

Instruction manual

Operating & Maintenance

4812162501_F.pdf

**Static Three-drum Roller
CS1400**

**Engine
Deutz TD 3.6 L04 (III B/T4f)**

**Serial number
10000514xxA016632 - A026300**



Translation of original instruction

Table of Contents

Introduction	1
The machine	1
Intended use	1
Signal symbols and meaning	1
Safety information	1
General	2
CE marking and Declaration of conformity	3
Safety - General instructions	5
Safety - when operating	7
Driving near edges	7
Work driving	8
Special instructions	9
Standard lubricants and other recommended oils and fluids	9
Higher ambient temperatures, above +40°C (104°F)	9
Lower ambient temperature - Freeze risk	9
Temperatures	9
high pressure cleaning	9
Fire fighting	10
Roll Over Protective Structure (ROPS), ROPS approved cab	10
Battery handling	10
Jump starting	11
Technical specifications	13
Vibrations - Operator station	13
Noise level	13
Slopes	13
Dimensions, side view	14
Dimensions, top view	15
Weights and volumes	16
Working capacity	16
General	17

Air Conditioning / Automatic Climate Control (ACC) (Optional)	17
Tightening torque	18
ROPS - bolts	19
Hydraulic system	19
Machine description	21
Diesel engine	21
Propulsion system/Transmission	21
Brake system	21
Steering system	21
FOPS and ROPS	21
Identification	22
Product and component plates	22
Product identification number on the frame	22
Machine plate	23
Explanation of 17PIN serial number	23
Engine plates	24
Decals	25
Location - decals	25
Location - decals, CALIFORNIA	26
Safety decals	26
Info decals	29
Instruments/Controls	30
Locations - Control panel and controls	30
Function descriptions	31
Locations - Instruments and controls, cab	34
Function description of instruments and controls in the cab	35
Electrical system	35
Fuses	35
Relays	37
Relays in cab	38

Fuses in cab	38
Operation	39
Before starting	39
Battery disconnect/ Electrical battery disconnect (Option) - Operation	39
Operator's seat - Adjusting.....	39
Parking brake - Check.....	40
Operator's station	40
View	41
Interlock.....	41
Instruments and lamps - Checking.....	42
Starting	43
Starting the engine	43
Driving	44
Operating the roller	44
Interlock/Emergency stop/Parking brake - Check	46
Sprinkler system/Water tanks	46
Braking	48
Normal braking.....	48
Emergency brake	49
Switching off.....	49
Parking	50
Chocking the drums	50
Battery disconnect/ Electrical battery disconnect (Option)	50
Long-term parking.....	51
Engine	51
Battery.....	51
Air cleaner, exhaust pipe.....	51
Sprinkler system.....	51
Fuel tank	51

Hydraulic reservoir	52
Steering cylinder, hinges, etc.	52
Hoods, tarpaulin	52
Miscellaneous	53
Lifting	53
Locking the articulation	53
Lifting the roller.....	53
Unlocking the articulation	54
Transport	54
Roller prepared for transport	54
Towing/Recovering	55
Short distance towing with the diesel engine switched off/not running	55
Brake release pump.....	56
Towing.....	58
Operating instructions - Summary	59
Preventive maintenance	61
Acceptance and delivery inspection	61
Warranty.....	61
Maintenance - Lubricants and symbols	63
Maintenance symbols	64
Maintenance - Maintenance schedule	65
Service and maintenance points	65
General	66
Every 10 hours of operation (Daily).....	66
After the FIRST 50 hours of operation	66
Every 50 hours of operation (Weekly).....	67
Every 250 / 750 / 1250 / 1750 hours of operation	67
Every 500 / 1500 hours of operation	67
Every 1000 hours of operation	68
Every 2000 hours of operation	69

Service - Checklist.....	70
Maintenance, 10h	71
Engine hood support.....	71
Diesel engine Check oil level	71
Hydraulic reservoir, Level check - Filling.....	72
Coolant level - Check	72
Fuel tank - Refueling	73
Water tanks - Filling	73
Sprinkler system - Check/Cleaning	74
Sprinkler system/Drum Cleaning	74
Brakes - Check.....	75
Scrapers - Check/Cleaning	76
Draining the diesel engine's fuel prefilter	76
Maintenance - 50h	77
Engine hood support.....	77
Air cleaner Checking - Change the main air filter	77
Backup filter - Change.....	78
Air cleaner - Cleaning.....	79
Articulation steering and steering cylinder bushings - Lubrication	79
Tightening the drum nuts - Check	80
Air conditioning (Optional) - Inspection.....	81
Air conditioning (Optional) - Cleaning.....	81
Maintenance measures - 250 h	83
Engine hood support.....	83
Radiator - Check/Cleaning	84
Maintenance measures - 500 h	85
Engine hood support.....	85

Radiator - Check/Cleaning	86
Hinges, controls - Lubrication.....	86
Diesel engine - Oil change	87
Hydraulic reservoir cap - Check	87
Maintenance - 1000h	89
Engine hood support	89
Radiator - Check/Cleaning	90
Hinges, controls - Lubrication.....	90
Diesel engine - Oil change	91
Replacing the fuel filter / fuel prefilter	92
Hydraulic reservoir cap - Check	92
Hydraulic fluid filter - Replacement	93
Fresh air filter - Replacement.....	94
Fuel tank - Draining off water	94
Hydraulic reservoir - Draining.....	95
Maintenance - 2000h	97
Engine hood support	97
Radiator - Check/Cleaning	98
Hinges, controls - Lubrication.....	98
Diesel engine - Oil change	99
Replacing the fuel filter / fuel prefilter	100
Hydraulic reservoir cap - Check	100
Hydraulic fluid filter - Replacement	101
Fresh air filter - Replacement.....	102
Fuel tank - Draining off water	102
Hydraulic reservoir - Changing the fluid	103
Fuel tank - Cleaning	103
Water tank - Cleaning	104
Steering joint - Check.....	104
Compressor - Check (Optional)	105

Air conditioning (Optional)	
Drying filter - Inspection	105
Hydraulic reservoir - Draining.....	106

Introduction

The machine

Dynapac CS1400 is a static 3-drums roller in 11 metric tonnes class with a compaction width of 2100 mm (83 in.) and with same static linear load on all drums. The machine has articulated steering and is equipped with drive and braking on all drums.

Intended use

CS1400 is mainly used for compaction of asphalt layers up to 50 mm (2 in.). It is suitable for surfaces, where the ground should not be vibrated, for example near old buildings and on bridges.

Signal symbols and meaning



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



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

Safety information



It is recommended to at least train operators in handling and daily maintenance of the machine in accordance with the instruction manual. Passengers are not allowed on the machine, and you must sit in the seat when operating the machine.



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



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



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



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




Replace immediately the instruction manuals if lost, damaged or unreadable.

CALIFORNIA

Proposition 65

Decal and location of decal shown in section Machine description.

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

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

For more information go to www.P65warnings.ca.gov/diesel.

General

This manual contains instructions for machine operation and maintenance.

The machine must be correctly maintained for maximal performance.

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

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

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



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

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



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

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

CE marking and Declaration of conformity

(Applies to machines marketed in EU/EEC)

This machine is CE marked. This shows that on delivery it complies with the basic health and safety directives applicable for the machine in accordance with machinery directive 2006/42/EC and that it also complies with other regulations and directives applicable for this machine.

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

Safety - General instructions

(Also read the safety manual)



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

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

Safety - when operating



Prevent persons from entering or remaining in the risk zone, i.e. a distance of at least 7 m (23 ft) in all directions from operating machines. The operator may allow a person to remain in the risk zone, however he/she must be attentive and operate the machine only when the person is fully visible or has given a clear indication of where he or she is.



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

Driving near edges



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



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

Work driving



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



Dynapac always recommends mounted ROPS (Roll Over Protective Structure), or a ROPS-approved cab and seat belt usage.

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

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

Special instructions

Standard lubricants and other recommended oils and fluids

Before leaving the factory, the systems and components are filled with the oils and fluids specified in the lubricant specification. These are suitable for ambient temperatures in the range -15°C to +40°C (5°F - 105°F).



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

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

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

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

Hydraulic system - mineral oil Shell Tellus S2V100 or similar.

Lower ambient temperature - Freeze risk

Make sure that the watering system is empty/drained of water (sprinkler, hoses, tank/s) or that anti-freeze has been added, to prevent the system freezing.

Temperatures

The temperature limits apply to standard versions of rollers.

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

high pressure cleaning

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

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



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

Fire fighting

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

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

Roll Over Protective Structure (ROPS), 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 ROPS structure in cab. These must be replaced with new ROPS structure or new cab.

Battery handling



When removing batteries, always disconnect the negative cable first.



When fitting batteries, always connect the positive cable first.



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



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

Jump starting

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



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

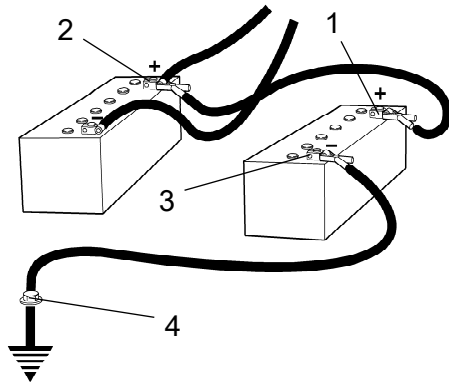


Fig. Jump starting

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

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

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

Technical specifications

Vibrations - Operator station (ISO 2631)

Vibration levels have been measured according to the operational cycle described in the EU directive 2000/14/EC on machines equipped for the EU market with operator seat in transport position.

Measured whole-body vibrations are below the action value of 0.5 m/s^2 as specified in Directive 2002/44/EC. (Limit is 1.15 m/s^2)

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

Noise level

Sound levels have been measured according to the operational cycle described in the EU directive 2000/14/EC on machines equipped for the EU market with operator seat in transport position.

Guaranteed sound power level, L_{WA} 101 dB (A)

Sound pressure level at the operator's ear (platform), L_{pA} $80 \pm 3 \text{ dB (A)}$

Sound pressure level at the operator's ear (cab), L_{pA} $78 \pm 3 \text{ dB (A)}$



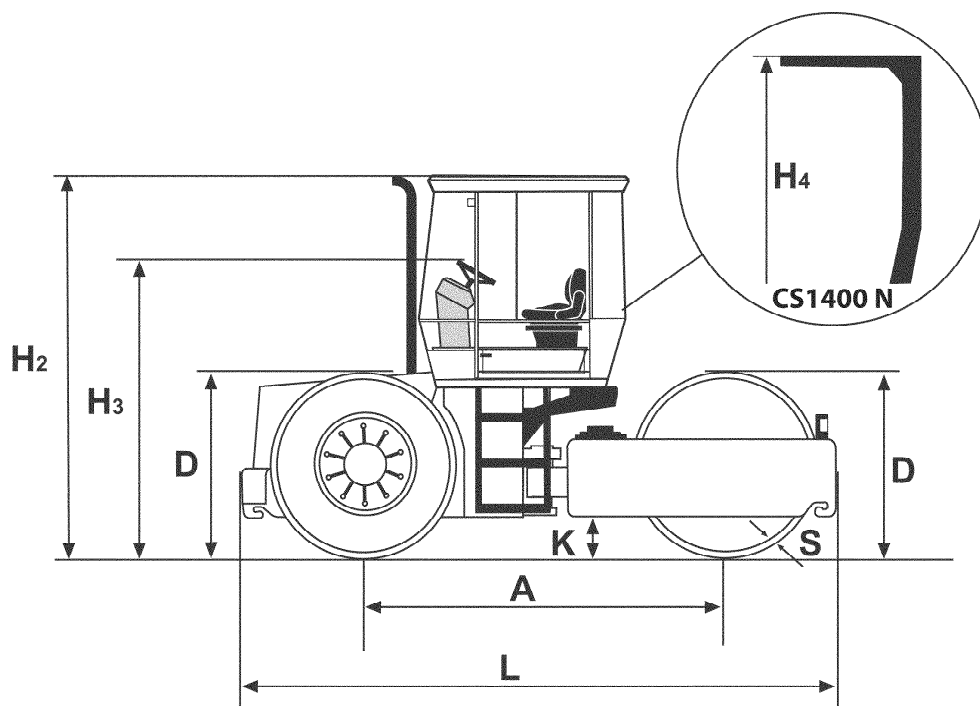
Max 20° or 36%

Slopes

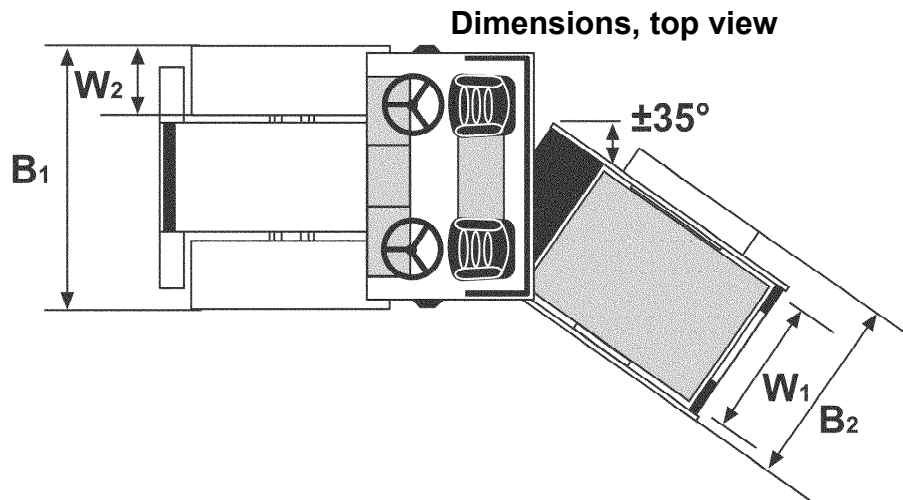
The recommended max slope angle is for a machine that runs straight on hard, flat surface.

