

INSTRUCTION MANUAL

DRS180D Soil Roller



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Introduction

Warning symbols



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



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

Safety information



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



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



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



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

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.

The attachment or installation of additional devices, which are used to intervene in the function of the machine or with which its function are supplemented, is only permitted with the written approval of the manufacturer.

If necessary, approval should be sought from local authorities.

Consent from the authorities is however no substitute for approval from the manufacturer.



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

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



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

Safety - General instructions

(Also read the safety manual)



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

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

Safety - when operating**Driving near edges**

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



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

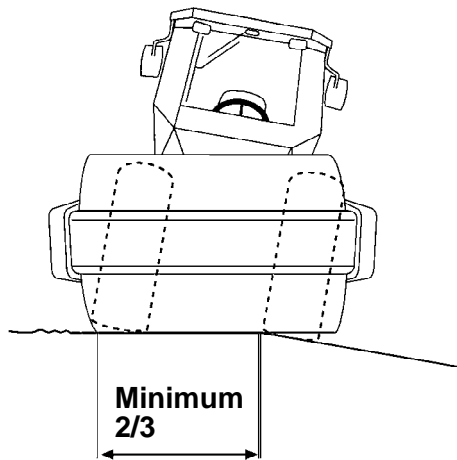


Fig. Position of drum when driving near an edge

Slopes

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

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

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



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



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

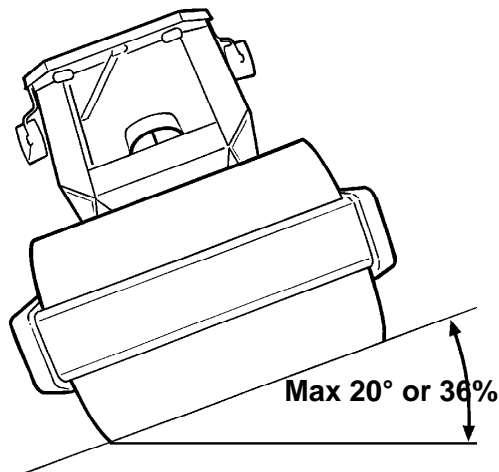


Fig. Operating on slopes



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

Safety (Optional)**Air conditioning**

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

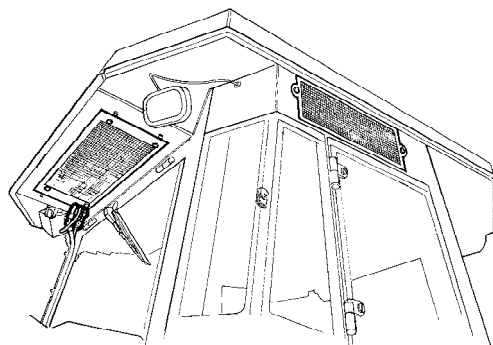


Fig. Cab



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



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



The system must be refilled with an approved refrigerant by authorized personnel when necessary.

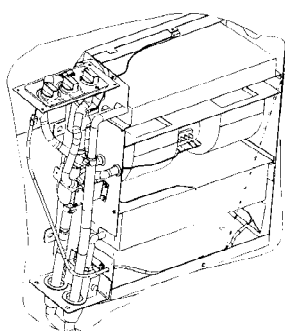


Fig. Air conditioning

Special instructions

Standard lubricants and other recommended oils and fluids

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

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

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

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

Hydraulic system - mineral oil Shell Tellus T100 or similar.

Temperatures

The temperature limits apply to standard versions of rollers.

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

High pressure cleaning

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

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



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

Fire fighting

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

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

Roll Over Protective Structure (ROPS), ROPS approved cab

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



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

Battery handling

When removing batteries, always disconnect the negative cable first.



When fitting batteries, always connect the positive cable first.



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



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

Jump starting

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



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

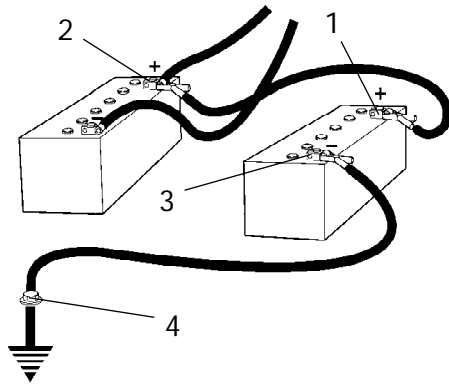
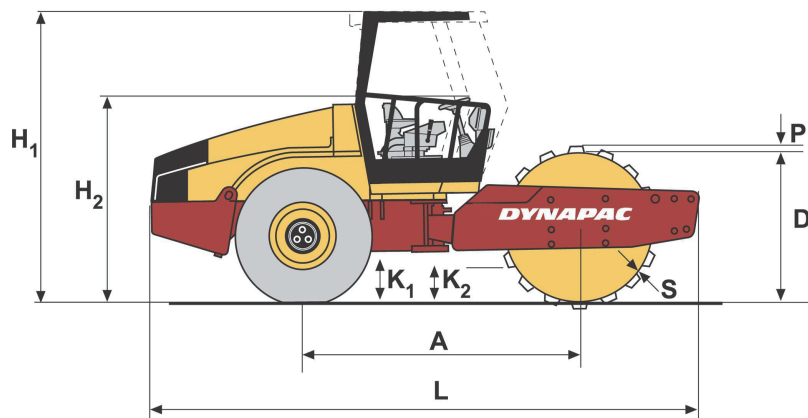


Fig. Jump starting

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

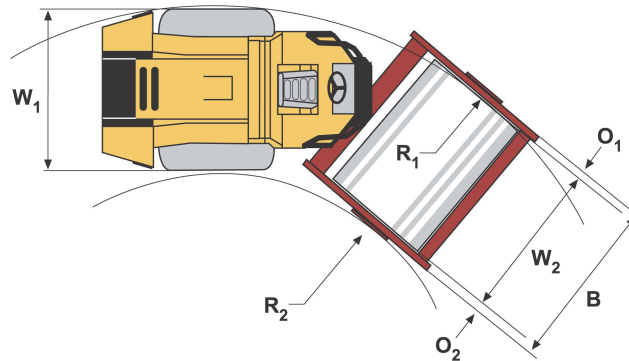
First connect the jump start battery's positive terminal (1) to the flat battery's positive terminal (2). Then connect the jump start battery's negative terminal (3) to, for example, a bolt (4) or the lifting eye on the machine with the flat battery.

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

Technical specifications - Dimensions
Dimensions, side view


	Dimensions	mm	in
A	Wheelbase, drum and wheel	2992	118
L	Length, standard equipped roller	6180	244
H1	Height, with ROPS (D)	2921	115
H1	Height, with ROPS (PD)	2989	117,6
H1	Height, with cab (D)	2961	116,5
H1	Height, with cab (PD)	3008	118,4
H2	Height, without ROPS (D)	2186	86
H2	Height, without ROPS (PD)	2238	88
D	Diameter, drum (D)	1573	61,9
D	Diameter, drum (PD)	1543	60,75
S	Thickness, drum shell, Nominal (D)	50	1,97
S	Thickness, drum shell, Nominal (PD)	35	1,38
P	Height, pads (PD)	100	4
K1	Clearance, tractor frame (D)	450	17,7
K1	Clearance, tractor frame (PD)	450	17,7
K2	Clearance, drum frame (D)	460	18,1
K2	Clearance, drum frame (PD)	460	18,1

Dimensions, top view



	Dimensions	mm	in
B	Width, standard equipped roller	2400	94
O1	Overhang, left frame side	115	4,5
O2	Overhang, right frame side	135	5,3
R1	Turn radius, external	5400	213
R2	Turn radius, internal	3200	126
W1	Width, tractor module	2130	84
W2	Width, drum	2130	84

Technical specifications - Weights and volumes

Fluid volumes

Rear axle		
- Differential	14 liter	3.7 gal
- Planetary gear	3.5 liters/side	0.9 gal/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	16.4 liter	17,3 qts
Coolant, diesel engine	35 liter	9,1 gal
Fuel tank	320 liters	84,5 gal

Weights

Service weight with ROPS (EN500) (D)	18300 kg	40345	lbs
Service weight with ROPS (EN500) (PD)	18300 kg	40345	lbs
Service weight without ROPS (D)	17800 kg	39242	lbs
Service weight without ROPS (PD)	17800 kg	39242	lbs
Service weight with cab (D)	18300 kg	40345	lbs
Service weight with cab (PD)	18300 kg	40345	lbs

Technical specifications - Working capacity**Compaction data**

Static linear load (D)	57,7 kg/cm	323 pli
Static linear load (PD)	- -	- -
Amplitude, high (D)	1,8 mm	0,071 in
Amplitude, high (PD)	1,8 mm	0,071 in
Amplitude, low (D)	1,1 mm	0,043 in
Amplitude, low (PD)	1,2 mm	0,043 in
Vibration frequency, high amplitude	29 Hz	1740 vpm
Vibration frequency, low amplitude	31 Hz	1860 vpm
Centrifugal force, high amplitude	317 kN	71264 lb
Centrifugal force, low amplitude	231 kN	51931 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 6BTAA5.9-C170	Water cooled turbo diesel with after cooler
Power (SAE J1995)	127 kW	170 hp
Engine speed	2200 rpm	
Fuel tank capacity	320 liters	

Electrical system

Battery	12V 170Ah
Alternator	12V 70A
Fuses	See the Electrical system section - fuses

Tire

Tire dimensions

Tire pressure

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



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

Hydraulic system

Opening pressure	MPa
Drive system	38,0
Supply system	2,0
Vibration system	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 :	M24 (PN 904562)
Strength class :	10.9
Tightening torque :	800 Nm (Dacromet treated)

Air Conditioning / Automatic Climate Control (ACC) (Optional)

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

Refrigerant: HFC-R134:A

Coolant weight when full: 1.5kg

Machine plate - Identification

Product identification number on the frame

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

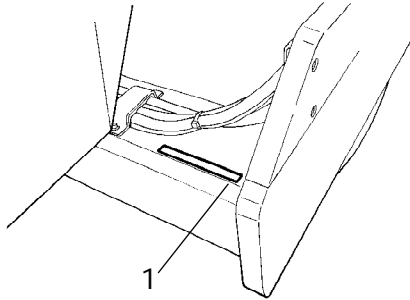


Fig. Front frame
1. PIN

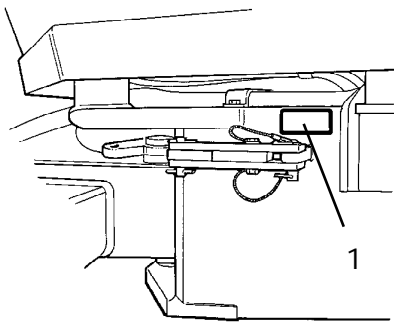


Fig. Operator platform
1. Machine plate

Machine plate

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

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



Fig. Machine plate

Please state the machine's PIN when ordering spares.

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

Explanation of 17PIN serial number

- A= Manufacturer
- B= Family/Model
- C= Check letter
- D= No coding
- E= Production unit
- F= Serial number

Engine plates

The engine 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.

