

Instructions manual

ICA600-1EN4.pdf
Driving & Maintenance

Vibratory roller
CA600

Engine
Cummins 6BTA5.9C

Serial number
***79X20600*-**
10000121x0A000001 -



Translation of original instruction

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Introduction

The machine

CA600 is one of Dynapac's heavy soil compaction rollers. It is available in D (smooth drum) and PD (padfoot drum) versions.

Intended use

The D version is intended for the compaction of rockfill. The main area of application for the PD version is on cohesive material and weathered stone material.

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.

CALIFORNIA

Proposition 65 Warning

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

General

This manual contains instructions for machine operation and maintenance.

The machine must be correctly maintained for maximal performance.

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

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

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



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

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



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

Safety - General instructions

(Also read the safety manual)



1. The operator must be familiar with the contents of the OPERATION section before starting the roller.
2. Ensure that all instructions in the MAINTENANCE section are followed.
3. Only trained and/or experienced operators are to operate the roller. Passengers are not permitted on the roller. Remain seated at all times when operating the roller.
4. Never use the roller if it is in need of adjustment or repair.
5. 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/ROPS-cab.
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:
 - Stop the engine
 - Do not smoke.
 - No naked flames in the vicinity of the roller.
 - Earth the filling equipment nozzle to the tank opening 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.

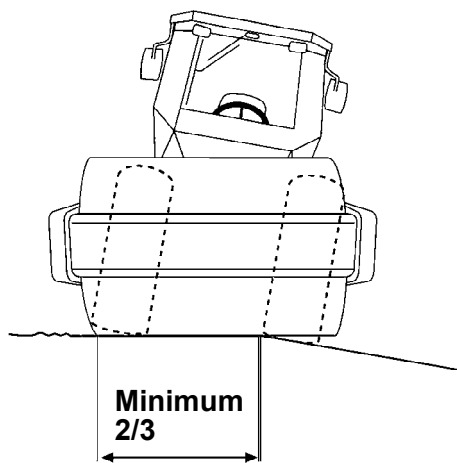


Fig. Position of drum when driving near an edge

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 seat belt.

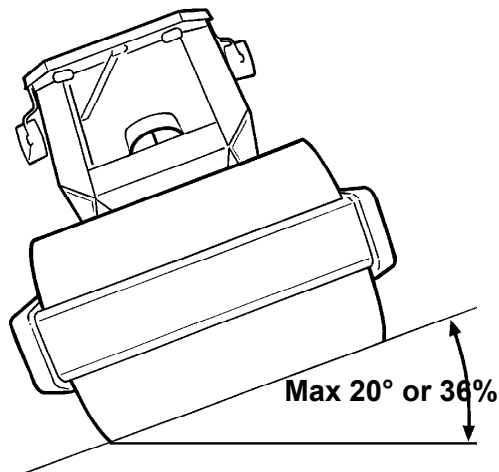


Fig. Operating on slopes



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 - 105°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 ABC-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.

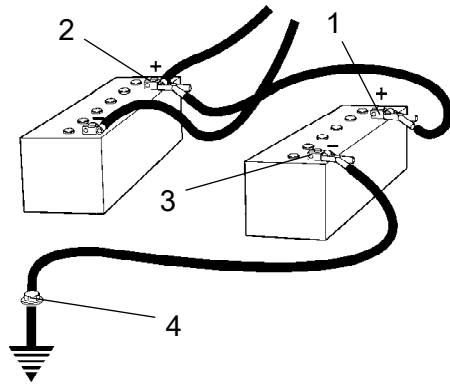


Fig. Jump starting

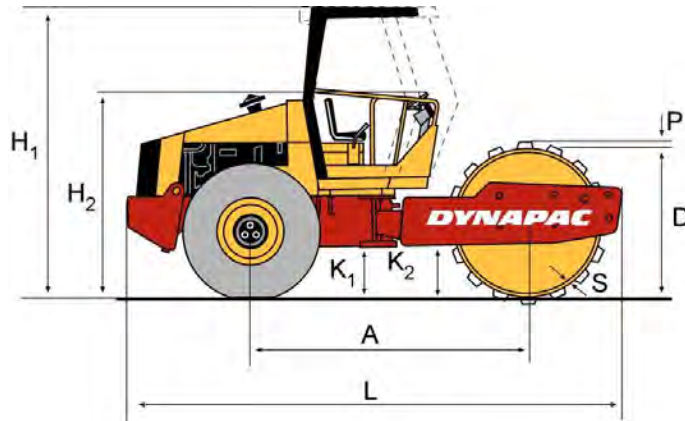
Turn the ignition and all power consuming equipment off. Switch off the engine on the machine which is providing jump start power.

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.

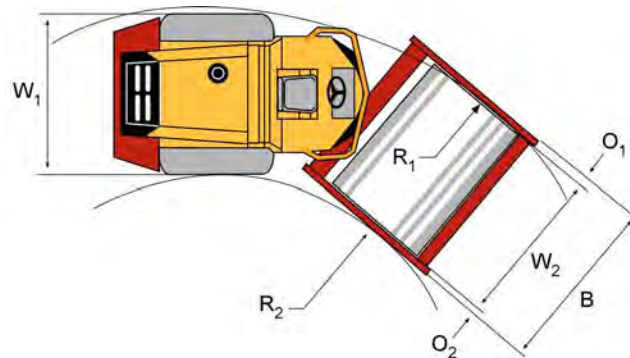
Technical specifications - Dimensions

Dimensions, side view



	Dimensions	mm	in
A	Wheelbase, drum and wheel	2992	118
L	Length, standard equipped roller	6000	236
H ₁	Height, with ROPS (D)	2955	116
H ₁	Height, with ROPS (PD)	2990	118
H ₁	Height, with cab (D)	2955	116
H ₁	Height, with cab (PD)	2990	118
H ₂	Height, without ROPS (D)	2190	86
H ₂	Height, without ROPS (PD)	2210	87
D	Diameter, drum (D)	1563	48
D	Diameter, drum (PD)	1543	60,75
S	Thickness, drum shell, Nominal (D)	45	1,8
S	Thickness, drum shell, Nominal (PD)	35	1,4
P	Height, pads (PD)	100	4
K ₁	Clearance, tractor frame (D)	450	17,7
K ₁	Clearance, tractor frame (PD)	450	17,7
K ₂	Clearance, drum frame (D)	460	18,1
K ₂	Clearance, drum frame (PD)	460	18,1

Dimensions, top view



	Dimensions	mm	in
B	Width, standard equipped roller	2400	94
O_1	Overhang, left frame side	115	4,5
O_2	Overhang, right frame side	135	5,3
R_1	Turn radius, external	5400	213
R_2	Turn radius, internal	3200	126
W_1	Width, tractor module	2130	84
W_2	Width, drum	2130	84

Technical specifications - Weights and volumes**Weights**

Service weight with ROPS (EN500) (D)	18300 kg	40,352 lbs
Service weight with ROPS (EN500) (PD)	18500 kg	40,793 lbs
Service weight without ROPS (D)	17800 kg	39,250 lbs
Service weight without ROPS (PD)	18000 kg	39,690 lbs
Service weight with cab (D)	18300 kg	40,352 lbs
Service weight with cab (PD)	18500 kg	40,793 lbs

Fluid volumes

Fuel tank	320 liters	84.5 gal
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Technical specifications - Working capacity**Compaction data**

Static linear load (D)	57,3 kg/cm	321,0 pli
Static linear load (PD)	- -	- -
Amplitude, high (D)	1,8 mm	0,071 in
Amplitude, high (PD)	1,7 mm	0,067 in
Amplitude, low (D)	1,1 mm	0,043 in
Amplitude, low (PD)	1,0 mm	0,039 in
Vibration frequency, high amplitude	29 Hz	1740 vpm
Vibration frequency, low amplitude	33 Hz	1980 vpm
Centrifugal force, high amplitude (D)	300 kN	67443 lb
Centrifugal force, high amplitude (PD)	300 kN	67443 lb
Centrifugal force, low amplitude (D)	238 kN	53504 lb
Centrifugal force, low amplitude (PD)	238 kN	53504 lb

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

Technical specifications - General

Engine

Manufacturer/Model	Cummins 6 BTA 5.9C	Water cooled turbo diesel with after cooler
Power (SAE J1995)	129 kW	175 hp
Engine speed	2200 rpm	
Fuel tank capacity	320 liters	

Electrical system

Battery	12V 170Ah
Alternator	12V 105A
Fuses	See the Electrical system section - fuses

Tire

Std-type	23.1 x 26.0 8 Ply, 600/60-30.5	110 kPa (1.1 kp/cm) (16 psi)
Air pressure	110 kPa (1.1 kp/cm ²)	180 kPa (1.8 kp/cm) (26 psi)



The tires can be optionally filled with fluid (extra weight up to 700 kg/tire) (1,543 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	37,5
Control systems	18,0
Brake release	1,4

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



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

ROPS - bolts

Bolt dimensions :	M20 (PN 4700500226)
Strength class :	8.8
Tightening torque :	330 Nm (Dacromet treated)

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.

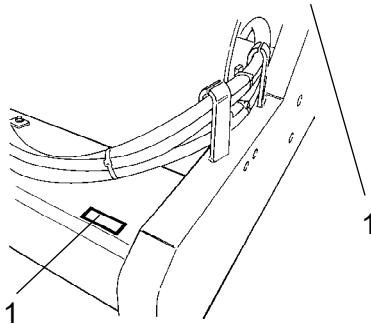


Fig. Front frame
1. PIN

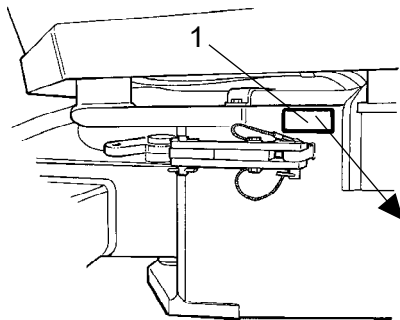


Fig. Operator platform
1. Machine plate

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 manufacturer's name and address, the type of machine, the PIN product identification number (serial number), service weight, engine power and year of manufacture. (If the machine is delivered outside the EU there are no CE markings, and on some machines the year of manufacture may not be specified.)

DYNAPAC			
Dynamac Compaction Equipment AB Box 504, SE-371 23 Karlavagnen Sweden			
Product Identification Number			
Designation	Type	Rated Power	Max axle load front / rear
		110	kg
Gross machinery mass	Operating mass	Max ballast	Year of Mfg
82	kg	kg	03
Made in Sweden 8011 0001 01			

Please state the machine's PIN when ordering spares.

Explanation of 17PIN serial number

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

A= Manufacturer

B= Family/Model

C= Check letter

D= No coding

E= Production unit

F= Serial number

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.

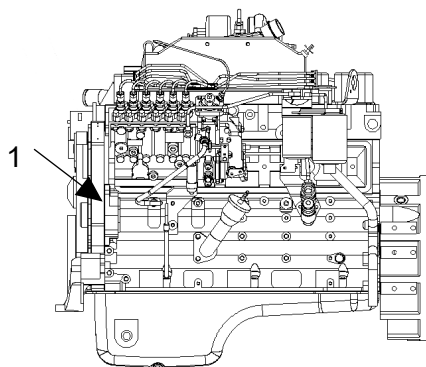


Fig. Engine
1. Type plate

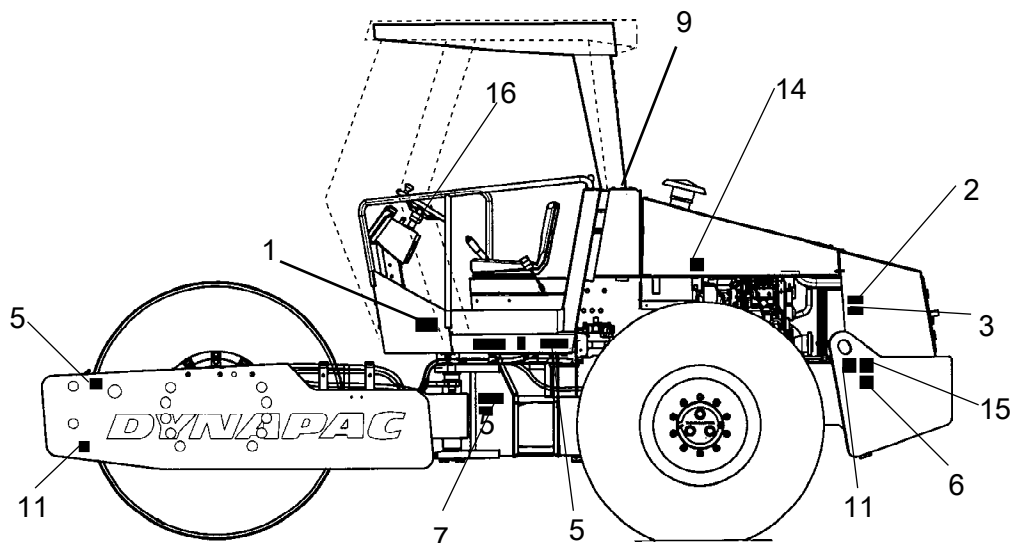
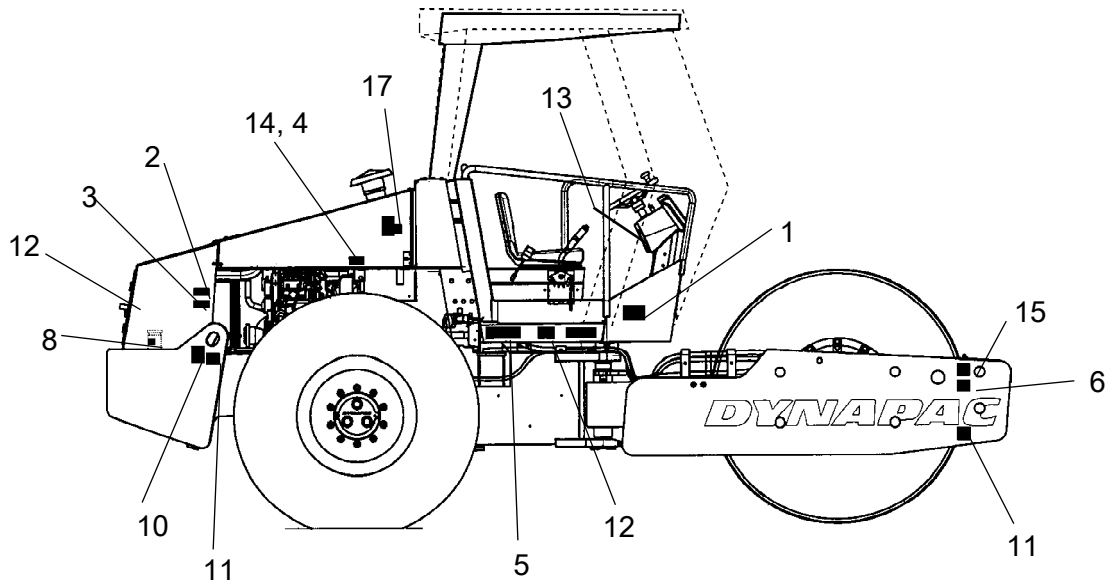
C	Cummins Engine Company, Inc. Columbus, Indiana 47202-3005	CID/L	359/5,9	CPL	2063	Engine Serial No	FEL	EPA			
		Family					XCEXL0359ABA	Cust. Spec.	376983	NOx	
		e					11*97/68AA*00/000*0011*00	Engine Model	B5.9-C	PM	
		Valve lash inch					.010 Int.	.020 Exh.	Timing-TDC	0.2	
		cold					NM	.254 Int.	.508 Exh.	Fuel rate at rated HP/KW	93 mm3/s
		Firing Order					1-5-3-6-2-4			FR91089	Low idle RPM 800-1100
		Rated HP/KW					173/129			at 2200 RPM	

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	4700903422	7. Product sign		13. Handbook compartment	4700903425
2. Warning, Rotating engine components	4700903423	8. Diesel fuel	4700991658	14. Tire pressure	4700385080
3. Warning, Hot surfaces	4700903424	9. Hydraulic fluid/Biohydraulic fluid	4700272372 / 4700904601	15. Hoisting plate	4700904870
4. Warning, Ballasted tire.	4700903985	10. Lifting point	4700588176	16. Warning sign	4700386084xx
5. Warning, Read instructions manual	4700903459	11. Fixing point	4700382751	17. Hydraulic fluid level	4700272373
6. Warning, locking		12. Master switch	4700904835		

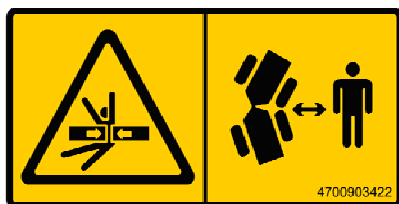
Safety decals

4700903422

Warning - Crush zone, articulation/drum.

Maintain a safe distance from the crush zone.

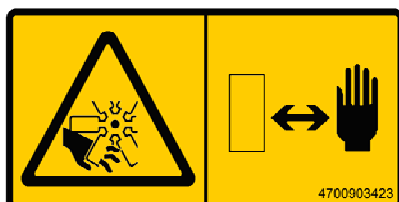
(Two crush zones on machines fitted with pivotal steering)



4700903423

Warning - Rotating engine components.

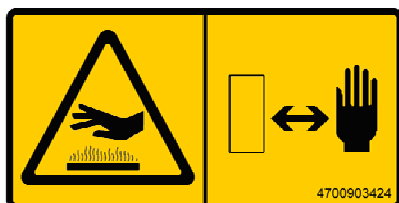
Keep your hands at a safe distance from the danger zone.



4700903424

Warning - Hot surfaces in the engine compartment.

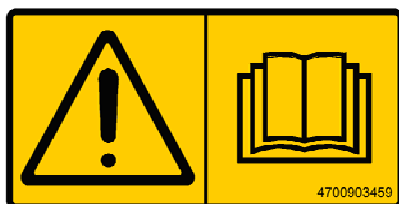
Keep your hands at a safe distance from the danger zone.



4700903459

Warning - Instruction manual

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



4700908229

Warning - Risk of crushing

The articulation must be locked when lifting.

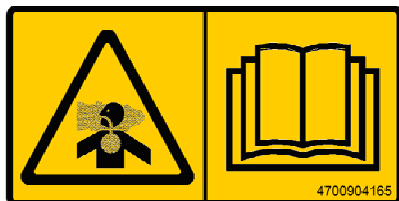
Read the instruction manual.



4700904165

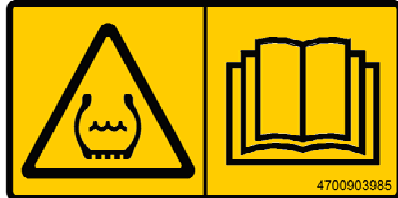
Warning - Toxic gas (option, ACC)

Read the instruction manual.





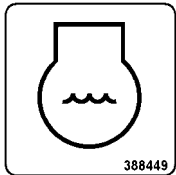
4700903590
-Emergency exit



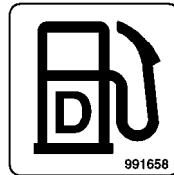
4700903985
Warning - Ballasted tire.
Read the instruction manual.

Info decals

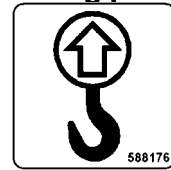
Coolant



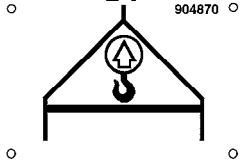
Diesel fuel



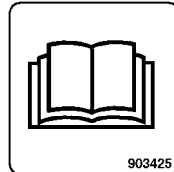
Lifting point



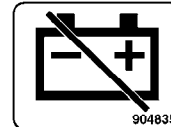
Hoisting plate



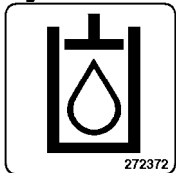
Handbook compartment



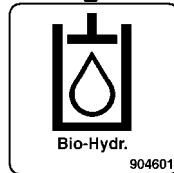
Master switch



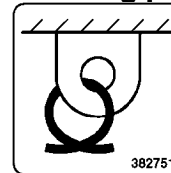
Hydraulic fluid



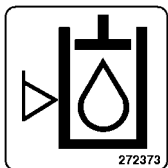
Biological hydraulic fluid



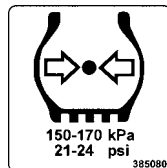
Securing point



Hydraulic fluid level



Tire pressure

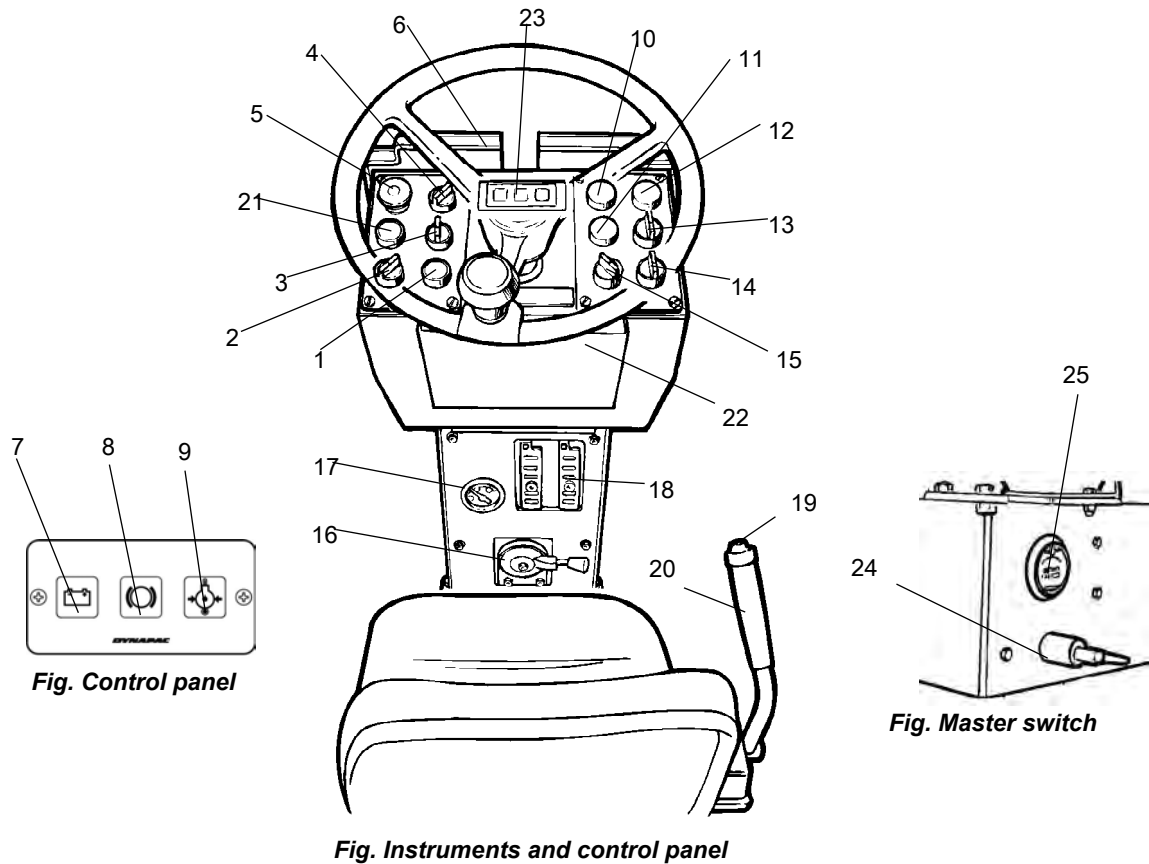


**Sound power level
LN version**




















Machine description - Instruments/Controls

Locations - Instruments and controls








- | | |
|--|-----------------------------------|
| 1. Horn | 13. Amplitude selector Low/O/High |
| 2. Starter switch | 14. Speed selector, drum |
| 3. Test button, warning lamps, Optional | 15. Speed selector, rear axle |
| 4. Working lights, Optional | 16. Engine RPM control |
| 5. Reserve/parking brake knob | 17. Fuel gauge |
| 6. Instrument cover | 18. Fuse box |
| 7. Warning lamp, charging | 19. Vibration ON/OFF |
| 8. Brake warning lamp | 20. Forward/Reverse lever |
| 9. Warning lamp, Engine - oil pressure/temperature | 21. Test button, warning lamps |
| 10. Warning lamp, hydraulic fluid filter | 22. Handbook compartment |
| 11. Warning lamp, air filter | 23. See fig. Control panel |
| 12. Warning lamp, hydraulic fluid temperature | 24. Master switch |
| | 25. Hourmeter |

Function descriptions

No	Designation	Symbol	Function
1	Horn, switch		Press to sound the horn.
2	Starter switch	  	The electric circuit is broken. All instruments and electric controls are supplied with power. Starter motor activation.
3	Hazard beacon, switch (Optional)		Turn to the right to switch on the hazard beacon.
4	Working lights (Optional)		Turn to the right to switch on the working lights.
5	Reserve/parking brake knob		Push in to activate the reserve brake. Parking brake is applied if pushed in when machine is stationary. Both brakes are released when knob is pulled out.
6	Instrument cover		Folded over the instruments to protect them against weather and damage.
7	Warning lamp, battery charging		If the lamp comes on while the engine is running, the alternator is not charging. Stop the engine and locate the fault.
8	Brake warning lamp		The lamp come on when the parking or emergency brake knob is depressed and the brakes are applied.
9	Warning lamp, engine oil pressure/temperature		This lamp lights if the engine is too hot or the oil pressure is too low. Stop the engine immediately and locate the fault. Refer also to the engine manual.
10	Warning lamp, hydraulic filter		If the lamp comes on while the diesel engine is running at full speed, the hydraulic fluid filter must be changed. Change when the oil is at normal operating temperature.
11	Warning air filter		If the lamp comes on while the engine is running at full speed, the air filter must be cleaned or replaced.
12	Temperature gauge, hydraulic fluid		Indicates the temperature of the hydraulic fluid. Normal temperature range 65°-80°C (149°-176°F). Stop the diesel engine if the lamp comes on. Locate the fault.
13	Amplitude / Frequency selector, switch	  	The left position gives low amplitude / high frequency. In the central position, amplitude / frequency is switched off. The right position gives high amplitude / low frequency.
14	Speed selector, drum	 	Transport speed (High) Working speed (Low)

Machine description - Instruments/Controls

No	Designation	Symbol	Function
15	Speed selector, rear axle		Transport speed (High)
			Working speed (Low)
16	Engines speed control, engine		In the right position, the engine idles. In the left position, the engine runs at maximum speed.
17	Fuel gauge		Shows level in the fuel tank.
18	Fuse box		Unscrew the cover to access the fuses.
19	Vibration On/Off, switch		Push in and release the switch to engage vibration. Press the switch again to disengage vibration. The above applies only when the amplitude selector (13) is in position High or Low.
20	Forward/Reverse lever		The lever must be in neutral to start the engine. The engine cannot be started if the forward/reverse lever is in any other position. The forward/reverse lever controls both the roller's driving direction and speed. When the lever is moved forward, the roller moves forward. The roller's speed is proportional to the distance the lever is from the neutral position. The further the lever is from the neutral position, the higher the speed.
21	Test button, warning lamps		Press in the switch to check the lamps 10. 11. 12
22	Handbook compartment		Storage space for the roller's safety manual and operator's manual.
23	Control panel		Warning lamps
24	Master switch		In the shut off position, the key can be removed. Turn the key a quarter of a turn clockwise to supply the roller with power.
25	Hourmeter		Registers the number of hours that the engine is operated.

Controls in the cab

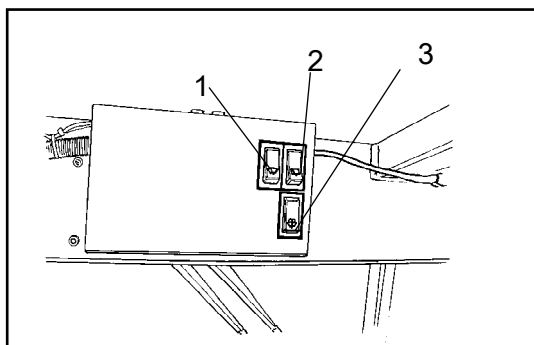


Fig. Cab roof, front

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

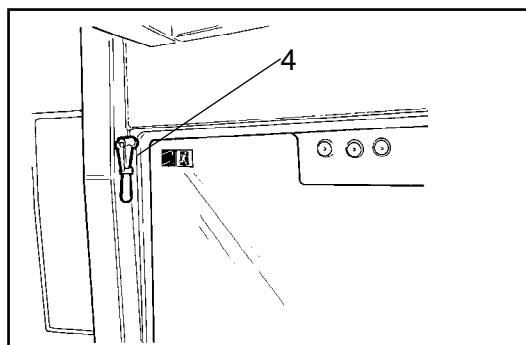


Fig. Cab roof, rear

- 4. Hammer for emergency escape

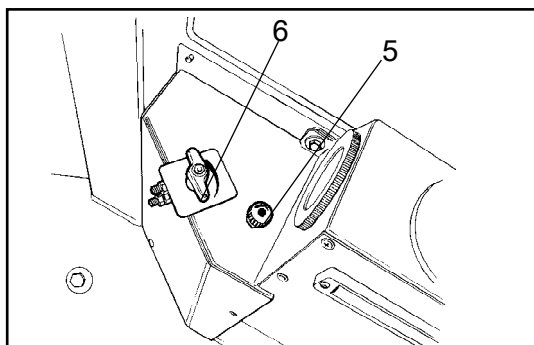


Fig. Cab right side (optional AC)

- 5. Heater control
- 6. Switch, Ventilation fan

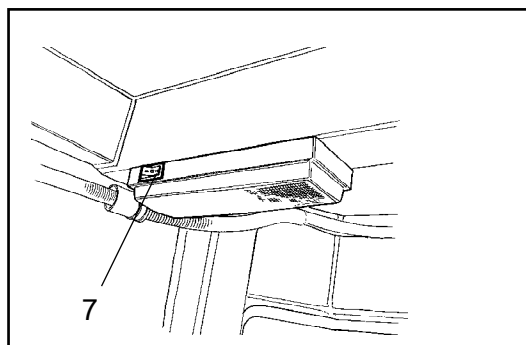


Fig. Cab, rear

- 7. Switch, cab lighting

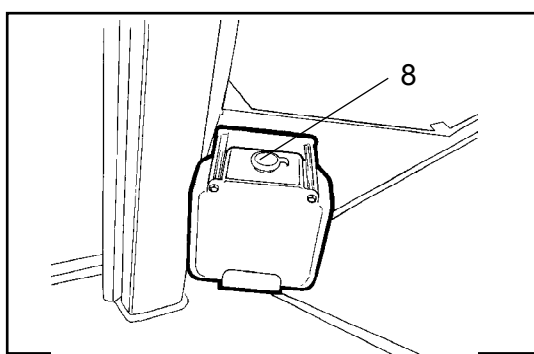


Fig. Cab left side

- 8. Screenwash bottle

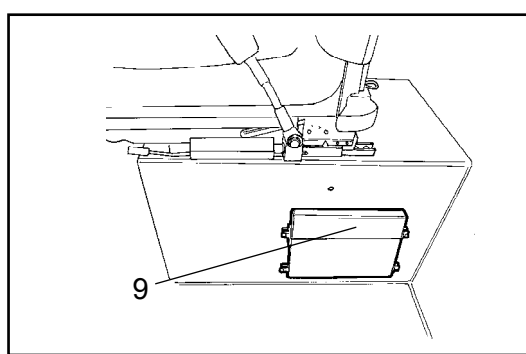




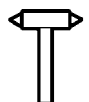






Fig. Cab left side

- 9. Hand book 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		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	Heater control (Optional)		In the left position, maximum heating. In the right position, the heating is OFF.
6	Ventilation fan, switch (Optional)		In the left position, the fan is OFF. To the right, the fan has three levels.
7	Cab lighting, switch		Push in to turn on cab lighting
8	Screenwash bottle		Fill with screenwash as required.
9	Handbook compartment		Stowage space for safety manual and instruction manuals.

Machine description - Electrical system

Fuses and relays

The electrical regulating and control system is protected against overload by fuses and relays. The number of fuses and relays is dependent on how much extra equipment the machine in question has.

The fuse boxes and relays are located behind the column cover on the lower part of the instrument column, as illustrated. The cover for the fuses is removed with 2 screws (1). To access the relays, open the entire cover by unscrewing the screws (2) according to fig.

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



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

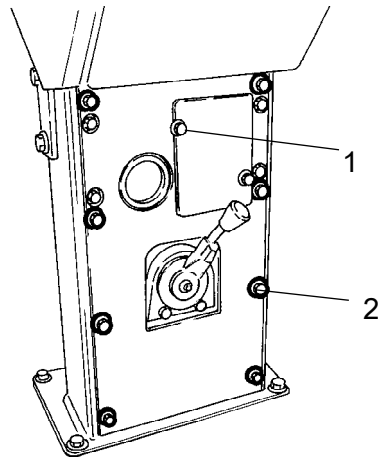


Fig. Instrument column
1. Screws for fusebox cover (2)
2. Screws for column cover (12)

Location, fuses and relays

The figure shows the position of the different relays in the machine.

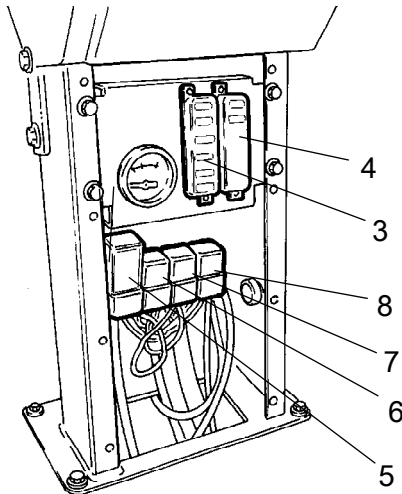


Fig. Instrument panel with fuses and relays.

- 3. Fuse box, left side
- 4. Fuse box, right side
- 5. VBS relay
- 6. Main relay
- 7. Hourmeter
- 8. Light relay, optional

Fuses

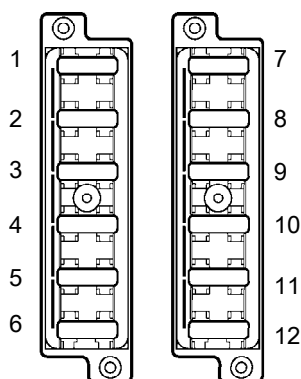


Fig. Fuse box, left and right side.

The figure shows the position of the fuses.

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

Fuse boxes, left side

1. Hourmeter	7.5A
2. VBS relay	7.5A
3. Warning lamp	7.5A
4. Horn, Fuel gauge	7.5A
5.	
6. Front wiper, cab (Optional)	10A

Fuse boxes, right side

7. High/Low gear (Optional)	7.5A
8. Compaction meter (Optional)	3A
9. Hazard beacon (Optional)	7.5A
10. Reversing alarm (Optional)	3A
11. Working lights (Optional)	20A
12. Working lights (Optional)	20A

Main fuses

Undo the screws (2) to remove the cover (1) on the Master switch/fuse box, in order to access main fuses and relays.

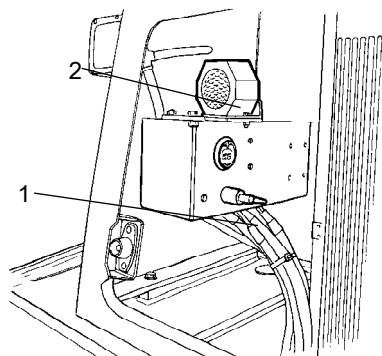


Fig. Master switch/fuse box in engine compartment.

- 1. Cover
- 2. Screw

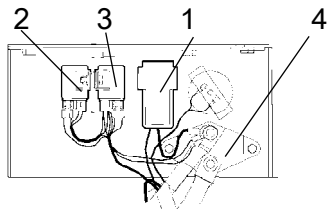


Fig. Master switch

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

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 hourmeter (2) records the number of hours the engine has been running.

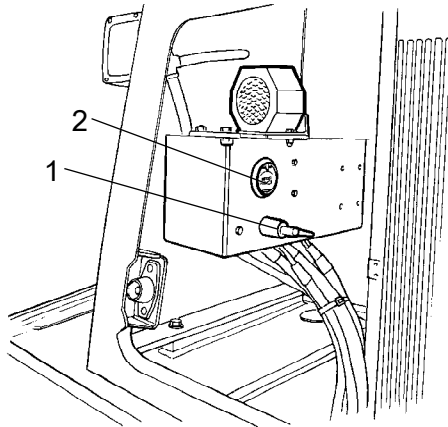


Fig. Engine compartment
1. Master switch
2. Hourmeter



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

Driver seat (Std.) - Adjustment

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

The seat can be adjusted lengthways (1).

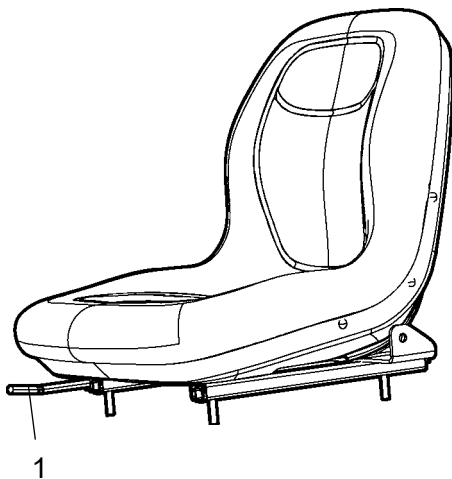


Fig. Operator's seat
1. Length adjustment

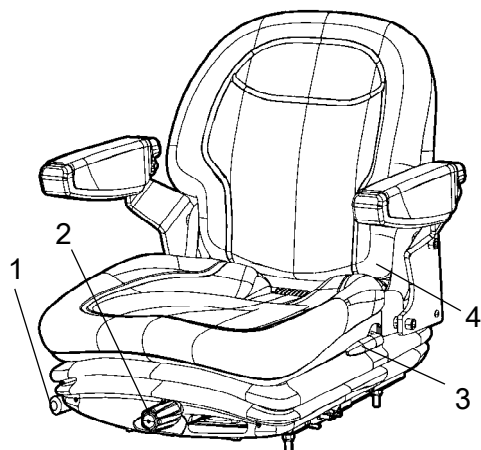


Fig. Driver seat
1. Lock lever - Length adjustment
2. Weight adjustment
3. Back support angle
4. Seat belt

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

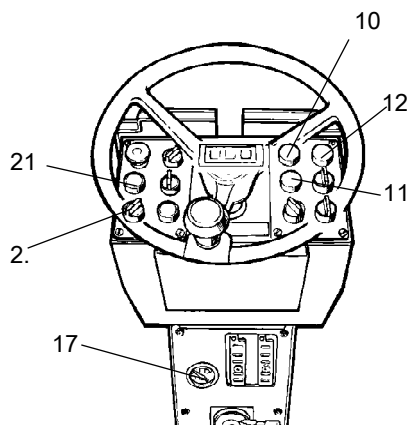


Fig. Instrument panel
2. Starter switch
10. Warning lamp, hydraulic fluid filter
11. Warning lamp, air filter
12. Warning lamp, hydraulic fluid temperature
17. Fuel gauge
21. Test button, warning lamp

Turn the starter switch (2) to position I. Push in the test button (21) and check that all the control lamps come on.

Check that the fuel gauge (17) gives a reading.

Check that the warning lamps for charging (7), oil pressure (9) and the parking brake (8) come on.

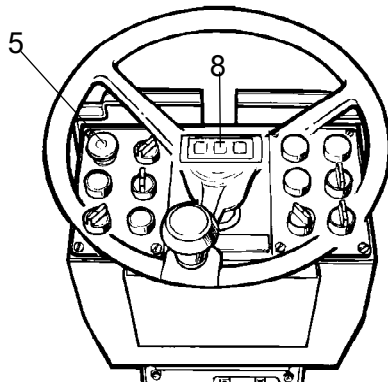


Fig. Control panel
5. Emergency/Parking brake knob
8. Warning lamp, brake system

Parking brake - Check



Make sure that the emergency/parking brake knob (5) really is in the depressed position and that the warning lamp for the brake system (8) is on. The roller can start to roll when the engine is started on sloping ground, if the emergency/parking brake is not applied.

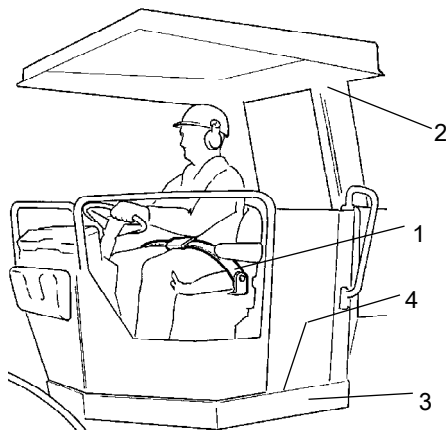


Fig. Operator's station
1. Seat belt
2. ROPS
3. Rubber element
4. Anti-slip

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.

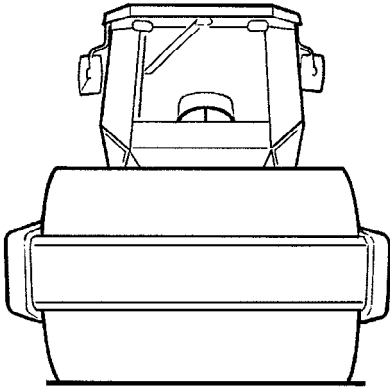


Fig. view

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

Starting the engine

Set the forward/reverse lever (20) in neutral. The engine can only be started when the lever is in neutral.

Set the amplitude selector (13) for Low/High vibration to position O.

Set the engine speed control (16) to the idling mode.

Turn the starter switch (2) to the right to position I. Then activate the starter motor by turning one position further.



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

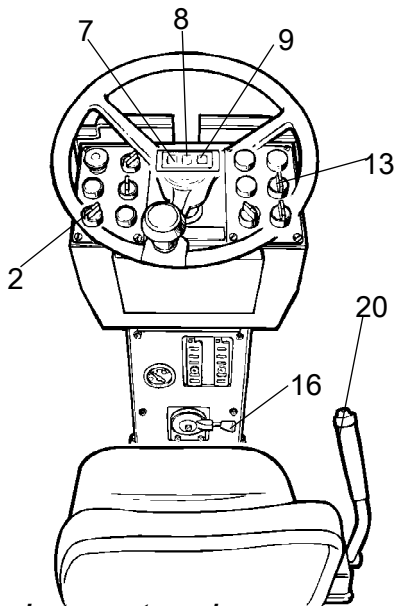


Fig. Instrument panel

- 2. Starter switch
- 7. Charging lamp
- 8. Brake warning lamp
- 9. Oil pressure/temperature lamp
- 13. Amplitude selector
- 16. Speed control
- 20. Forward/reverse lever

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

While the engine is warming up, check that the warning lamps for oil pressure (9) and charging (7) are turned off. The warning lamp (8) for the reserve/parking brake should still be lit.



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



When starting up and driving a cold machine, which implies cold hydraulic fluid, the braking distance will be longer than normal until the machine reaches working temperature.

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.

Turn the engine speed control (16) and lock it in its limit position; the engine speed should now be approximately 2300 rpm. The speed when idling should be approximately 900 rpm.

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.



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



Pull up the reserve/parking brake knob (5) and check that the parking brake warning lamp is off. Be prepared that the roller may begin to roll.

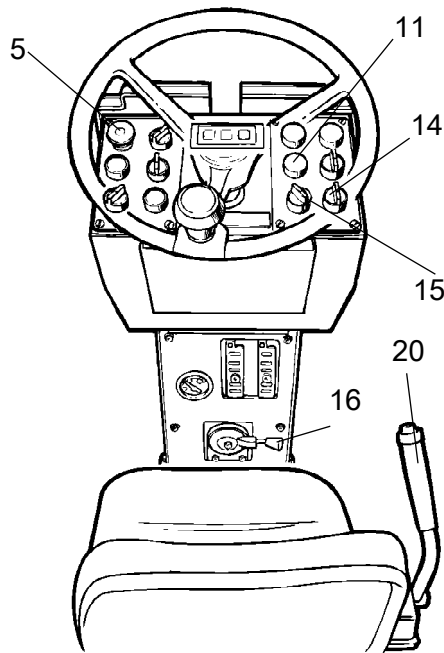


Fig. Instrument panel

- 5. Reserve/parking brake knob**
- 11. Warning lamp, air filter**
- 14. Speed selector, drum**
- 15. Speed selector, rear axle**
- 16. Engine speed control**
- 20. Forward/reverse lever**

Set the High/Low speed selectors (14) and (15) to the desired mode, see decal on the instrument panel.

Max. speed/hour

Low drum/Low rear axle	4 km/h
High drum/Low rear axle	5 km/h
Low drum/High rear axle	6 km/h
High drum/High rear axle	11 km/h



The High/High mode may only be used for transport runs on an even 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.

Carefully move the forward/reverse lever (20) forwards or backwards, depending on which direction of travel is required. Speed increases as the lever is moved away from the neutral position.



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



Test the reserve brake by pressing the reserve/parking brake knob (5) while the roller is running slowly forward.

Check while driving that the gauges show normal readings. If the oil pressure lamp comes on or if the buzzer sounds, immediately stop the roller and turn off the diesel engine. Check and remedy any fault; see also the chapter on maintenance and the engine manual.



If the warning lamp for the air filter (11) comes on during operation (when the diesel engine is running at full speed), the main filter must be cleaned or replaced. See the Maintenance Manual.

Operation - Vibration

Amplitude/frequency - Changeover

There are two settings for the drum vibration, use the switch (13) to select.

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



The amplitude setting must not be changed when vibration is in operation. Switch the vibration off (19) and wait until vibration stops before adjusting the amplitude.

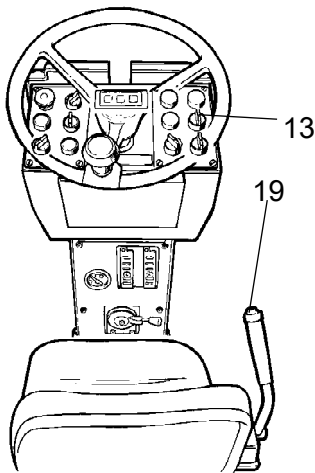


Fig. Instrument panel
13. Amplitude selector
19. Vibration On/Off

Engagement and disengagement of the vibration is made with the switch (19) on the top of the forward/reverse lever.

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



Vibration should not be active when the roller is stationary. This can damage both the surface and the machine.

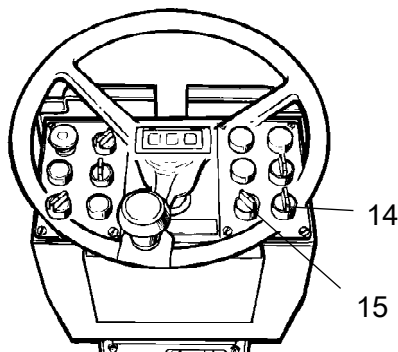


Fig. Instrument panel
14. Speed selector, drum
15. Speed selector, rear axle

Driving on difficult surfaces

If the machine becomes stuck and is equipped with two-speed drum drive, set the drive knobs as described below

- If the drum spins, turn the drum drive to high and the rear axle to low.

- If the tires spin, turn the drum drive to low and the rear axle to high.

When the machine has regained grip, set the knobs to their original position.

Operating - Stopping

Braking

Emergency brake

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

There are also disc brakes in the drum motor and the rear axle that act as an emergency brake when in motion and as a parking brake when stationary.



To perform emergency braking, press the reserve/parking brake knob (5), hold the steering wheel firmly and be prepared for a sudden stop.

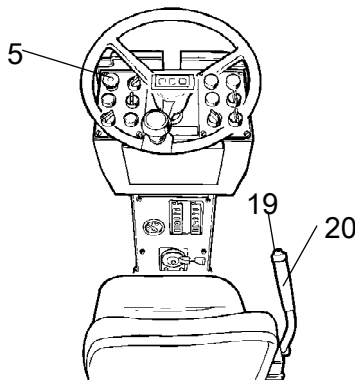


Fig. Control panel
5. Reserve/parking brake knob
19. Switch, vibration On/Off.
20. Forward/reverse lever

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

Normal braking

Press the switch (19) to switch off the vibration.

Move the forward/reverse lever (20) to the neutral position to stop the roller.



Always press the reserve/parking brake knob (5) even for brief stops when on sloping ground.

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



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

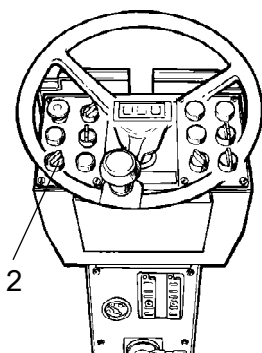


Fig. Instrument panel
2. Starter switch

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 (2) to the left to the off position O. Lower the instrument cover (on rollers without cab) and lock it.

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.

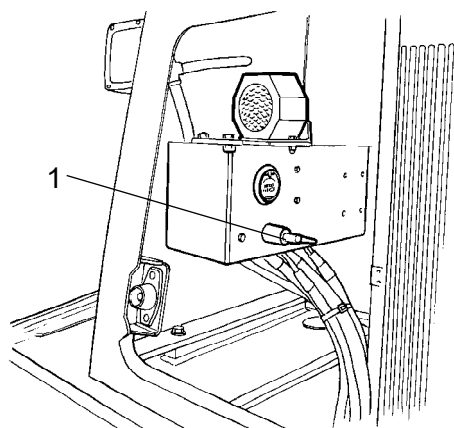


Fig. Engine compartment
1. Master switch

Chocking the drums



Never disembark from the machine when the is engine 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.

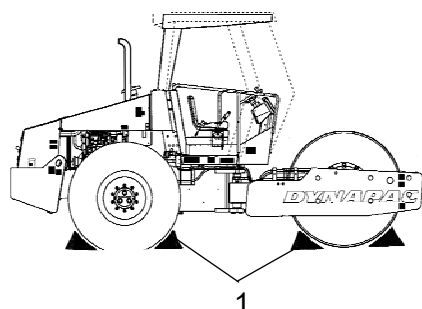


Fig. Arrangement
1. Chock



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).

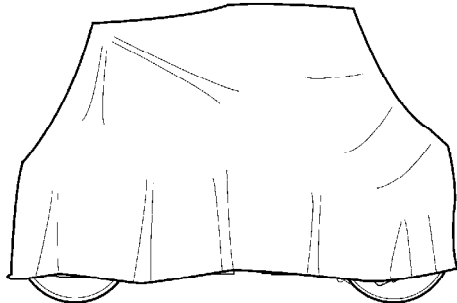


Fig. Roller weather protection

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 outside, check that the electrolyte level is correct (see under the heading "Every 250 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 steering joint bearings and both bearings on the steering cylinder with grease (see under the heading 'Every 50 hours of operation').

Grease the steering cylinder piston with conservation grease.

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

Tires (All-weather)

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

Hoods, tarpaulin

* Lower the instrument cover over the instrument panel.

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

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

Miscellaneous

Lifting

Locking the articulation



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

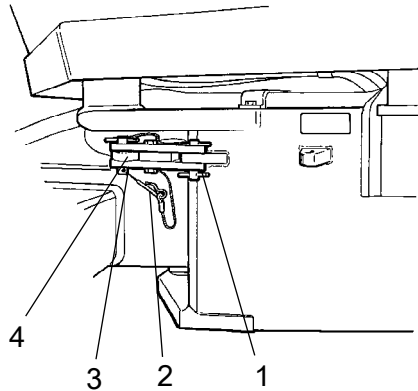


Fig. Articulation in the locked position

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

Weight: refer to the hoisting plate on the roller

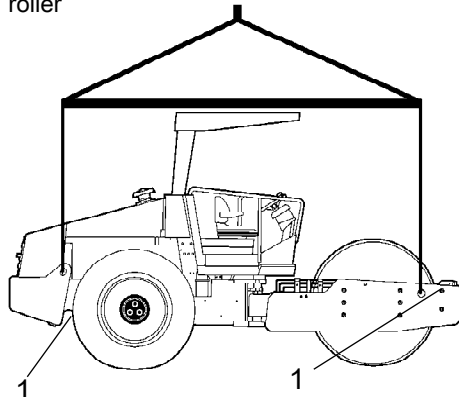


Fig. Roller prepared for lifting
1. Hoisting plate

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.

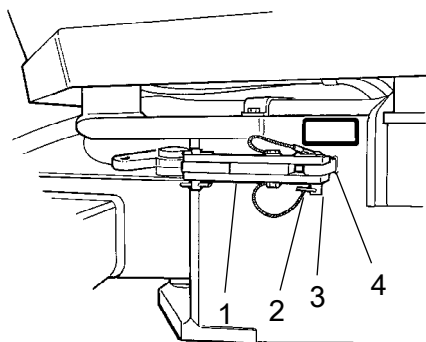


Fig. Articulation in the open position

- 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

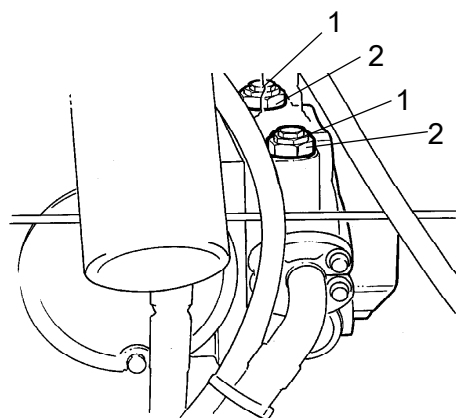


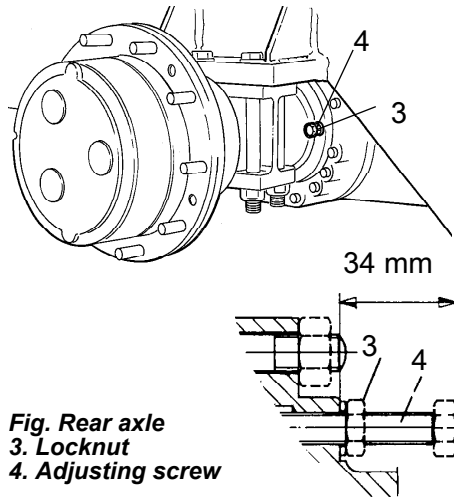
Fig. Propulsion pump

- 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.



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.

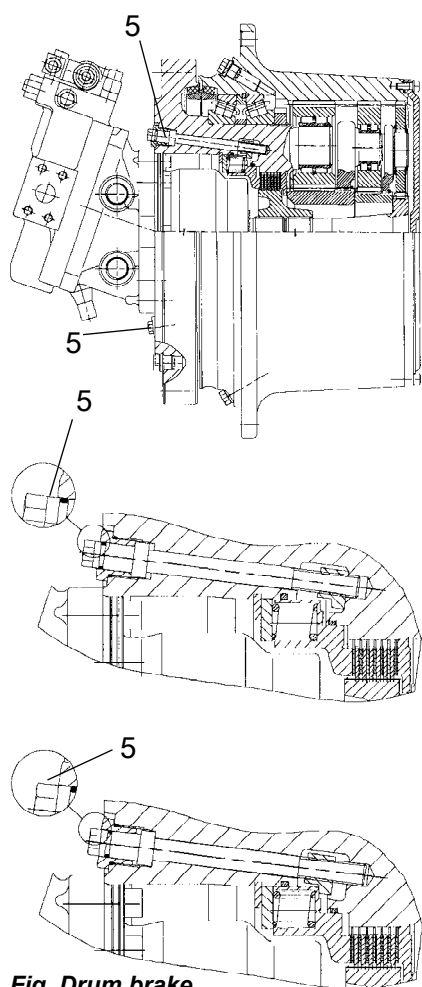


Fig. Drum brake
5. Screw

Drum gearbox brake

Disengage the drum brake by screwing in the two screws (5) until they stop.

Screw in each screw equally, alternating between the two. This is necessary to prevent jamming the brake piston.

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



After towing, don't forget to reset the towing valves (1). Screw out the adjustment screw (4) to its original position 34 mm from the stop surface, and tighten the locking nuts (3). Loosen the drum brake screws (5). See the section "Short distance towing" options 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).

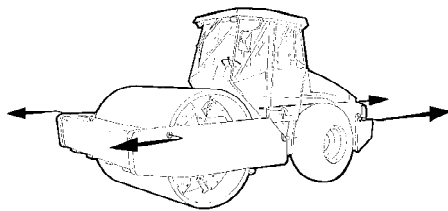


Fig. Towing

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 illustrated. Maximum gross pulling force 240 kN (53954 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.

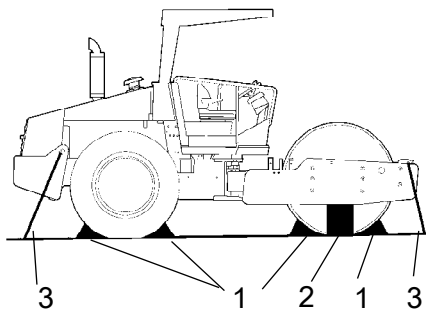


Fig. Transport
1. Chock
2. Block up
3. Lashing wire

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	12,5 liter	13,2 qts
- Planetary gear	1,85 liters/side	1,95 qts/side
Drum gearbox	3,5 liter	3,7 qts
Drum cartridge	2,3 liters/side	2,1 qts
Hydraulic reservoir	52 liters	13,7 gal
Oil in hydraulic system	38 liters	10 gal
Lubrication oil, diesel engine	14 liter	14,7 qts
Coolant, diesel engine	34 liter	8,9 gal











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
















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

Maintenance - Lubricants and symbols

DYNAPAC

	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 - +50°C (5°F-122°F)	Shell Tellus S2 V68 or equivalent.	
		Air temperature over +50°C (122°F)	Shell Tellus S2 V100 or equivalent.	
	BIOLOGICAL HYDRAULIC FLUID, Bio-Hydr. PANOLIN	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.	PANOLIN HLP Synth 46 (www.panolin.com)	
	BIOLOGICAL HYDRAULIC FLUID	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.	BP Biohyd SE-S46	
	DRUM OIL	Air temp. -15°C - +40°C (5°F-104°F)	Mobil SHC 629	Dynapac Drum Oil 1000 , P/N 4812156456 (5 litres)
	GREASE		SKF LGHB2 (NLGI-Klass 2) or equivalent for the articulated joint.	Dynapac Roller Grease (0.4kg), P/N 4812030096
			Shell Retinax LX2 or equivalent for other grease points.	
	FUEL	See engine manual.	-	-
	TRANSMISSION OIL	Air temperature -15°C - +40°C (5°F-104°F)	Shell Spirax S3 AX 80W/90, API GL-5 or equivalent	Dynapac Gear oil 300 , P/N 4812030756 (5 litres), P/N 4812030117 (20 litres), P/N 4812031574 (209 litres)
		Air temperature 0°C (32°F) - above +40°C (104°F)	Shell Spirax AX 85W/140, API GL-5 or equivalent.	
	COOLANT	Anti-freeze protection down to about -37°C (-34.6°F)	GlycoShell/Carcoolant 774C or equivalent, (mixed 50/50 with water)	

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

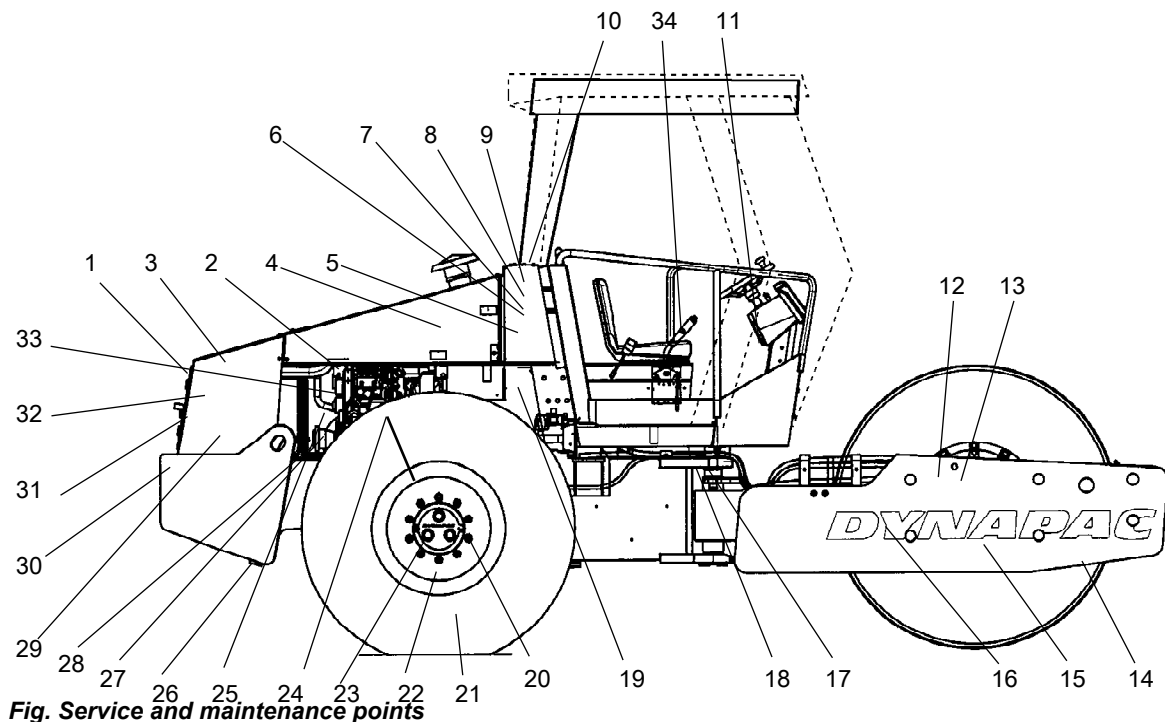


Fig. Service and maintenance points

- | | | |
|-------------------------------------|--|--|
| 1. Radiator grille | 13. Drum gearbox | 25. Oil filter, diesel engine |
| 2. Oil level, diesel engine | 14. Scrapers | 26. Drainage, fuel tank |
| 3. Fuel filter, fuel pre-filter | 15. Drum cartridge oil, level plug, x2 | 27. Diesel engine mountings, x4 |
| 4. Air filter | 16. Rubber elements and fastening screws | 28. Supply pump, fuel |
| 5. Engine hood, hinge | 17. Steering hitch | 29. Diesel engine, filling |
| 6. Hydraulic reservoir, sight glass | 18. Steering cylinders, x2 | 30. Battery |
| 7. Bleeder filter | 19. Flywheel cover, hydraulic pumps | 31. Radiator |
| 8. Hydraulic fluid filter, x1 | 20. Wheel nuts | 32. Hydraulic fluid cooler |
| 9. Drainage, hydraulic reservoir | 21. Tires, air pressure | 33. Driving belts, cooling, alternator |
| 10. Hydraulic fluid, filling | 22. Rear axle, differential | 34. Forward/reverse lever |
| 11. Fuse box | 23. Rear axle, planetary gears, | |
| 12. Drum oil, filling, x2 | 24. Rear axle mounting, 2 sides | |

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.



Where both operational hours and time intervals are specified, maintenance should be carried out at the point in time that occurs first.

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	
14	Check the scraper setting	
1	Check for free circulation of cooling air	
31	Check coolant level	Refer to the engine manual
2	Check the engine oil level	Refer to the engine manual
29	Refuel	
6	Check fluid level in hydraulic reservoir	
	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	
12	Change the drum oil	

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
17	Lubricate the articulation	
18	Lubricate the steering cylinder mounts	
20	Check the wheel-nuts are tightened	
21	Check the tire pressure	

Every 250 hours of operation (Monthly)

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

Pos. in fig	Action	Comment
23	Check oil level in rear axle/planetary gearing	
2	Change the diesel engine oil	Refer to the engine manual
25	Change the engine oil filter	Refer to the engine manual
13	Check oil level in drum gearbox	
15	Check oil level in the drum cartridge	
32	Clean the coolers	
20	Check the bolted joints	The above applies to new or reconditioned components only
24	Check the bolted joints	The above applies to new or reconditioned components only
16	Check rubber elements and bolted joints	
30	Check battery	

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
3	Replace the fuel filter.	Refer to the engine manual
3	Clean/Replace fuel pre-filter	Refer to the engine manual
7	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
8	Change the hydraulic fluid filter	
9	Drain the condensate from hydraulic reservoir	
26	Drain condensate from fuel tank	
22	Change oil in rear axle differential	
23	Change oil in the rear axle planetary gearing	
	Check engine valve clearances	Refer to the engine manual
33	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
9, 10	Change the hydraulic fluid	
12	Change the oil in the drum cartridge	
13	Change the oil in the drum gearbox	
37	Lubricate the Forward/Reverse lever	

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.

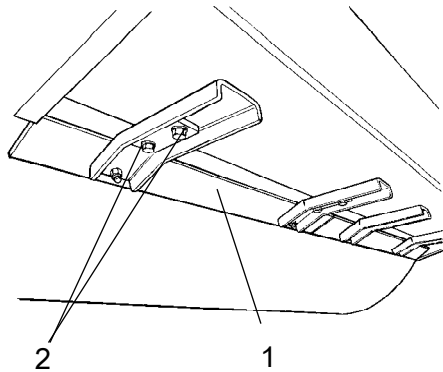


Fig. Scrapers
1. Scraper blades (x4)
2. Screws

If necessary, adjust distance to the drum as follows:

Loosen 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).

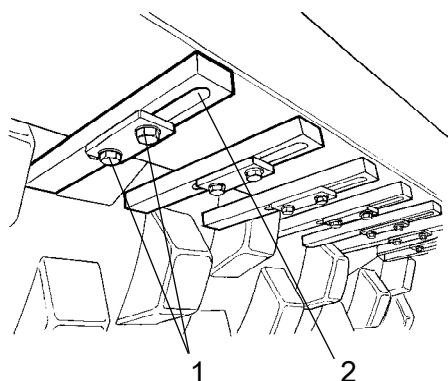


Fig. Scrapers
1. Screws
2. Scraper teeth (x18)

Scrapers, Pad-drum

Loosen the screws (1), then adjust each scraper tooth (2) to 20 mm between scraper tooth and drum.

Center each scraper tooth (2) between the pads.

Tighten the screws (1).

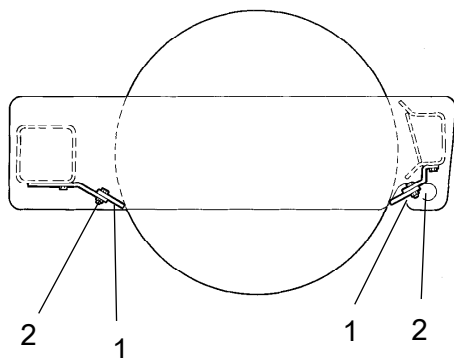


Fig. Scrapers
1. Scraper blade
2. Screws

Soften scrapers (Optional)

Loosen the screws (2).

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

Tighten the screws (2).

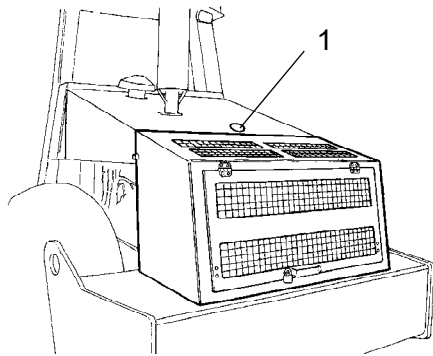


Fig. Cooler grille
1. Filler cap, coolant

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.



Coolant level - Check

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



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

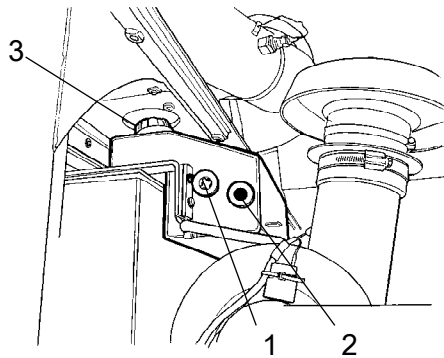


Fig. Water tank
1. Max. level
2. Min. level
3. Filler cap

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



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

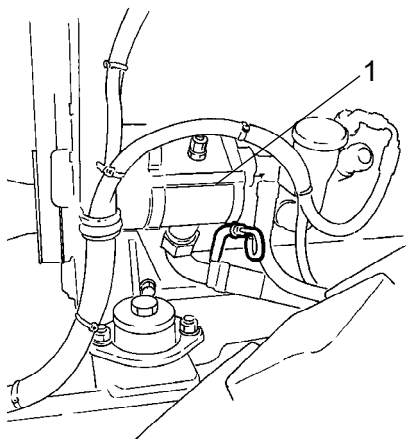


Fig. Engine, right side
1. Oil dipstick

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.

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

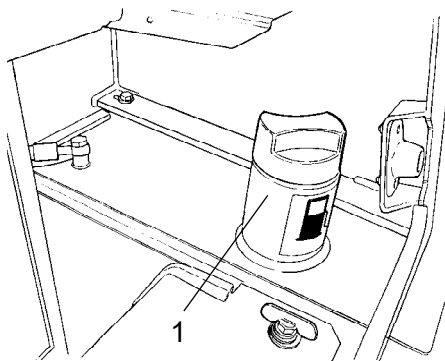


Fig. Filling with fuel
1. Filler pipe



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 320 liters of fuel.



Hydraulic reservoir - Check fluid level

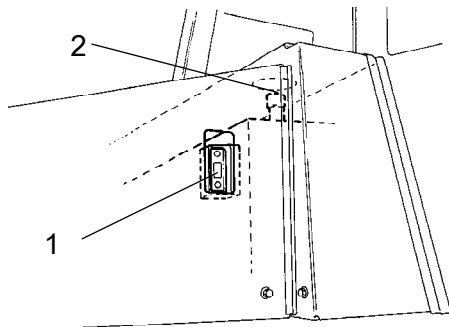


Fig. Sight glass hydraulic reservoir
1. Sight glass

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

Place the roller 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.



Brakes - Check



Check the brakes by carrying out the following :

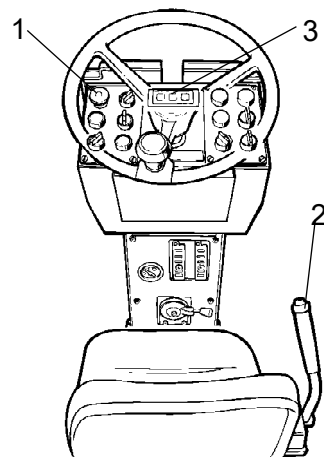


Fig. Control panel
1. Emergency/parking brake knob
2. Forward/Reverse lever
3. Brake warning lamp

Drive the roller **slowly** forwards.

Depress the emergency/parking brake knob (1). The warning lamp (3) on the instrument panel should come on and the roller should stop.

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

Pull up the emergency/parking brake knob.

The roller is now ready for operation.

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.

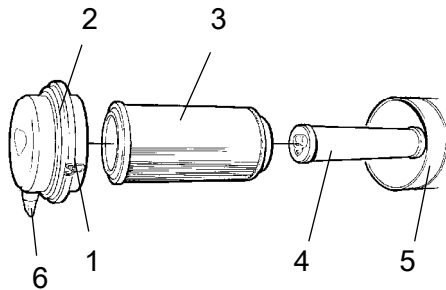


Fig. Air cleaner

- 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.

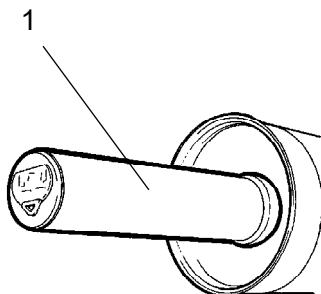


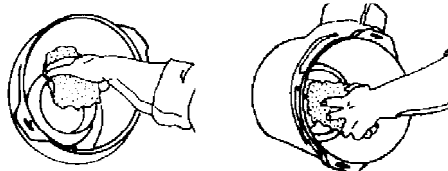
Fig. Air filter
1. Backup filter



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.

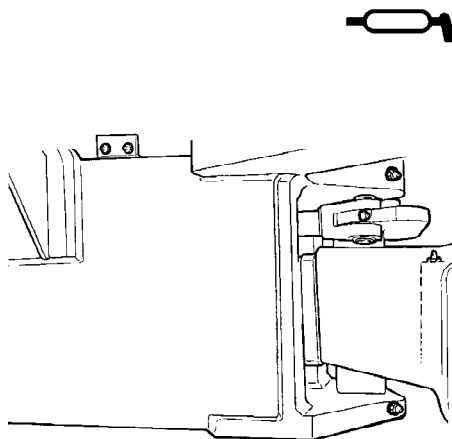


Fig. Steering hitch right side

Steering joint/steering cylinder - Lubrication



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

Turn the steering wheel fully to the left to gain access to all the steering system's lubricating nipples (7) on the right-hand side of the machine.



Use grease as per the lubricant specification

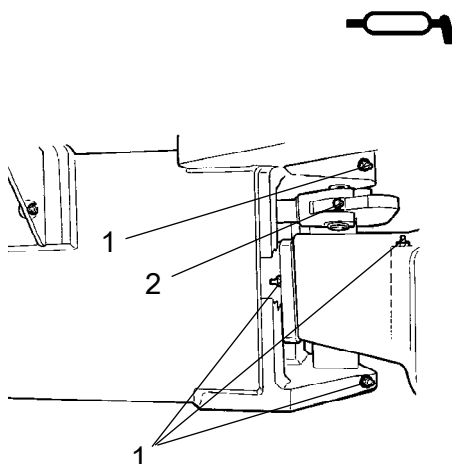


Fig. Steering hitch right side
1. Lubricating nipples articulation (x4)
2. Lubricating nipple cylinder mount (x1)

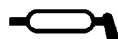
Steering joint - Lubrication

Wipe off any dirt and grease from the nipples.

Lubricate each nipple (1 and 2) with five strokes of a manual 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.



Steering cylinder - Lubrication

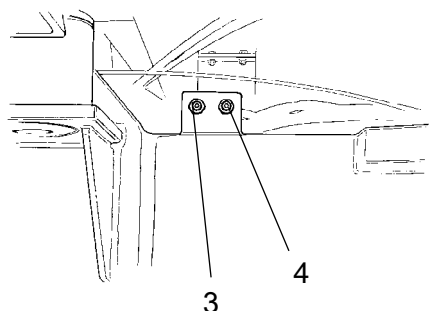


Fig. Steering cylinder right side
3. Lubricating nipple right rear cylinder mount (x1)
4. Lubricating nipple left rear steering cylinder (x1)

Wipe off any dirt and grease from the nipples.

Lubricate the nipples (3 and 4) with two strokes of a manual grease gun.

Turn the steering wheel fully to the right to gain access to the front lubricating nipple on the left steering cylinder and the lubricating nipple on the bearing cap.

Allow some grease to remain on the nipples after lubrication. This prevents dirt from penetrating into the nipples.



Tires - Air pressure - Wheel nuts - Tightening

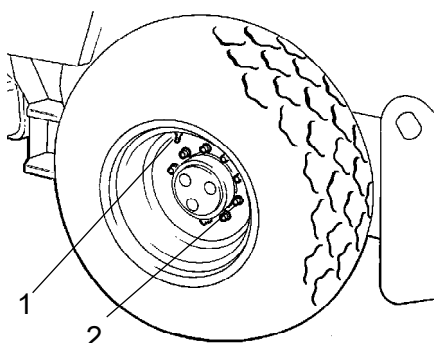


Fig. Wheels
1. Air valve
2. Wheel nut

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.

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.

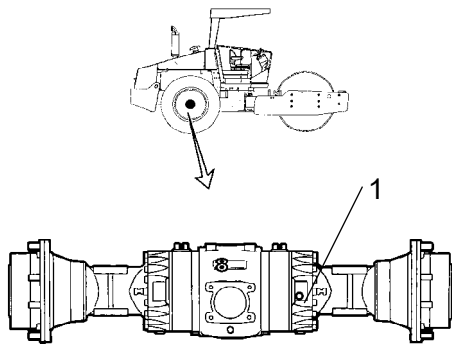


Fig. Level check - differential housing
1. Level/Filler plug

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

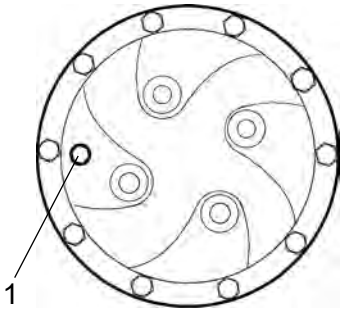


Fig. Level check - planetary gear
1. Level/Filler plug

Position the roller so that the level plug (1) in the planetary gear is at "9 o'clock" or "3 o'clock".

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.



Diesel engine - Oil and Filter change



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

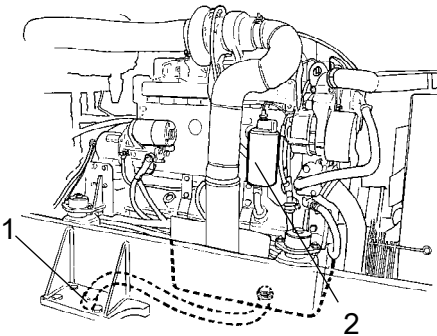


Fig. Engine, left side
1. Drainage plug
2. Oil filter

The oil plug (1) is most easily accessible from the underside of the engine, and is fitted with a hose on the tractor frame. Drain the oil when the engine is warm. Place a receptacle that holds 15 liters (4 gal) under the drain plug.

Change the engine oil filter at the same time. Refer to the engine manual.



Deliver the drained oil and filter to environmentally correct handling.



Drum gearbox - Checking the oil level

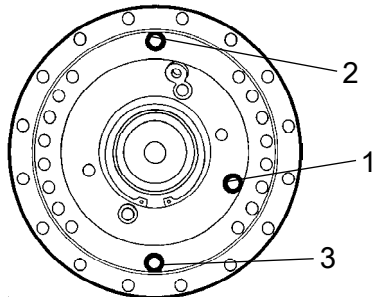


Fig. Oil level check - drum gearbox
1. Level plug
2. Filler plug
3. Drain plug

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 cartridge - Checking the oil level

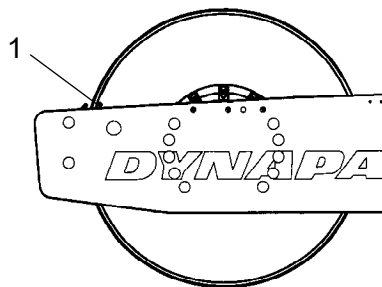


Fig. Left drum side
1. Indicator pin

Position the machine level so that the indicator pin (1) on the inside of the drum is aligned with the top of the drum frame.

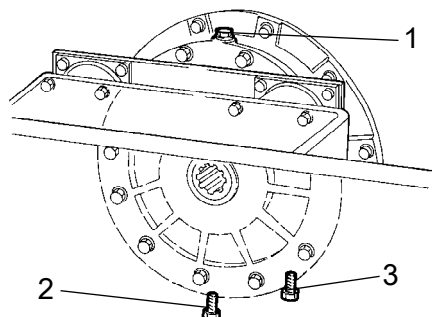


Fig. Right drum side
1. Filler plug
2. Drain plug
3. Level plug

Wipe clean the filler plug (1) and level plug (3).

Unscrew the filler plug (1).

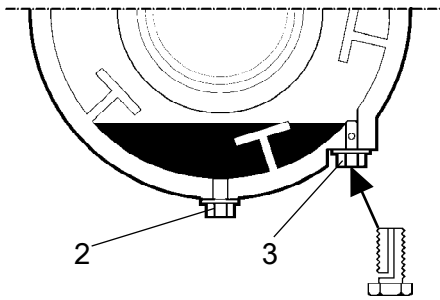


Fig. Drum cartridge
2. Drain plug
3. Level plug

Then loosen the level plug (3) on the underside of the cartridge and unscrew it until the hole in the middle of the plug becomes visible.

Top off with oil through the filler plug (1), until oil begins to run out from the level plug's (3) hole. The level is correct when it stops running.



Ensure that only MOBIL SHC 629 is used in the cartridges..



Do not overfill with oil - risk for overheating.

Clean and refit the plugs. Now repeat the procedure on the opposite side.

Drum cartridge - Cleaning the ventilation screw

Clean the drum's ventilation hole and ventilation screw (1). The hole is required to eliminate excess pressure inside the drum.

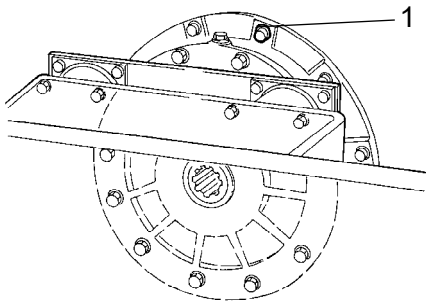


Fig. Drum
1. Ventilation screw

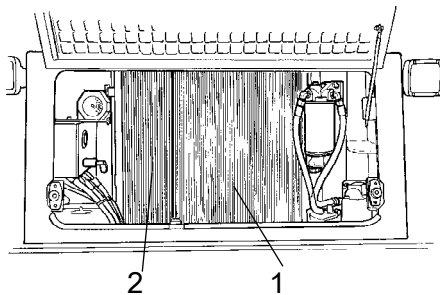


Fig. Hydraulic fluid cooler
1. Radiator
2. Hydraulic fluid cooler

Radiator - Check/Cleaning

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

Make sure that the air flow through the coolers is unobstructed (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.



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

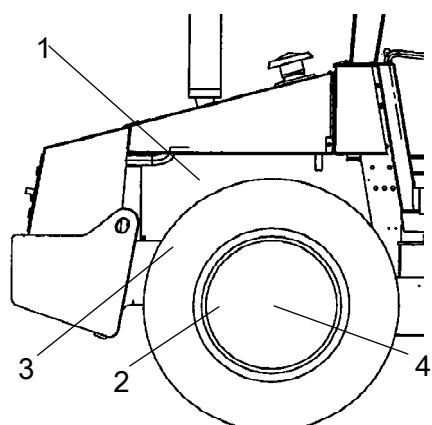


Fig. Right side of machine

- 1. Steering pump
- 2. Rear axle
- 3. Engine suspension
- 4. Wheel nuts

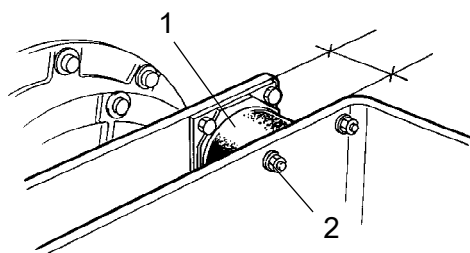


Fig. Drum, vibration side

- 1. Rubber element
- 2. Fastening screws

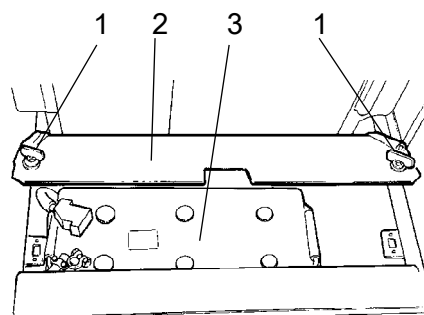


Fig. Battery shelf

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

Bolted joints - Checking tightening torque

Steering pump against engine (1) 38 Nm (28 lbf.ft).

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

Engine suspension (3). Check that all engine bolts are tight

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

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

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.

Battery - Check electrolyte level



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

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

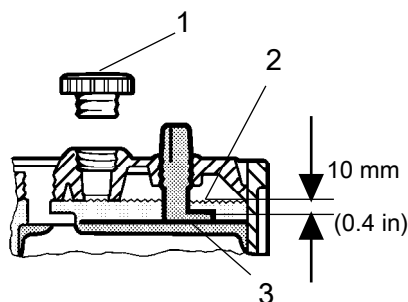


Fig. Electrolyte level in battery

- 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.

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.

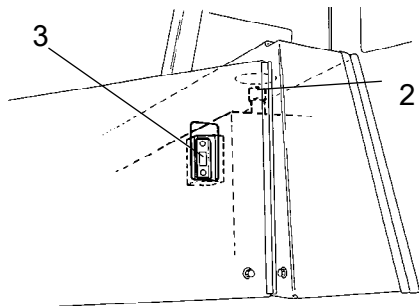


Fig. Hydraulic reservoir
2. Filler cap/Air filter
3. Sight glass

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.



Diesel engine pre-filter - Cleaning/Replacement

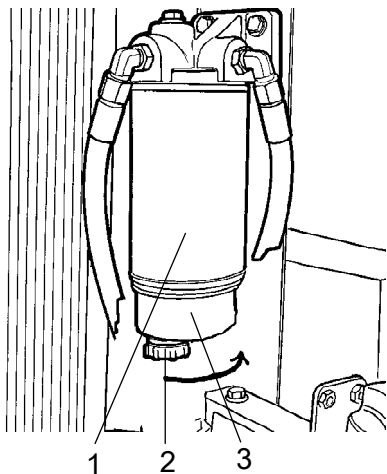


Fig. Diesel engine
1. Fuel pre-filter
2. Drainage valve
3. Plastic cup

Open the engine compartment cover.

When water or sediment is visible in the plastic cup (3), open the drainage valve (2) by turning it. When drainage is complete, close the drainage valve (2) again.

Replace the disposable fuel pre-filter (1) as required or at the latest every 500 hours of operation. Unscrew the fuel pre-filter, clean the plastic cup (3) and refit it in the new filter.



Save the diesel and hand in together with the disposable filter to a waste disposal station.



Ensure that the fuel pre-filter is pre-filled to avoid starting problems.

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.

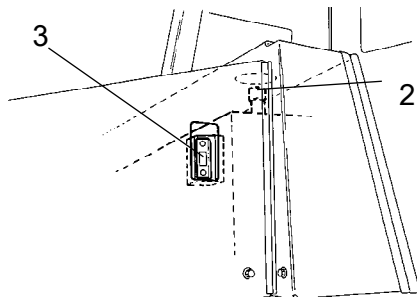


Fig. Hydraulic reservoir
2. Filler cap
3. Sight glass

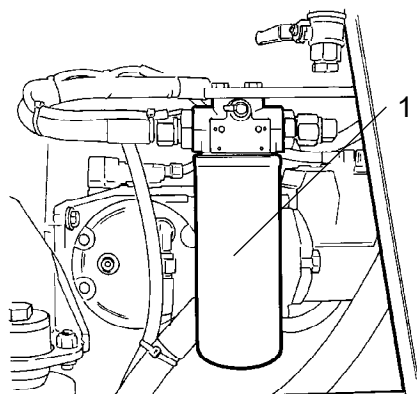


Fig. Engine compartment
1. Hydraulic fluid filter (x1)

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.

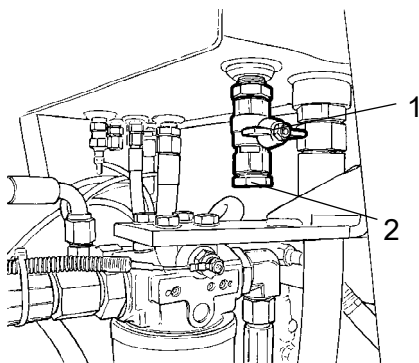


Fig. Hydraulic reservoir, bottom
1. Drainage tap
2. Plug



Fuel tank - Drainage

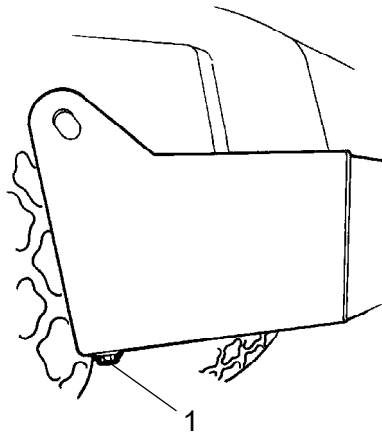


Fig. Fuel tank
1. Drainage plug

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.



Rear axle differential - Oil change



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

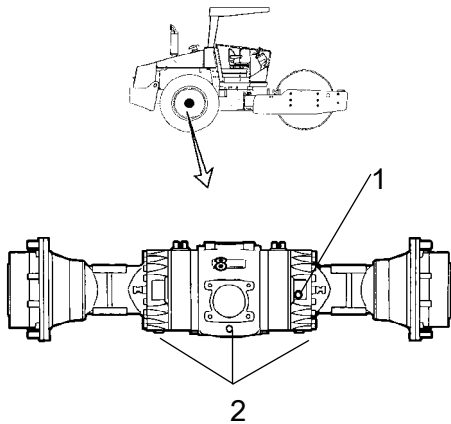


Fig. Rear axle
1. Level/Filler plug
2. Drain plugs



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 planetary gear - Oil change

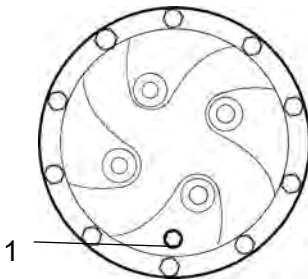


Fig. Planetary gear/drainage position
1. Plug

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

Wipe clean, unscrew the plug (1) and drain the oil into a suitable receptacle. The volume is approximately 1.85 liters (1.95 qts).



Oil should be taken to your local waste disposal station.

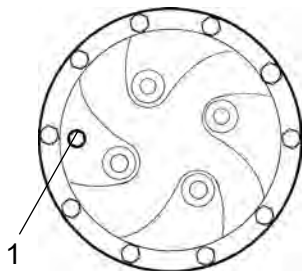


Fig. Planetary gear/filling position
1. Plug

Position the roller so that the plug (1) in the planetary gear is at "9 o'clock" or "3 o'clock".

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

Clean and refit the plug.

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

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



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

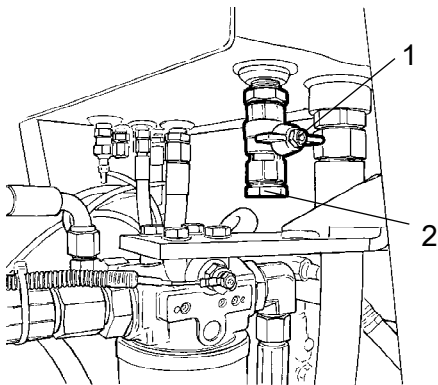


Fig. Hydraulic reservoir, bottom
1. Stop cock (3/4")
2. Plug

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

Unscrew the drainage plug (1).

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 cartridge - Oil change

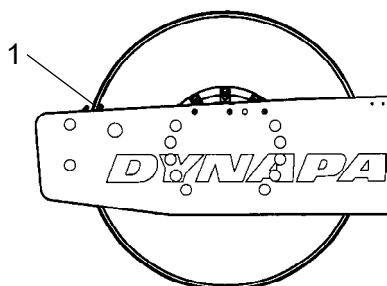


Fig. Left drum side
1. Indicator pin

Position the machine level so that the indicator pin (1) on the inside of the drum is aligned with the top of the drum frame.

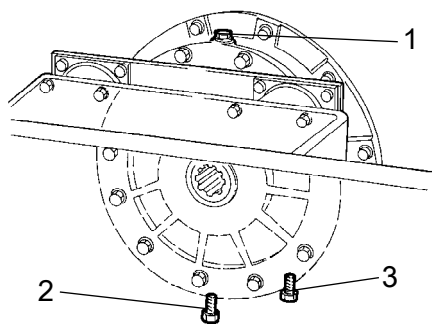


Fig. Right drum side
1. Filler plug
2. Drain plug
3. Level plug

Place a receptacle for about 5 liters (1.32 gal) underneath the drain plug (2).



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

Clean and unscrew the filler plug (1) and the drain plug (2).

Allow all the oil to run out. Fit the drain plug and fill with new synthetic oil in accordance with the instructions under "Drum cartridge - checking the oil level".

Repeat the procedure on the opposite side.



Ensure that only MOBIL SHC 629 is used in the cartridges..



Drum gearbox - Oil change

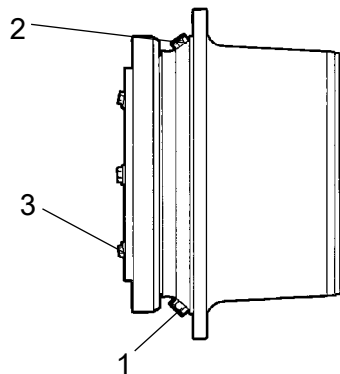


Fig. Drum gearbox
1. Drain plug
2. Filler plug
3. Level plug

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).

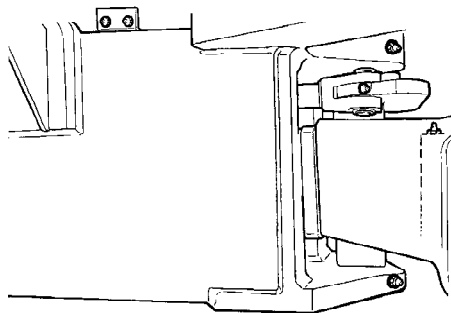


Fig. Steering hitch

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.

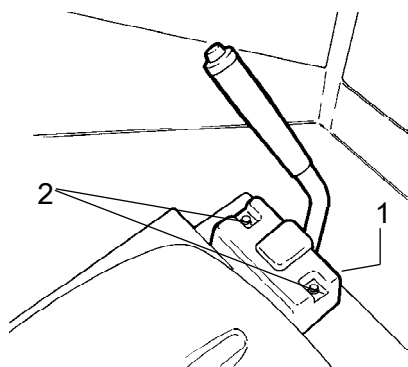


Fig. Steering joint
1. Protective cover
2. Screws

Controls - Lubrication

Lubricate the forward/reverse lever's mechanical mechanism. Remove the protective cover (1) by undoing the screws (2). Lubricate the mechanism with oil.

Check and tighten any loose bolts.

Refit the protective cover.

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