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

Dimensions, side view



	Dimensions		mm	in
A	Wheel base		2900	114.2
D	Diameter, drum		1500	59
H ₂	Height, with cab		2990	117.7
H ₃	Height, without cab/ROPS		2500	98.4
H ₄	Height, with ROPS		3400	133.8
K			320	12.6
L	Length		4780	188.2
S	Thickness		22	0.87



	Dimensions	mm	in
B ₁		2100	82.7
B ₂		1515	59.7
W ₁		1060	41.7
W ₂		570	22.4

Weights and volumes

Weights

Operating mass, with ROPS/Cab and ballast (EN500)	13200 kg	29,100 lbs
Drum module weight (with ballast), front	6900 kg	15,210 lbs
Drum module weight (with ballast), rear	6300 kg	13,890 lbs

Fluid volumes

Fuel tank	110 liters	29 gal
Water tank	530 liters	140 gal

Working capacity

Compaction data

Static linear load, front	51 kg/cm	285 pli
Static linear load, rear	49 kg/cm	274 pli
Static line load (with ballast), front	60 kg/cm	336 pli
Static line load (with ballast), rear	59 kg/cm	330 pli

Propulsion

Speed range	0-15	km/h	0-9	mph
Climbing capacity (theoretical)	45	%		

General

Engine

Manufacturer/Model	Deutz TD3.6 L04 (IIIB/T4)	Water-cooled turbo diesel
Power output (SAE J1995), 2200 rpm	55 kW	74 hp
Engine speed		
- idling	900 rpm	
- loading/unloading	1800 rpm	
- work/transport	2200 rpm	



Tier 4i/Stage IIIB engines require the use of Ultra Low Sulphur Diesel (ULSD) fuel, which has a sulphur content of 15 ppm (parts per million) or less. A higher sulphur content will cause operating problems and put the useful life of components at risk, which can lead to engine trouble.



To use diesel fuel with up to max 50 ppm Sulphur content a modification / downgrade of the diesel engine software for shutting down of the EGR function is possible.

Please note that such a downgrade is not allowed for emission regulated markets as this will make the engine none certified.

Electrical system

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

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.

The system contains fluorinated greenhouse gases.

Coolant designation: HFC-134a

Coolant weight when full: 1,600 kg

CO₂-equivalent: 2,288 ton

GWP:1430

Tightening torque

Tightening torque in Nm for oiled or dry bolts tightened with a torque wrench.

Metric coarse screw thread, bright galvanized (fzb):

STRENGTH CLASS:

M - thread	8.8, Oiled	8.8, Dry	10.9, Oiled	10.9, Dry	12.9, Oiled	12.9, Dry
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 :	M22 (PN 4700195096 - 4700195097)
Strength class :	10.9
Tightening torque :	626 Nm

Hydraulic system

Opening pressure	MPa
Drive system	42.0
Supply system	2,2
Control systems	14,0
Brake release	1.5

Machine description

Diesel engine

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

Propulsion system/Transmission

The propulsion system is a hydrostatic system with a hydraulic pump supplying oil to three driver motors connected in parallel. Each motor drives one drum.

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

Brake system

The brake system consists of a service brake, secondary brake and parking brake. The service brake is hydrostatic and is activated by moving the control lever to neutral.

Secondary/Parking brake

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

Steering system

The steering system is a hydrostatic system. The control valve on the steering column distributes the flow to the control cylinder, which actuates the articulation. The steering angle is proportional to the deflection of the steering wheel.

FOPS and ROPS

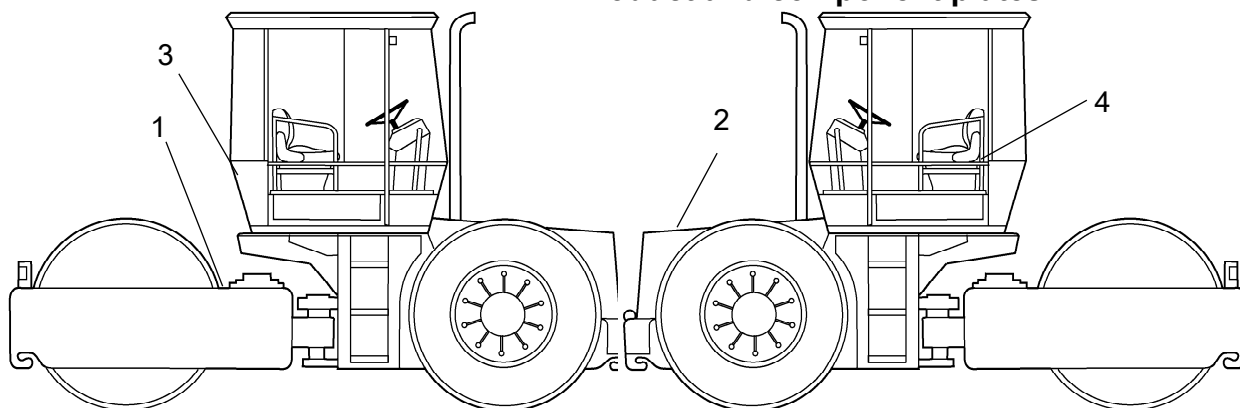
FOPS is the abbreviation for "Falling Object Protective Structure" (roof protection) and ROPS is the abbreviation for "Roll Over Protective Structure".

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

Never perform any modifications on the cab or FOPS/ROPS structure without first having discussed the modification with Dynapac's production unit. Dynapac determines whether the modification could result in the approval according to the FOPS/ROPS standards becoming invalid.

Identification

Product and component plates



1. Product plate - Product Identification Number (PIN), model/type designation
2. Engine plate - Type description, product and serial numbers
3. Component plate, ROPS Product and serial numbers
4. Component plate, Cab Product and serial numbers

Product identification number on the frame

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

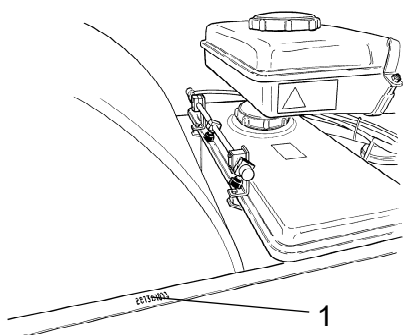


Fig. 1. PIN, Rear frame

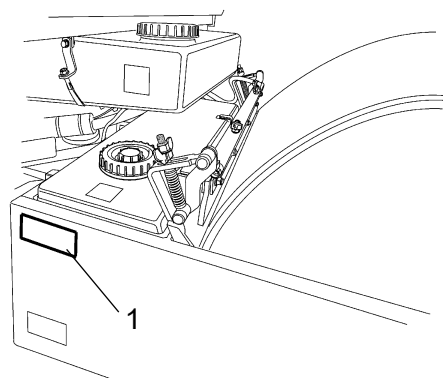





Fig. Machine plate, Rear frame
1. Machine plate

Machine plate

The machine type plate (1) is affixed on the left side of the rear frame.

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

		 Dynapac Compaction Equipment AB Box 504, SE-371 23 Karlskrona Sweden		
Product Identification Number			XXXXXXXXXXXXXXXXXX	
Designation	Type	Rated Power	Max axle load front / rear	
XXXXXX	XXXXXX	XXX kW	XXXX/XXXX kg	
Gross machinery mass	Operating mass	Max ballast	[Date of Mfg]	
XXXX kg	XXXX kg	XXXX kg	XXXX	
Made in Sweden				
4811 1001 54				

Please state the machine's PIN when ordering spares.

100	00123	V	x	A	123456
A	B	C	F		

Explanation of 17PIN serial number

A= Manufacturer

B= Family/Model

C= Check letter

F= Serial number

Engine plates

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

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

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

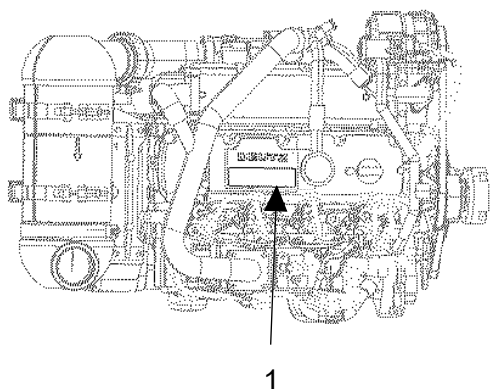
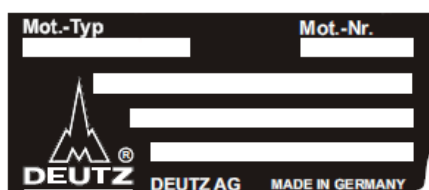
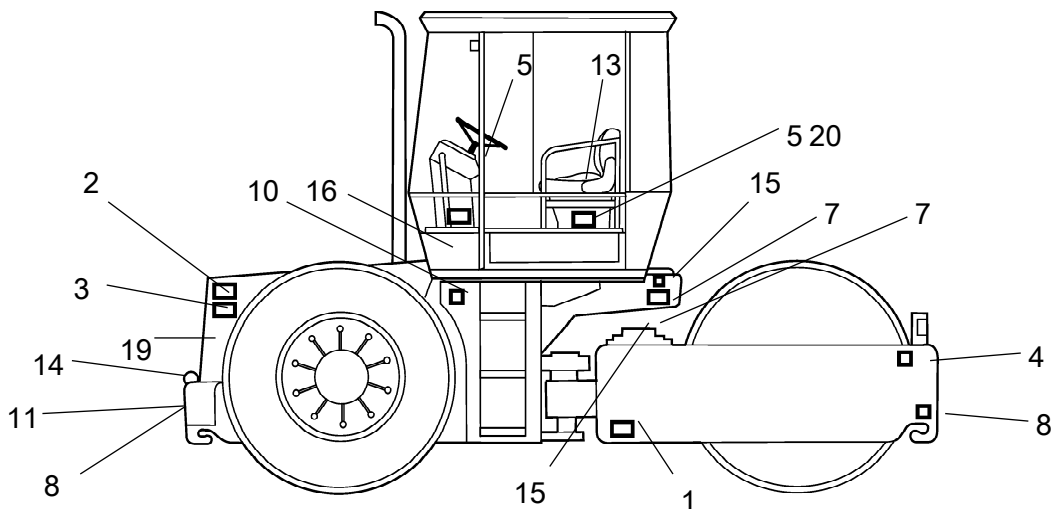
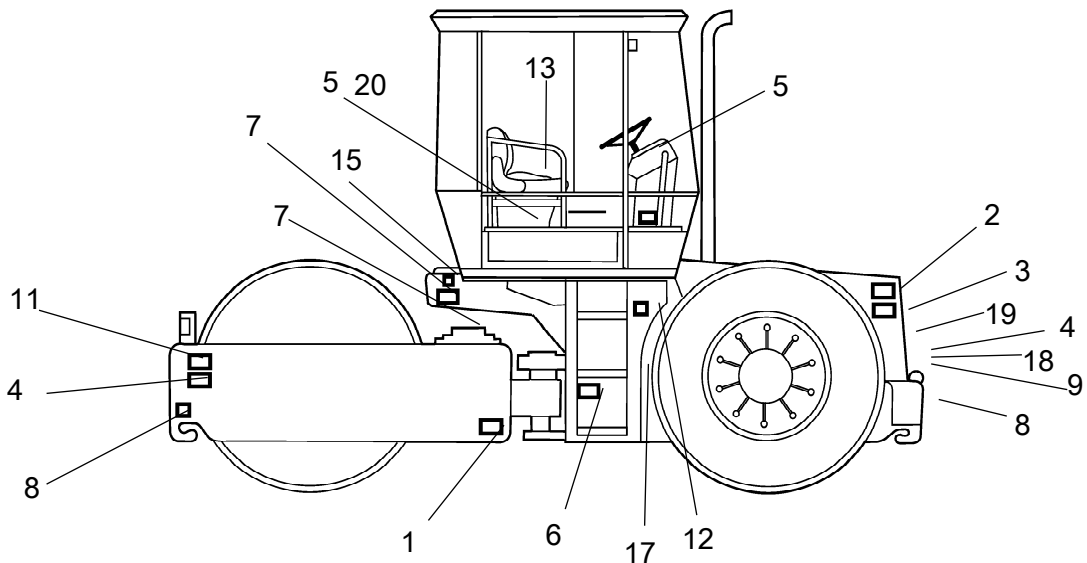


Fig. Engine
1. Type plate



Decals

Location - decals



1.	Warning, crush zone	4700903422	10.	Fuel with low sulphur content	4811000344
2.	Warning, rotating engine components	4700903423	11.	Hoisting plate	4700904870
3.	Warning, burning hot surfaces	4700903424	12.	Hydraulic fluid/ Biological hydraulic fluid	4700272372/ 4700792772
4.	Lifting point	4700588176	13.	Handbook compartment	4700903425
5.	Warning, instructions manual	4700903459	14.	Warning, locking	4700908229
6.	Warning, brake release	4700904895	15.	Water	4700991657
7.	Warning, slippery surfaces	4700904406	16.	Sound effect level	4700791271
8.	Fixing point	4700382751	17.	Hydraulic fluid level	4700272373
9.	Master switch	4700904835	18.	Coolant	4700388449
			19.	Battery voltage	4700791491
			20.	Warning, locking during transportation	4812125363

Location - decals, CALIFORNIA

Proposition 65

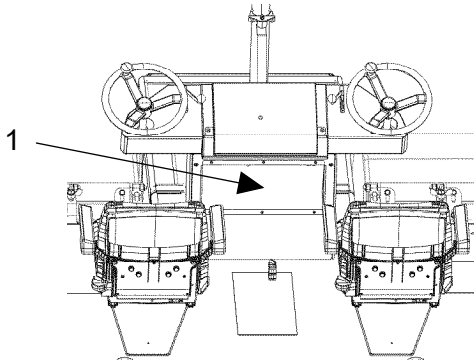


Fig. Location

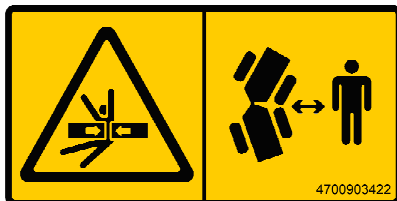
1. Warning, CALIFORNIA Proposition 65

4812129673

Safety decals

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

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

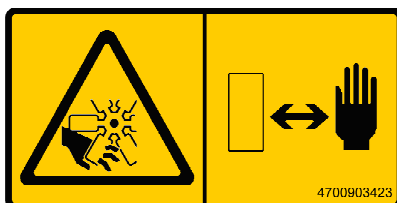


4700903422

Warning - Crush zone, articulation/drum.

Maintain a safe distance from the crush zone.

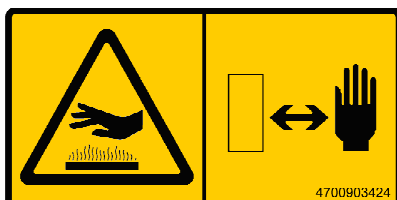
(Two crush zones on machines fitted with pivotal steering)



4700903423

Warning - Rotating engine components.

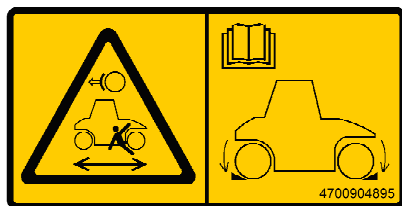
Keep your hands at a safe distance.



4700903424

Warning - Hot surfaces in the engine compartment.

Keep your hands at a safe distance.

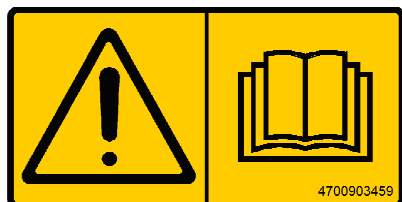


4700904895

Warning - Brake disengagement

Study the towing chapter before disengaging the brakes.

Danger of being crushed.



4700903459

Warning - Instruction manual

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



4700908229

Warning - Risk of crushing

The articulation must be locked when lifting.

Read the instruction manual.

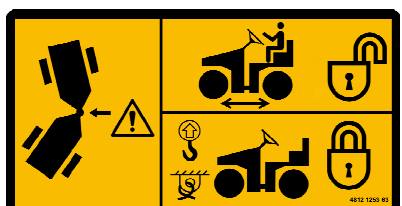


4700904406

Warning - Danger of slipping or falling.

Warning, danger of slipping or falling.

Read the instruction manual.



4812125363

Warning - Locking

The articulation must be locked during transport and lifting,

but be open during operation.

Read the instruction manual.

4812129673

Warning

CALIFORNIA - Proposition 65



WARNING

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

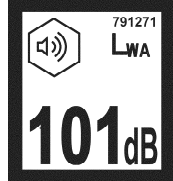
- Always start and operate the engine in a well-ventilated area.
- If in an enclosed area, vent the exhaust to the outside.
- Do not modify or tamper with the exhaust system.
- Do not idle the engine except as necessary.

For more information go to
www.P65warnings.ca.gov/diesel

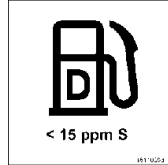
4812129673

Info decals

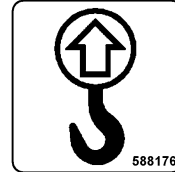
Noise power level



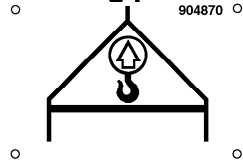
Diesel fuel



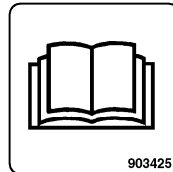
Lifting point



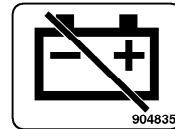
Hoisting plate



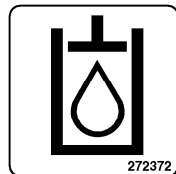
Handbook compartment



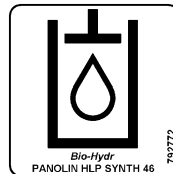
Master switch



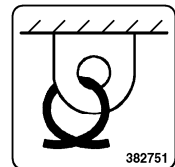
Hydraulic fluid



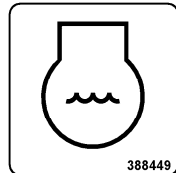
Biological hydraulic fluid
PANOLIN



Fixing point



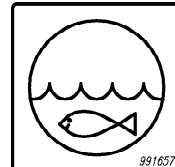
Coolant



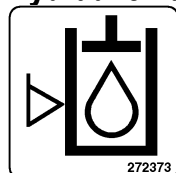
Battery voltage



Water



Hydraulic fluid level



(with ROPS only)

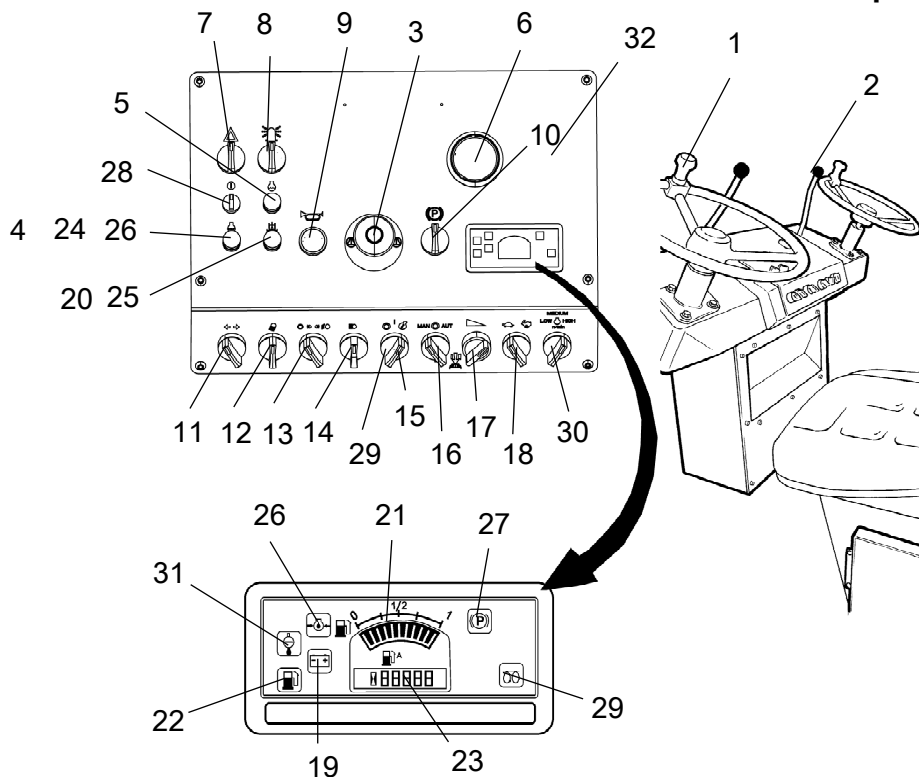


Fuel with low sulphur content



Instruments/Controls

















Locations - Control panel and controls


















- | | |
|--|---|
| 1. Steering wheel | 16. Manual/Automatic sprinkler |
| 2. Forward/reverse lever | 17. Sprinkler timer |
| 3. Emergency stop | 18. Gear selector, low/high |
| 4. Warning lamp, engine | 19. Warning lamp, battery charging |
| 5. Warning lamp, coolant level / temperature | 20. Warning lamp, hydraulic fluid temperature |
| 6. * Temperature gauge, hydraulic fluid | 21. Fuel gauge |
| 7. * Hazard indicators | 22. Warning lamp, low fuel level |
| 8. * Rotating beacon | 23. Hourmeter / Error code |
| 9. Horn | 24. Warning lamp, air filter |
| 10. Parking brake | 25. Warning lamp, hydraulic fluid filter |
| 11. * Direction indicator | 26. Warning lamp, engine oil pressure |
| 12. * Light switch for working lights | 27. Warning lamp, brakes |
| 13. * Light switch for parking/dipped lights | 28. Browse in error codes |
| 14. * Light switch for full/dipped beam | 29. Glowing |
| 15. Start/stop knob | 30. Engine speed control |
| | 31. See point 5 |
| | 32. * Asphalt temperature sensor, switch |

*) Optional

Function descriptions

No	Designation	Symbol	Function
1	Steering wheel		There are two steering wheels, one on the left and one on the right side.
2	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.
3	Emergency stop		When pressed, the emergency stop is activated. The engine switches off and the brakes are activated. Brace yourself for a sudden stop.
4	Fault indicating lamp, Serious fault		Stop the engine.
5	Warning lamp, water temperature / coolant level		The lamp lights and a symbol appears in the display if the water temperature is too high or in the event of a low coolant level. There is a risk of overheating.
6	Temperature gauge, hydraulic fluid (Optional)		Shows hydraulic fluid temperature. Normal temperature range is 65°-80°C (149°-176°F). Stop the engine if the gauge shows a temperature of more than 85°C (185°F). Locate the fault.
7	Hazard flashers, switch (Optional)		Turn the switch to the right to turn on the hazard warning lights.
8	Hazard beacon, switch (Optional)		Turn to the right to switch on the hazard beacon.
9	Horn, switch		Press to sound the horn.
10	Parking brake		Left position = Brake released Right position = Brake activated
11	Direction indicator, switch (Optional)		Turn to the left to switch on the left direction indicators etc. The direction indicators are off in the middle position.
12	Light switch, Rear working lights (Optional)		Turn to the right to switch on the working lights.
13	Light switch for parking/dipped lights forward. (Optional)		Lights off.
			Parking lights on
			Front working lights on
14	Light switch for Full/Dipped beam (Optional)		In the right position, the switch lights and the main beam is on. In the left position, the dipped beam is on.
15	Starter switch		The electric circuit is broken.
			All instruments and electric controls are supplied with power.

No	Designation	Symbol	Function
			Starter motor activation.
16	Watering, switch	MAN O AUTO	In the left position, the drums are continually watered. In the middle position, watering is off. In the right position, watering is automatically switched on/off via the forward/reverse lever when the direction of travel is changed.
17	Sprinkler timer, switch		The switch has six different timer positions which controls the amount of water supplied to the drums. Switch with reley 4700374240 The left mode supplies most water and the right mode least. Switch with relay 4700374213 The left mode supplies least water and the right mode most. The leftmost position gives maximum pausing time. The far right position activates the ACV function. As soon as the Forward / Reverse lever is out of neutral position, the pump will start and switch off as soon as the Forward / Reverse lever is in neutral position again.
18	Gear selector, low/high	 	Tortoise = Working speed, low. Hare = Transportation speed, high
19	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.
20	Warning lamp, hydraulic fluid temperature		If the lamp comes on, the hydraulic fluid is too hot. Do not drive the roller. Cool the fluid by allowing the engine to idle and locate the fault.
21	Fuel gauge		Shows level in the fuel tank.
22	Warning lamp, low fuel level		When the lamp comes on, there is only a small amount of fuel left. Refuel as soon as possible.
23	Hourmeter / Error code		- Engine running time is shown in hours. - Error codes are also shown in the display.
24	Warning lamp, air filter		If the lamp comes on while the engine is running at full speed, the air filter must be cleaned or replaced.
25	Warning lamp, hydraulic filter		If the lamp comes on while the engine is running at full speed, the hydraulic filter must be changed.
26	Warning lamp, engine oil pressure		The lamp comes on if the engine oil pressure is too low. Stop the engine immediately and locate the fault.
27	Warning lamp, brakes		The lamp lights when the parking brake is activated and the brakes are applied.

No	Designation	Symbol	Function
28	Browse in error codes		Turn off / on the ignition. Turn the switch to the right to show the error code on the display and the engine warning light starts flashing. On the warning light shows error codes through various intervals of blinking. Short-long-short flashes indicates the error code is.
29	Glowing		Lights up when preheating of diesel engine is in progress and starter switch is in position I.
30	Electronic speed control		Controls speed of diesel engine. Low (900 rpm), Medium (1500 rpm), High (2200 rpm).
31	Warning lamp, coolant level / temperature		See point 5.
32	Asphalt temperature gauge, switch (option)		The temperature is read at the instrument on the instrument panel.

Warning indication - Electronic engine control

Status is shown with the warning lamp.
The system monitors both engine status and itself.

Function check

- Ignition on, the warning lamp lights for approx. 2 sec. and then goes out.

The warning lamp does not light

- In connection with the lamp test, a lamp that goes out indicates that the system is working.



The warning lamp lights with a continuous red glow

- Fault in the system
- The work can continue, but with limitations in the system.
- A representative from DEUTZ must check the engine.
- If the lamp shines continuously, the monitored unit (e.g. coolant temperature, oil pressure) is below/above the permitted value range.
Depending on the fault in question, the engine output may be reduced to protect the engine.



The warning lamp flashes red

- Serious fault in the system
- Stop the engine immediately.
- After an engine stop, the start inhibitor may be activated
- The start inhibitor is deactivated by turning off the system with the ignition key for approx. 30 sec.
- Additional control lamps for e.g. oil pressure or oil temperature may light



When braking, engine braking carefully.
Use the brake only in emergency cases, as there is a risk for engine overspeed.

Locations - Instruments and controls, cab

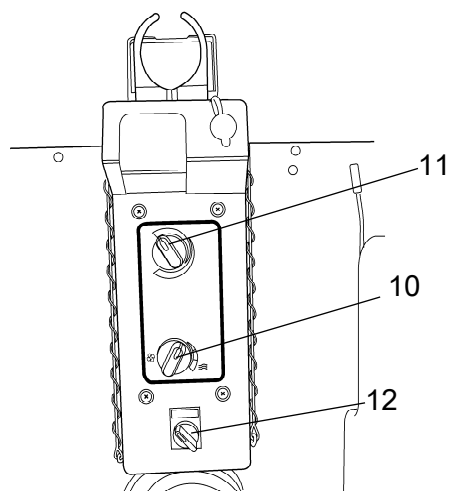


Fig. Cab, control between seats, with AC (optional)

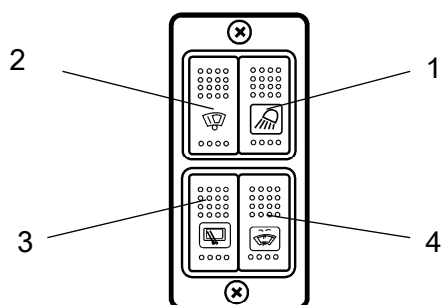


Fig. Cab roof

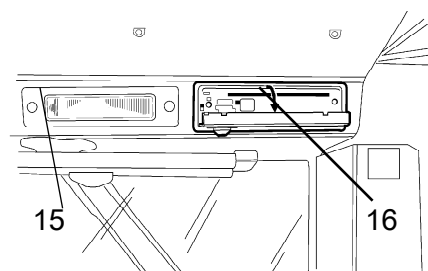








Fig. Cab roof, radio

Function description of instruments and controls in the cab

No	Designation	Symbol	Function
1	Working lights, switch		Press to switch on the working lights.
2	Front wiper, switch		Press to operate the front screen wiper.
3	Rear wiper, switch		Press to operate the rear screen wiper.
4	Front and rear window screen washers, switch		Press to wash windshield.
10	Ventilation fan, switch		In the left position, the fan is off. Turning the knob to the right increases the volume of air entering the cab.
11	Heater control		Turn to the right to increase heating. Turn to the left to reduce heating.
12	Seat selector		Selection of seat used by the operator.
15	Interior lighting		Three positions; On, Controlled via door switch, Off
16	Radio with CD player		See separate manual for Radio/CD

Electrical system



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

Fuses

Flat pin fuses protect the electrical regulating and control system.

The fuse boxes (1) are located underneath the instrument panel.

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

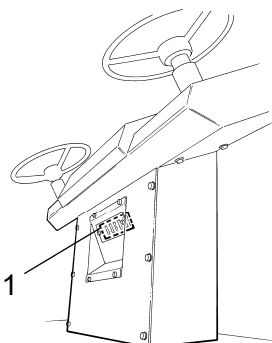


Fig. Instrument panel
1. Fuse boxes

Fuses

The figure shows the position of the fuses.

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

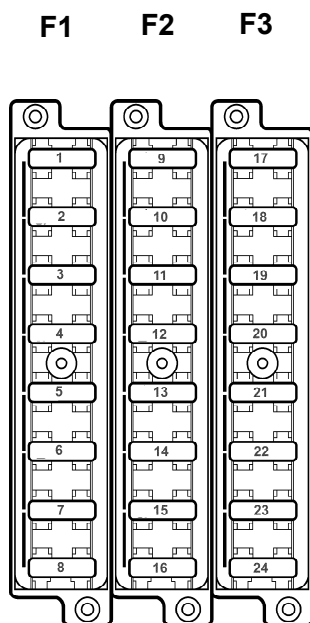


Fig. Fuse boxes

Fuse box (F1)

1.	VBS relay, Interlock	10A
2.	Control panel, Indicator lamps	10A
3.	Instrument, Low/High speed	10A
4.	Neutral relay, Sprinkler relay	10A
5.	Sprinkler motor 1 / Sprinkler motor 2	7.5A
6.	Indicator relay, 12V outlet	7.5A
7.	Reserve	-
8.	Reserve	-

Fuse box (F2)

9.	Horn	7.5A
10.	Beeper	5A
11.	Rotating beacon	7.5A
12.	Working lights	20A
13.	Working lights	20A
14.	Reserve	
15.	Reserve	
16.	Reserve	

Fuse box (F3)

17.	Dipped beam	7.5A
18.	Full beam	7.5A
19.	Position light right, Brake light	7.5A
20.	Position light left	5A
21.	Indicator relay	10A
22.	Direction indicator right	5A
23.	Direction indicator left	5A
24.	Reserve	-

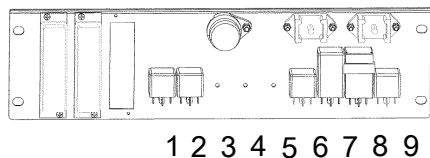


Fig. Instrument panel

Relays

- | | | |
|----|-----|----------------------|
| 1. | K1 | Main relay |
| 2. | K2 | Neutral start |
| 3. | K8 | Lights |
| 4. | K9 | Direction indicators |
| 5. | K10 | Brake lamp |
| 6. | K11 | Neutral |
| 7. | K12 | Sprinkler timer |
| 8. | K20 | Interlock |
| 9. | K38 | High/Low speed |

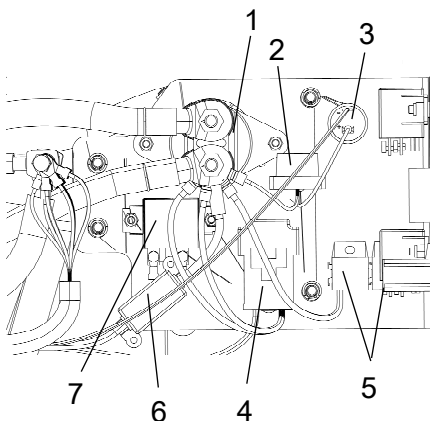


Fig. Main fuse panel

1. Battery disconnecter
2. Fuses (F15, F5, F20)
3. 12V socket
4. Fuses (F5, F13, F15)
5. Preheating relay (100A)
6. Fuse (F20)
7. Starter relay (75A)

The main fuse panel is located behind the battery isolation switch in the front member.

- | | | |
|-----|----------------------------|--------|
| F5 | Main fusing | (30A) |
| F13 | Engine ECU | (30A) |
| F15 | Fuel pump | (20A) |
| F16 | Lights | (40A) |
| F20 | Preheater unit | (100A) |
| F21 | Outlet, engine compartment | (10A) |
| F55 | Tachograph | (5A) |

Relays in cab

- | | | |
|----|-----|-------------|
| 1. | K1 | Washer pump |
| 2. | K5 | Condenser |
| 3. | K9 | AC fan |
| 4. | K10 | AC fan |

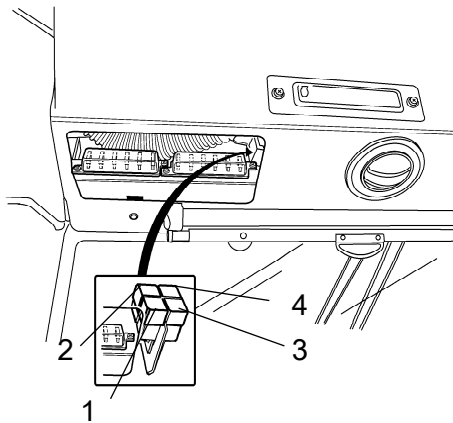


Fig. Relays in cab roof

Fuses in cab

Flat pin fuses protect the electrical regulating and control system.

The fuse boxes (1) are located on the right side of the cab roof.

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

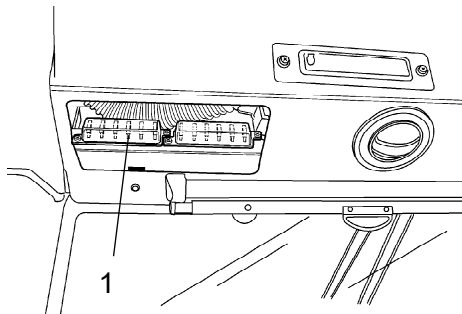


Fig. Cab roof
1. Fuse boxes



Fig. Fuse boxes, left and right

The figure shows the position of the fuses.

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

Fuse box, left side			Fuse box, right side		
1.	Working lights rear	10A	1.	Washer pump	7.5A
2.	Working lights front	10A	2.	Interior lighting	7.5A
3.	Left front wiper	15A	3.	Radio	10A
4.	Left rear wiper	15A	4.	AC fan	25A
5.	Right front wiper	15A	5.	Cigarette lighter socket	10A
6.	Right rear wiper	15A	6.	Condenser	20A

Operation

Before starting

Battery disconnecter/ Electrical battery disconnecter (Option) - Operation

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

The battery disconnecter is located in the front beam. Turn the key (3) to the On position. The roller is now supplied with power.

The machine may be fitted with an electrical battery disconnecter. The disconnecter function is then integrated in the ignition lock and there is no key (3) in the battery bay.



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

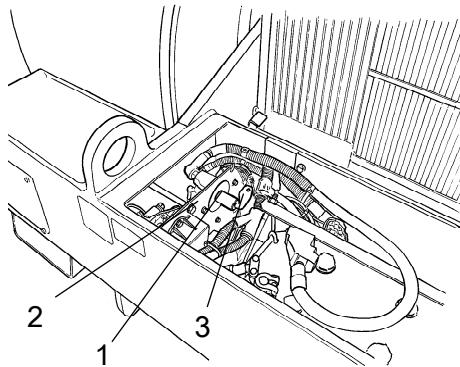


Fig. Battery bay in front beam
 1. Battery disconnecter
 2. Power socket, 12V
 3. Key

Operator's seat - Adjusting

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 :

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



Fig. Operator position
 1. Backrest inclination
 2. Length adjustment
 3. Weight adjustment

To adjust weight. Weight is increased by pushing the lever down until the required weight is achieved. To lower weight, push the lever down to its lowest position and release. The seat is now set for the minimum weight.

Parking brake - Check

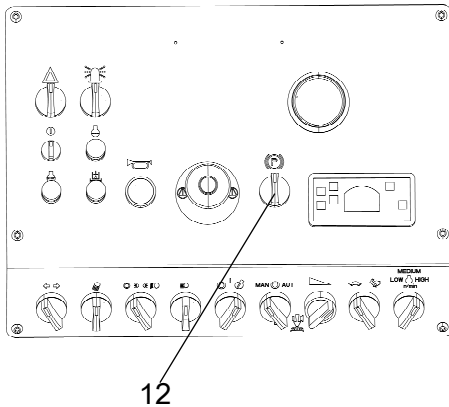


Fig. Control panel
12. Parking brake control



Make sure that the parking brake knob (12) is definitely in the right-hand position. The roller can start to roll when the engine is started on sloping ground, if the parking brake is not applied.

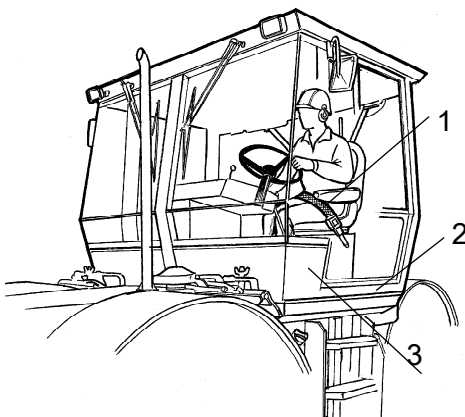


Fig. Operator's station
1. Seat belt
2. Rubber element
3. Anti-slip

Operator's station

Always fasten the seat belt (1) that is provided if a ROPS (Roll Over Protective Structure) is fitted on the roller, and wear a protective helmet.



Always replace the seat belt (1) with a new one if it is worn or has been subjected to a heavy load.



Check that rubber elements (2) on the platform are intact. Worn elements will impair comfort.



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



Make sure that anti-slip (3) on the platform is in good condition. Replace with new anti-slip if friction is poor.

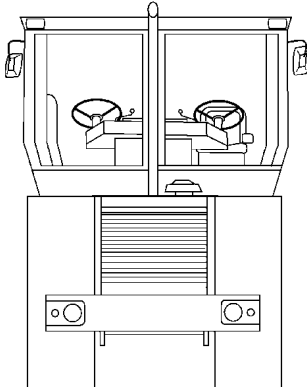


Fig. View

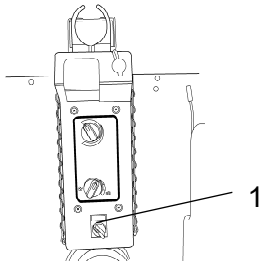


Fig. Panel in cab
1. Switch, interlock

View

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

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

Interlock

The roller is equipped with Interlock.

The engine switches off 4 seconds after the operator rises from the seat.

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

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



Sit down for all operations!



When changing operator seat the interlock must be changed to suit the current seat using the switch (1)

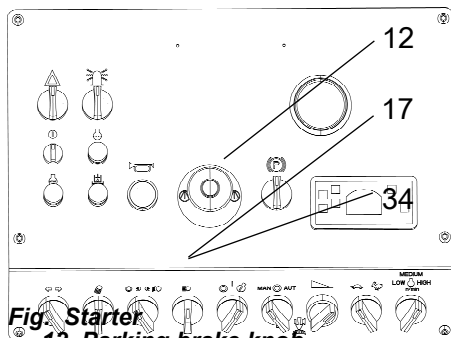


Fig. Starter
12. Parking brake knob
17. Start/stop knob
34. Preheating lamp

Instruments and lamps - Checking



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

Turn the starter switch (17) to the right to position I. All warning lamps should light for about 5 seconds and the buzzer should sound. Make sure that the warning lamps light.

Check that the warning lamps for charging (21), oil pressure (28) and parking brake (29) light.

Preheating lamp (34) should go on.

The hourmeter (25) records the number of hours as long as the engine is running.

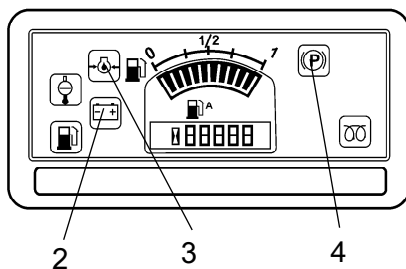


Fig. Control panel
21. Charging indicator lamp
28. Oil-pressure warning light
29. Brake lamp

Starting

Starting the engine

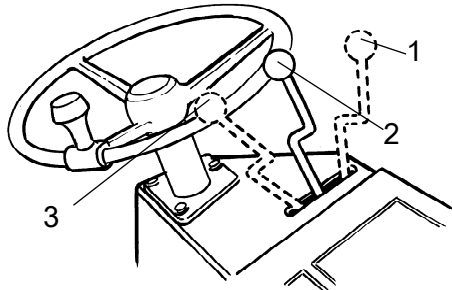


Fig. Forward/reverse lever

1. Forward
2. Neutral
3. Reverse



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

Make sure that the emergency stop (35) is pulled out and the parking brake (12) is activated.

Put the forward/reverse lever in neutral (2). You cannot start the engine in any other position on the control.

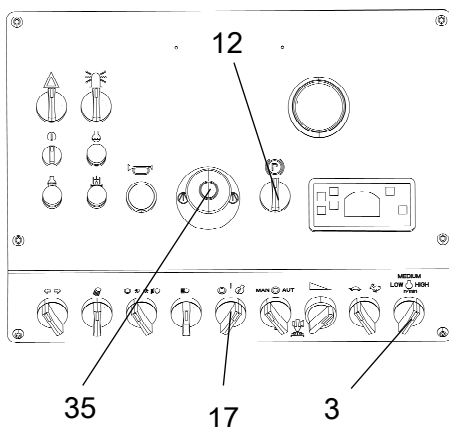


Fig. Starting controls

3. Rev control
12. Parking brake knob
17. Start/stop knob
35. Emergency stop

Set rev control (3) in idling position (900 rpm).

Turn the start dial (17) to position I to start the preheating. Wait until the start dial goes off, and then turn the dial to the right to the starting position. Release the switch as soon as the engine starts.

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



Do not run the starter motor too long; it is better to wait a minute or so if the engine does not start.

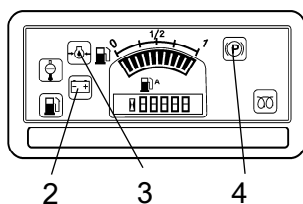


Fig. Control panel

21. Charging indicator lamp
28. Oil-pressure warning light
29. Brake lamp



When you start up and drive a cold machine, the hydraulic fluid is cold and the braking distance will be longer than normal until the machine reaches normal working temperature.

Driving

Operating the roller



Always drive with engine revs higher than 1500 rpm.

Increase engine speed to 2200 rpm for maximum driving speed.



When changing the operator seat the interlock must be changed to suit the new seat via the switch.

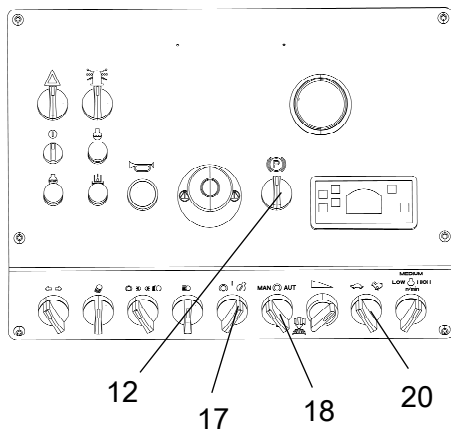


Fig. Starting controls
 12. Parking brake knob
 17. Start/stop knob
 18. Sprinkler switch
 20. Gear selector

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 area in front of and behind the roller is clear.



Set the parking brake knob (12) to the left and check that the warning lamp for the parking brake is now off. Note that the roller can start to roll if it is standing on a slope.

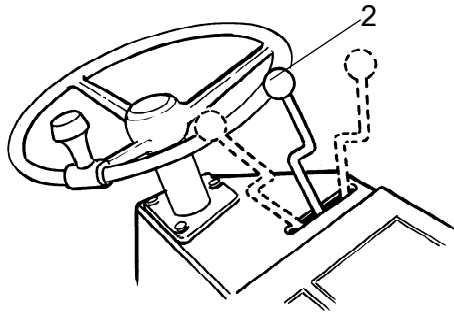


Fig. Instrument panel
2. Forward/reverse lever

Put the gear selector (20) at "Tortoise" setting and carefully move the forward/reverse lever (2) in the desired direction of travel.

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.



Check the parking brake function by activating the parking brake while the roller is slowly moving forward.

Check while driving that the gauges show normal readings. In the event of abnormal values, or if the buzzer sounds, stop the roller and engine immediately. Check and correct any faults; see also chapter on maintenance and the engine manual.

When changing direction of travel, always stop the roller completely before moving the forward/reverse lever in the opposite direction. Use the "Hare" setting for transport driving and "Tortoise" for compaction.

Interlock/Emergency stop/Parking brake - Check



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



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



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



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

Sprinkler system/Water tanks

Turn on the sprinkler switch (18) and wet the drums thoroughly before driving/compacting on the course. Choose the amount of water using the sprinkler timer (19). The roller is equipped with two water tanks; see "Technical Specifications" for water volume.

See also "Maintenance" for filling/pumps/filter etc., and the following page regarding different settings for the sprinkler pumps.

Make sure the scrapers are correctly adjusted on the drums.

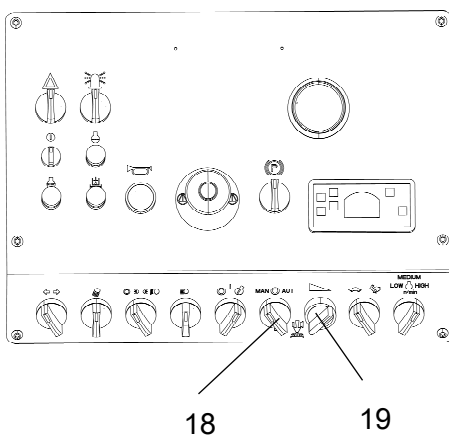
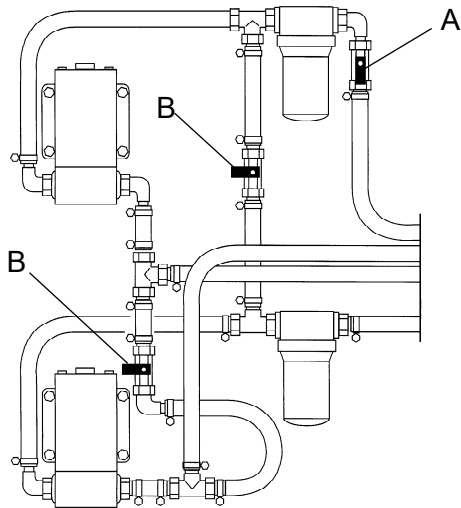


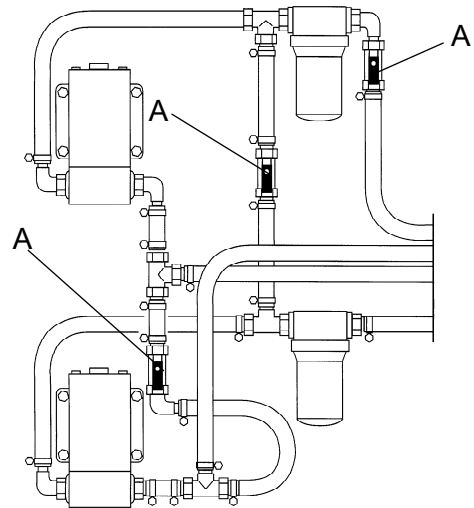
Fig. Sprinkler control
18. Sprinkler switch
19. Sprinkler timer

Sprinkler system/Water tanks

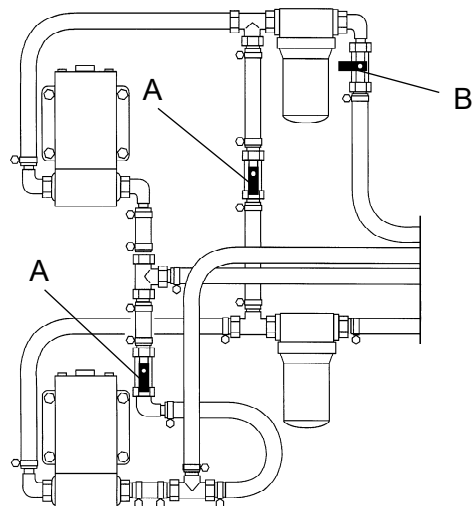
Basic setting



Two tanks - one pump (lower)



One tank (lower) - one pump (upper)



One tank (lower) - two pumps

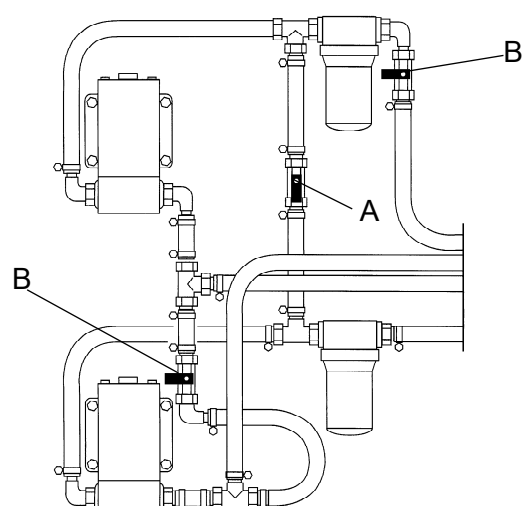


Fig. Sprinkler system

A. Open
B. Closed

Allow water from the upper tank to fill the lower one, then close the tap before the filter.

Allow water from the upper tank to fill the lower one, then turn off the tap in front of the filter.

Braking

Normal braking

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

Always activate the parking brake, even for short stops on sloping ground.

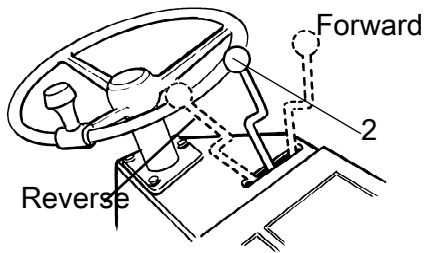
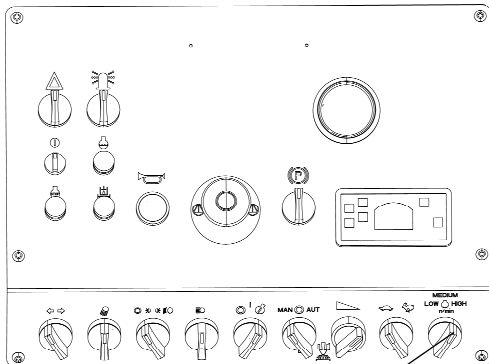


Fig. Control panel
2. Rev control in neutral



3

Fig. Rev control
3. Rev control

Set speed control (3) in idling position (900 rpm). Allow the engine to idle for a few minutes to cool down. Switch off the machine with the key.



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

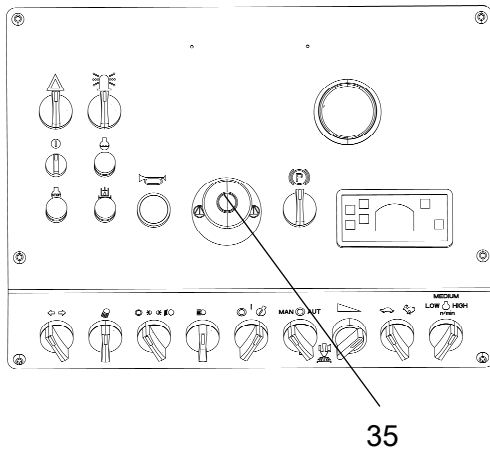


Fig. Control panel
35. Emergency stop

Emergency brake

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

A disc brake in each drum motor also acts as emergency brake when driving, and as a parking brake when stationary.



To brake, press the emergency stop, hold the steering wheel firmly, and prepare for a sudden stop. The brakes are applied and the machine stops.

After braking, return the forward/reverse lever to the neutral position and pull out the emergency stop knob.

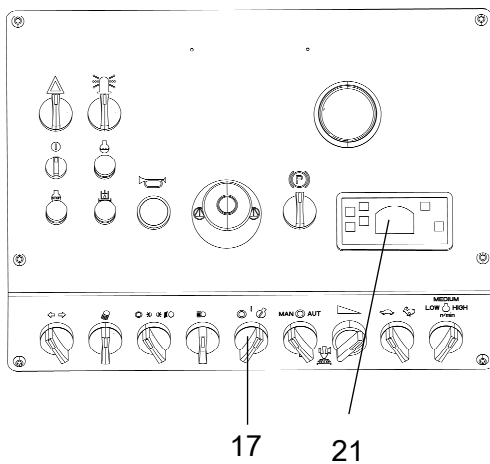


Fig. Control panel
17. Start/stop knob
21. Warning lamps

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 (17) to off position 0. Lower the instrument cover (on rollers without cab) and lock it.

Parking

Chocking the drums



Never get off the roller when the diesel engine is running, without first activating the parking brake.



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



Remember that there is a risk of freezing during the winter. Empty the water tanks, water pipes and ballast water from the drums.

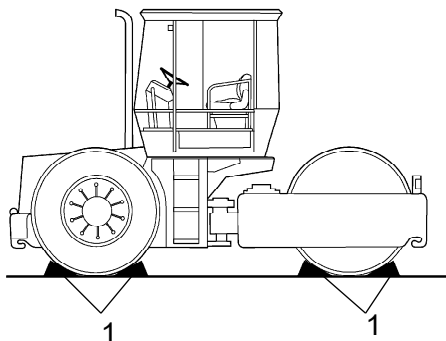


Fig. Positioning
1. Chocks

Battery disconnecter/ Electrical battery disconnecter (Option)

Before leaving the roller at the end of the shift, switch off the battery disconnecter (1) and remove the key (3).

This will prevent battery discharge and will also make it difficult for any unauthorized person to start and drive the machine. Also lock the hood to the engine compartment.

The machine may be fitted with an electrical battery disconnecter. The disconnecter function is then integrated in the ignition lock and there is no key (3) in the battery bay.

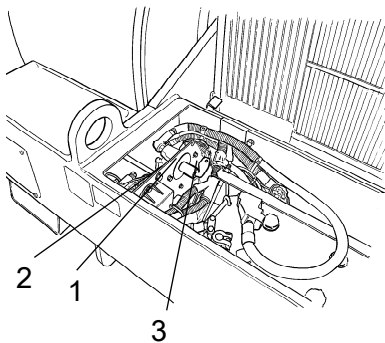


Fig. Battery bay in front beam
1. Battery disconnecter
2. Power socket, 12V
3. Key

Long-term parking



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

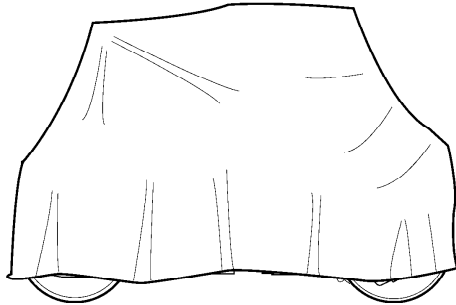


Fig. Roller weather protection

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.

Sprinkler system

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

Fuel tank

Fill the fuel tank completely full to prevent condensation.

Hydraulic reservoir

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

Steering cylinder, hinges, etc.

Lubricate the steering joint bearings and both bearings on the steering cylinder with grease (see under the heading 'Every 50 hours of operation').

Grease the steering cylinder piston with conservation grease.

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

Hoods, tarpaulin

* Lower the instrument cover over the instrument panel.

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

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

Miscellaneous

Lifting

Locking the articulation



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

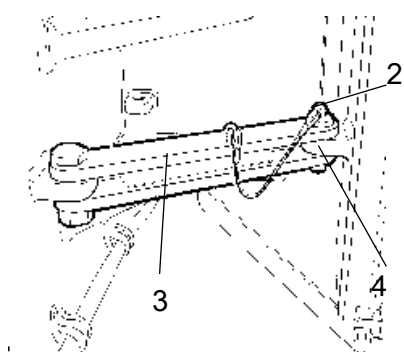


Fig. Articulation in interlocked mode

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

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

Pull up the locking pin (2), provided with wire.

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

Insert the locking pin through the holes in the locking arm and locking lug.



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.

Lifting the roller



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



Lifting gear such as chains, steel wires, straps, and lifting hooks must conform with current regulations.



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

Weight: refer to the hoisting plate on the roller

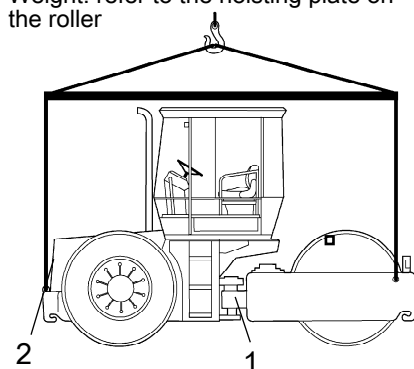


Fig. Roller prepared for lifting

- 1. Articulation lock
- 2. Lifting plate

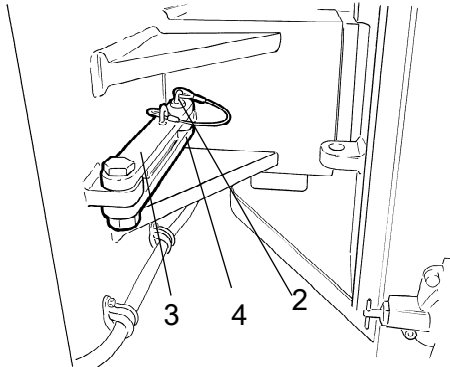


Fig. Articulation in the locked position
 2. Locking dowel
 3. Locking arm
 4. Locking lug

Unlocking the articulation



Remember to unlock the articulation before operating.

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

Fold the locking arm (3) back and secure it in the locking lug (4) with the locking dowel (2).

The locking lug is located on the front frame of the machine.

Transport

Roller prepared for transport



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

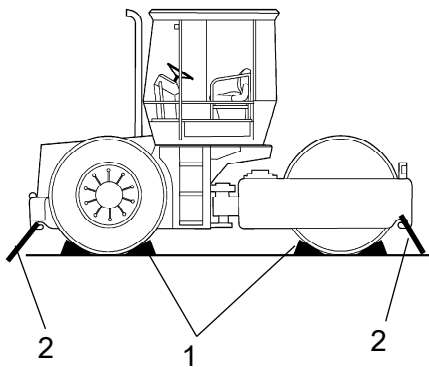


Fig. Arrangement
 1. Chock
 2. Lashing wire

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

Clamp down the roller with lashing strap (2) at all four corners; decals indicate the fixing points.



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



The roller must be unoccupied during transportation.

Towing/Recovering

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

Short distance towing with the diesel engine switched off/not running

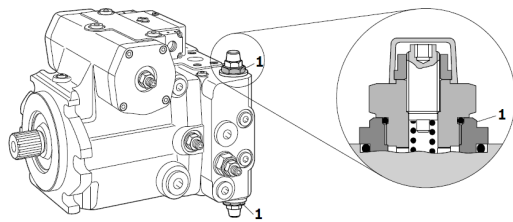


Fig. Propulsion pump
1. By-pass valve



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

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

On the pump there are two by-pass valves (1), which should be loosened by turning counter-clockwise to set the system in by-pass mode.

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

The by-pass valves (1) is restored by clockwise rotation. (200 Nm)

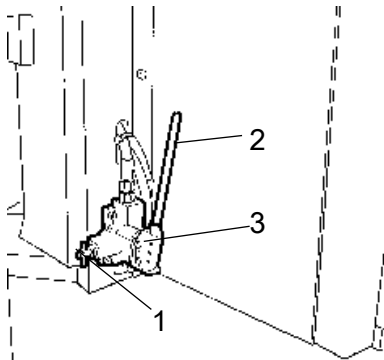


Fig. Brake release pump

- 1. Valve
- 2. Pump arm
- 3. Pump

Brake release pump



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

The disengagement pump for the brakes is located behind the hydraulic tank, near the articulated link.

Make sure that the valve (1) is pushed in and then pump with the pump arm (2) until the brakes are disengaged.

When restoring, hold the valve (1) in the extended position for a few seconds.



The machine must not be moved at a speed higher than 3 km/h (2 mph), and no more than 300 meters (330 yards). Otherwise there is a risk of damaging the drives.

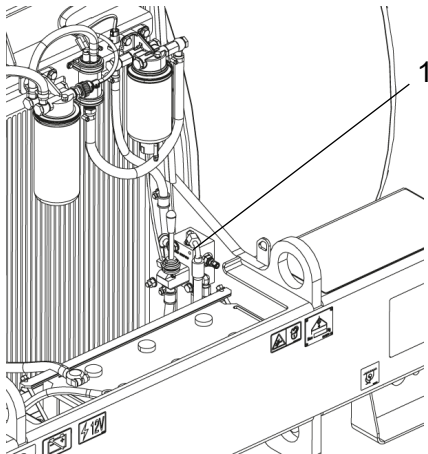


Fig. Engine compartment
1. Brake release pump

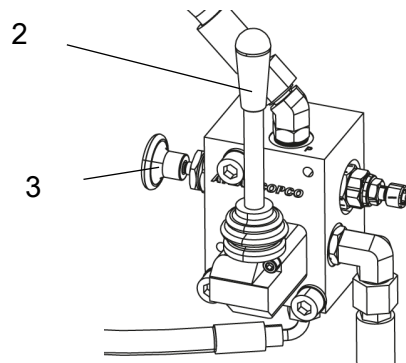


Fig. Brake disengagement pump
2. Pump arm
3. Brake release button

Brake release pump



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

The release pump for the brakes is located in the front part of the engine compartment.

For towing:

Press in the brake release button (3).

Pump with the arm (2) until the brakes are released.

The roller can now be towed.



After towing, pull the brake release button (3) out to apply the brakes.



If the diesel engine is once again in working order and starts, the brakes are reactivated if the supply pressure is reached.



The machine must not be moved at a speed higher than 3 km/h (2 mph), and no more than 300 meters (330 yards). Otherwise there is a risk of damaging the drives.

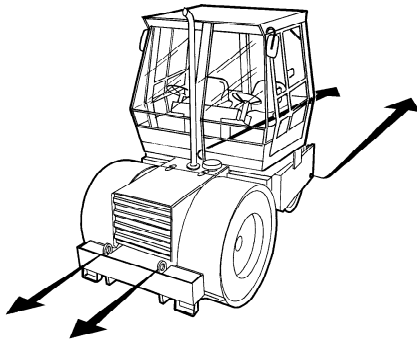


Fig. Towing the roller

Towing



A towing bar must be used when towing, as the roller has no brakes and can only be slowed and stopped by the vehicle towing the roller.



The roller must be towed slowly, max. 3 km/h (2 mph) and for short distances only, max. 300 m (330 yards).

When towing/retrieving a machine, the towing device must be connected to both lifting holes. Pulling forces shall act longitudinally on the machine as illustrated. Maximum gross pulling force 60 kN (13.5 lbf), i.e 30 kN (6.75 lbf) per fork.

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.
6. Set the speed control in the idling position (900 rpm).
7. Start the engine and allow it to warm up.
8. Set the speed control in working position (2200 rpm).
9. Set the emergency stop 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.**

13. Check that the drums are thoroughly watered when watering is required.



14. **IN AN EMERGENCY:**
 - **Push in the EMERGENCY STOP**
 - **Hold the steering wheel firmly.**
 - **Brace yourself for a sudden stop.**
15. When parking:
 - Activate the parking brake
 - Stop the engine and chock the drums.
16. When lifting: - Refer to the relevant section in the Instruction Manual.
17. When towing: - Refer to the relevant section in the Instruction Manual.
18. When transporting: - Refer to the relevant section in the Instruction Manual.
19. When recovering - Refer to the relevant section in the Instruction Manual.

Preventive maintenance

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

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

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

Acceptance and delivery inspection

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

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

Any transport damage must be reported immediately to the transport company, as this is not covered by the product warranty.

Warranty

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

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

Maintenance - Lubricants and symbols









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

Fluid volumes














Hydraulic reservoir	100 liters	26.4 gal
Diesel engine		
- Lubricating oil incl. replacement of oil filter	8,6 liters	9.1 qts
- Coolant	19 liter	5 gal
Drum		
- Ballast front	2x470 liters	2x124 gal
- Ballast rear	1130 liter	298.3 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.

	ENGINE OIL	Air temperature -15°C - +50°C (5°F-122°F)	Dynapac Engine oil 200	P/N 4812161855 (5 liter), P/N 4812161856 (20 liter), P/N 4812161857 (209 liter)
	HYDRAULIC FLUID	Air temperature -15°C - +50°C (5°F-122°F)	Dynapac Hydraulic 300	P/N 4812161868 (20 liter), P/N 4812161869 (209 liter)
		Air temperature over +50°C (122°F)	Shell Tellus S2 V100	
	BIOLOGICAL HYDRAULIC FLUID, Bio-Hydr. PANOLIN	When it leaves the factory, the machine may be filled with biologically degradable fluid. The same type of fluid must be used when changing or topping up.	PANOLIN HLP Synth 46 (www.panolin.com)	
	GREASE		for the articulated joint.	Dynapac Roller Grease (0.4kg), P/N 4812030096
			Shell Retinax LX2 for other grease points.	
	FUEL	See engine manual.	-	-
	COOLANT	Anti-freeze protection down to about -37°C (-34.6°F)	Dynapac Coolant 100 (mixed 50/50 with water)	P/N 4812161854 (20 liter)

Maintenance symbols

	Engine, oil level		Air filter
	Engine, oil filter		Battery
	Hydraulic reservoir, level		Sprinkler
	Hydraulic fluid, filter		Sprinkler water
	Lubricating oil		Fuel filter
	Fuel gauge		Recycling
	Coolant level		

Maintenance - Maintenance schedule

Service and maintenance points

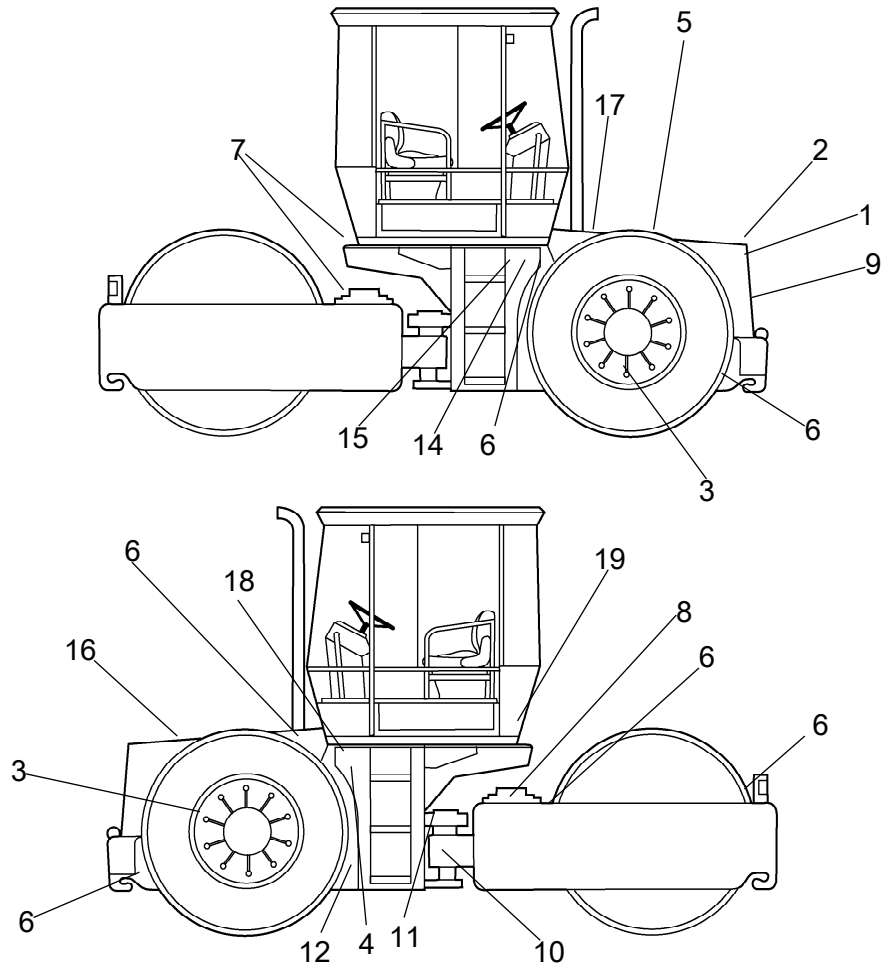


Fig. Service and maintenance points

- | | | |
|-------------------------|------------------------------|-------------------------|
| 1. Engine oil | 8. Sprinkler system | 15. Hydraulic reservoir |
| 2. Radiator | 9. Battery | 16. Diesel engine |
| 3. Drum nuts | 10. Articulation joint | 17. Hinge |
| 4. Refueling | 11. Steering cylinder | 18. Fuel tank |
| 5. Air cleaner | 12. Hydraulic filter | 19. Fresh air filter |
| 6. Scrapers | 13. Hydraulic fluid level | |
| 7. Water tanks, filling | 14. Hydraulic fluid, filling | |

General

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



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



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

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

Every 10 hours of operation (Daily)

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

Pos. in fig	Action	Comment
	Before starting up for the first time on that day	
1	Check the engine oil level	Refer to the engine manual
13	Check the hydraulic reservoir level	
2	Check the coolant level	
4	Refuel	
7	Fill the water tanks	
8	Check the sprinkler system	
	Test the brakes	
6	Check the scraper setting	
	Drain the diesel engine's fuel prefilter	

After the FIRST 50 hours of operation

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

	Action	Comment
12	Change the hydraulic fluid filter	

Every 50 hours of operation (Weekly)

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

	Action	Comment
5	Check/clean the filter element in the air cleaner.	
10	Lubricate the articulation	
11	Lubricate the steering cylinder mounts	
15	Check tightening of drum nuts.	
	Check the AC	Optional

Every 250 / 750 / 1250 / 1750 hours of operation

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

Pos. in fig	Action	Comment
2	Clean the cooler element	If necessary

Every 500 / 1500 hours of operation

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

Pos. in fig	Action	Comment
2	Clean the cooler element	If necessary
1	Change the engine oil and oil filter	Refer to the engine manual *) 500 h or once every six months
	Lubricate hinges and controls	
14	Check the cap/breather filter on the hydraulic reservoir	

Every 1000 hours of operation

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

Pos. in fig	Action	Comment
2	Clean the cooler element	If necessary
1	Change the engine oil and oil filter	Refer to the engine manual *) 500 h or once every six months
16	Change the engine fuel filter	Refer to the engine manual
	Change the engine pre-filter	Refer to the engine manual
	Lubricate hinges and controls	
14	Check the cap/breather filter on the hydraulic reservoir	
16	Check the engine V belt tension	Refer to the engine manual
16	Check engine valve clearances	Refer to the engine manual
12	Change the hydraulic fluid filter	
15	Drain the condensation water from the hydraulic reservoir	
19	Drain the fuel tank	
20	Replace the air cleaner filter in the cab	Optional

Every 2000 hours of operation

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

Pos. in fig	Action	Comment
2	Clean the cooler element	If necessary
1	Change the engine oil and oil filter	Refer to the engine manual *) 500 h or once every six months
16	Change the engine fuel filter	Refer to the engine manual
	Change the engine pre-filter	Refer to the engine manual
	Lubricate hinges and controls	
14	Check the cap/breather filter on the hydraulic reservoir	
16	Check the engine V belt tension	Refer to the engine manual
16	Check engine valve clearances	Refer to the engine manual
12	Change the hydraulic fluid filter	
20	Replace the air cleaner filter in the cab	Optional
19	Drain the fuel tank	
15	Drain the condensation water from the hydraulic reservoir	
15	Change the hydraulic fluid	
9	Drain and clean the fuel tank	
5	Drain and clean the water tanks	
10	Check the condition of the articulation	
	Overhaul the air conditioning	Optional

Service - Checklist

Pos	Action	After the first 50 hours of operation (Daily)	Every 50 hours of operation (Weekly)	Every 250 hours of operation (Weekly)	Every 500 hours of operation	Every 750 hours of operation	Every 1000 hours of operation	Every 1250 hours of operation	Every 1500 hours of operation	Every 1750 hours of operation	Every 2000 hours of operation	Every 24 months	NOTE
1	Check the engine oil level	<input type="radio"/>											Refer to the engine manual
13/15	Check the hydraulic reservoir level/ Change the hydraulic fluid	<input type="radio"/>									●		
2	Check the coolant level	<input type="radio"/>											
4	Refuel	<input type="radio"/>											
7	Fill the water tanks	<input type="radio"/>											
8	Check the sprinkler system	<input type="radio"/>											
	Test the brakes	<input type="radio"/>											
6	Check the scraper setting	<input type="radio"/>											
	Drain the diesel engine's fuel prefilter	●											
12	Change the hydraulic fluid filter										●		
	Check the AC	<input type="radio"/>											Optional
5	Check/clean the filter element in the air cleaner	<input type="radio"/>											
10	Lubricate the articulation	<input type="radio"/>											
11	Lubricate the steering cylinder mounts	<input type="radio"/>											
15	Check tightening of drum nuts	<input type="radio"/>											
2	Clean the cooler element		<input type="radio"/>										If necessary
1	Change the engine oil and oil filter		<input type="radio"/>										Refer to the engine manual
1	Change the engine pre-filter												
	Lubricate hinges and controls												
14	Check the cap/breather filter on the hydraulic reservoir												
16	Change the fuel filter												
16	Check the engine V belt tension												Refer to the engine manual
16	Check engine valve clearances												Refer to the engine manual
20	Replace the air cleaner filter in the cab												Optional
19	Drain the fuel tank												
15	Drain the condensation water from the hydraulic reservoir												
9	Drain and clean the fuel tank												
5	Drain and clean the water tanks												
10	Check the condition of the articulation												
	Overhaul the air conditioning												Optional

☐ Check ● Change

Maintenance, 10h

Every 10 hours of operation (Daily)



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



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

Engine hood support

**Ensure that the engine hood support is
securely in position for all work in the engine
compartment.**

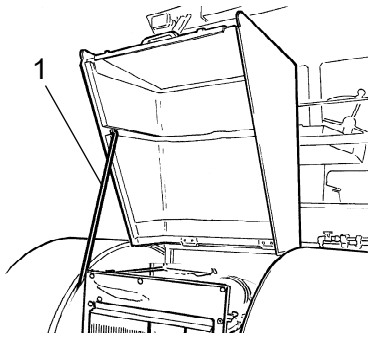


Fig. Engine compartment
1. Engine hood support

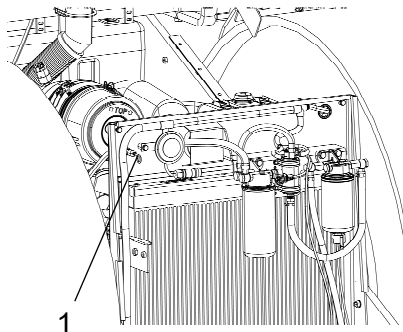


Fig. Engine
1. Dipstick

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.



Hydraulic reservoir, Level check - Filling

Wipe the sight glass (1) and check that the oil level is between the upper and lower marks.

If necessary, fill with hydraulic fluid by unscrewing the filler cap (2). See under the "Lubricants" heading for the correct oil grade.

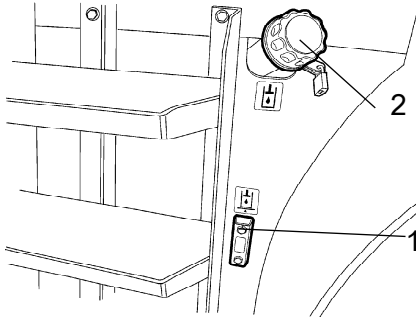


Fig. Hydraulic reservoir
 1. Sight glass
 2. Filler cap



Coolant level - Check

Place the roller on a flat surface and check that the level of the coolant is between max./min. in the sight glass (2) and (3).

Top up with coolant if the level is too low.



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

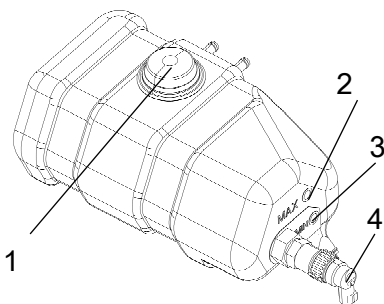


Fig. Expansion tank
 1. Filler cap
 2. Max. level
 3. Min. level
 4. Level sensor

Fill with a mixture of 50% water and 50% anti freeze. See the lubrication specifications 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.



Fuel tank - Refueling



Never refuel while the engine is running, do not smoke, and avoid spilling fluid.

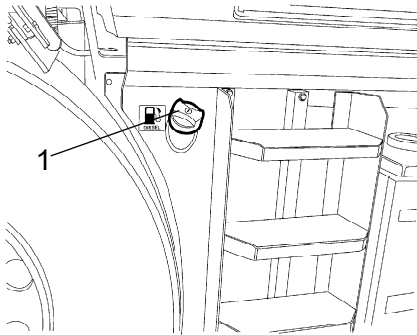


Fig. Fuel tank
1. Filler cap

Refuel every day before commencing work. Unscrew the lockable tank cap (1) fill with diesel up to the lower edge of the filler pipe.

See the engine handbook for the grade of diesel fuel.

The tank holds 110 l (29 gallons) of fuel.



Water tanks - Filling



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

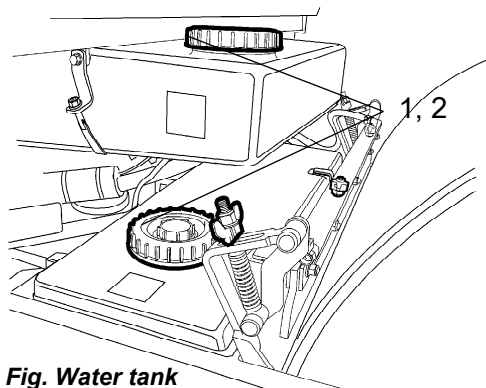


Fig. Water tank
1. Tank cap

Fill both water tanks; they hold a total of 550 liters (145.2 gallons).



Only additive: A small amount of environmentally friendly antifreeze.



Sprinkler system - Check/Cleaning

Start the sprinkler system and make sure that no nozzle (1) is clogged. Clean the nozzle and the roughing filter located by the water pump (2) if necessary see fig. below.

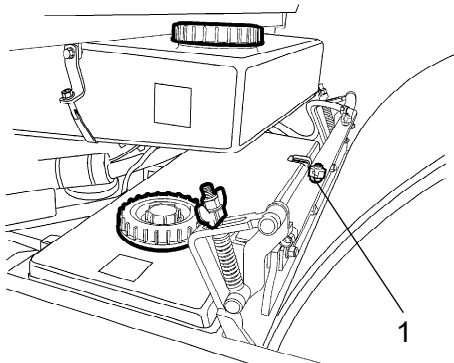


Fig. Sprinkler ramp
1. Water nozzle

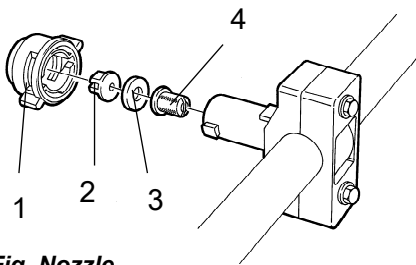


Fig. Nozzle
1. Sleeve
2. Nozzle
3. Seal
4. Fine filter

Sprinkler system/Drum Cleaning

Dismantle the blocked nozzle by hand.

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

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



Wear protective goggles when working with compressed air.

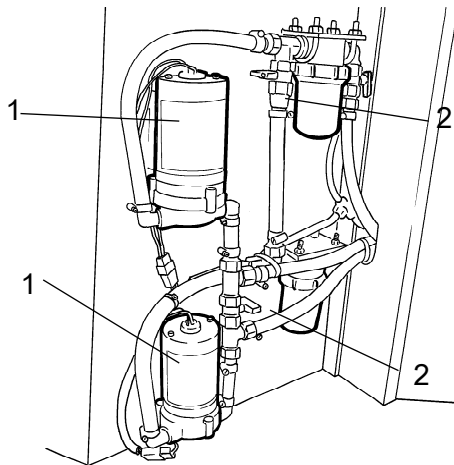


Fig. Water system (basic setting)
1. Water pump
2. Water filter housing

Inspect the intake water filters of the pumps every day.

The water filter housing (2) can be removed.

Flush the housing and the filter clean with water and then put them back into place.



Only use clean water in the water tank.



The water system must be completely drained if the roller is to be left unused for a longer period or if temperatures below zero can be expected. Remove the bottom plug to drain the tank.

There are two filters located behind the fuel tank.



Brakes - Check



Check operation of the brakes as follows:

Drive the roller slowly forward.

Activate the parking brake (12).

The brake warning lamp (29) should light up and the roller should stop.

After checking the brakes, put the forward/reverse lever (2) in neutral before resetting the parking brake.

Set the parking brake knob to the left.

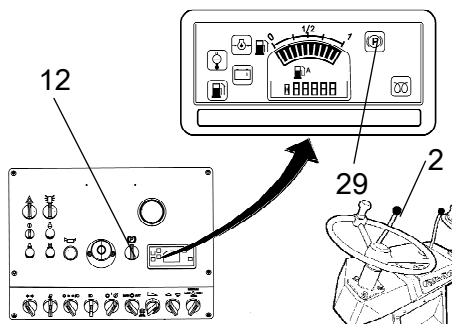


Fig. Instrument panel
2. Forward/reverse lever
12. Parking brake knob
29. Control lamp, brake

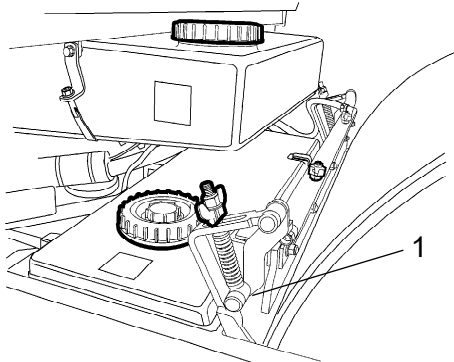


Fig. Spring-action scrapers
1. Drum scraper

Scrapers - Check/Cleaning

Make sure that the scrapers are undamaged. The spring-action scrapers require no adjustment because the spring force provides the correct contact force. Asphalt remnants can accumulate on the scraper and influence the contact force. Clean as necessary.



Make sure the scrapers are retracted from the drum when transporting.



Draining the diesel engine's fuel prefilter

The fuel prefilter (1) is located in front of the cooler in the engine compartment.

Unscrew the lower part (2) of the prefilter and drain off any water, and then replace the filter unit if necessary.

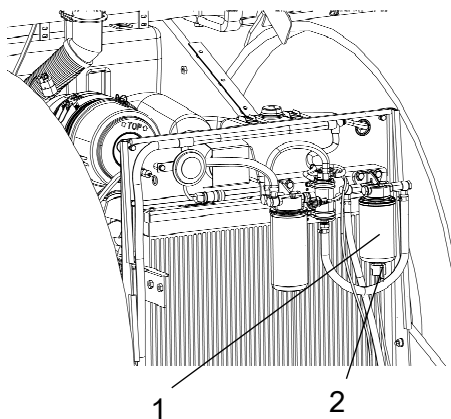


Fig. Engine compartment
1. Prefilter

Maintenance - 50h

Every 50 hours of operation (Weekly)



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



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

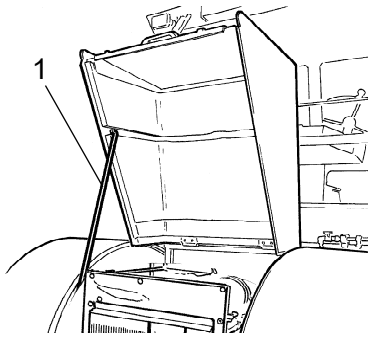


Fig. Engine compartment
1. Engine hood support

Engine hood support



**Ensure that the engine hood support is
securely in position for all work in the engine
compartment.**



Air cleaner

Checking - Change the main air filter



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

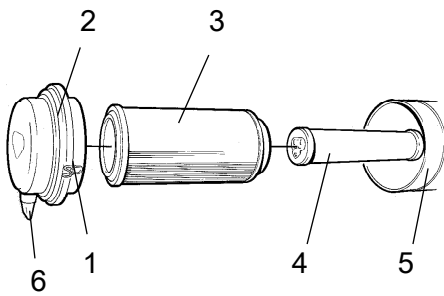


Fig. Air cleaner
 1. Clips
 2. Cover
 3. Main filter
 4. Backup filter
 5. Filter housing
 6. Dust valve

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

Do not remove the backup filter (4).

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

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

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

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



Backup filter - Change

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

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

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

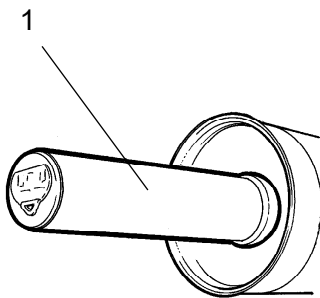


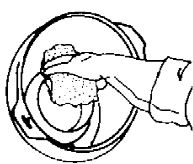
Fig. Air filter
 1. Backup filter



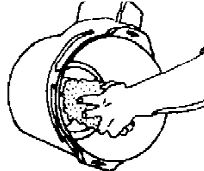
Air cleaner - Cleaning

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

Wipe clean on both sides of the outlet pipe.



Inner edge of outlet pipe.



Outer edge of outlet pipe.

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



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



Articulation steering and steering cylinder bushings - Lubrication



Nobody must be allowed near the steering joint when the engine is running. Danger of being crushed when steering is operated. Push the reserve/parking brake knob before lubricating.

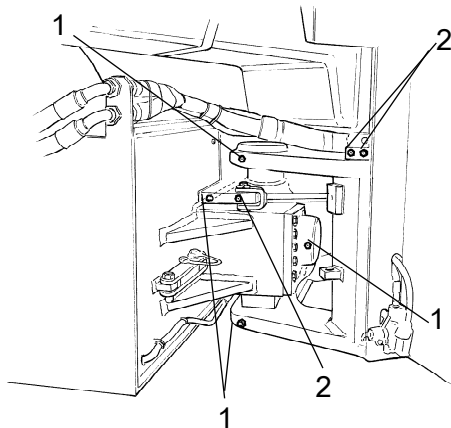
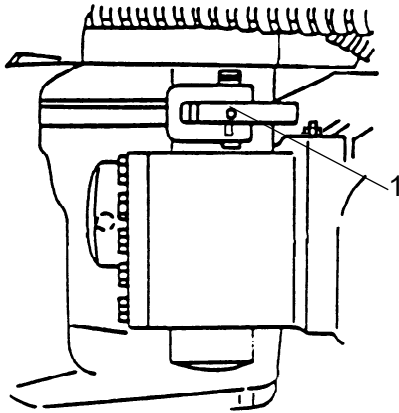


Fig. Lubricant nipples

1. Lubricant nipples, articulation
2. Bearings, steering cylinder

Turn the steering wheel fully to gain access to all seven grease nipples (1 and 2) from the right side of the machine.

Wipe the grease nipples. Lubricate the articulation nipples (1) with five strokes of the hand grease gun, and the steering cylinder bearings (2) with three strokes in each bearing. Make sure that grease penetrates 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.



Turn the machine back for driving straight ahead. This makes the rear bearing (1) of the left steering cylinder accessible from the left side of the machine.

Wipe the lubricant nipple and grease with three strokes of the hand grease gun.

Fig. Lubricant nipple
1. Lubricant nipple, steering cylinder

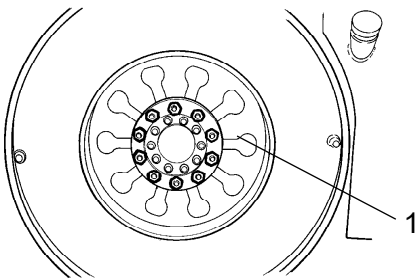


Fig. Drum
1. Drum nut

Tightening the drum nuts - Check

This only applies to a new machine or newly fitted drums.

Ensure that all nuts on all three drums are properly tightened. Tightening torque: 500 Nm.



Air conditioning (Optional)

- Inspection



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.

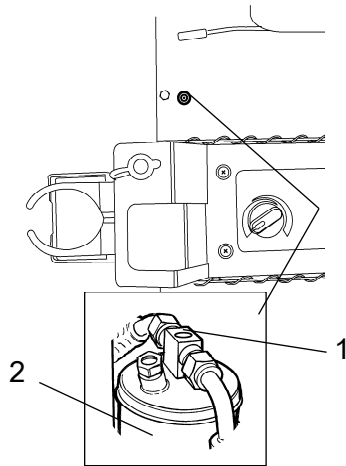


Fig. Drying filter
1. Sight glass
2. Filter holder

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

The filter is located inside the box placed under the seats, close to the left of the right seat. The hole in the box is covered with a rubber cover. See the illustration.

If bubbles are visible through the sight glass, this indicates that the refrigerant level is too low. Shut off the unit, as it can be damaged if it is run with insufficient refrigerant. Fill with refrigerant.



Air conditioning (Optional)

- