummins 4BT 3.9 102C**

**Serial number
10000127x0E000001 -**



Translation of original instruction

*Reservation for changes
Printed in Sweden*

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Introduction

The machine

CA250 is one of Dynapac's medium-heavy soil compaction rollers. It is available in STD and D versions.

Intended use

All types of base courses and subbase courses can be compacted deeper and the interchangeable drums, D to PD, and vice versa, facilitate even greater variety in the range of application.

The cab and safety-related accessories are described in this manual. Other accessories, such as compaction meter, tachograph and field computer, are described in separate instructions.

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.

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

16. Hearing protection is recommended if the noise level exceeds 85 dB(A). The noise level can vary depending on the equipment on the machine and the surface the machine is being used on.
17. Do not make any changes or modifications to the roller that could affect safety. Changes are only to be made after written approval has been given by Dynapac.
18. Avoid using the roller before the hydraulic fluid has reached its normal working temperature. Braking distances can be longer than normal when the fluid is cold. See instructions in the STOP section.
19. For your own protection always wear:
 - helmet
 - working boots with steel toecaps
 - ear protectors
 - reflecting clothing/high visibility jacket
 - working gloves

Safety - when operating

Driving near edges

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



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.

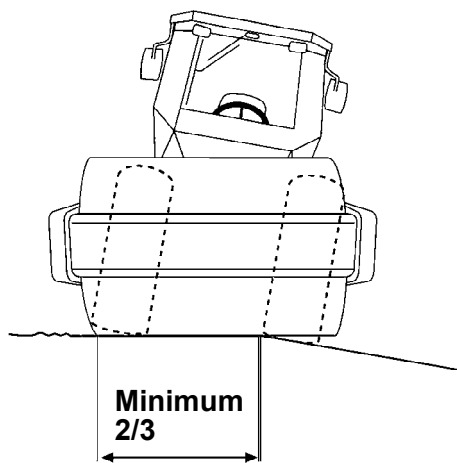


Fig. Position of drum when driving near an edge

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) or a ROPS-approved cab is always used when driving on slopes or unsafe ground. Always wear a safety belt.

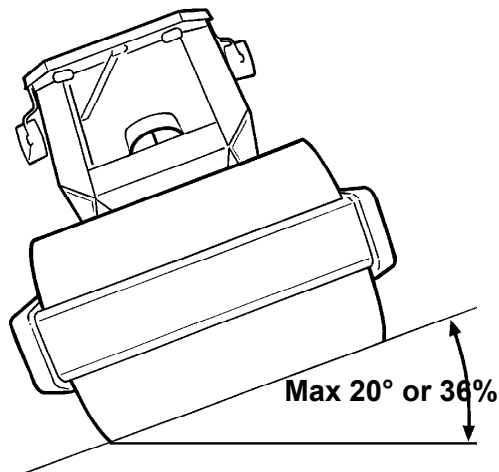


Fig. Operating on slopes



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

Special instructions

Standard lubricants and other recommended oils and fluids

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

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

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

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

Hydraulic system - mineral oil Shell Tellus T100 or similar.

Temperatures

The temperature limits apply to standard versions of rollers.

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

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.

Roll Over Protective Structure (ROPS), ROPS approved cab



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



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

Battery handling



When removing batteries, always disconnect the negative cable first.



When fitting batteries, always connect the positive cable first.



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



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

Jump starting



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



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

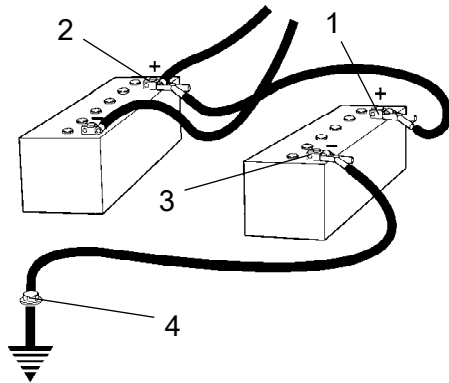


Fig. Jump starting

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

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

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

**Technical specifications -
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)

Electrical system

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

Noise level

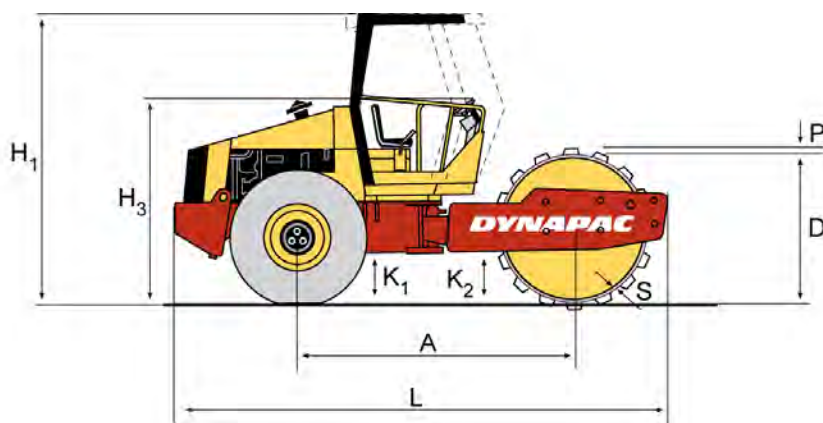
The noise level is measured in accordance with the operational cycle described in EU directive 2000/14/EC on machines equipped for the EU market, on soft polymer material with vibration switched on and the operator's seat in the transport position.

Guaranteed sound power level, L_{WA}	107 dB (A)
Sound pressure level at the operator's ear (platform), L_{pA}	90 dB (A)
Sound pressure level at the operator's ear (cab), L_{pA}	85 dB (A)

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

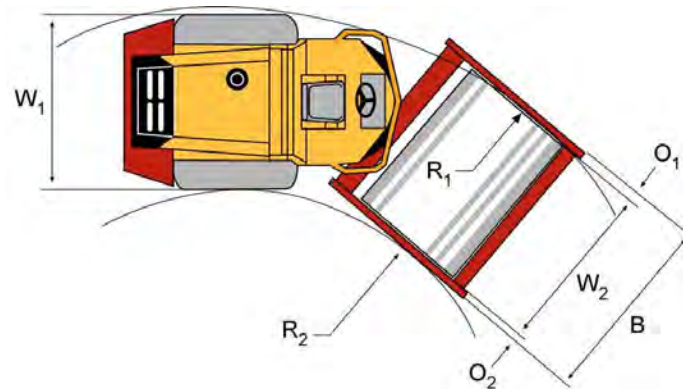
Technical specifications - Dimensions

Dimensions, side view



	Dimensions	mm	in
A	Wheelbase, drum and wheel	2879	113,3
L	Length, standard equipped roller	5550	218,5
H1	Height, with ROPS (STD, D)	2952	116,2
H1	Height, with cab (STD, D)	2952	116,2
H3	Height, without ROPS/cab (STD, D)	2190	86,2
D	Diameter, drum	1523	60
S	Thickness, drum sweep, nominal	25	0,98
K1	Clearance, tractor frame	453	17,8
K2	Clearance, drum frame (STD, D)	400	15,7

Dimensions, top view



	Dimensions	mm	in
B	Width, standard equipped roller	2384	93,9
O1	Overhang, left frame side	127	5,0
O2	Overhang, right frame side	127	5,0
R1	Turn radius, external	5400	212,6
R2	Turn radius, internal	3100	122
W1	Width, tractor section	2130	83,9
W2	Width, drum	2130	83,9

Technical specifications - Weights and volumes

Weights

Service weight (STD)	9700 kg	21 390 lbs
Service weight (D)	9900 kg	21 830 lbs

Fluid volumes

Fuel tank	250 liters	66 gal
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Technical specifications - Working capacity**Compaction data**

Static linear load (STD)	25,3 kg/cm	141,7 pli
Static linear load (D)	26,3 kg/cm	147,3 pli
Amplitude, high (STD, D)	1,7 mm	0,066 in
Amplitude, low (STD, D)	0,8 mm	0,031 in
Vibration frequency, high amplitude (STD, D)	33 Hz	1980 vpm
Vibration frequency, low amplitude (STD, D)	33 Hz	1980 vpm
Centrifugal force, high amplitude (STD, D)	246 kN	55,35 lb
Centrifugal force, low amplitude (STD, D)	119 kN	26,77 lb

Technical specifications - General

Engine

Manufacturer/Model	Cummins 4BT 3.9C	Water cooled turbo diesel
Power (SAE J1995)	78 kW	102 hp
Engine speed	2300 rpm	

Electrical system

Battery	12V 150Ah
Alternator	12V 55A
Fuses	See the Electrical system section - fuses

Tire

Tire dimensions

Tire pressure

Std-type	23.1 x 26.0 8 ply	110 kPa (1.1 kp/cm) (16 psi)
Tractor type	23.1 x 26.0 12 ply	110 kPa (1.1 kp/cm) (16 psi)



The tires can be optionally filled with fluid, (extra weight up to 500 kg/tire) (1102 lbs/tire). When servicing, bear this extra weight in mind.

Hydraulic system

Opening pressure	MPa
Drive system	38,0
Supply system	2.0
Vibration system	42,5
Control systems	17,5
Brake release	1,4

ROPS - bolts

Bolt dimensions :	M24 (PN 904562)
Strength class :	10.9
Tightening torque :	800 Nm (Dacromet treated)



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

Tightening torque

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

Metric coarse screw thread, bright galvanized (fzb):

STRENGTH CLASS:

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

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

STRENGTH CLASS:

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

Machine 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 or the upper edge of the right frameside.

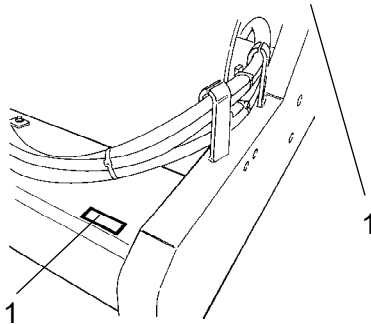


Fig. Front frame
1. PIN

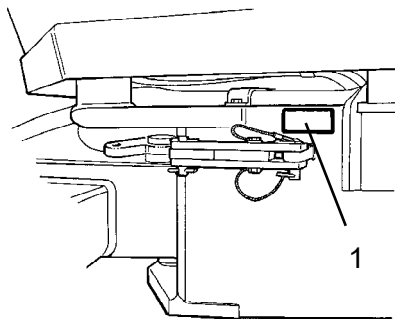


Fig. Operator platform
1. Machine plate

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. (If the machine is supplied to outside the EU, there are no CE markings and in some cases no year of manufacture.)

DYNAPAC			
Atlas Copco (India) LTD			
Plot No. 98, MIDC, Satpur, Nashik - 422007, India			
Product Identification Number			
Type	Rated Power	Max. safe load front / rear	
	kW	kg	
Gross machinery mass	Operating mass	Max. ballast	Year of Mfg.
kg	kg	kg	

Fig. Machine plate

Please state the machine's PIN when ordering spares.

Machine plate - Identification

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

Explanation of 17PIN serial number

A= Manufacturer

B= Family/Model

C= Check letter

D= No coding

E= Production unit

F= Serial number

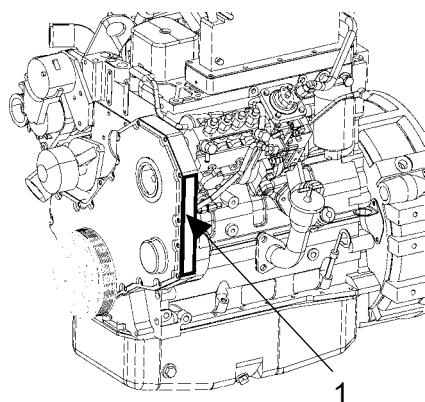


Fig. Engine
1. Type plate

Engine plates

The engine plate (1) is affixed to the right side of the engine.

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


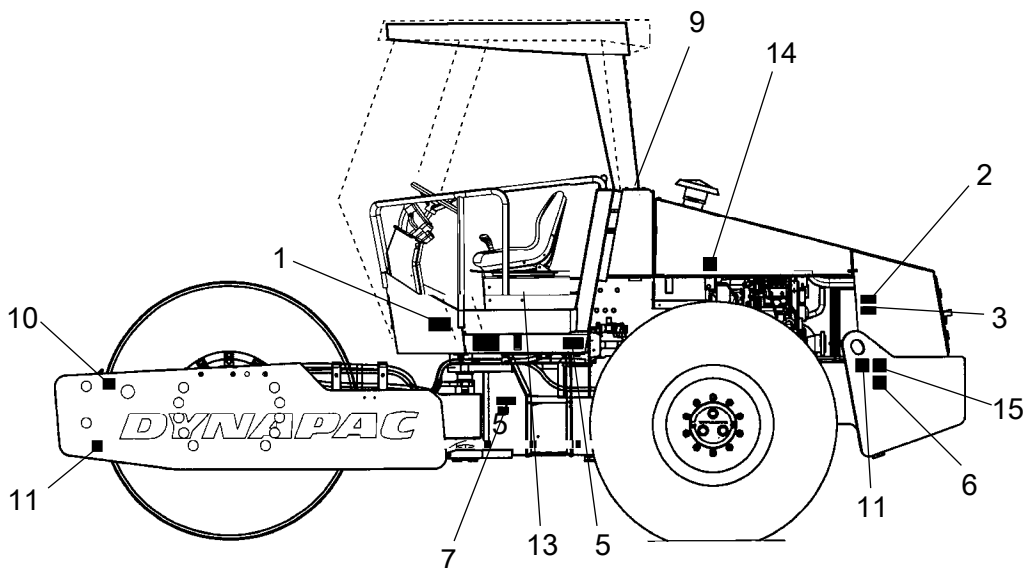
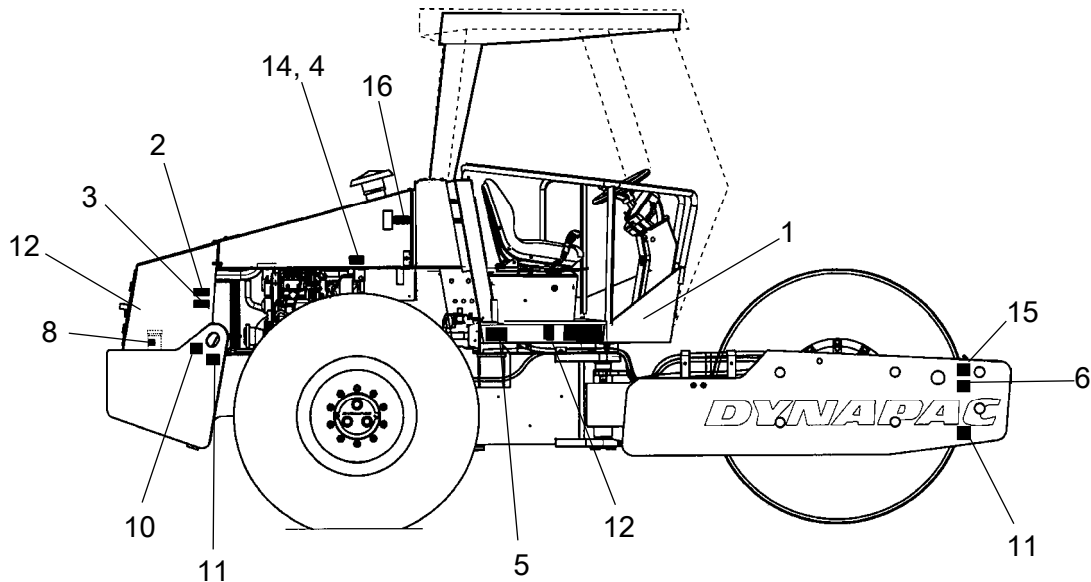
 <div>Manufactured in India by: Cummins India Limited Registered Office: Kolkata, Post-411 029 (India)</div> <div><input type="checkbox"/> Warning: Injury May Result and Warranty is Voided if Fuel Rate, RPM or Altitudes Exceed Published Maximum Values for This Model and Application.</div>	Cert. I.D.		C.I.D./L	Series	CPL	Engine Serial No.
	Timing- TDC					Injector P/N.
	Valve lash cold Int. mm					Exh. Cust. Spec.
	Firing Order					Rated HP at RPM
	Low idle RPM					Fuel rate at rated HP mm ³ /Stroke
Mfg. Date:	Delivery Date:					E.C.S.
						Model Name