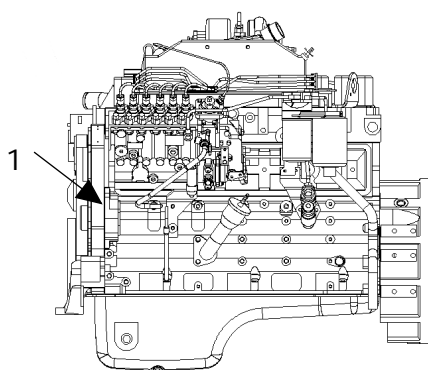


Fig. Engine
1. Type plate

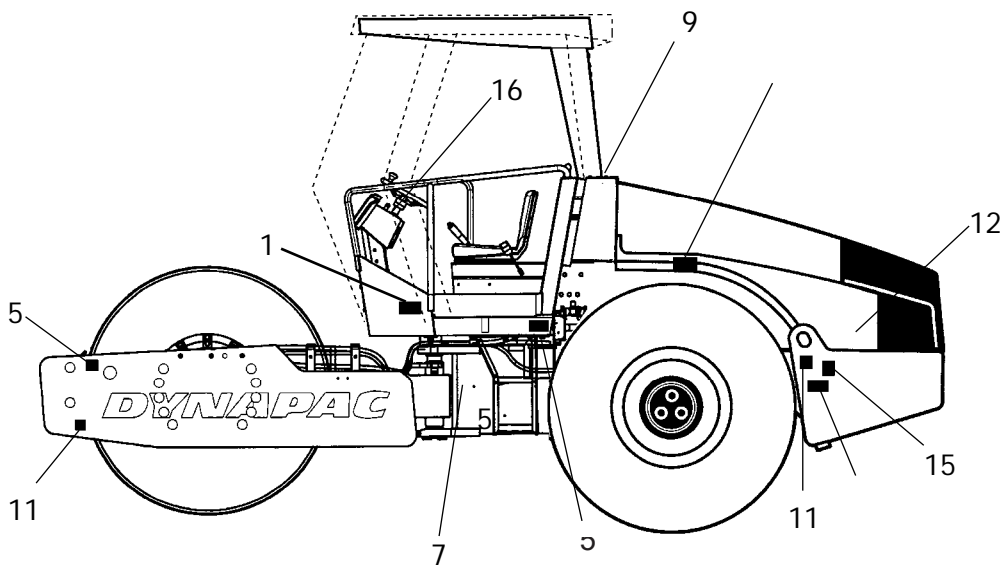
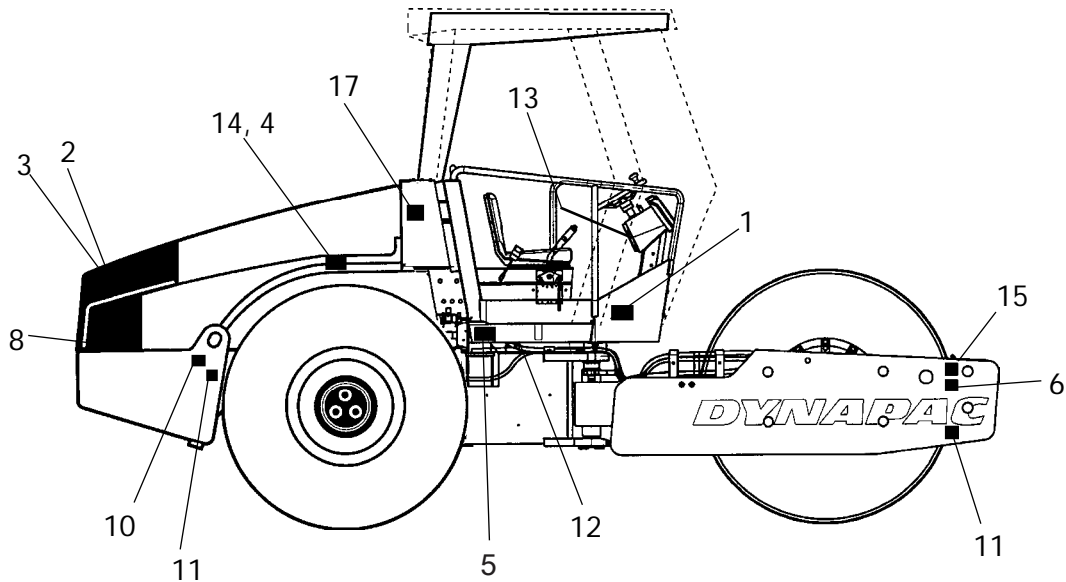


Fig. Type plate

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

Machine description- Decals

Location - decals



- | | | |
|--|---------------------------------------|----------------------------------|
| 1. Warning, Crush zone | 7. Product sign | 13. Handbook compartment |
| 2. Warning, Rotating engine components | 8. Diesel fuel | 14. Tire pressure |
| 3. Warning, Hot surfaces | 9. Hydraulic fluid/Biohydraulic fluid | 15. Hoisting plate |
| 4. Warning, Ballasted tire. | 10. Lifting point | 16. Warning sign |
| 5. Warning, Read instructions manual | 11. Fixing point | 17. Hydraulic fluid/Biohydraulic |
| 6. Warning, locking | 12. Master switch | |

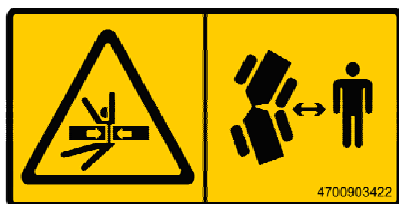
Safety decals

4700903422

Warning - Crush zone, articulation/drum.

Maintain a safe distance from the crush zone.

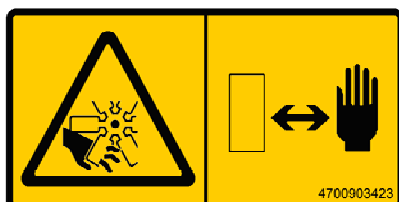
(Two crush zones on machines fitted with pivotal steering)



4700903423

Warning - Rotating engine components.

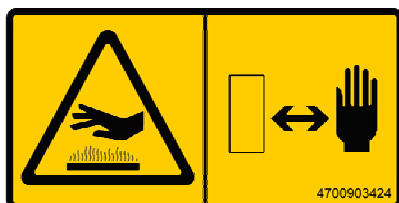
Keep your hands at a safe distance from the danger zone.



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.

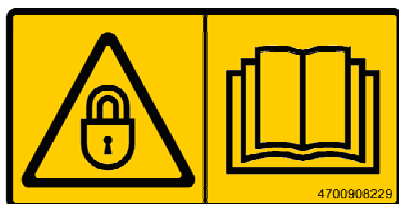


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Warning - Locking

The articulation must be locked when lifting.

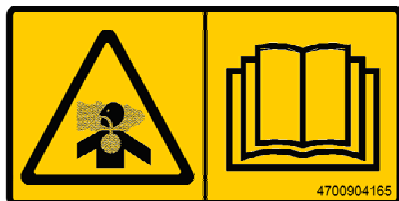
Read the instruction manual.



4700904165

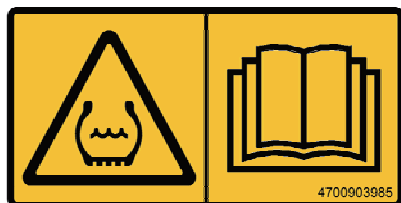
Warning - Toxic gas (option, ACC)

Read the instruction manual.





4700903590
-Emergency exit



4700903985
Warning - Ballasted tire.

Read the instruction manual.



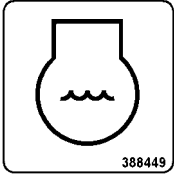
4700904895
Warning - Brake disengagement

Study the towing chapter before disengaging the brakes.

Danger of being crushed.

Info decals

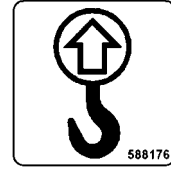
Coolant



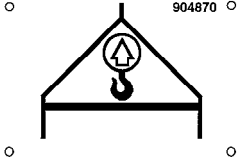
Diesel fuel



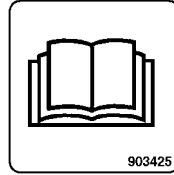
Lifting point



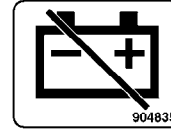
Hoisting plate



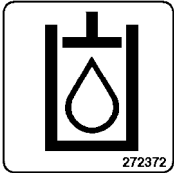
Handbook compartment



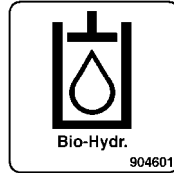
Master switch



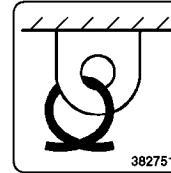
Hydraulic fluid



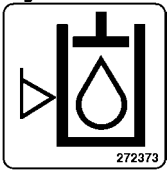
Biological hydraulic fluid



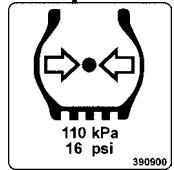
Securing point



Hydraulic fluid level

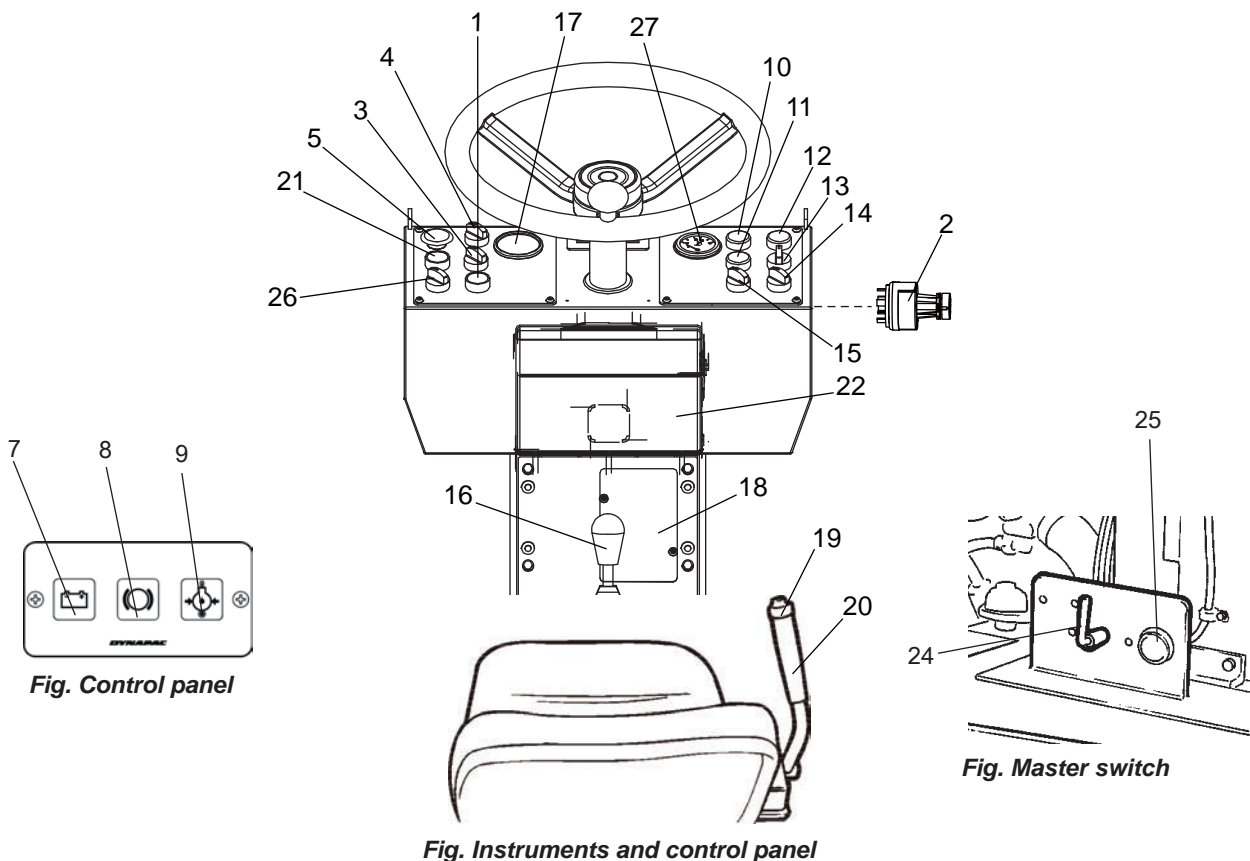


Tire pressure



**Machine description -
Instruments/Controls**





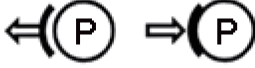
Locations - Instruments and controls



- | | |
|--|------------------------------------|
| 1. Horn | 13. Amplitude selector Low/O/High |
| 2. Starter switch | 14. Speed selector, drum |
| 3. Rotating beacon | 15. Speed selector, rear axle |
| 4. Working lights, Optional | 16. Engine RPM control |
| 5. Emergency/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. Engine pre-heater |
| 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 |
| | 26. Parking brake |
| | 27. Engine water temperature gauge |

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	Emergency/parking brake knob		Push in to activate the emergency stop.
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)

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.
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.
26	Parking brake		Parking brake is applied if it's rotated to the right position When switch is rotated to the left, parking brake release.
27	Engine water temperature gauge		Show engine coolant temperature.
28	Warning lamp		Engine warning lamp (yellow); Engine stop (red).
29	Engine RPM control		Engine RPM control, LOW: 900rpm; MID: 1800rpm; HI: 2200rpm.

Controls in the cab

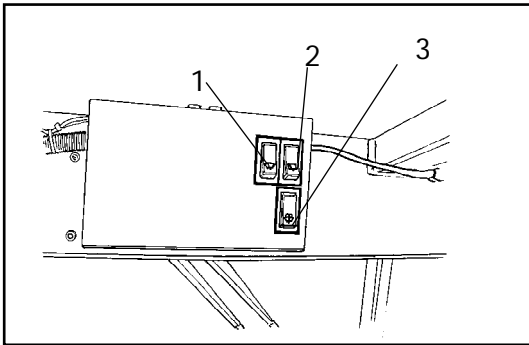


Fig. Cab roof, front
1. Front wiper
2. Rear wiper (Optional)
3. Front and rear windshield washers

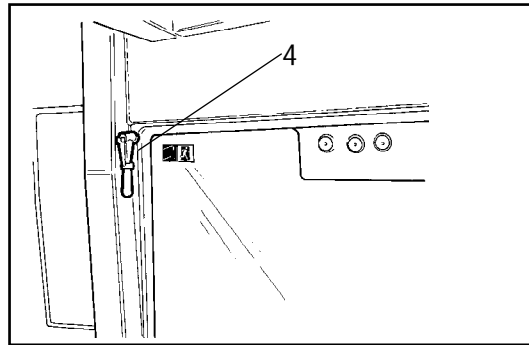


Fig. Cab roof, rear
4. Hammer for emergency escape

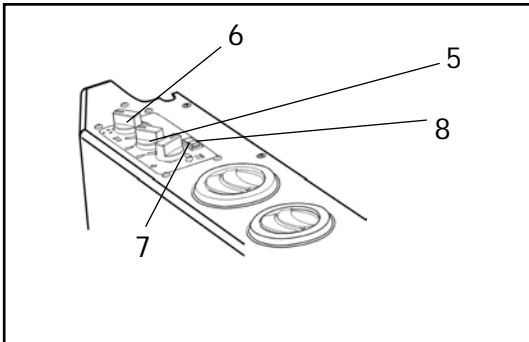


Fig. Cab, right side. Heater (Optional)
5. Control, temperature
6. Control, circulation,
7. Control, fan
8. Switch, AC (Optional)

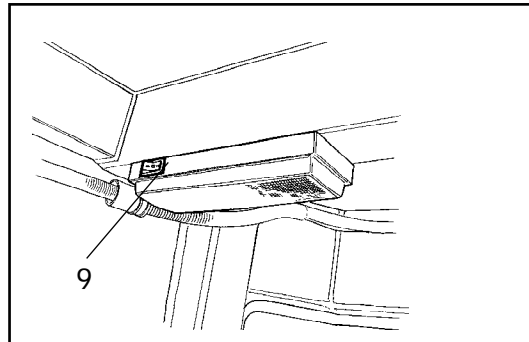


Fig. Cab, rear
9. Switch, cab lighting (Optional)

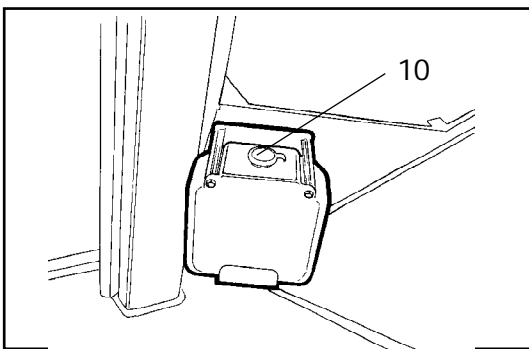


Fig. Cab, left side
10. Windscreen washer fluid container (Optional)

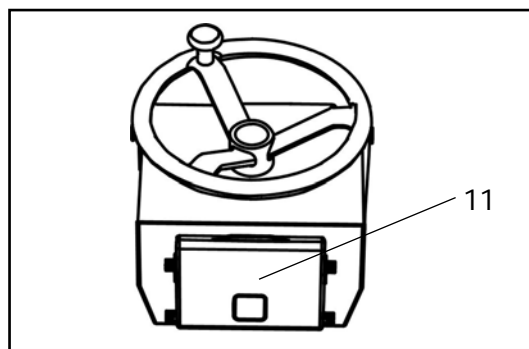













Fig. Cab steering column
11. Handbook compartment

Function description of instruments and controls in the cab

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

Machine description - Electrical system

Fuses and 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.

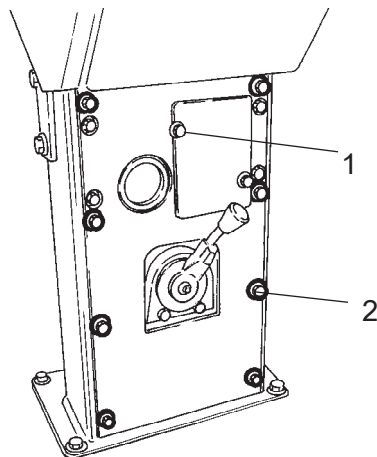


Fig. Instrument column

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.

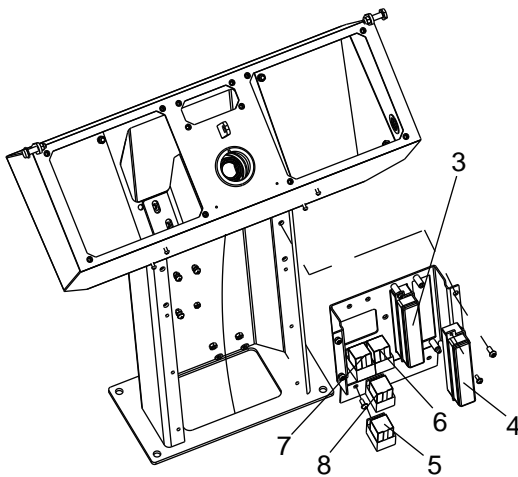


Fig. Instrument panel with fuses and relays.

3. Fuse box, left side
4. Fuse box, right side
5. VBS relay
6. Relay, hourmeter
7. Relay, front working light
8. Relay, rear working light

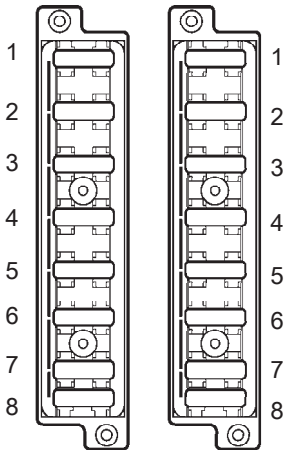


Fig. Fuse box, left and right side.

Fuses

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.	Reversing alarm	10A
2.	Front wiper	10A
3.	Warning lamp (Optional)	7.5A
4.	Engine, Fuel pre-heater	50A
5.	Compaction meter (Optional)	
6.		
7.	Working light, rear	20A
8.	Working light, front	20A

Fuse boxes, right side

1.	Emergency stop, neutral start switch	5A
2.	VBS Relay	5A
3.		
4.	Warning lamp, charging	7.5A
5.	Hour meter	10A
6.	Horn	7.5A
7.	Oil gauge, water temperature gauge	7.5A
8.	High/low gear	7.5A

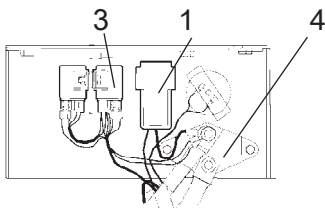


Fig. Master switch
1. Main fuse
3. Starter relay
4. Master switch

Main fuses

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

Main fuse	100A
Engine pre-heater	150A
Air conditioner fuse	20A

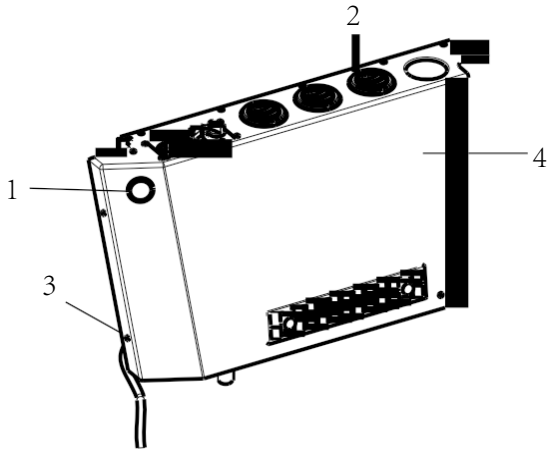


Fig. Heater box in cab.

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

Fuses and relay in cab heater box (Optional)

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

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

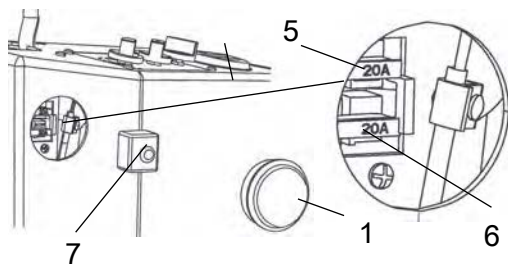


Fig. Heater box in cab.

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

Fuses in heater box

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

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

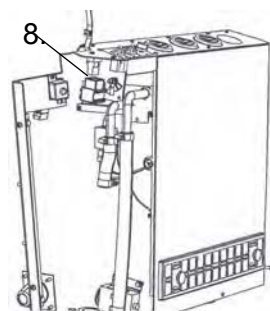


Fig. Heater box in cab.

- 8. Relay 12V

Relay in heater box

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

Operation - Starting

Before starting

Master switch - Switching on

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

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



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

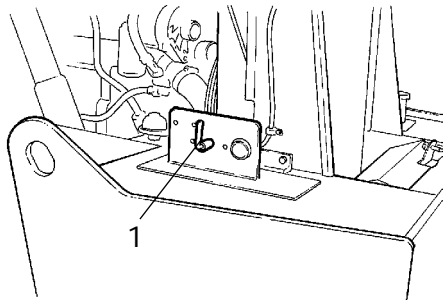


Fig. Engine compartment
1. Master switch

Driver seat (Std.) - Adjustment

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

The seat can be adjusted lengthways (1).

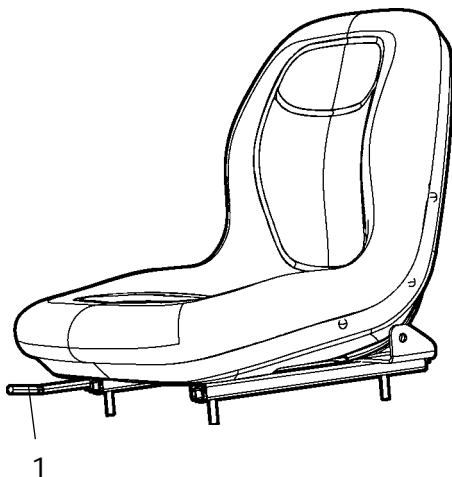


Fig. Operator's seat
1. Length adjustment

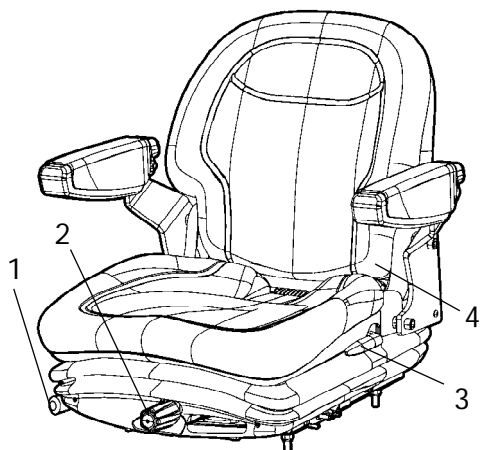


Fig. Driver seat
1. Lock lever - Length adjustment
2. Weight adjustment
3. Back support angle
4. Seat belt

Driver seat (Option)- Adjustment

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

The seat can be adjusted as follows.

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



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



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

Instruments and lamps - Checking

Turn the starter switch (2) to position I.

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.

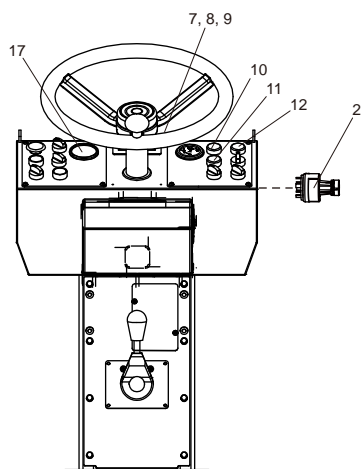


Fig. Instrument panel
2. Starter switch
10. Warning lamp, hydraulic fluid filter
11. Warning lamp, air filter
12. Warning lamp, hydraulic fluid temperature
17. Fuel gauge

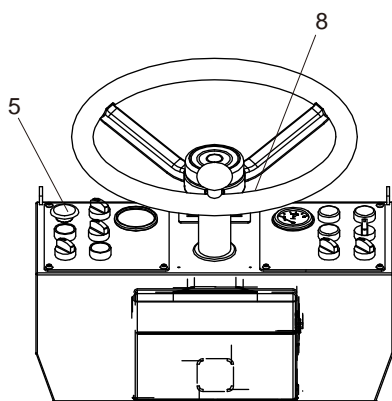


Fig. Control panel
5. Emergency/Parking brake knob
8. Warning lamp, brake system

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.

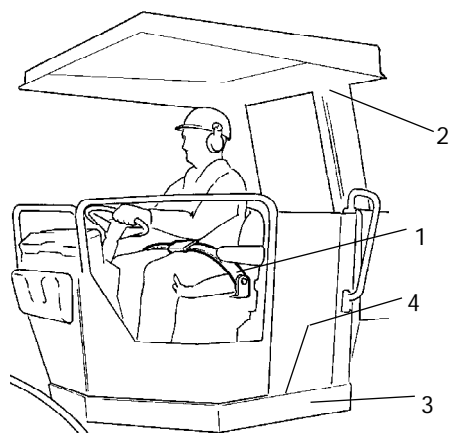


Fig. Operator's station
1. Seat belt
2. ROPS
3. Rubber element
4. Anti-slip

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.

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.

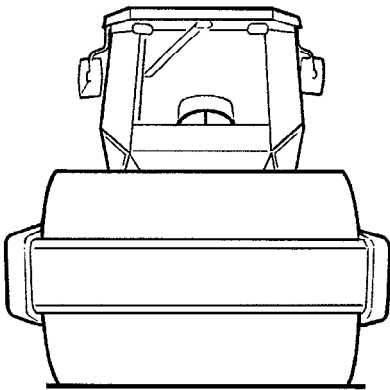


Fig. view

Interlock (Optional)

The roller can be equipped with Interlock.

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

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

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

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 more than 30 sec. If the engine does not start immediately, wait for 2 minutes to start the engine.

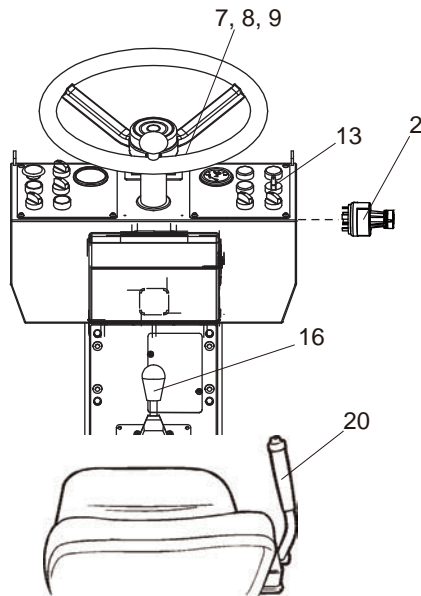


Fig. Instrument panel

- 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 2-5 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.

! *Engine run in idle speed must not exceed 10 minutes.*

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.*

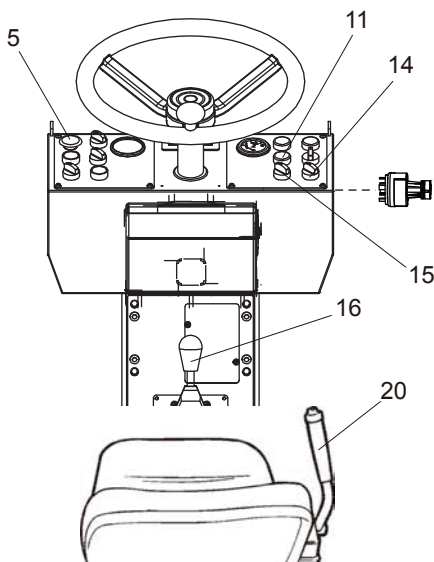


Fig. Instrument panel

- 5. Emergency/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
Low drum/High rear axle	5 km/h
High drum/Low 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.

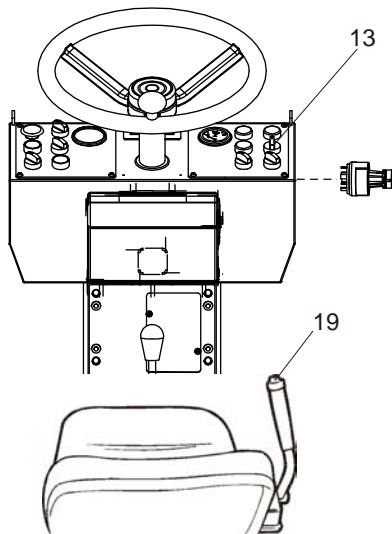


Fig. Instrument panel
13. Amplitude selector
19. Vibration On/Off

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.

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.

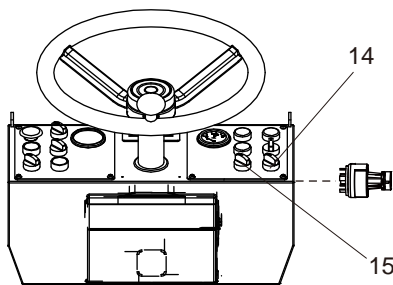


Fig. Instrument panel
14. Speed selector, drum
15. Speed selector, rear axle

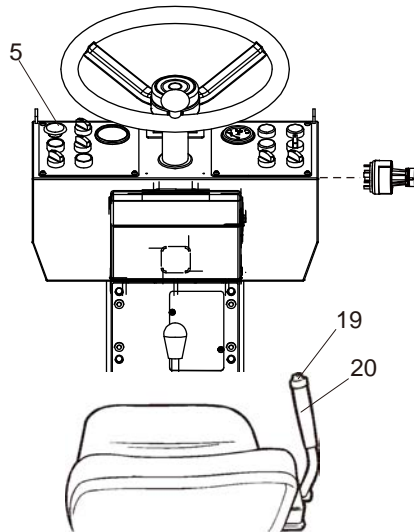


Fig. Control panel
5. Emergency/parking brake knob
19. Switch, vibration On/Off.
20. Forward/reverse lever

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.

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.

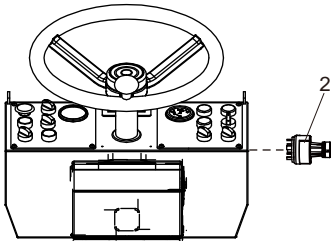


Fig. Instrument panel
2. Starter switch

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

Chocking the drums



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



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



Remember the 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.

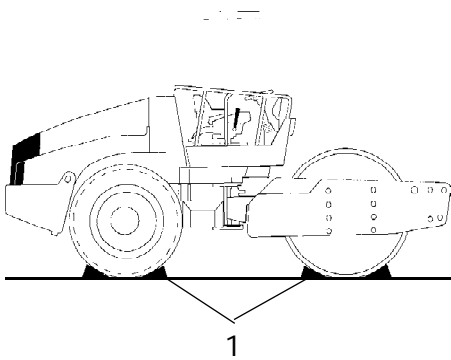


Fig. Arrangement
1. Chock

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.

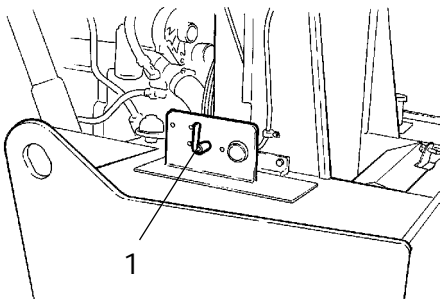


Fig. Engine compartment
1. Master switch

Long-term parking

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

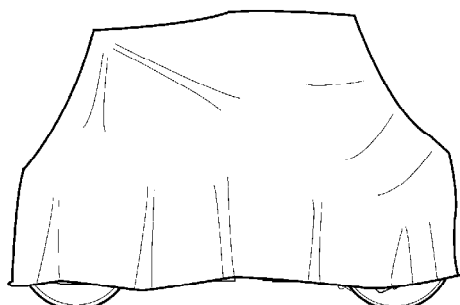


Fig. Roller weather protection

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.

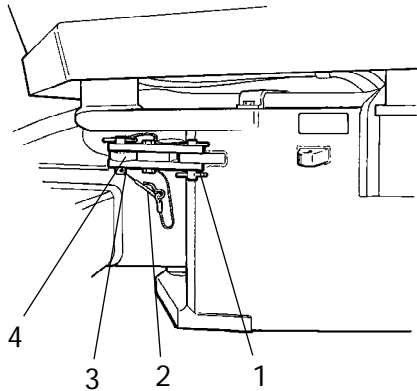


Fig. Articulation in the locked position

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

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

Weight: refer to the hoisting plate on the roller

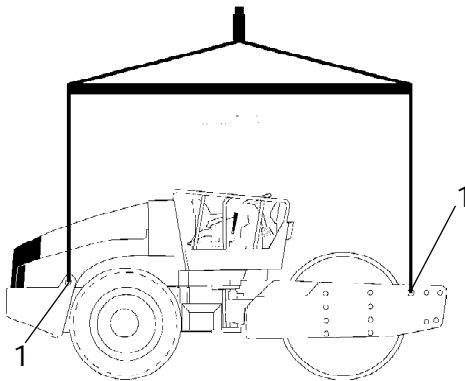


Fig. Roller prepared for lifting
1. Hoisting plate

Lifting the roller



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



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



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

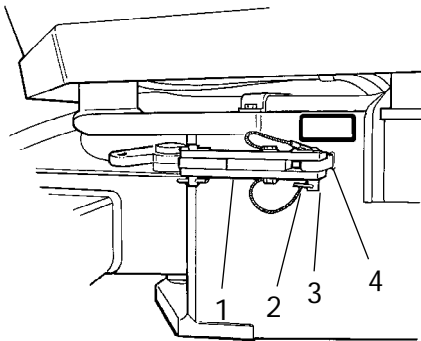


Fig. Articulation in the open position

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

Unlocking the articulation



Remember to unlock the articulation before operating.

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

Towing

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

Alternative 1

Short distance towing with the engine running



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

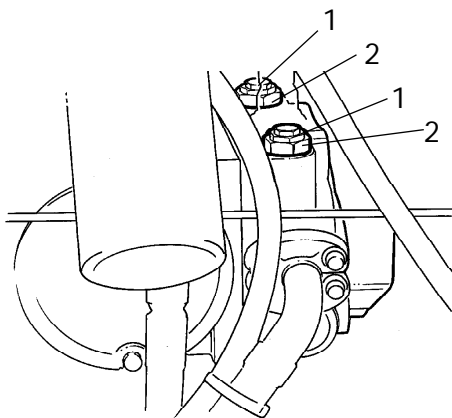


Fig. Propulsion pump

- 1. Towing valve
- 2. Locknut

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

Start the engine and allow it to idle.

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

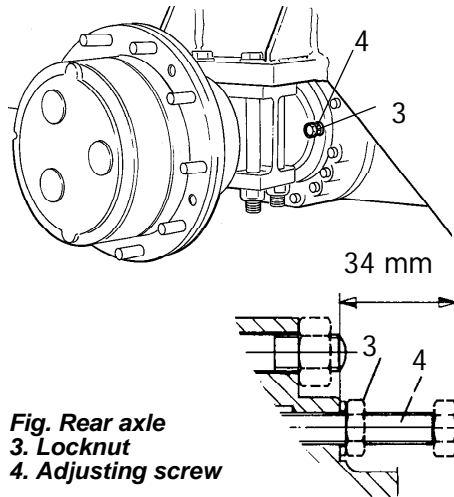


Fig. Rear axle
3. Locknut
4. Adjusting screw

Alternative 2

Towing short distances where the engine is inoperative

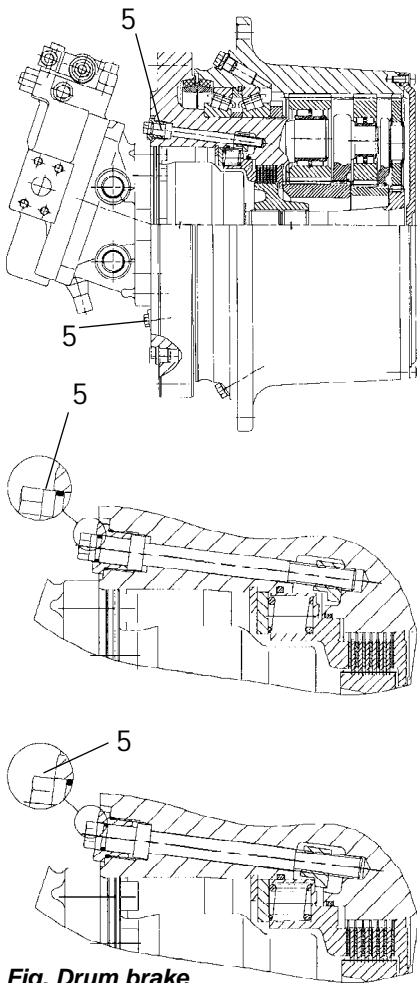


Chock the drums to prevent the roller from moving when the brakes are mechanically disengaged.

First release both towing valves as per alternative 1.

Rear axle brake

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



Drum gearbox brake

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).

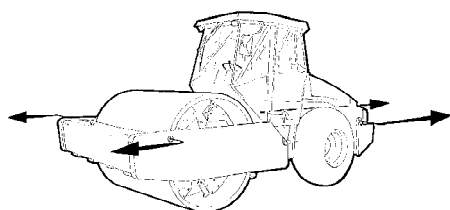


Fig. Towing

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 shown in the figure. Maximum gross pulling force 308 kN (69241 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.*

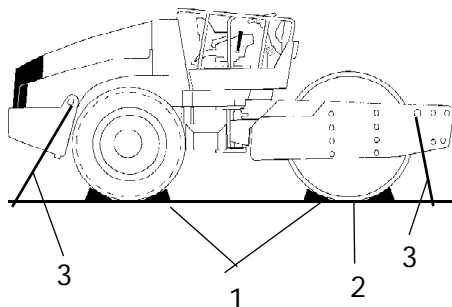


Fig. Transport
1. Chock
2. Block up
3. Lashing wire

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.














Maintenance - Lubricants and symbols

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

	ENGINE OIL	Air temperature -15°C - +50°C (5°F-122°F) API CH-4 or equivalent. P/N: 5580020624 (5 liters); 5501522700 (20 liters)
	HYDRAULIC FLUID	Air temperature -15°C-+40°C (5°F-104°F) P/N: 9106230330 (20 liters), 9106230331 (209 liters) Air temperature above +40°C (104°F) Shell Tellus T100 or equivalent.
	BIOLOGICAL HYDRAULIC FLUID	BP Biohyd SE-S46 When it leaves the factory, the machine may be filled with biodegradable fluid. The same type of fluid must be used when changing or topping up.
	TRANSMISSION OIL	Air temperature -15°C - +40°C (5°F-104°F) AC Fluid Gearbox 100, API GL-5, or equivalent. P/N: 4812008274 (5 liters), 4812008275 (20 liters) Air temperature 0°C (32°F) - above +40°C (104°F) Shell Spirax AX 85W-140, API GL-5 or equivalent.
	DRUM OIL	AC Drum Oil 1000 P/N: 4812156456
	GREASE	SKF LGHB2 (NLGI-Klass 2) or equivalent for the articulated joint. Dynapac Roller Grease; P/N: 4812030096 or equivalent for other grease points.
	FUEL	See engine manual.
	COOLANT	GlycoShell or equivalent, (mixed 50/50 with water). Anti-freeze protection down to about -37°C (-34.6°F). Coolant 150, P/N: 2658449097 (5 gal)

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

Maintenance symbols

	Engine, oil level		Tyre pressure
	Engine, oil filter		Air filter
	Hydraulic reservoir, level		Battery
	Hydraulic fluid, filter		Recycling
	Transmission, oil level		Fuel filter
	Drum, oil level		Coolant, level
	Oil for lubrication		

Maintenance - Maintenance schedule

Service and maintenance points

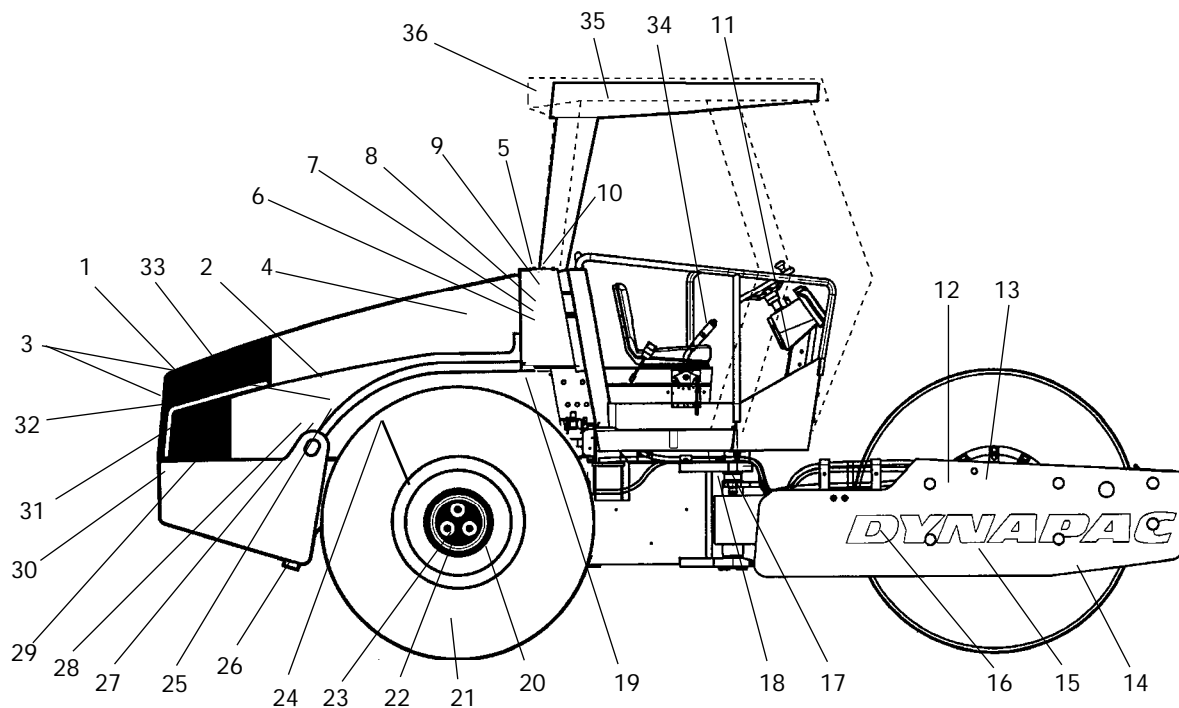


Fig. Service and maintenance points

- | | | |
|-------------------------------------|--|--|
| 1. 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, | 35. Fresh air filter * |
| 12. Drum oil, filling, x2 | 24. Rear axle mounting, 2 sides | 36. Air conditioning * |
- * Optional equipment

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	

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	
36	Check the Air conditioning	Optional
3	Clean fuel pre-filter	Refer to the engine manual

Every 250 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
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	
36	Check the Air conditioning	Optional
3	Change the Fuel filter	

Maintenance - Maintenance schedule

Every 500 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
3	Replace the fuel pre-filter.	Refer to the engine manual
7	Check bleeder filter on hydraulic reservoir	
17	Check steering hitch	

Every 1000 hours of operation (Yearly)

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
35	Replace the fresh air filter in the cab	Optional
12	Change the oil in the drum cartridge	
13	Change the oil in the drum gearbox	
37	Lubricate the Forward/Reverse lever	

Every 2000 hours of operation (Every two years)

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	
36	Overhaul Air conditioning	Optional
	Replace the engine coolant	Refer engine manual

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.

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.

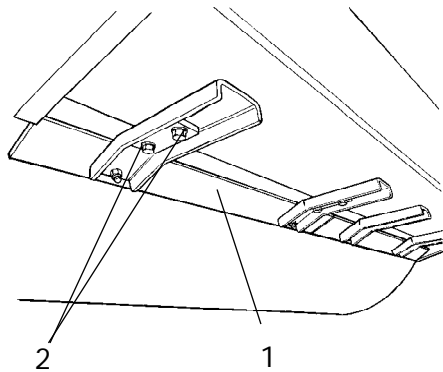


Fig. Scrapers
1. Scraper blades (x4)
2. Screws

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).

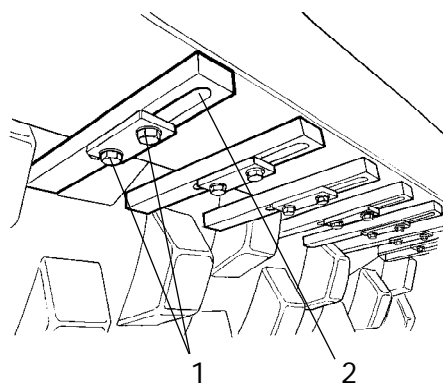


Fig. Scrapers
1. Screws
2. Scraper teeth (x18)

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).

Soften scrapers (Optional)

Loosen the screws (2).

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

Tighten the screws (2).

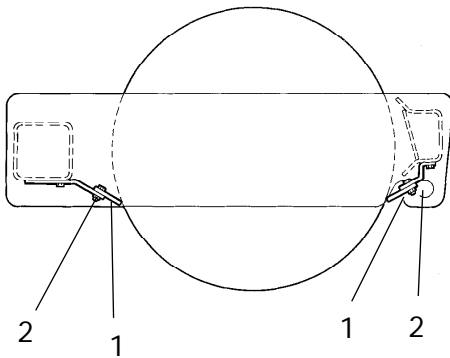


Fig. Scrapers
1. Scraper blade
2. Screws

Air circulation - Check

Ensure that the engine has free circulation of cooling air through the protective grille in the hood.

To open the engine hood, turn the locking arm (1) upward. Raise the hood to its fully open position, checking that the red safety catch on the left gas spring is latched.



If the engine's gas-springs are out of action and the hood is put at its upper position - block the hood so that it cannot fall.

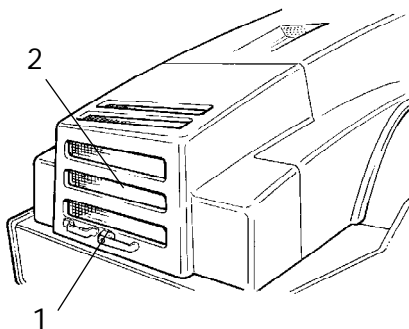


Fig. Engine hood
1. Hood lock
2. Protective grille

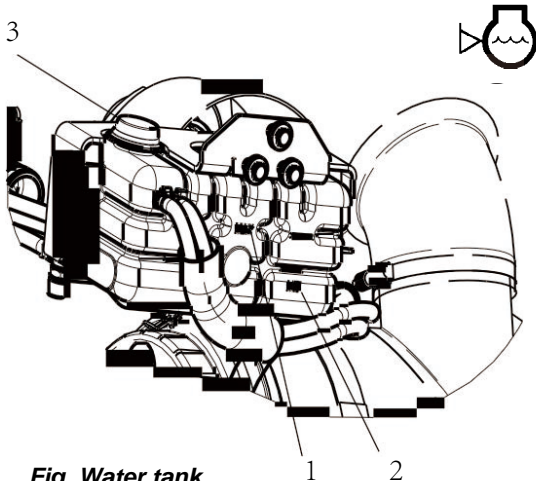


Fig. Water tank
1. Max. level
2. Min. level
3. Filler cap

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.*

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.

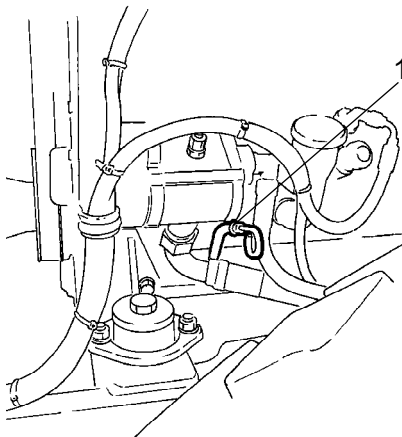


Fig. Engine, right side
1. Oil dipstick

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

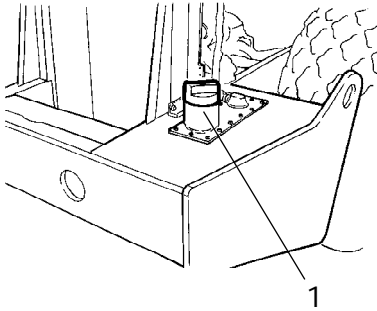


Fig. Fuel tank
1. Filler pipe

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



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



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

The tank holds 320 liters (84.5 gal) of fuel.



Hydraulic reservoir - Check fluid level

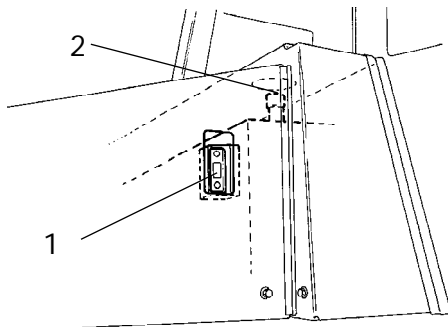


Fig. Sight glass hydraulic reservoir
1. Sight glass

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.

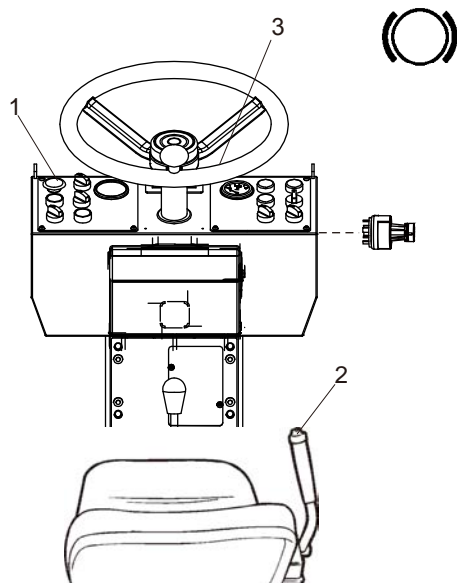


Fig. Control panel

- 1. Emergency/parking brake knob**
- 2. Forward/Reverse lever**
- 3. Brake warning lamp**

Brakes - Check



Check the brakes by carrying out the following :

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.

**Air cleaner****Checking - Change the main air filter**

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

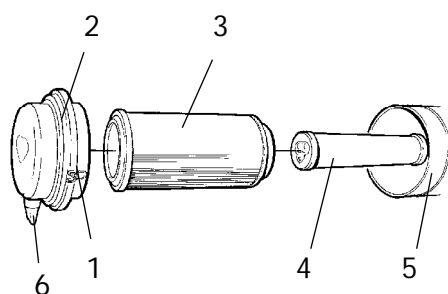


Fig. Air cleaner
1. Clips
2. Cover
3. Main filter
4. Backup filter
5. Filter housing
6. Dust valve

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

Do not remove the backup filter (4).

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

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

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

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



Backup filter - Change

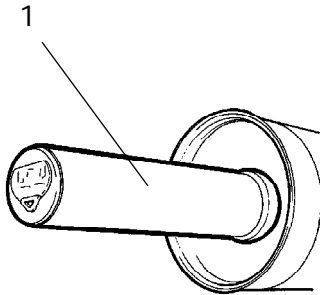


Fig. Air filter
1. Backup filter

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

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

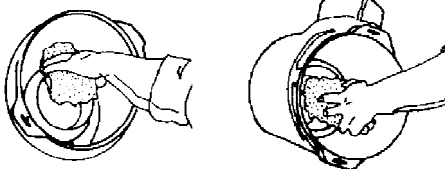
Clean the air cleaner if necessary, see section Air cleaner - Cleaning.



Air cleaner - Cleaning

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

Wipe clean on both sides of the outlet pipe.



Inner edge of outlet pipe.

Outer edge of outlet pipe.

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



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

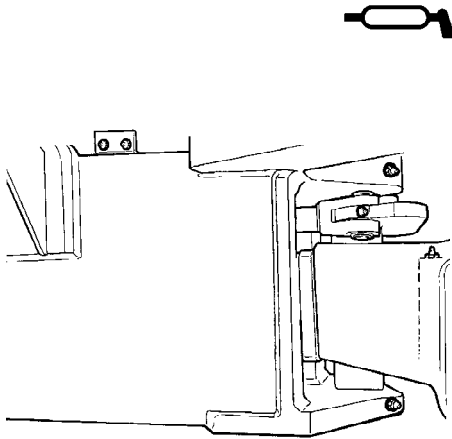


Fig. Steering hitch right side

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

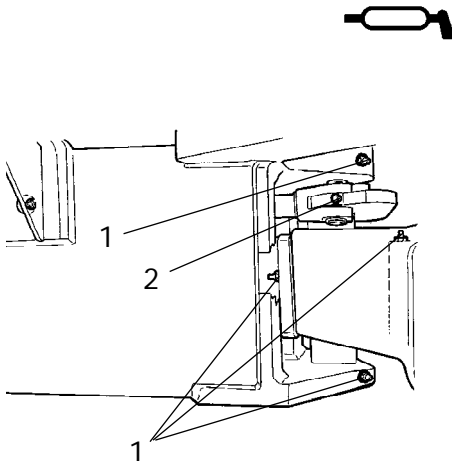


Fig. Steering hitch right side
1. Lubricating nipples articulation (x4)
2. Lubricating nipple cylinder mount (x1)

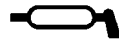
Steering joint - Lubrication

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

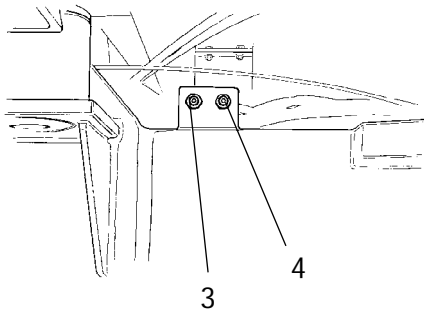


Fig. Steering cylinder right side
3. Lubricating nipple right rear cylinder mount (x1)
4. Lubricating nipple left rear steering cylinder (x1)

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

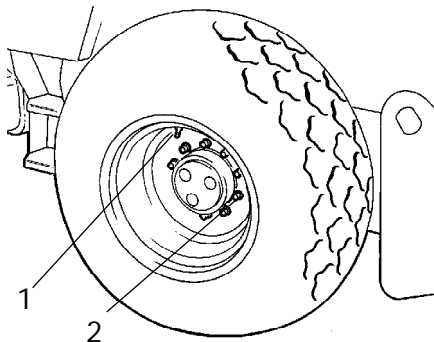


Fig. Wheels
1. Air valve
2. Wheel nut

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.



Automatic Climate Control (Optional) - Inspection

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

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

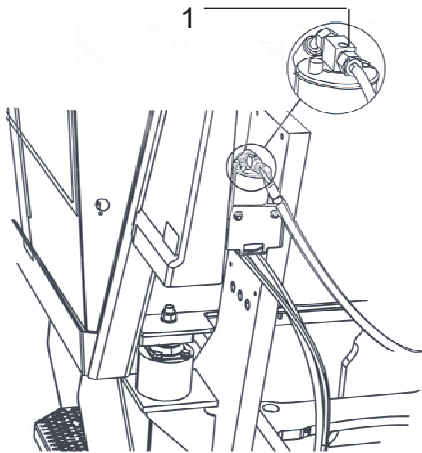


Fig. Drying filter
1. Sight glass

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

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

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

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

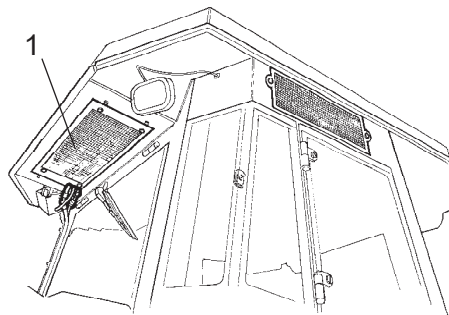


Fig. Cab
1. Condenser element



Fuel pre-filter - Cleaning

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

See instruction manual for the engine when cleaning the filter, the chapter on the fuel system.

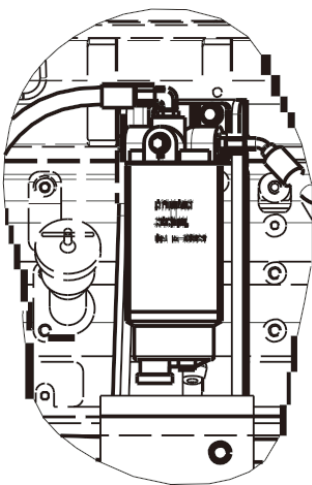


Fig. Engine compartment
1. Fuel prefilter

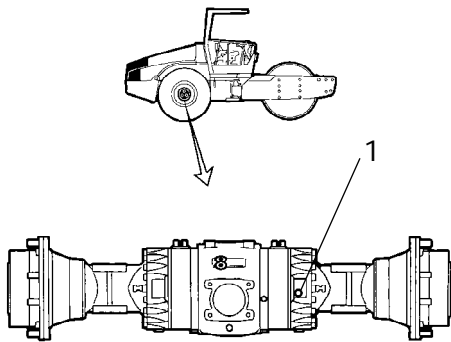
Maintenance - 250h

! *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.*



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.*



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 according to the lubricant specification.

Clean and refit the plug.

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



Rear axle planetary gears - Check oil level

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

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

Clean and refit the plug.

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

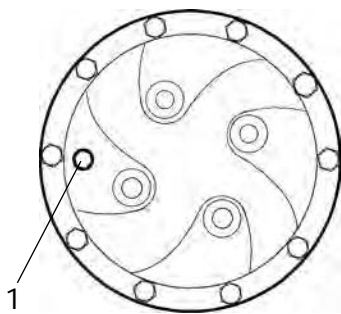


Fig. Level check - planetary gear
1. Level/Filler plug



Diesel engine - Oil and Filter change



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

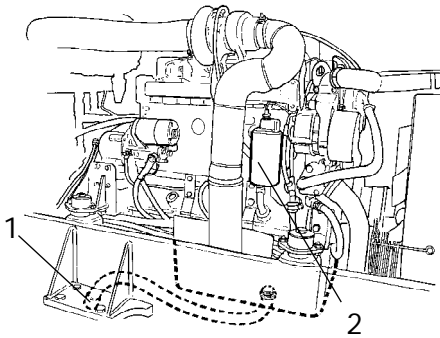


Fig. Engine, left side
1. Drainage plug
2. Oil filter

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 16.5 liters (4.1 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

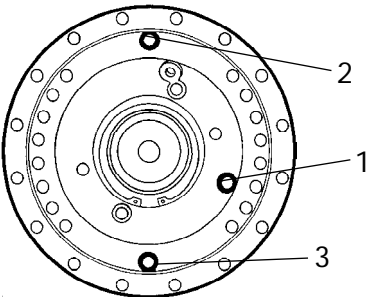


Fig. Oil level check - drum gearbox
1. Level plug
2. Filler plug
3. Drain plug

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.

Fuel filter - Changing the fuel filter

The fuel filter is placed on the right side of the engine compartment.

Unscrew the fuel filter (1) and (2), then replace.

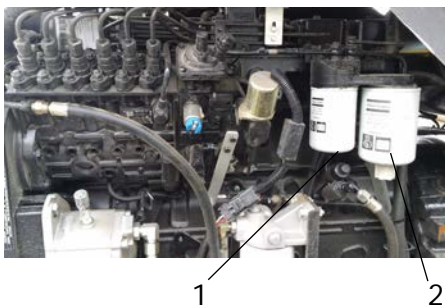


Fig. Fuel filter - engine
1. Fuel filter
2. Fuel filter



Drum cartridge - Checking the oil level

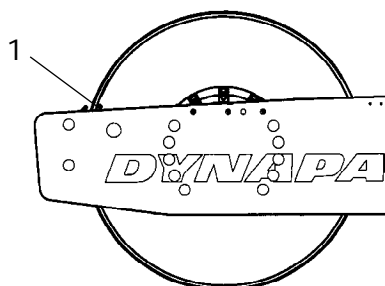


Fig. Left drum side
1. Indicator pin

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.

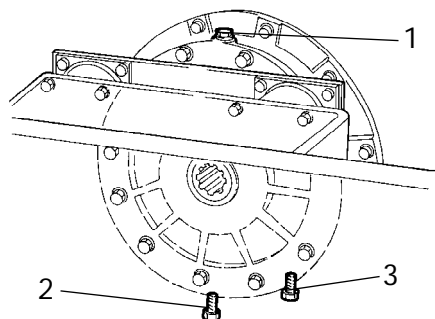


Fig. Right drum side
1. Filler plug
2. Drain plug
3. Level plug

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

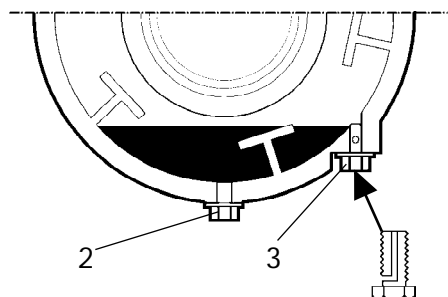


Fig. Drum cartridge
2. Drain plug
3. Level plug

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.

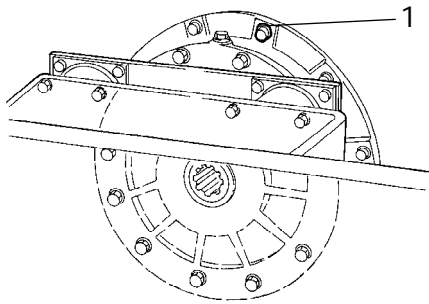


Fig. Drum
1. Ventilation screw

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.

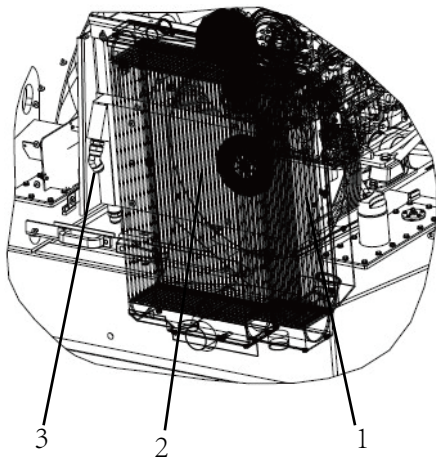


Fig. Radiator
1. Intercooler
2. Coolant radiator
3. Hydraulic fluid cooler

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) (2) and (3).

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.

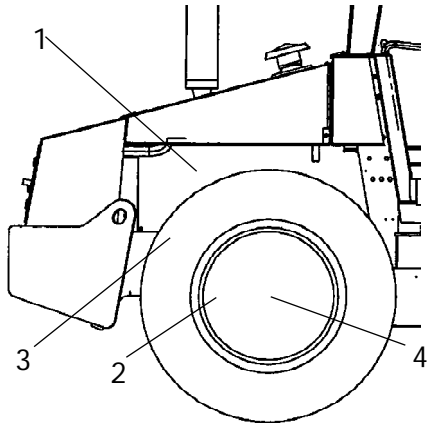


Fig. Right side of machine
 1. Steering pump
 2. Rear axle
 3. Engine suspension
 4. Wheel nuts

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).

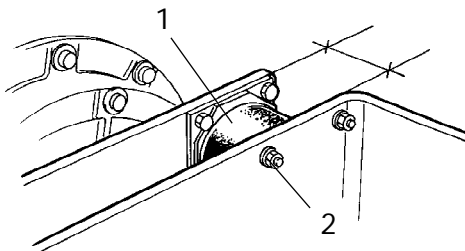


Fig. Drum, vibration side
 1. Rubber element
 2. Fastening screws

Rubber elements and fastening screws - Check

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

Check using a knife blade or pointed object.

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



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.

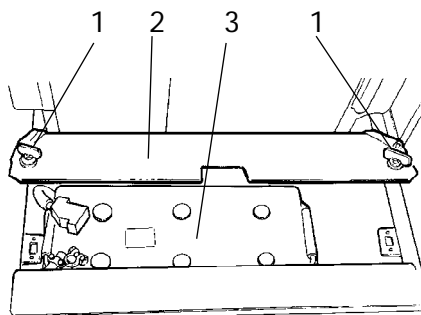


Fig. Battery shelf
 1. Quick-screws
 2. Battery cover
 3. Battery



Battery cell

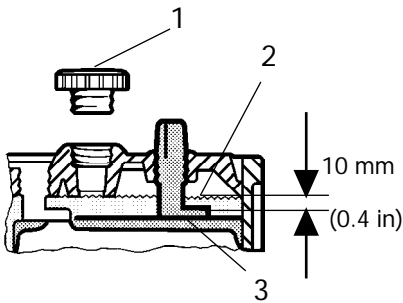


Fig. Electrolyte level in battery
1. Cell cap
2. Electrolyte level
3. Plate

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

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

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

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



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



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



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

Air conditioning (Optional)

- Inspection

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

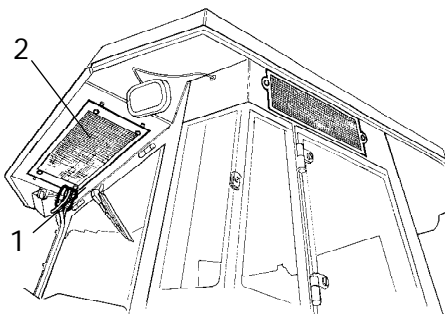


Fig. Air conditioning
1. Refrigerant hoses
2. Condensor element

Maintenance - 500h

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



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

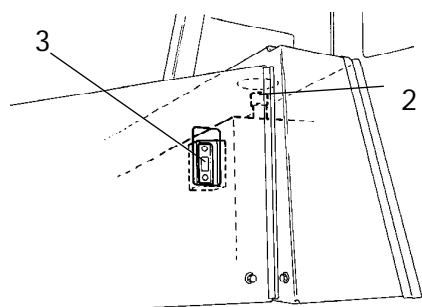
**Bleeder filter - Inspection/Cleaning**

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

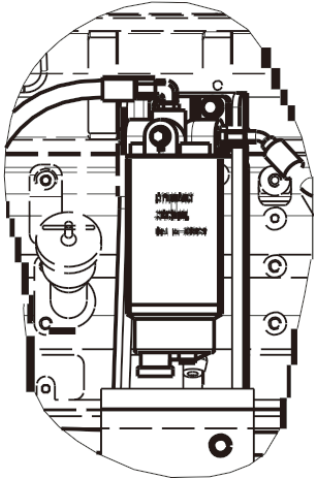
If passage in either direction is blocked, clean the filter with a little diesel oil and blow through with compressed air until the block is removed, or replace the cap with a new one.



Always wear protective goggles when working with compressed air.

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

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



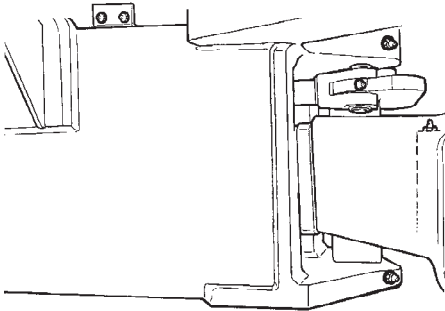
Fuel pre-filter - Replace



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

See instruction manual for the engine when replacing the filter, the chapter on the fuel system.

Fig. Engine compartment
1. Fuel prefilter



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 hitch

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.

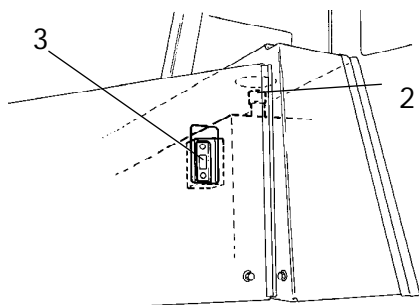


Fig. Hydraulic reservoir
2. Filler cap
3. Sight glass

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.

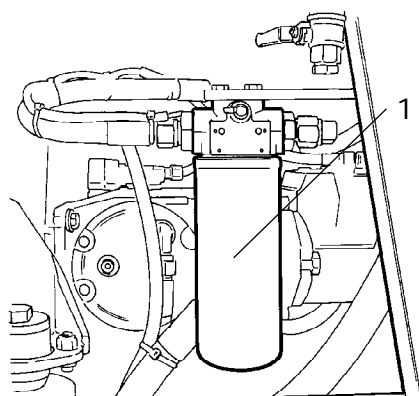


Fig. Engine compartment
1. Hydraulic fluid filter (x1)

Carefully clean round the hydraulic filter.



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



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

Thoroughly clean the sealing surfaces on the filter head.

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



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

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



Hydraulic fluid reservoir - Draining

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

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

Drain as follows:

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



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

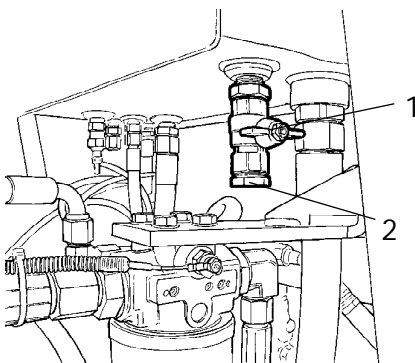


Fig. Hydraulic reservoir, bottom
1. Drainage tap
2. Plug



Fuel tank - Drainage

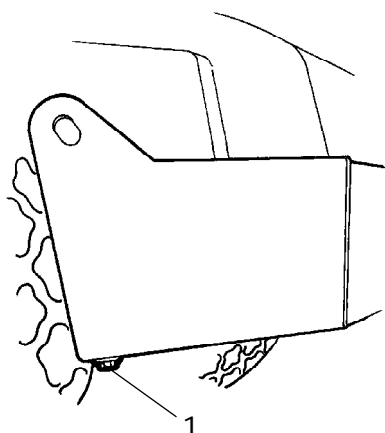


Fig. Fuel tank
1. Drainage plug

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

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

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

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



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

Drain as follows:

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



Air conditioning (Optional) Fresh air filter - Change



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

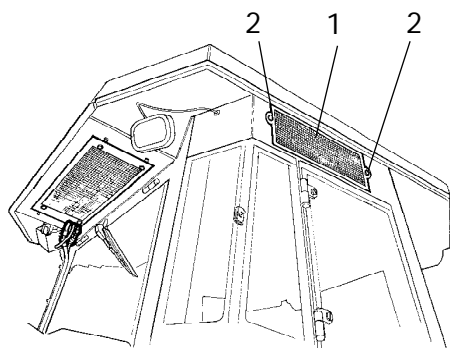


Fig. Cab
1. Fresh air filter
2. Screw (x2)

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

Replace with a new filter.

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



Rear axle planetary gear - Oil change

Oil can be filled through plug (2) at 12 o' clock (filling position) with suitable volume for each side. And oil level can be checked through oil level hole (3). Wipe clean, unscrew the plug (2) (when the plug is at 6 o' clock) and drain the oil into a suitable receptacle.

Plug (1) which for central oil filling, oil level can be shown from oil level hole (4), unscrew drainage plug (5) to drain the oil.


The plug (6) on the central reducer at 6 o' clock is for oil drainage.

After filling three filling portals. Oil arrives at all gear meshing position by oil transmission.

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.

 Oil should be taken to your local waste disposal station.

Check the brake cylinder through checking hole (7).

To release brake by using option port (8).

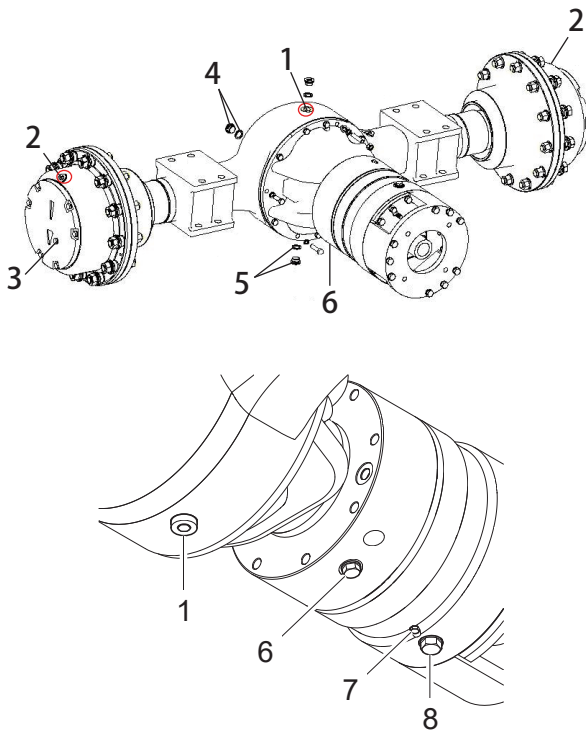


Fig. Planetary gear/filling/drainage position

- 1. Plug
- 2. Plug
- 3. Level hole
- 4. Level hole
- 5. Drainage plug
- 6. Drainage plug
- 7. Checking hole
- 8. Option port

*The plug at 12 o'clock- filling position
The plug at 6 o'clock - drainage position*



Drum cartridge - Oil change

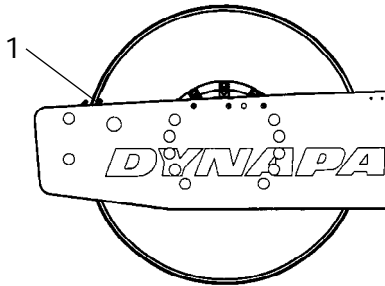


Fig. Left drum side
1. Indicator pin

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.

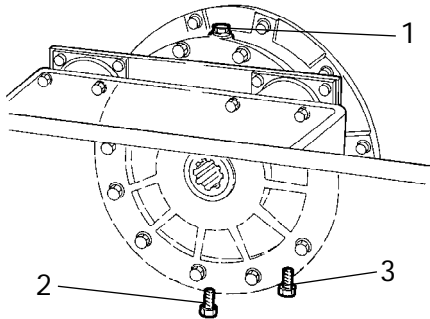


Fig. Right drum side
1. Filler plug
2. Drain plug
3. Level plug

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

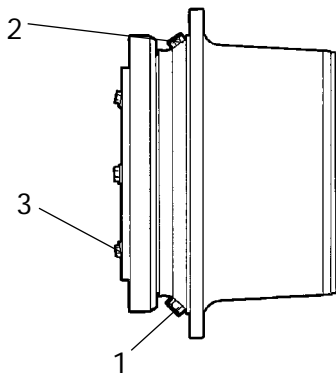


Fig. Drum gearbox
1. Drain plug
2. Filler plug
3. Level plug

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).

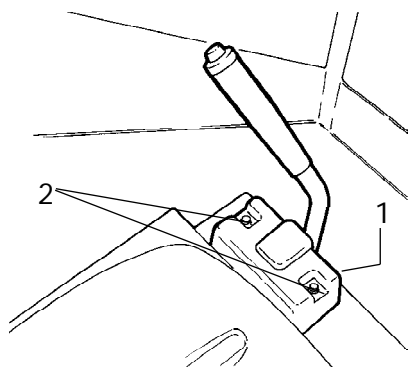


Fig. Steering joint
1. Protective cover
2. Screws

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.

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.

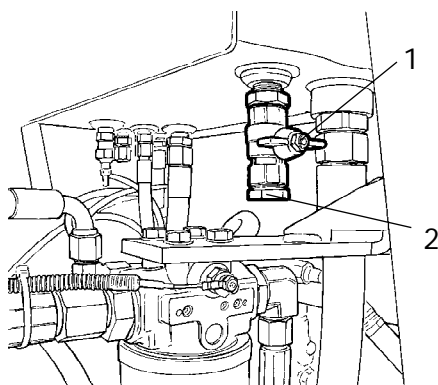


Fig. Hydraulic reservoir, bottom
1. Stop cock (3/4")
2. Plug

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.

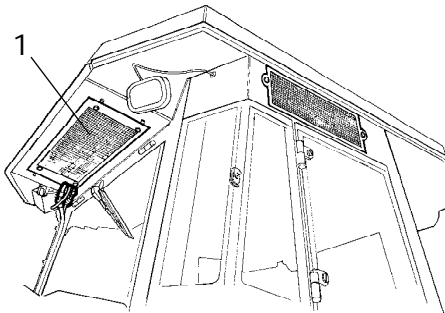


Fig. Cab
1. Condensor element

Automatic Climate Control (Optional) - Overhaul

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

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



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



Wear protective goggles when working with compressed air.

Inspect the condenser element attachment.

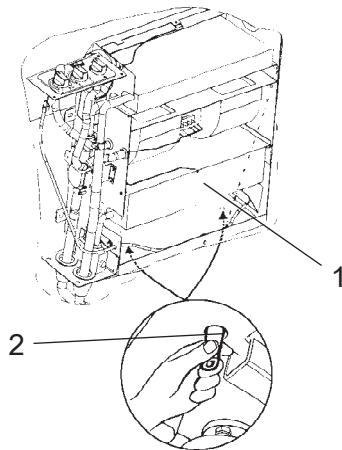


Fig. Automatic climate control
1. Cooling element
2. Drain valve (x2).

Engine coolant - Replace

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

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

Drain by pinching the valves (2), re-fill new coolant.

Refer Engine Manual for replacement.

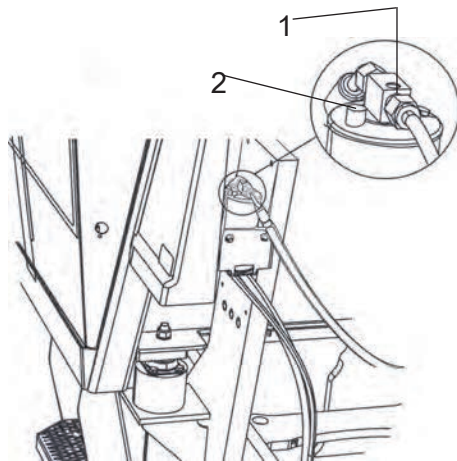


Fig. Drying filter in engine compartment
1. Sight glass
2. Moisture indicator

Drying filter - Check

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

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

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



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



Do not disconnect or undo the hose couplings.



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



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

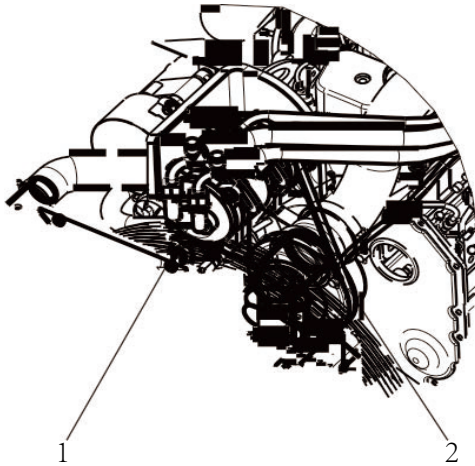


Fig. Engine compartment
1. Compressor
2. Drive belt

Compressor - Check (Optional)

Inspect the attachment of the compressor (1).

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

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



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

Disposal

Correctly sorted disposal must be carried out after replacing wear and spare parts and after the machine has been withdrawn from service (scrapped).

The materials must be sorted correctly according to metal, plastic, electronic scrap, various operating substances etc.

Any oily or greasy parts (hydraulic hoses, lube pipes etc.) must be treated separately.

Electric devices, accessories and packaging should be recycled in an environment-friendly manner.

Always observe the local regulations.

Air conditioning operation and maintenance (Optional)

1. Operation

Refrigeration: After starting the engine, turn on the COOL switch. For best results, run for one minute and then switch the temperature-control to the COOL position. At this time, the air conditioning system begins to work and the cab temperature begins to drop. When reaching the desired temperature, rotate the temperature-control switch counterclockwise until the compressor stops working. This will establish the desired indoor temperature. When the cab temperature is higher than the desired temperature, the indicator lamp is bright and refrigeration will automatically resume. When cab temperature is lower than the desired temperature, the indicator lamp goes off and the system stops working.

The fan control switch has three different speeds: high, medium and low. Cabin vents can be adjusted both vertically and horizontally to control the direction of air flow.



Notice: Please do not fasten the temperature-control switch to low-grade air vent to COOL position while using air condition, in case that the evaporator forms frost, influence the refrigeration result.

Cold warm air conditioner: please don't turn on the hot water valve at the time of refrigeration in summer.

Heat: To operate the heater in the winter, close the temperature-control switch first. After the engine is started, open the switch and choose the HOT position. The hot water valve is opened at this moment. The air vent is opened and the indoor temperature begins to rise. When the desired temperature is reached, the air vent closes. When the temperature is lower than desired, the air vent will open again.

The fan control switch has three different speeds: high, medium and low. Cabin vents can be adjusted both vertically and horizontally to control the direction of air flow.



Notice: The heat source of the heating system adopts the engine cooling water, communicate with water tank of the engine, when the environment temperature is lower than 0 degree centigrade and the engine does not work, should put the water tank of the engine empty, or annotate the anti-icing fluid in the water tank, so as not to freeze the heating system to crack and heat the core body.

2. Maintenance

In unsuited season for air conditioning function, need to keep A/C function running for 2-3 hours/month.



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