Fig. Type plate

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

Machine description- Decals

Location - decals



- | | | |
|--|---------------------------------------|----------------------------------|
| 1. Warning, Crush zone | 7. Product sign | 13. Handbook compartment |
| 2. Warning, Rotating engine components | 8. Diesel fuel | 14. Tire pressure |
| 3. Warning, Hot surfaces | 9. Hydraulic fluid/Biohydraulic fluid | 15. Hoisting plate |
| 4. Warning, Ballasted tire. | 10. Lifting point | 16. Hydraulic fluid/Biohydraulic |
| 5. Warning, Read instructions manual | 11. Fixing point | |
| 6. Warning, locking | 12. Master switch | |



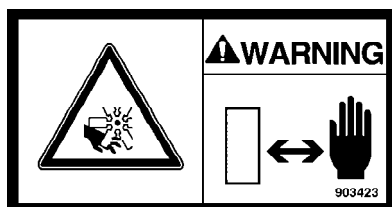
Safety decals

903422

Warning - Crush zone, articulation/drum.

Maintain a safe distance from the crush zone.

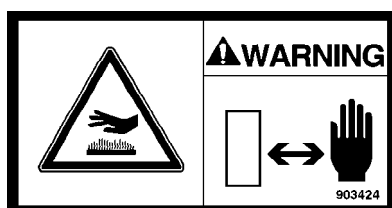
(Two crush zones on machines fitted with pivotal steering)



903423

Warning - Rotating engine components.

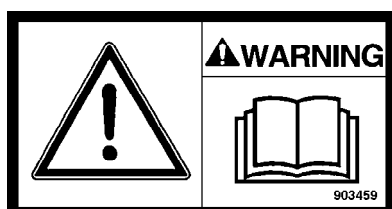
Keep your hands at a safe distance from the danger zone.



903424

Warning - Hot surfaces in the engine compartment.

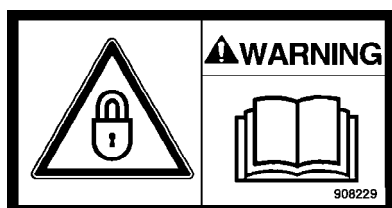
Keep your hands at a safe distance from the danger zone.



903459

Warning - Instruction manual

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

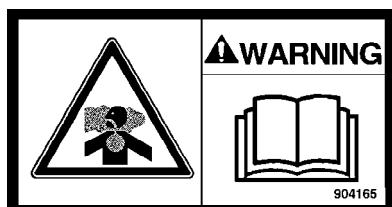


908229

Warning - Locking

The articulation must be locked when lifting.

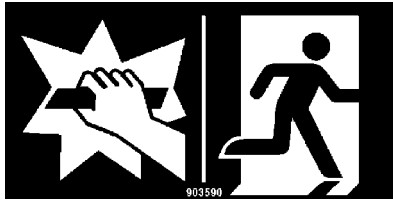
Read the instruction manual.



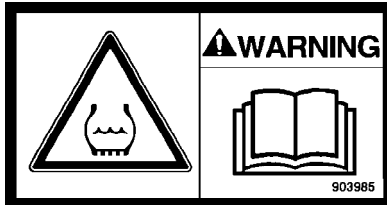
904165

Warning - Toxic gas (accessory, ACC)

Read the instruction manual.



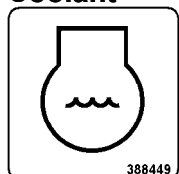
903590
-Emergency exit



903985
Warning - Ballasted tire.
Read the instruction manual.

Info decals

Coolant



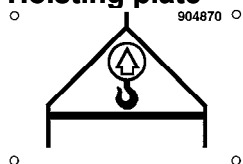
Diesel fuel



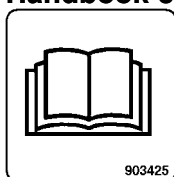
Lifting point



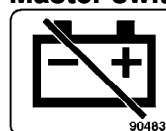
Hoisting plate



Handbook compartment



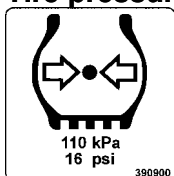
Master switch



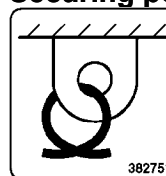
Hydraulic fluid



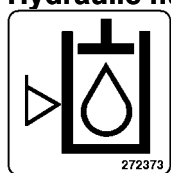
Tire pressure



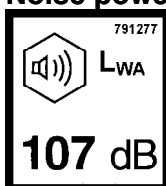
Securing point



Hydraulic fluid level



Noise power level



Machine description - Instruments/Controls

Locations - Instruments and controls

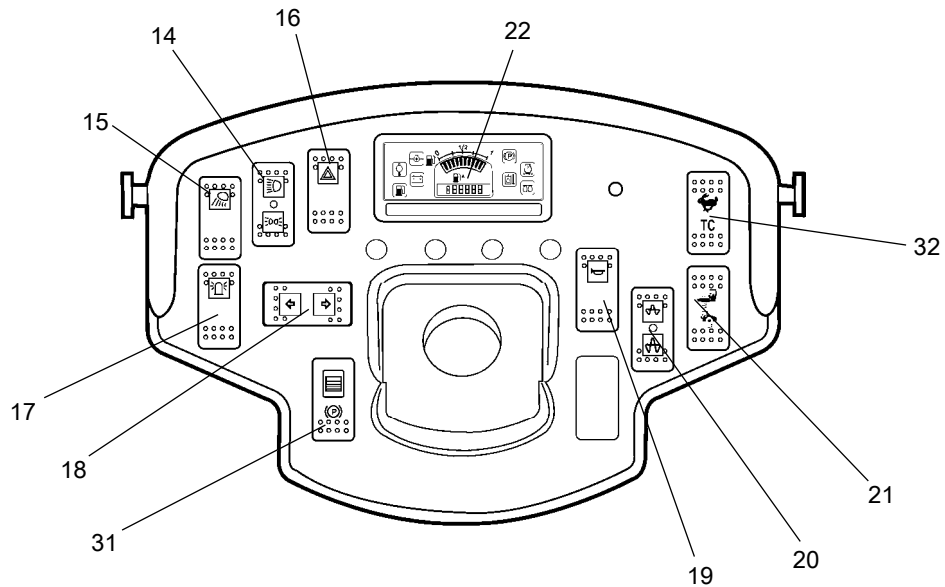


Fig. Instruments and control panel

- | | | | |
|-----|--------------------------------------|-----|--|
| 14. | Driving lights, Low beam | 22. | Control panel |
| 15. | Driving lights, High beam | 31. | Parking brake On/Off |
| 16. | Hazard flashers | 32. | Transport mode/Traction control (Optional) |
| 17. | Hazard beacon | | |
| 18. | Direction indicators | | |
| 19. | Horn | | |
| 20. | Vibration On/Off, Amplitude High/Low | | |
| 21. | Anti spin forward/equal share/back | | |

Locations - Control panel and controls

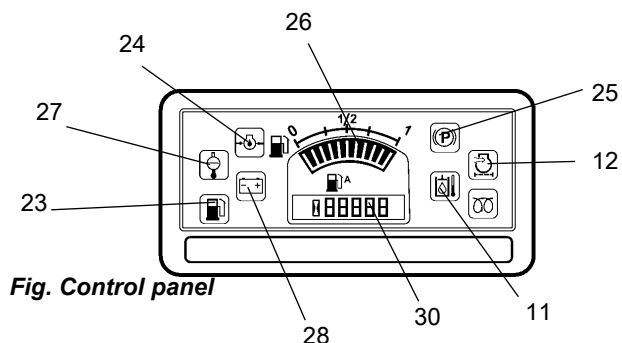


Fig. Control panel

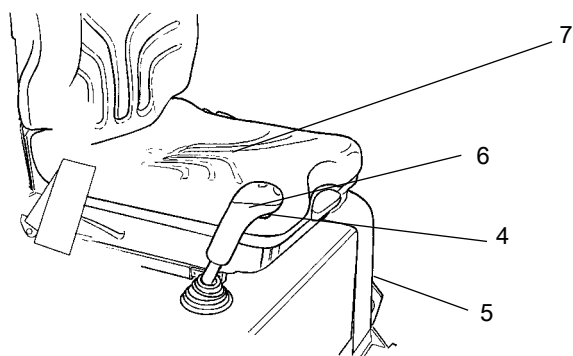


Fig. Operator position

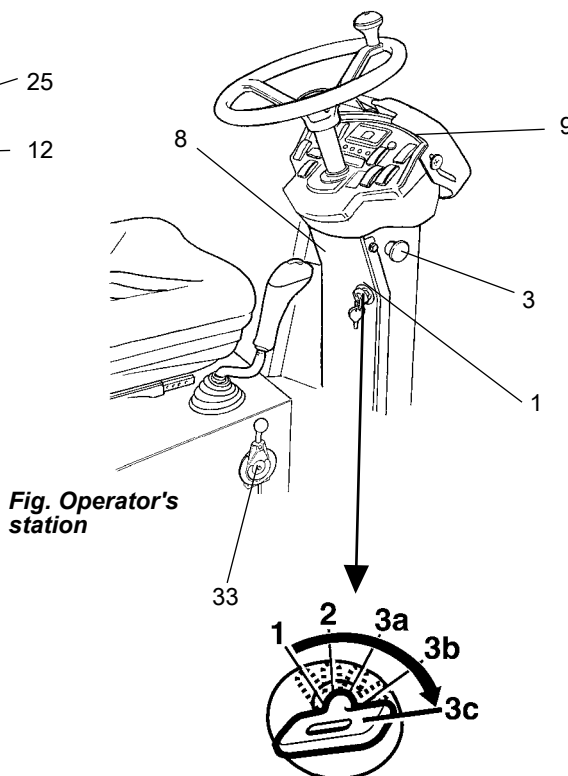

















Fig. Operator's station

1	Starter switch	23	Low fuel level
3	Emergency stop	24	Oil pressure, diesel engine
4	Vibration ON/OFF	25	Parking brake
5	Handbook compartment	26	Fuel level
6	Forward/Back control	27	Water temperature, diesel engine
7	Seat switch	28	Battery/charging
8	Fuse box	30	Hourmeter
9	Instrument guard	33	Engine speed control
11	Hydraulic temperature		
12	Air filter		

















Function description

No	Designation	Symbol	Function
1.	Starter switch		<p>Positions 1-2: Shut off position, key can be removed.</p> <p>Position 3a: All instruments and electric controls are supplied with power.</p> <p>Position 3c: Starter motor activation.</p>

Machine description - Instruments/Controls

No	Designation	Symbol	Function
3.	Emergency stop		When pressed, the emergency stop is activated. The brake is applied and the engine stops. Brace yourself for a sudden stop.
4.	Vibration On/Off. Switch		When the circuit breaker is pressed in and released the vibrations are connected up. Press again and the vibrations are disconnected. High or low amplitude must first be chosen on the instrument panel.
5.	Handbook compartment		Pull up and open the top of the compartment for access to handbooks.
6.	Forward/Reverse lever		The lever must be in neutral to start the diesel engine. The engine cannot be started if the 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 etc. 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.
7.	Seat switch		Remain seated at all times when operating the roller. If the operator stands up during operation, a buzzer sounds. After 3 seconds the brakes are activated and the engine stops.
8.	Fuse box (on control column)		Contains fuses for the electrical system. See under the heading 'Electrical system' for a description of fuse functions.
9.	Instrument cover		Lowered over the instrument plate to protect the instruments from the weather and sabotage. Lockable
11.	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.
12.	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.
14.	Driving lights, low beam, switch (Optional)		When depressed, the driving lights low beam are on.
15.	Driving lights, high beam, switch (Optional)		When depressed, the driving lights high beam are on.
16.	Hazard warning lights, switch (Optional)		Where depressed, the hazard warning lights are on
17.	Hazard beacon, switch (Optional)		Where depressed, the hazard beacon is on
18.	Direction indicators, switch (Optional)		When depressed to the left, the left direction indicators are on etc. In the middle position the function is shut off.
19.	Horn, switch		Press to sound the horn.
20.	Amplitude High/Low, Vibration On		Low Amplitude Activate the vibration together with the circuit breaker on forward/back control.

Machine description - Instruments/Controls

No	Designation	Symbol	Function
			Vibration switched off.
			Amplitude, high Activate the vibration together with the circuit breaker on forward/back control.
21.	Anti spin Forward/Equal share/Back (Optional)		Roller spinning symbol = less distribution of power to the roller.
			Mid position = Equal distribution of power forward/back.
			Wheel spinning symbol = Less distribution of power to the roller.
22.	Control panel		
23.	Warning lamp, low fuel level		This lamp lights when the fuel level in the diesel tank is too low.
24.	Warning lamp, oil pressure		This lamp lights if the lubricating pressure in the engine is too low. Stop the engine immediately and locate the fault.
25.	Warning lamp, parking brake		The lamp lights when the parking brake is activated.
26.	Fuel level		Shows the fuel level in the diesel tank.
27.	Warning lamp, water temperature		The light comes on if the water temperature is too high.
28.	Warning lamp, battery charging		If the lamp lights while the engine is running the alternator is not charging. Stop the engine and locate the fault.
30.	Hourmeter		Shows the number of hours the engine has run.
31.	Parking brake On/Off, switch		Push in to activate the parking brake, the machine stops with the engine running. Always use the parking brake when the machine is stationary on a sloping surface.
32.	Transport mode/Traction control (Optional)	 TC	Transport mode. Traction control mode (TC): Activate this function together with the power distribution selector switch.
33.	Engine speed control		Turn the lever backwards and release it into the groove to set engine speed to operating speed. To select idling speed, move the lever to forward end position.

Controls in the cab

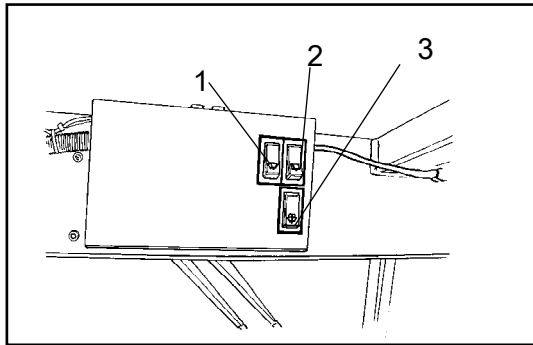


Fig. Cab roof, front

- 1. Front wiper
- 2. Rear wiper (Optional)
- 3. Front and rear windshield washers

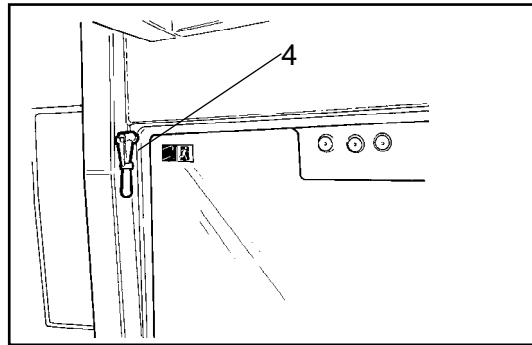


Fig. Cab roof, rear

- 4. Hammer for emergency escape

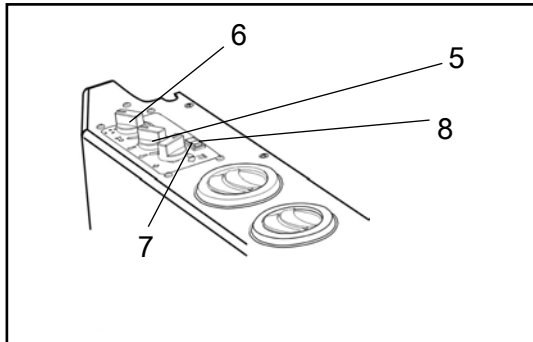


Fig. Cab, right side. Heater (Optional)

- 5. Control, temperature
- 6. Control, circulation,
- 7. Control, fan
- 8. Switch, AC (Optional)

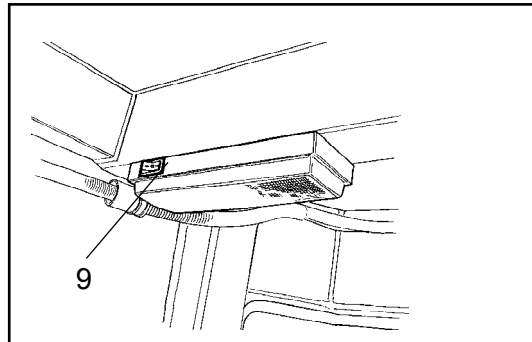


Fig. Cab, rear

- 9. Switch, cab lighting (Optional)

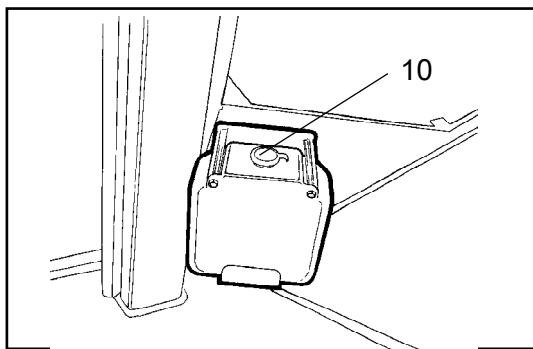


Fig. Cab, left side

- 10. Windscreen washer fluid container (Optional)

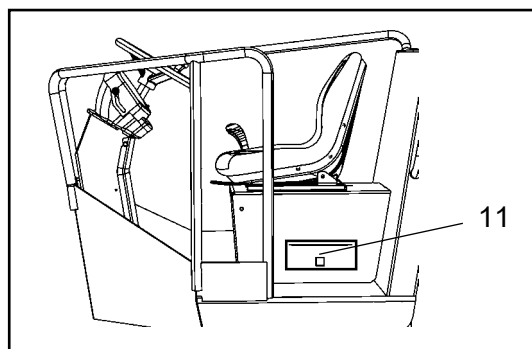




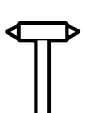






Fig. Cabin driving compartment

- 11. Manual compartment

Function description of instruments and controls in the cab

No	Designation	Symbol	Function
1	Front wiper, switch		Press to operate the front screen wiper.
2	Rear wiper, switch (Optional)		Press to operate the rear screen wiper.
3	Front and rear window screen washers, switch		Press at the top to spray the windshield.
			Press at the bottom to spray the rear windshield.
4	Hammer for emergency exit		To escape from the cab in an emergency, release the hammer and break the REAR window.
5	Control, temperature (Optional)		In the left position, the heating is OFF. In the right position, maximum heating.
6	Control, circulation (Optional)		In the left position, the circulation is OFF. In the right position, maximum circulation
7	Control, fan (Optional)		In the left position, the fan is OFF. In the right position, maximum fan.
8	AC, switch (Optional)		
9	Cab lighting, switch (Optional)		Push in to turn on cab lighting
10	Windscreen wiper fluid container (Optional)		Fill with screenwash as required.
11	Handbook compartment		Stowage space for safety manual and instruction books.

Machine description - Electrical system

Fuses and relay in cab heater box (Optional)

To access the fuses (x2) in the heater box, release the plug (1)

The relay in the heater box is accessed by releasing the screws (2) and (3) on the top of the cover, and the screws (3) on the front of the cover, after which the cover (4) can be lifted off the heater box.

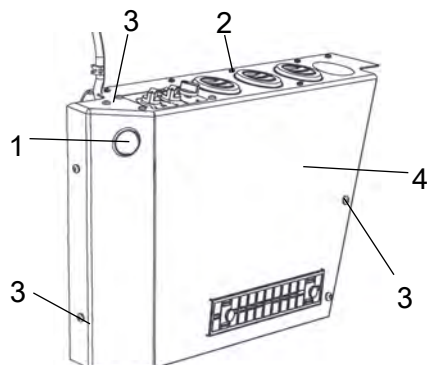


Fig. Heater box in cab.

- 1. Plug
- 2. Screws (x5)
- 3. Screws (x9)
- 4. Cover

Fuses in heater box

To access the fuses (x2) in the heater box, release the plug (1). Unscrew the cover (7) on the fuse box.

- 5. 20 A Fan
- 6. 20 A AC (Optional)

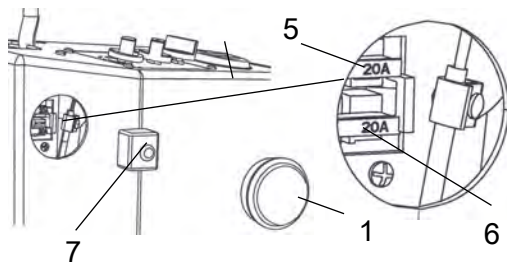


Fig. Heater box in cab.

- 1. Plug
- 5. Fuse (x1)
- 6. Fuse (x1)
- 7. Cover for fuse box

Relay in heater box

To access the relay (8) (x1) in the heater box: Unscrew the screws (2) and (3) on the top of the cover, and the screws (3) on the front of the cover. The cover (4) can now be lifted off the heater box.

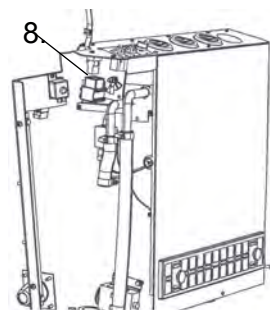


Fig. Heater box in cab.

- 8. Relay 12V

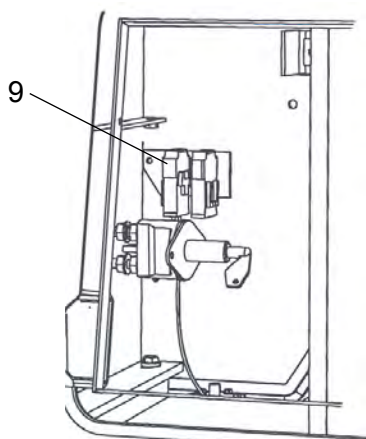


Fig. Battery disconnecter/fuse box in cooler compartment.
9. Fuse

Fuses, battery disconnecter/fuse box

To access the fuse (9), remove the front of the battery disconnecter/fuse box by unscrewing the screws. Pull off the top of the fuse holder to see the fuse.

9 50 A Main fuse for cab

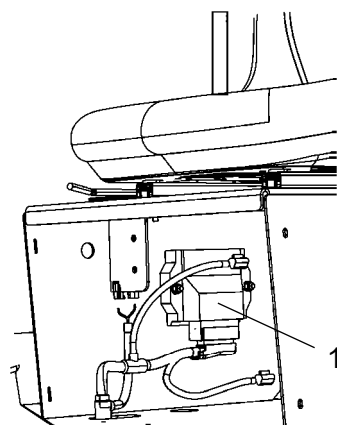
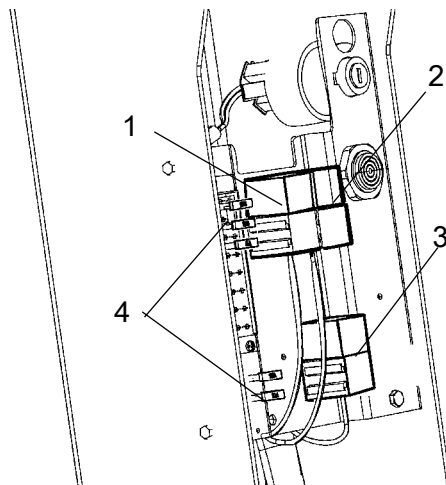


Fig. Driving compartment
1 Control unit (ECU)

Control unit (ECU:n) 1 is placed behind the front hatch under the driver seat.

This control unit runs the electrical driving system, vibration, start-stop, among other things.

Relays



- | | | |
|----|----|-----------------------------|
| 1. | k7 | <i>Direction indicators</i> |
| 2. | K6 | <i>Stop lights</i> |
| 3. | | <i>Working lights</i> |

Fig. Manöverpelare

1. *Flasher relay*
2. *Stop light relay*
3. *Working lights relay*
4. *Fuse boxes*

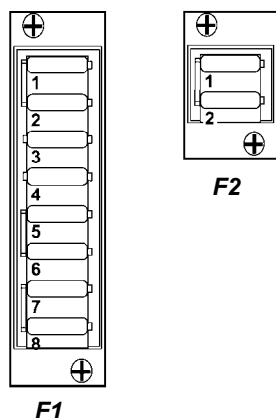


Fig. Fuses boxes.

Fuses in boxes F1

1.	Emergency stop, ECU, reversing alarm, neutral position, seat switch, vibration	15A	5.	High/Low speed	10A
2.	Horn, buzzer, control panel	10A	6.	Windshield wipers cabin	10A
3.	Reserve		7.	Compaction meter	10A
4.	Rotating hazard beacon	10A	8.	Indicators, warning indicators, cab interior lightning	10A

Fuses in boxes F2

1.	Working lights	20A
2.	Traffic lights: headlight, navigation light, braking lights, number plate illumination	20A

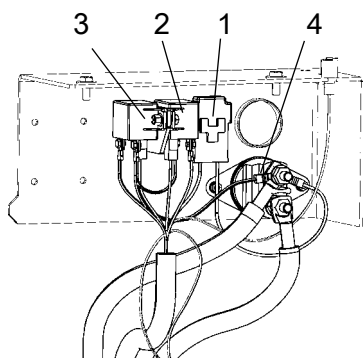


Fig. Engine house

1. Main fuse
2. Fuel solenoid relay
3. Starter relay
4. Master switch

Fuses

The figure shows the position of the fuses.

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

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

Main fuses

The main fuse (1) is placed by the battery disconnecter (4). The fuse is of the flat pin type. The fuel solenoid relay (2) and the starter relay (3) are also fitted here.

Main fuse 30A (Green)

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. Open the engine cover and set 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.

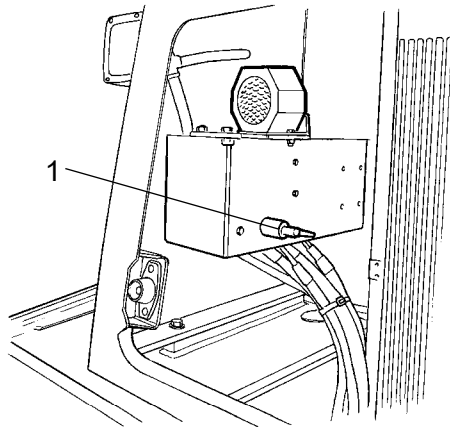


Fig. Engine house
1. Battery disconnection switch

Driver seat (Std.) - Adjustment

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

The seat can be adjusted lengthways (1).

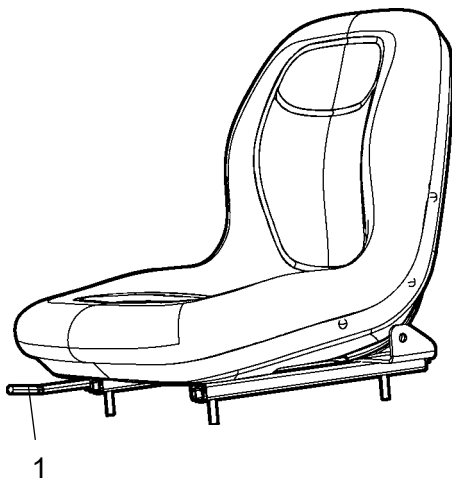


Fig. Operator's seat
1. Length adjustment

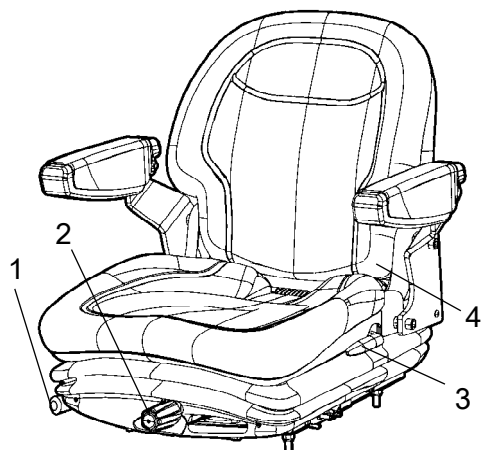


Fig. Driver seat
1. Lock lever - Length adjustment
2. Weight adjustment
3. Back support angle
4. Seat belt

Driver seat (Option)- Adjustment

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

The seat can be adjusted as follows.

- Length adjustment (1)
- Weight adjustment (2)
- Back support angle (3)



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



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

Instruments and lamps - Checking



Make sure that the emergency stop (2) is pulled out. When the roller is in neutral or there is no load on the operator seat, the automatic brake function is engaged.

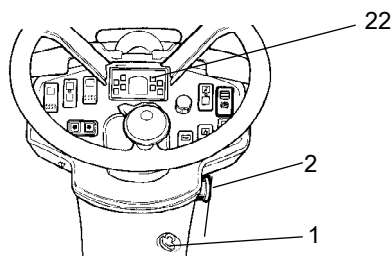


Fig. Instrument panel
1. Starter switch
2. Emergency stop
22. Warning panel

Pull out the emergency stop (2).

Turn the switch (1) to position 3a.

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

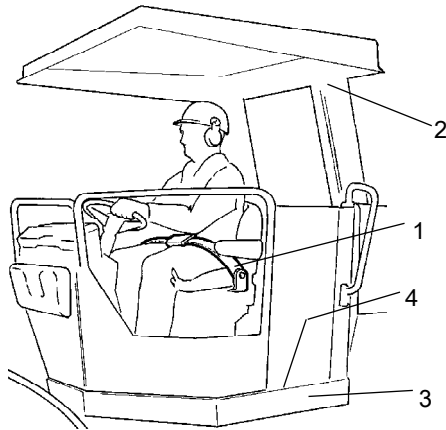


Fig. Operator's station
1. Seat belt
2. ROPS
3. Rubber element
4. Anti-slip

Operator position

If a ROPS (2) (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.



Check that rubber elements (3) on the platform are intact. Worn elements will impair comfort.



Ensure that the anti-slip (4) 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.

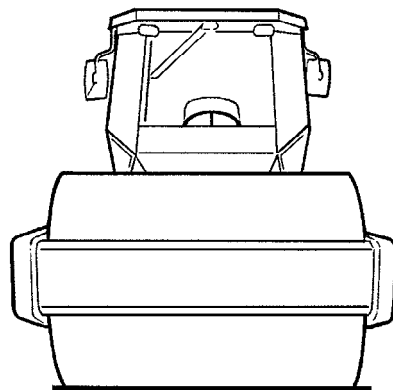


Fig. view

View

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

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

Interlock

The roller is equipped with Interlock.

The engine switches off 4 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!

Starting

Start of diesel motor

Make sure that the emergency stop (3) is pulled out.

Make sure that the parking brake switch (31) is activated.

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

Turn the vibration switch (20) to the Off position (position O).

At normal/high environmental temperature, set engine speed control (33) at the position for idle running (forward end position).

Turn switching starter(1) to position 3c. As soon as the motor has started, let the starting switch go.



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

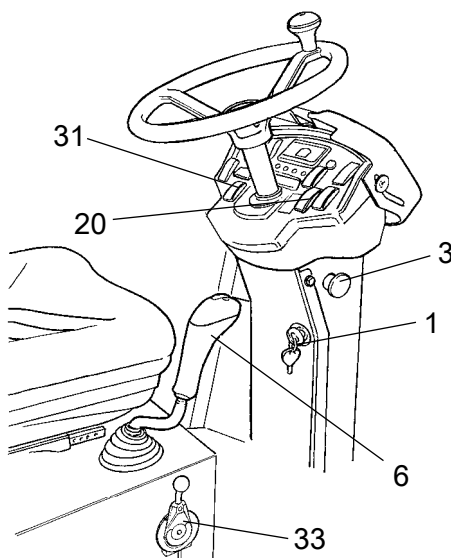


Fig. Control panel

- 1. Ignition starter switch**
- 3. Emergency shut down**
- 6. Forward/Back regulator**
- 20. Vibration switch**
- 31. Parking brake switch**
- 33. Engine speed control**

Idle the engine for a few minutes until it is warm, longer if the ambient temperature is below +10 °C (50 °F)

At temperatures below 0°C (32°F) the diesel engine and hydraulic system should be warmed up for at least 15 minutes.

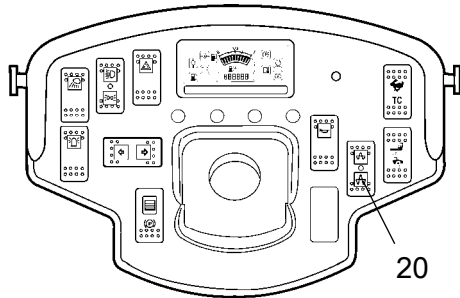


Fig. Instrument panel
20. Vibration switch

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

The warning lamp (25) 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.

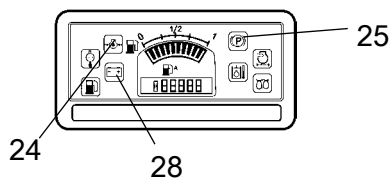


Fig. Control panel
28. Charging lamp
24. Oil pressure lamp
25. Brake lamp



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

Operation - Driving

Operating the roller



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

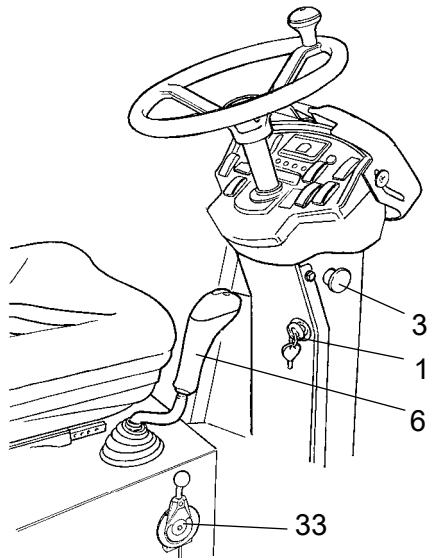


Fig. Control panel

**1. Ignition starter switch
3. Emergency shut down
6. Forward/Back regulator
33. Engine speed control**



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

Pull back the engine speed control (33) until it locks in the operational 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.

Carefully move the forward/reverse lever (6) forwards or backwards, depending on which direction of travel is required.

The speed increases as the lever is moved away from the neutral position.



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



Test the emergency stop by pressing the emergency stop button (3) while the roller is moving slowly forward. Brace yourself for a sudden stop. The engine will be switched off and the brakes activated.

Check while driving that the warning lamps have not gone on.



If the engine is overheated or if the oil pressure is too low then the buzzer sounds for 10 seconds and the engine shuts off. Brace yourself for a sudden stop.

Operation - Vibration

Vibration On/Off

Activation/deactivation of the vibration is selected with the switch (20).

The operator must activate the vibration via the switch (4) on the underside of the forward/reverse handle. See illustration below.

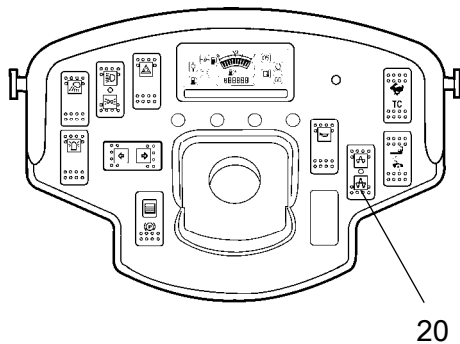


Fig. Instrument panel
20. Vibration switch.

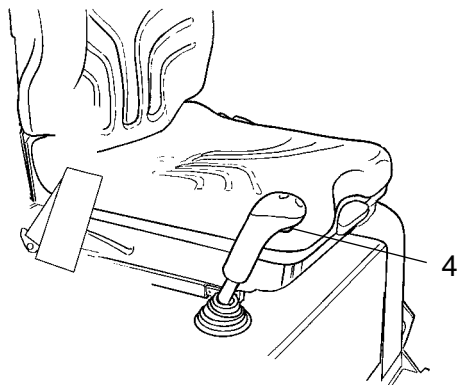


Fig. Forward/Reverse lever
4. Switch, vibration On/Off

Vibration - Activation



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

Engage and disengage vibration using the switch (4) on the underside of the forward/reverse lever.

Vibration can only be engaged at low and high speed.

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

Operating - Stopping

Braking

Emergency braking

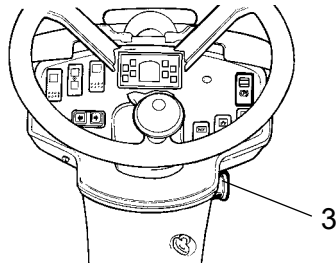
Braking is normally activated using the forward/reverse lever. The hydrostatic transmission brakes the roller when the lever is moved towards the neutral position.

There is also a brake in the drum motor and rear axle that acts as an emergency brake during operation.



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

Fig. Instrument panel
3. Emergency stop



After emergency braking, return the forward/reverse lever to neutral position and pull out the emergency stop (3). When the roller is fitted with an Interlock it is necessary to sit down in the driver seat to restart the engine.

Normal braking

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

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

Turn the engine speed control (33) forward to idling position.

Set the parking brake switch (31) in the On position.

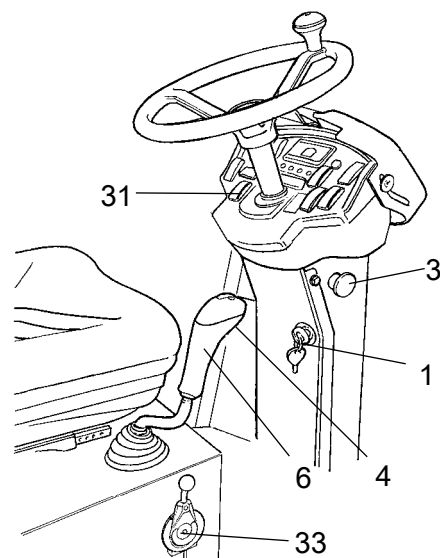


Always use the parking brake (31) when the machine is stationary on a sloping surface.



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. Key
3. Emergency shut down
4. Vibration On/Off.
6. Forward/Back regulator
31. Parking brake starting switch
33. Engine speed control



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 switched off position 1. At the end of the shift, lower the instrument cover (22) and lock it.

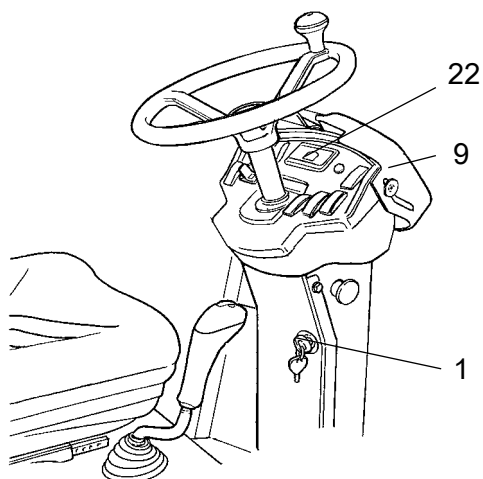


Fig. Instrument panel
1. Starter switch
9. Instrument guard
22. Panel for warning lamps

Parking

Master switch

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

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

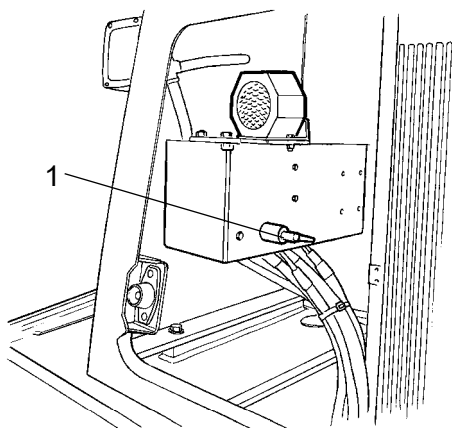


Fig. Engine compartment
1. Master switch

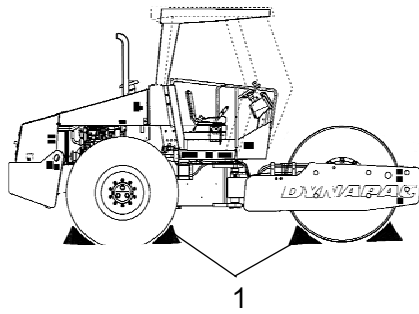


Fig. Arrangement
1. Chock

Chocking the drums



Never disembark from the machine when the engine is running, unless the reserve/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.



Keep in mind that there is a risk of freezing during the winter. Fill the engine cooling system and the screenwash bottle in the cab with suitable anti-freeze mixtures. See also the maintenance instructions.

Long-term parking



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

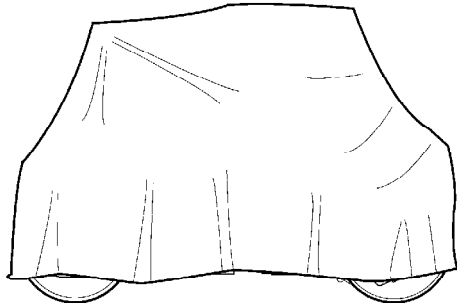


Fig. Roller weather protection

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

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

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

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

Engine

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

Battery

* 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.

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 articulation bearing 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.

Tires (All-weather)

Check that tire pressure is 110 kPa (1.1 kp/cm²), (16 psi).

Miscellaneous

Lifting

Locking the articulation



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

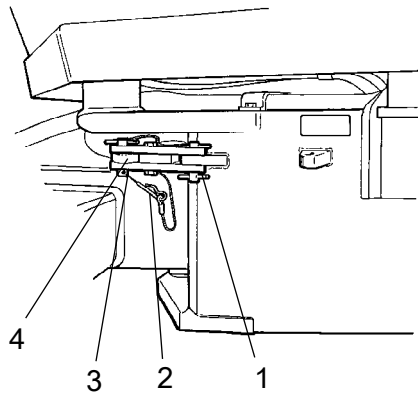


Fig. Articulation in the locked position

- 1. Locking arm**
- 2. Locking pin**
- 3. Locking stud**
- 4. Locking lug**

Weight: refer to the hoisting plate on the roller

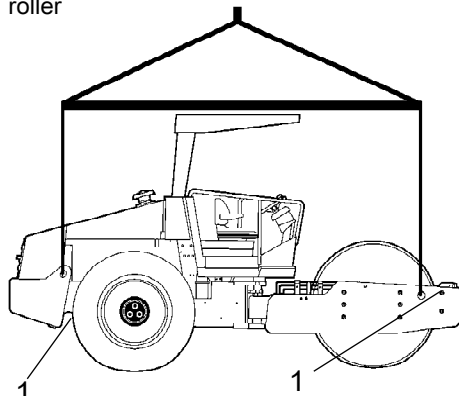


Fig. Roller prepared for lifting
1. Hoisting plate

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

Pull out the lowermost locking pin (2), which has a wire attached. Pull up the locking dowel (3) which also has a wire attached.

Fold out the locking arm (1) and secure it to the upper locking lug (4) on steering joint.

Fit the locking stub (3) in the holes through the locking arm (1) and locking lug (4) and secure the stud in position with the locking pin (2).

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.

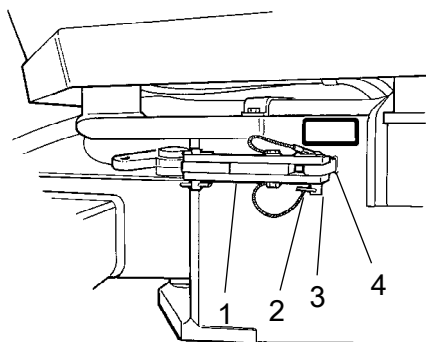


Fig. Articulation in the open position

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

Unlocking the articulation



Remember to unlock the articulation before operating.

Fold the locking arm (1) back and secure it in the locking lug (4) with the locking stud (3). Insert the lowermost locking pin (2) fitted with a wire, to secure the locking stud (3). The locking lug (4) is located on the tractor frame.

Towing

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

Alternative 1

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 roller from moving

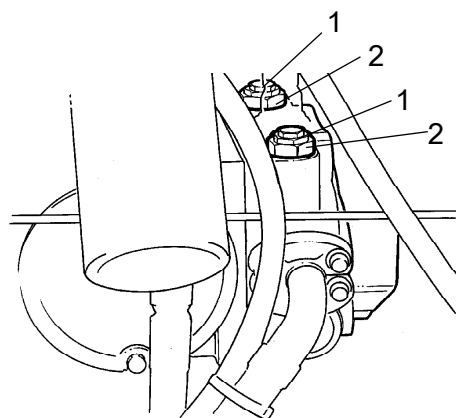


Fig. Propulsion pump

- 1. Towing valve
- 2. Locknut

Turn both towing valves (1) (middle hexagonal nut) three turns counter clockwise, while holding the multifunction valve (2) (lowermost hexagonal nut) in place. The valves are placed on the forward drive 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.

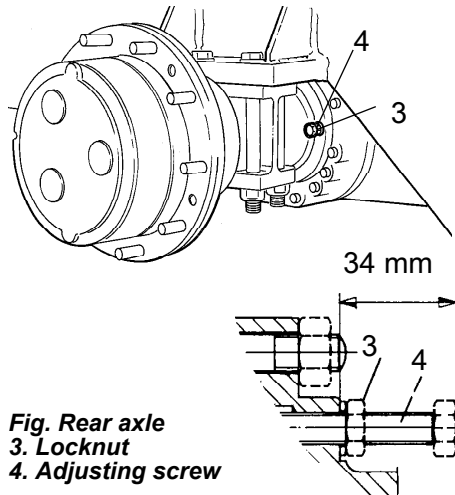


Fig. Rear axle
3. Locknut
4. Adjusting screw

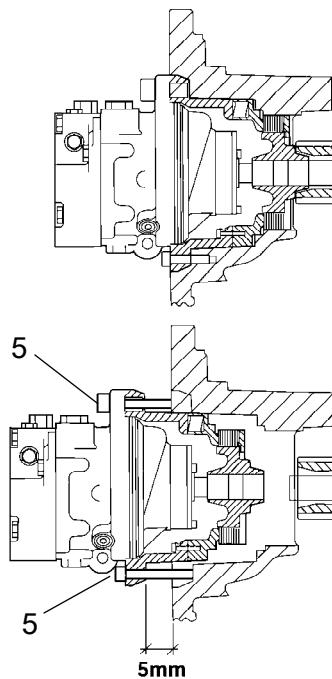


Fig. Drum brake
5. Screw

Alternative 2

Towing short distances where the engine is inoperative



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

First release both towing valves as per alternative 1.

Rear axle brake

Undo the lock nut (3) and screw the adjustment screws (4) by hand until resistance increases, and then one additional turn. The adjustment screws are located on the rear axle, two screws on each side of the differential housing.

Drum gearbox brake

The drum brake is disengaged by screwing out the 4 hexagonal socket screws (5) approx. 5 mm, and then pulling out the engine adapter towards the screw heads.

The brakes are now disengaged and the roller can be towed.



After towing, remember to reset the towing valves (1). Unscrew the adjusting screw (4) to its original position 34 mm from the contact surface and tighten the lock nuts (3). Tighten the four hexagonal socket screws (5). See section "short distance towing" alternative 1 and 2.

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 (330 yards).

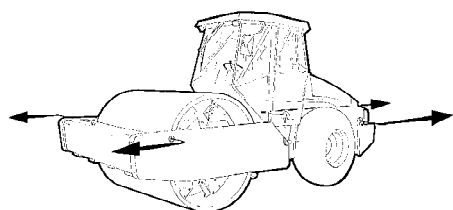


Fig. Towing

When towing/retrieving a machine, the towing device must be connected to both lifting holes. The pulling force must act longitudinally on the machine as shown in the figure. Maximum gross pulling force 185 kN (41590 lbf).



Restore the items for towing according to alternative 1 or 2 on the preceding pages.

Roller prepared for transport



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

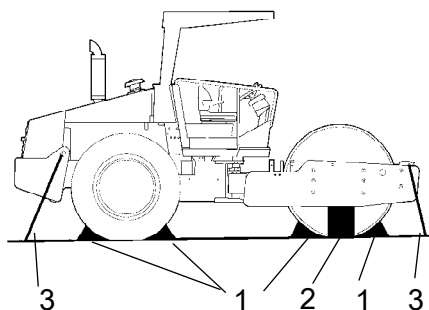


Fig. Transport
1. Chock 2. Block up
3. Lashing wire

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 at all four corners; decals (3) 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. **IN AN EMERGENCY:**
 - **Push in the EMERGENCY/PARKING BRAKE KNOB**
 - **Hold the steering wheel firmly.**
 - **Brace yourself for a sudden stop.**
14. When parking:
 - Push in the reserve/parking brake knob.
 - Stop the engine and chock the drum and wheels.
15. When lifting: - Refer to the relevant section in the Instruction Manual.
16. When towing: - Refer to the relevant section in the Instruction Manual.
17. When transporting: - Refer to the relevant section in the Instruction Manual.
18. When recovering - Refer to the relevant section in the Instruction Manual.

Preventive maintenance

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

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

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

Acceptance and delivery inspection

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

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

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

Warranty

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

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

Maintenance - Lubricants and symbols

Fluid volumes




Rear axle		
- Differential	10 liter	10,6 qts
- Planetary gear	1,9 liters/side	2,0 qts/side
Drum gearbox	3.0 liter	3,2 qts
Drum	15 liter	16 qts
Hydraulic reservoir	52 liters	13.7 gal
Oil in hydraulic system	23 liters	6 gal
Lubrication oil, diesel engine	11 liter	11,7 qts
Coolant, diesel engine	24 liter	6,4 gal



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

	ENGINE OIL	Air temperature -15°C - +50°C (5°F-122°F) Shell Rimula R4 L 15W-40, API CH-4 or equivalent.
	HYDRAULIC FLUID	Air temperature -15°C-+40°C (5°F-104°F) Shell Tellus T68 or equivalent. Air temperature above +40°C (104°F) Shell Tellus T100 or equivalent.
	BIOLOGICAL HYDRAULIC FLUID	BP Biohyd SE-S46 When it leaves the factory, the machine may be filled with biodegradable fluid. The same type of fluid must be used when changing or topping up.
	BIOLOGICAL HYDRAULIC FLUID, PANOLIN	PANOLIN HLP Synth 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. (www.panolin.com)
	TRANSMISSION OIL	Air temperature -15°C - +40°C (5°F-104°F) Shell Spirax AX 80W-90, API GL-5 or equivalent. Air temperature 0°C (32°F) - above +40°C (104°F) Shell Spirax AX 85W-140, API GL-5 or equivalent.
	DRUM OIL	Mobil SHC 629














Maintenance - Lubricants and symbols

	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.
	COOLANT	GlycoShell or equivalent, (mixed 50/50 with water). Anti-freeze protection down to about -37°C (-34.6°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		Tyre pressure
	Engine, oil filter		Air filter
	Hydraulic reservoir, level		Battery
	Hydraulic fluid, filter		Recycling
	Transmission, oil level		Fuel filter
	Drum, oil level		Coolant, level
	Oil for lubrication		

Maintenance - Maintenance schedule

Service and maintenance points

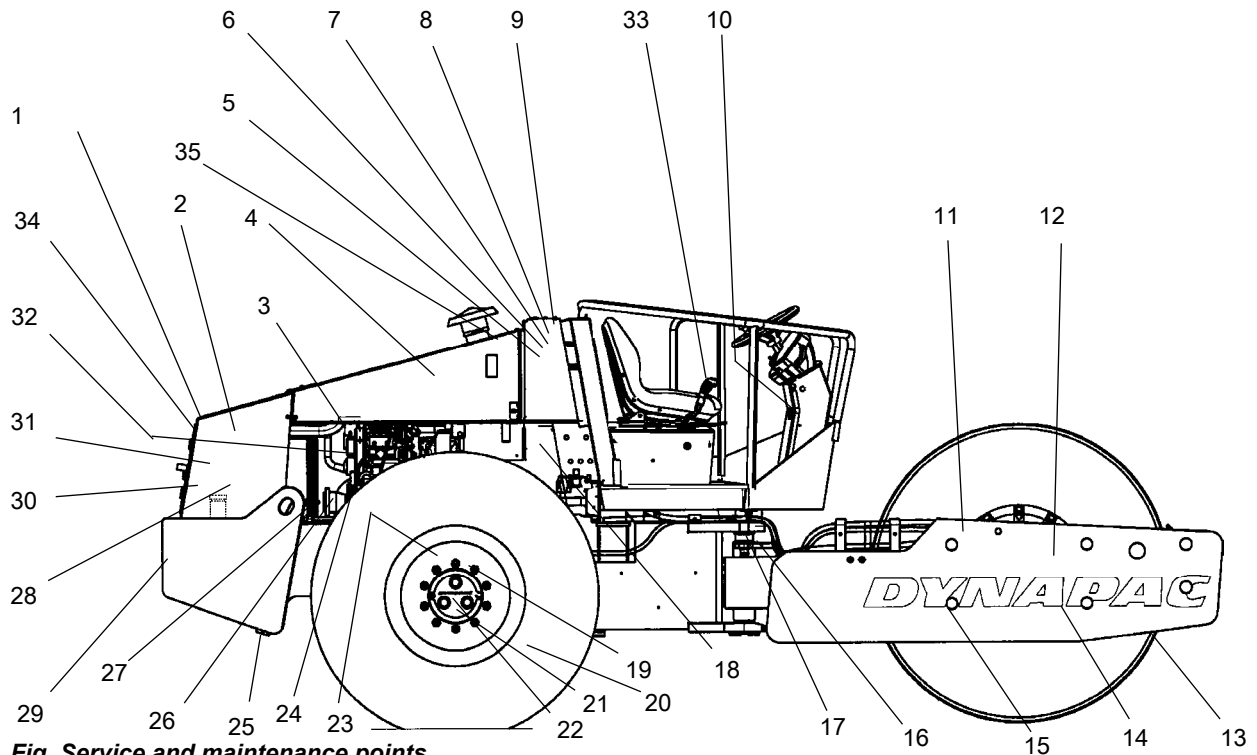


Fig. Service and maintenance points

- | | | |
|--|---|--|
| 1. Cooler grille | 13. Scrapers | 25. Draining, fuel tank |
| 2. Fuel filter, fuel prefilter | 14. Drum oil, level plug | 26. Diesel engine suspension, x4 |
| 3. Oil level, diesel engine | 15. Shock absorbers and attachment screws | 27. Feed pump, fuel |
| 4. Air filter | 16. Steering joint | 28. Diesel engine, filling |
| 5. Hydraulic reservoir, sight glass | 17. Steering cylinders, x2 | 29. Battery |
| 6. Bleeder filter | 18. Flywheel casing, hydraulic pumps | 30. Cooler |
| 7. Hydraulic fluid filter, x1 | 19. Wheel-nuts | 31. Hydraulic fluid cooler |
| 8. Draining, hydraulic fluid reservoir | 20. Tires, air pressure | 32. Drive belts, cooling, alternator |
| 9. Hydraulic fluid, filling | 21. Rear axle, differential | 33. Forward/Reverse lever |
| 10. Fuse box | 22. Rear axle, planetary gears, x2 | 34. Engine hood, hinge |
| 11. Drum oil, filling | 23. Rear axle suspension, 2 sides | 35. Cooling liquid level, diesel motor |
| 12. Drum gearbox | 24. Oil filter, diesel engine | |

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.

Maintenance - Maintenance schedule



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	
13	Check the scraper setting	
1	Check for free circulation of cooling air	
35	Check coolant level	Refer to the engine manual
3	Check the engine oil level	Refer to the engine manual
28	Refuel	
5	Check the hydraulic reservoir level	
	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
3	Change the fuel filter	Refer to the engine manual
8	Change the hydraulic fluid filter	

Maintenance - Maintenance schedule

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
	Check that hoses and couplings are not leaking	
4	Inspect/clean the filter element in the air cleaner	Replace as required
16	Lubricate the articulation	
17	Check that the guiding cylinders are tight	
19	Check the wheel-nuts are tightened	
20	Check the tire pressure	
	Check the air conditioning	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
22	Check oil level in rear axle/planetary gearing	
12	Check oil level in drum gearbox	
14	Check oil level in the drum	
31	Clean the coolers	
19	Check the bolted joints	The above applies to new or reconditioned components only
23	Check the bolted joints	The above applies to new or reconditioned components only
15	Check rubber elements and bolted joints	
24	Change the engine oil and oil filter	Refer to the engine manual
29	Check battery	
	Check the AC	Optional

Maintenance - Maintenance schedule

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
2	Replace the fuel filter	Refer to the engine manual
2	Clean the fuel pre-filter.	
6	Check bleeder filter on hydraulic reservoir	

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
7	Change the hydraulic fluid filter	
8	Drain the condensate from hydraulic reservoir	
25	Drain condensate from fuel tank	
21	Change oil in rear axle differential	
22	Change oil in the rear axle planetary gearing	
	Check engine valve clearances	Refer to the engine manual
32	Check belt tension for drive system	Refer to the engine manual

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
8, 9	Change the hydraulic fluid	
11	Change the oil in the drum	
12	Change the oil in the drum gearbox	
33	Lubricate the Forward/Reverse lever	
	Overhaul air conditioning	Optional

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.***



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

Scrapers - Check, adjustment



It is important to consider movement of the drum when the machine turns, i.e., the scrapers can be damaged or wear of the drum may increase if adjustment is made closer than the values stated.

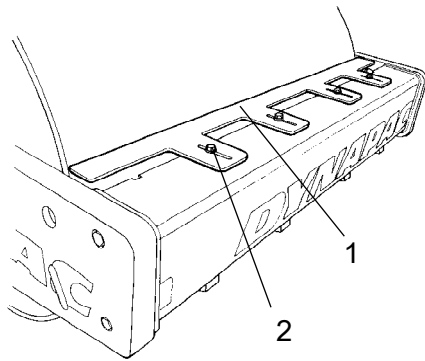


Fig. Scrapers
1. Scraper blades
2. Screws (4)

If necessary, adjust distance to the drum as follows:

Undo the screws (2) on the scraper attachment.

Then adjust the scraper blade (1) to 20 mm from the drum.

Tighten the screws (2).

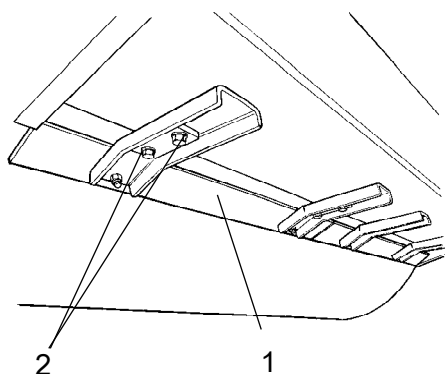


Fig. Scrapers
1. Scraper blades (x4)
2. Screws

Steel scrapers (Optional)

If necessary, adjust distance to the drum as follows:

Undo the screws (2) on the scraper attachment.

Then adjust the scraper blade (1) to 20 mm from the drum.

Tighten the screws (2).

Repeat the procedure for the other scraper blades (x4).

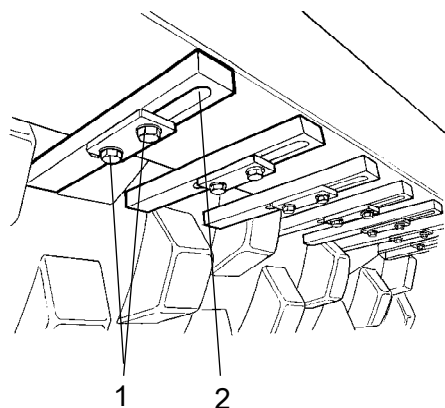


Fig. Scrapers
1. Screws
2. Scraper teeth (x18)

Scrapers, Pad-drum

Undo the screws (1), then adjust each scraper tooth (2) to 25 mm (1.0 in) between scraper tooth and drum.

Center each scraper tooth (2) between the pads.

Tighten the screws (1).

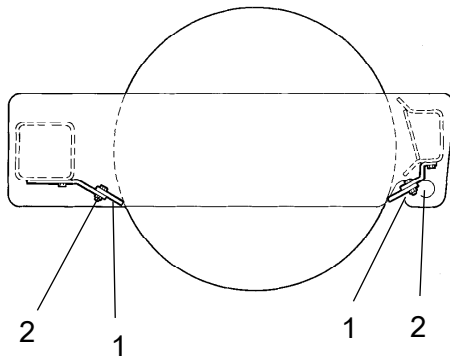


Fig. Scrapers
1. Scraper blade
2. Screws

Soften scrapers (Optional)

Loosen the screws (2).

Then, adjust the scraper blade (1) so that it lightly touches the drum.

Tighten the screws (2).

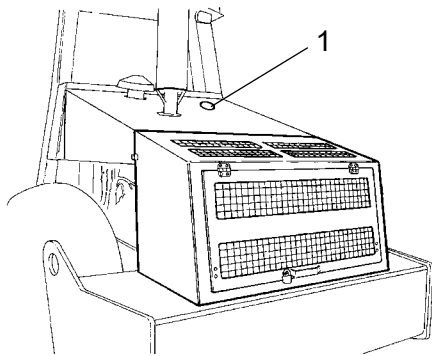


Fig. Cooler grille
1. Filler cap, coolant

Air circulation - Check

Ensure that the diesel engine has free circulation of cooling air through the vents in the hood.



Observe extreme caution if the filler cap must be opened when the engine is hot. NOTE, the engine must be switched off. Wear protective gloves and goggles.

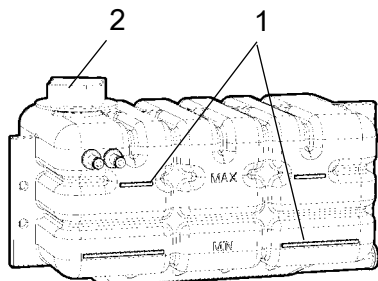


Fig. Coolant container
1. Level mark in coolant container
(min/max markings)
2. Filler cap

Coolant level - Check

Cooling liquid holder is placed up beside the hydraulic oil tank and is seen easiest from the right side of the roller.

The filler cap (2) is accessible from the top of the engine hood.

Check the coolant level with the engine stopped and cold.

Check that the coolant level is between the max/min markings (1).

Make sure that cooling air flows freely through the protective grille to the engine.



The coolant is hot and under pressure at working temperature and the escaping steam can cause serious scalding. Open the filler cap carefully to release the pressure. Wear protective goggles and protective gloves.

Fill with a mixture of 50% water and 50% antifreeze. See instructions for lubricant and symbols.



Diesel engine Check oil level



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

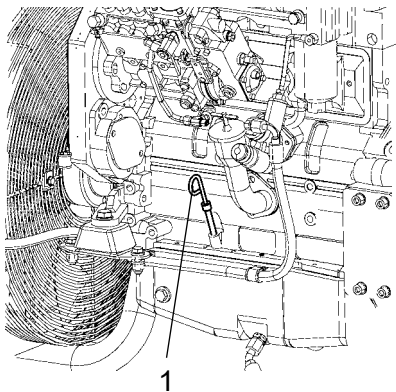


Fig. Engine compartment
1. Dipstick

The dipstick is located on the engine's right side.

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 - Filling

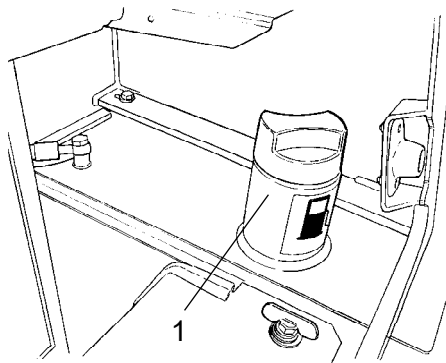


Fig. Filling with fuel
1. Filler pipe

Refuel daily with diesel fuel up to the lower edge of the filler pipe (1). Follow the engine manufacturer's specification with regard to the quality of diesel fuel.



Stop the diesel engine. Short-circuit (press) the filler gun against a non-insulated part of the roller before filling, and against the filler pipe (1) while filling.



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

The tank holds 250 liters of fuel.



Hydraulic reservoir - Check fluid level

The sight glass is located on the right-hand side of the roller behind the operator's seat.

Place the sight glass on a flat surface and check the fluid level in the sight glass (1). If the level is too low, top up with the type of hydraulic fluid specified in the lubricant specification.

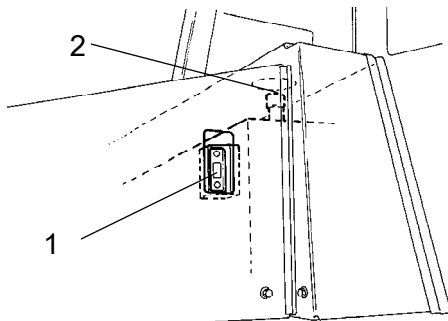


Fig. Sight glass hydraulic reservoir
1. Sight glass

Brakes - Check



Check operation of the brakes as follows:



Checking the emergency stop

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

Press the emergency stop (1). The roller will stop abruptly and the engine will be switched off.

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

Pull out the emergency stop (1). Start the engine.

The roller is now ready for operation.

Refer also to the section in the manual on operation.

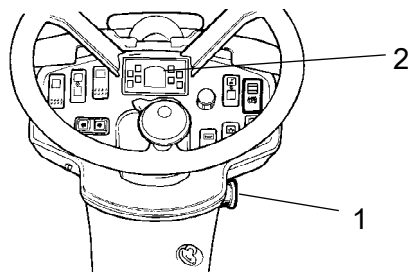


Fig. Instrument panel
1. Emergency stop
2. Parking brake lamp

Brakes - Check



Check operation of the brakes as follows:



Checking the parking brake

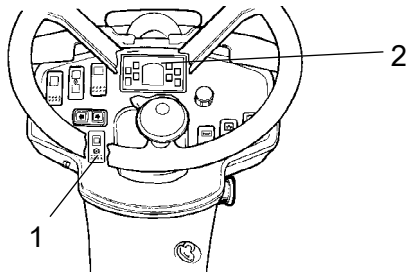


Fig. Instrument panel
1. Parkering brake switch
2. Parkering brake lamp

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

Push in the parking brake switch (1). The roller should stop immediately with the engine running.

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

Reset the parkering brake switch (1).

The roller is now ready for operation.

Refer also to the section in the manual on operation.

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.



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



Air cleaner

Checking - Change the main air filter



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

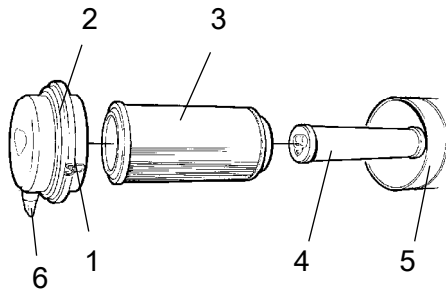


Fig. Air cleaner

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

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

Do not remove the backup filter (4).

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

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

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

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



Backup filter - Change

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

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

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

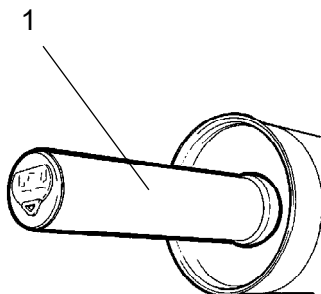


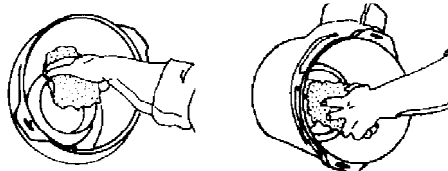
Fig. Air filter
1. Backup filter



Air cleaner - Cleaning

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

Wipe clean on both sides of the outlet pipe.



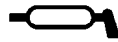
Inner edge of
outlet pipe.

Outer edge of outlet
pipe.

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



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



Articulation - Lubrication

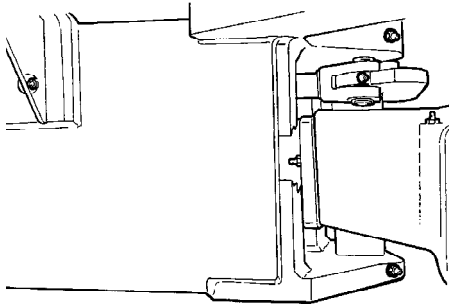


Fig. Steering hitch right side

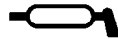


Do not allow anyone to remain in the vicinity of the steering joint when the engine is running. Risk of being crushed when the steering is operated. Press the emergency/parking brake knob before lubricating.

Turn the steering wheel fully to the left to gain access to all the steering system's lubricating nipples (4) on the right-hand side of the machine.



Use grease as per the lubricant specification



Steering joint - Lubrication

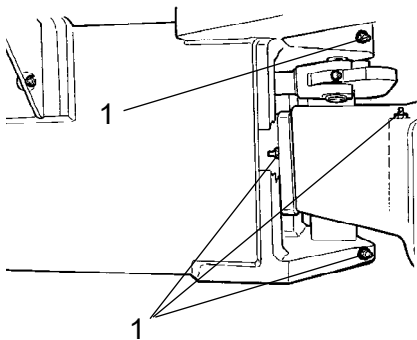


Fig. Articulation, right side
1. Lubricating nipples, articulation (4 pcs)

Wipe off any dirt and grease from the nipples.

Grease each nipple (1) with five strokes of a hand-operated grease gun. Make sure that grease penetrates into the bearings.



If grease does not penetrate the bearings, it may be necessary to relieve the articulation joint with a jack while repeating the greasing process.



Tires - Air pressure - Wheel nuts - Tightening

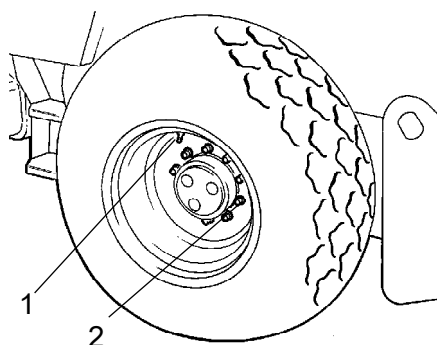


Fig. Wheels
1. Air valve
2. Wheel nut

Check the tire pressures using a pressure gauge.

If the tires are filled with fluid, the air valve (1) must be in the "12 o'clock" position during pumping.

Recommended pressure: See Technical Specifications.

Check the tire pressure.



When changing the tires it is important that both of them have the same rolling radius. This is necessary to ensure proper functioning of the anti-slip in the rear axle.

Check the tightening torque of the wheel nuts (2) at 630 Nm (465 lbf.ft).

Check both wheels and all nuts. (This only applies to a new machine or newly fitted wheels).



Check the safety manual that accompanies the roller before filling the tires with air.



Automatic Climate Control (Optional) - Inspection

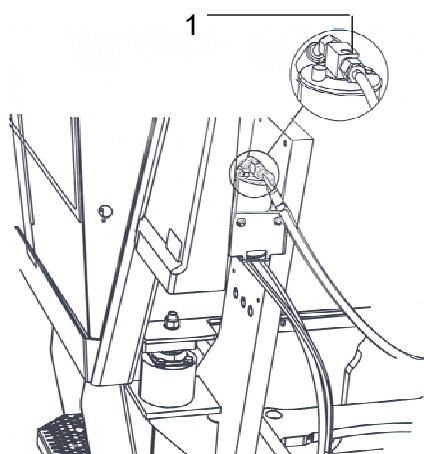


Fig. Drying filter
1. Sight glass

The system described in this manual is type ACC (Automatic Climate Control).



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

The filter is located on the left side of the engine compartment's front edge

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

The filter is located on the left side of the engine compartment's front edge. If bubbles are visible through the sight glass, it is a sign that the refrigerant level is too low. If so, stop the unit. The unit may be damaged if it is run with insufficient refrigerant.

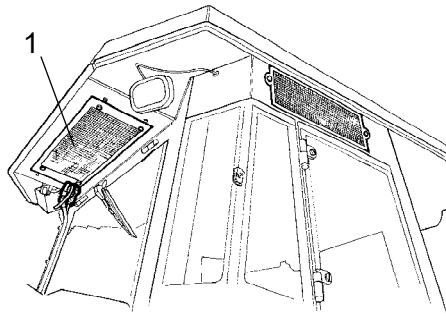


Fig. Cab
1. Condensor element

Where cooling capacity is markedly reduced, clean the condensor element (1) located on the rear edge of the cab. Also clean the cooling unit in the cab. See under the heading 2000 hours, automatic climate control - overhaul.

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.



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



Rear axle differential - Check oil level



Never work under the roller when the engine is running. Park on a level surface. Block the wheels securely.

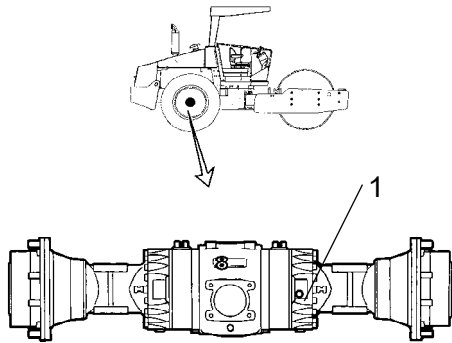


Fig. Level check - differential housing
1. Level/Filler plug

Wipe clean and remove the level plug (1) and check that the oil level reaches the lower edge of the plug hole. Top up with oil to the right level if the level is low. Use transmission oil, see lubricant specification.

Clean and refit the plug.



Rear axle planetary gears - Check oil level

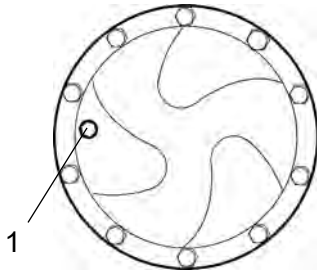


Fig. Level check - planetary gear, std
1. Level/Filler plug

Position the roller with the plug in the planetary gear (1) in the "9 o'clock" position.

Wipe clean and remove the level plug (1) and check that the oil level reaches the lower edge of the plug hole. Top off with oil to the right level if the level is low. Use transmission oil. See lubrication specification.

Clean and refit the plug.

Check the fluid level in the same way on the rear axle's other planetary gear.

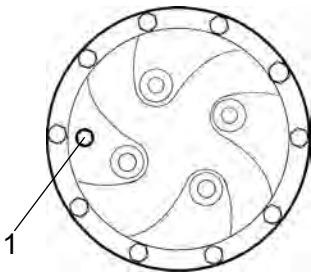


Fig. Level check - planetary gear, optional
1. Level/Filler plug



Drum gearbox - Checking the oil level

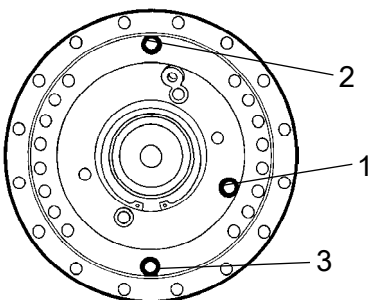


Fig. Oil level check - drum gearbox
1. Level plug
2. Filler plug
3. Drain plug

Position the drum so that the filler plug (2) is straight up.

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

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

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

Clean and refit the plugs.



Drum - Checking the oil level

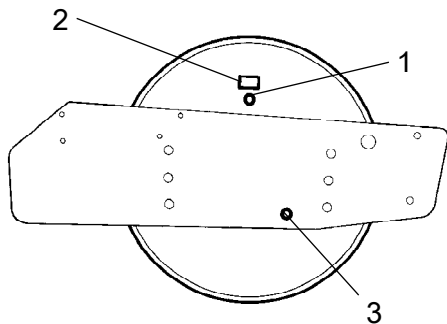


Fig. Roller, right-hand side

- 1. Filler plug
- 2. Number plate
- 3. Sight glass

Place the roller on a level surface so that the filler plug (1) and the drum's number plate (2) are visible on the right side of the drum.

The oil level should now reach the sight glass (3).

If necessary, remove the filler plug (1) and fill to halfway up the sight glass.

Clean any metal residue from the magnetic filler plug (1) before reinstalling it.

See the lubrication specification for the correct oil grade.



Do not overfill with oil - risk for overheating.

Radiator - Check/Cleaning

Check that air can pass unobstructed through the radiators (1) and (2).

Clean a dirty radiator using compressed air or a high-pressure water jet.

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



Be careful when using a high-pressure washer - do not place the nozzle too close to the radiator.

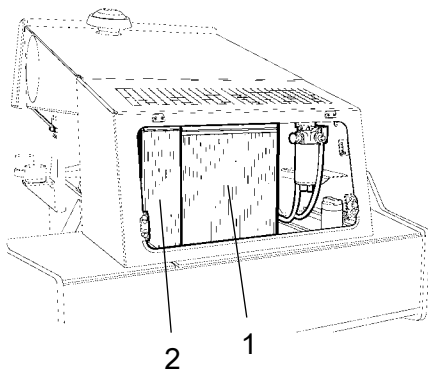


Fig. Engine compartment

- 1. Water cooler
- 2. Hydraulic fluid cooler



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

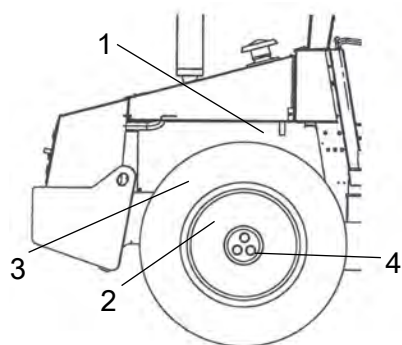


Fig. Right side of machine
1. Steering pump
2. Rear axle
3. Engine suspension
4. Wheel nuts

Bolted joints - Checking tightening torque

Steering pump to diesel engine (1) 55 Nm, lightly oiled

Rear axle suspension (2) 330 Nm (243 lbf.ft), oiled.

Engine suspension (3). Check that all the M12 bolts (x20) are tightened, 70 Nm, and lightly oiled.

Wheel nuts (4). Check that all nuts are tightened, 630 Nm oiled.

(The above applies to new or replaced components only).

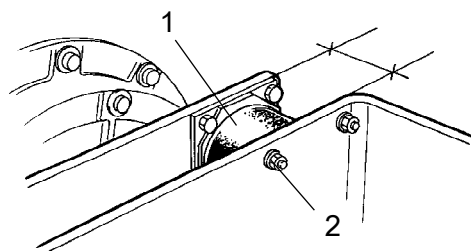


Fig. Drum, vibration side
1. Rubber element
2. Fastening screws

Rubber elements and fastening screws - Check

Check all rubber elements (1), replace all of the elements if more than 25% of them on one side of the drum are cracked deeper than 10-15 mm (0.4-0.6 in).

Check using a knife blade or pointed object.

Check also that the screw fasteners (2) are tightened.



Diesel engine - Oil and Filter change



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

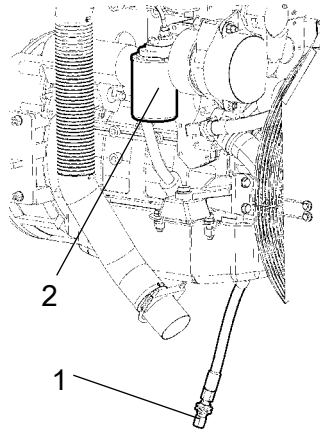


Fig. Left side of engine
1. Drain plug
2. Oil filter

The oil drain plug (1) is most easily accessible from the bottom of the engine and is located attached to a hose on the rear axle.. Drain the oil when the engine is warm. Place a receptacle that holds at least 15 liters (4 gal) under the drain plug.

Replace the engine oil filter (2) at the same time. Refer to the engine manual.



Deliver the drained oil and filter to environmentally correct handling.



Battery - Check electrolyte level



Never use a naked flame when checking the battery as the electrolyte emits explosive gas while the alternator is charging.

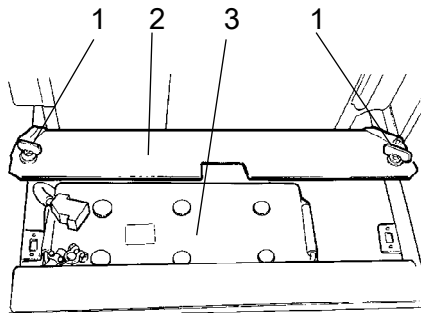


Fig. Battery shelf
1. Quick-screws
2. Battery cover
3. Battery

Open the engine cover and undo the quick-release screws (1).

Raise the battery cover (2).

Wipe the top of the battery.



Wear safety goggles. The battery contains corrosive acid. Rinse with water if electrolyte comes into contact with the body.



Battery cell

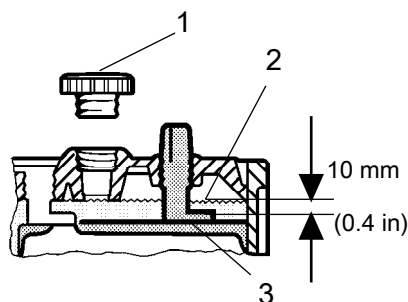


Fig. Electrolyte level in battery

- 1. Cell cap
- 2. Electrolyte level
- 3. Plate

Take off the cell caps (1) and make sure that electrolyte (2) is about 10 mm (0.4 in) above the plates (3). Check the level of all cells. Top off with distilled water to the right level if the level is low.

If the ambient temperature is below freezing, run the engine for a while before topping off with distilled water. Otherwise the electrolyte might freeze.

Make sure that ventilation holes in the cell cover are not clogged, then put the cover back on.

The cable shoes should be clean and well tightened. Clean corroded cable shoes and grease them with acid-free Vaseline.



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



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



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

Air conditioning (Optional)

- Inspection

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

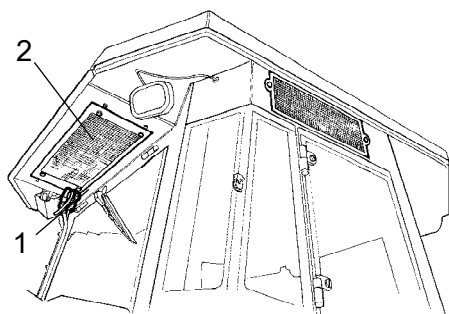


Fig. Air conditioning

- 1. Refrigerant hoses
- 2. Condensor element

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.

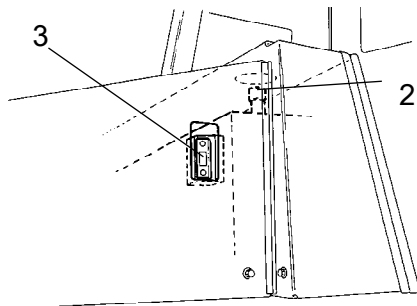


Fig. Hydraulic reservoir
2. Filler cap/Air filter
3. Sight glass

Bleeder filter - Inspection/Cleaning

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.



Always wear protective goggles when working with compressed air.

Check that the bleeder filter (2) is not clogged. Air should be able to pass through the cap unobstructed in both directions.

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check level of fluid in the sight glass (3) and top up as required.



Fuel pre-filter - Replacement



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

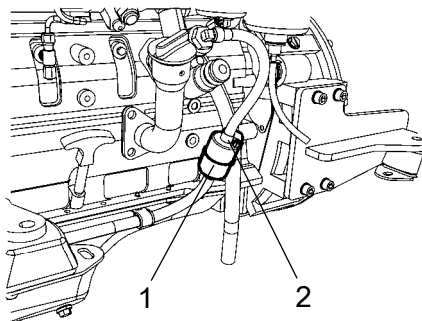


Fig. Engine compartment
1. Fuel prefilter
2. Hose clamps (2 pcs.)



Discard the pre-filter (1) in a safe manner, its of expendable type and can not be cleaned.

Loosen the hose clamps (2) and remove the pre-filter (1). Fit the new filter, taking care to fit in the direction of flow.

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

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.

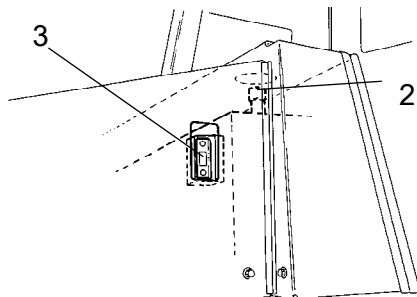


Fig. Hydraulic reservoir
2. Filler cap
3. Sight glass

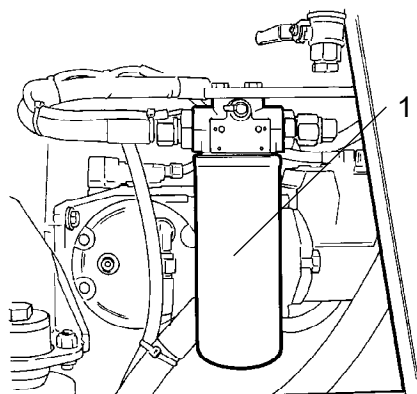


Fig. Engine compartment
1. Hydraulic fluid filter (x1)

Hydraulic fluid filter - Replacement

Undo the cover/bleeder filter (2) on top of the reservoir so that over-pressure inside the reservoir can be eliminated.

Check that the bleeder filter (2) is not clogged, air must flow 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.

Carefully clean round the hydraulic filter.



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



Make sure that the old seal is not left on the filter head. Leakage will otherwise occur between the new and old seal.

Thoroughly clean the sealing surfaces on the filter head.

Apply a thin coat of fresh hydraulic fluid to the seal on the new filter. Screw tight the filter by hand.



First tighten the filter until its seal is in contact with the filter attachment. Then turn an additional half revolution. Do not tighten the filter too hard as this could damage the seal.

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check level of fluid in the sight glass (3) and top up as required.



Hydraulic fluid reservoir - Draining

Condensate in the hydraulic reservoir is drained via the plug (2).

Drainage must be performed when the roller has been stationary for an extended period, e.g. after being stationary overnight.

Drain as follows:

- Remove the plug (2).
- Place a container under the tap. - Open the tap (1). Drain off any condensate.
- Close the drainage tap and refit the plug.



Save the condensate and hydraulic fluid and hand it in to an environment-friendly waste disposal station.

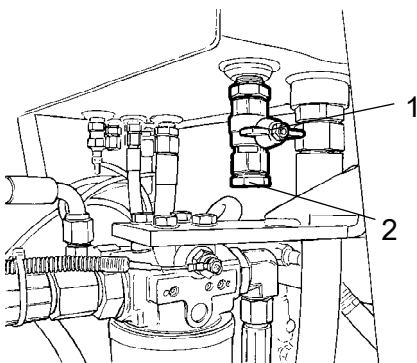


Fig. Hydraulic reservoir, bottom
1. Drainage tap
2. Plug



Fuel tank - Drainage

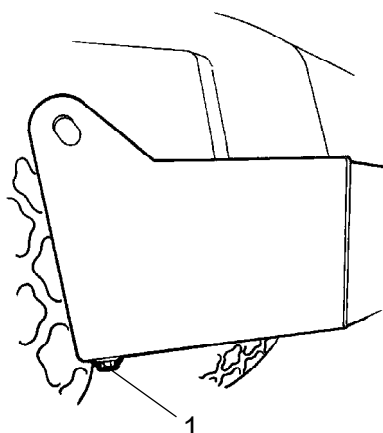


Fig. Fuel tank
1. Drainage plug

Water and sediment in the fuel tank are removed via the drainage plug (1) in the bottom of the fuel tank.



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

Drainage must be performed when the roller has been stationary for an extended period, e.g. after being stationary overnight. The fuel level should be as low as possible.

The roller should preferably have been standing with this side slightly lower, so that water and sediment have gathered near the drainage plug (1).



Save the condensate and sediment and hand it in to an environment-friendly waste disposal station.

Drain as follows:

- Place a container under the plug (1).
- Remove the plug (1).
- Drain out the condensate and sediment until only pure fuel emerges at the plug.
- Screw in the plug again.



Air conditioning (Optional) Fresh air filter - Change



Use a step ladder to reach the filter (1). The filter can also be accessed via the right cab window.

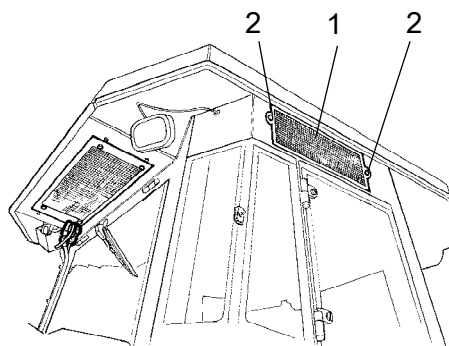


Fig. Cab
1. Fresh air filter
2. Screw (x2)

Loosen the two screws (2) on the cab's right side. Take down the whole holder and remove the filter insert.

Replace with a new filter.

It may be necessary to change the filter more often if the machine is working in a dusty environment.



Rear axle differential - Oil change



Never work under the roller when the engine is running. Park on a level surface. Block the wheels securely.

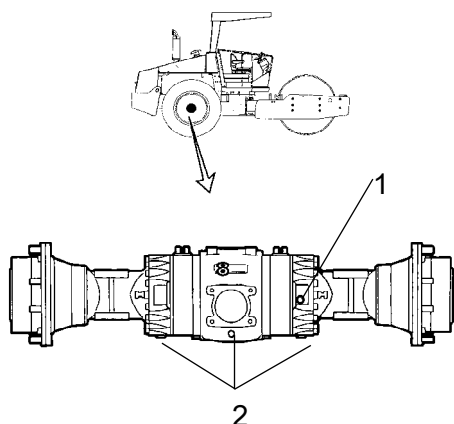


Fig. Rear axle
1. Level/Filler plug
2. Drain plugs



Save the oil and hand in to an environment-friendly waste disposal station.

Wipe clean and remove the level/filler plug (1) and all three drain plugs (2) and drain the oil into a suitable receptacle. The volume is approximately 12.5 liters (13.2 qts).

Refit the drainage plugs and top up with fresh oil until the correct level is reached. Note that it takes a while for the oil to be distributed in the axle. Do not fill the entire volume at once. Refit the level/filler plug. Use transmission oil, see Lubricant Specification.



Rear axle's planetary gears - Draining the oil

Position the roller with the plug (1) at its lowest position.

Wipe clean and remove the plug (1) and drain the oil into a receptacle. The volume is approx. 2 liters (2.1 qts).



Save the oil and hand in to an environment-friendly waste disposal station.

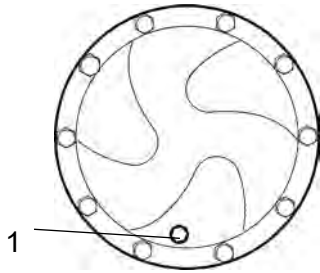


Fig. Draining the oil - planetary gear, std
1. Level/Filler plug

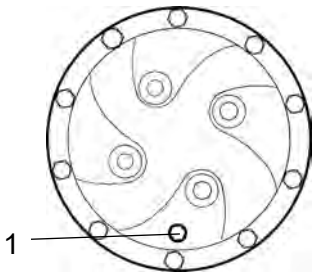


Fig. Draining the oil - planetary gear, optional
1. Level/Filler plug



Rear axle's planetary gears - Oil change - Oil filling

Set the roller so that the plug (1) in the planetary gear is at "9 o' clock".

Wipe clean and remove the plug (1).

Fill with oil to the lower edge of the level hole. Use transmission oil. See lubrication specification.

Clean and refit the plug (1).

Fill with oil in the same way as for the rear axle's second planetary gear.

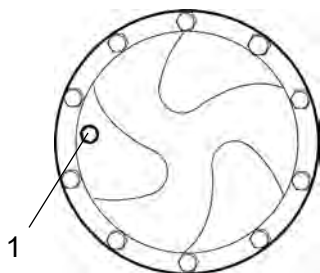


Fig. Oil filling - planetary gear, std
1. Level/Filler plug

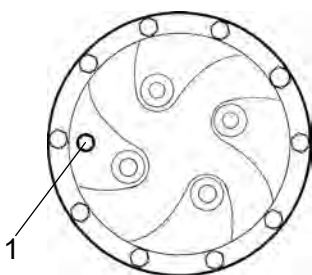


Fig. Oil filling - planetart gear, optional
1. Level/Filler plug

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 - Changing the fluid



Observe care when draining the hydraulic fluid. Wear protective gloves and goggles.

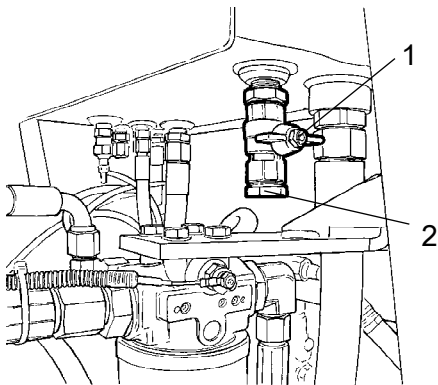


Fig. Hydraulic reservoir, bottom
1. Stop cock (3/4")
2. Plug

Place a receptacle that holds at least 60 liters (15.9 gal)) beside the roller.

Unscrew the drain plug (2).

Open the stock cock and allow the oil to run through a hose to the drainage receptacle.

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

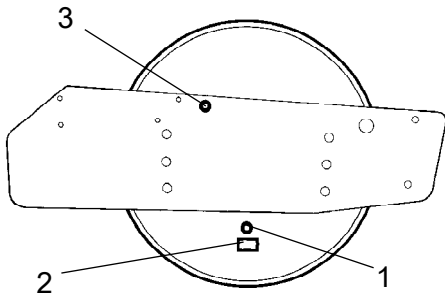


Fig. Roller, right-hand side
1. Drain/Filler plug
2. Number plate
3. Sight glass

Place the roller on a level surface so that the drain plug (1) is straight down. Position a container that holds 15 liters under the plug.



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

Clean and remove the drain plug (1). Allow all of the oil to drain off. Fill with oil according to "Drum - Checking the oil level."



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



Drum gearbox - Oil change

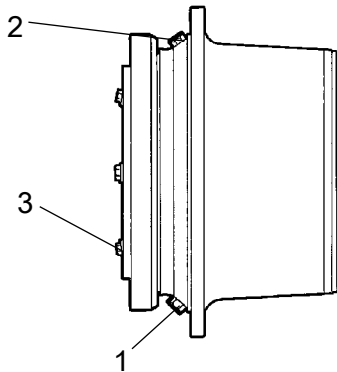


Fig. Drum gearbox
1. Drain plug
2. Filler plug
3. Level plug

Place the roller on a level surface with the plugs (1) and (2) as illustrated.

Wipe clean, unscrew the plugs (1, 2 and 3) and drain the oil into a suitable receptacle, capacity about 3.5 liters (1 gal.).

Refit the plug (1) and fill with oil up to the level plug (3), according to "Drum gearbox - Checking the oil level".

Use transmission oil according to the lubricant specification.

Clean and refit the level plug (3) and filler plug (2).

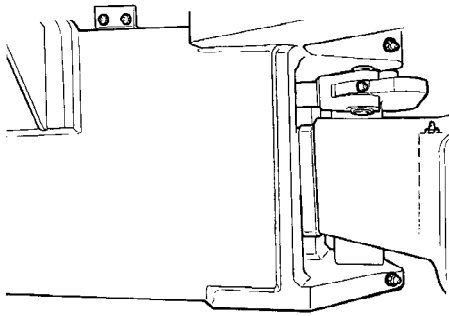


Fig. Steering hitch

Steering hitch - Check

Inspect the steering hitch to detect any damage or cracks.

Check and tighten any loose bolts.

Check also for any stiffness and play.

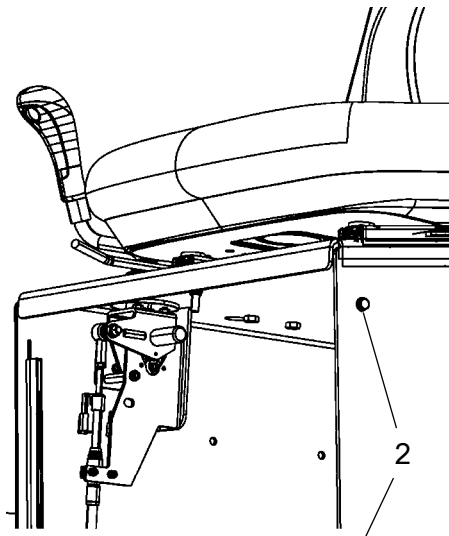


Fig. F/B control
2. Screws

Controls - Lubrication

Grease Forward/Back- throttle mechanical mechanism. Take away the outer hatch down below the seat by loosening the screws (2). Grease the workings with oil.

Refit the hatch.

Automatic Climate Control (Optional) - Overhaul

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

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



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



Wear protective goggles when working with compressed air.

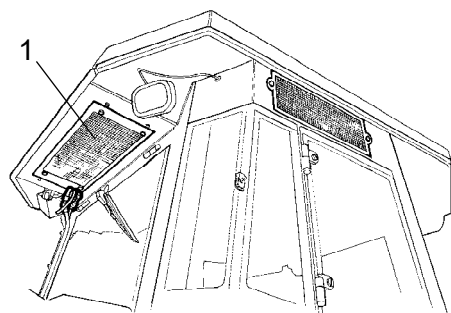


Fig. Cab
1. Condensor element

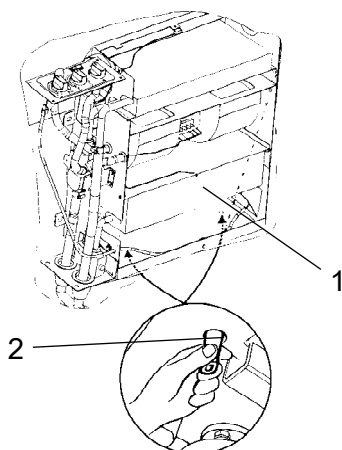


Fig. Automatic climate control
1. Cooling element
2. Drain valve (x2).

Inspect the condenser element attachment.

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

Check the system hoses for chafing. Make sure that drainage from the cooling unit is unobstructed so that no condensation accumulates inside the unit.

Drain by pinching the valves (2)

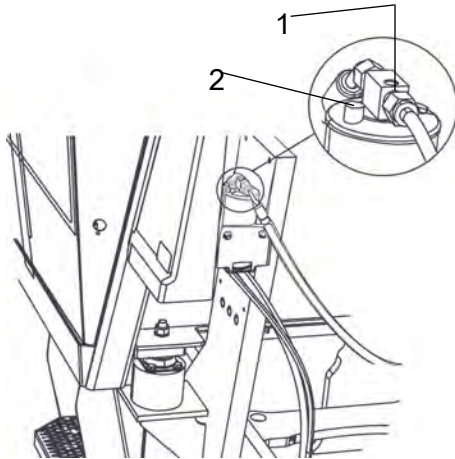


Fig. Drying filter in engine compartment

- 1. Sight glass
- 2. Moisture indicator

Drying filter - Check

The drying filter is located on the left side of engine compartment's front edge.

With the unit in operation, open the engine hood and check using the sight glass (1) that bubbles are not visible on the drying filter. If bubbles are visible through the sight glass, it is a sign that the refrigerant level is too low. If so, stop the unit. The unit may be damaged if it is run with insufficient refrigerant.

Check the moisture indicator (2). It should be blue. If it is beige, the dryer cartridge should be changed by an authorized service company.



The compressor will be damaged if the unit is run with too little refrigerant.



Do not disconnect or undo the hose couplings.



The cooling system is pressurized. Incorrect handling can result in serious personal injury.



The system contains pressurized refrigerant. It is forbidden to release refrigerants into the atmosphere. Work on the refrigerant circuit is only to be carried out by authorized companies.

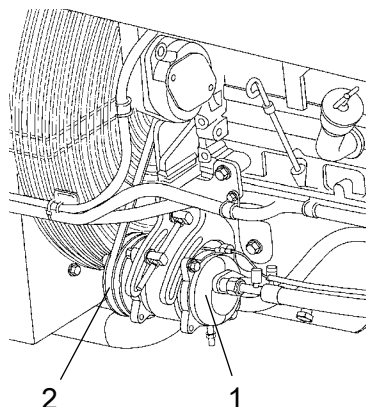


Fig. Engine compartment

- 1. Compressor
- 2. Drive belt

Compressor - Check (Optional)

Inspect the attachment of the compressor (1).

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

Check the drive belt (2) for any physical damage or cracks.



The air conditioning unit should not be run when the outdoor temperature is below 0 C, other than for the above.

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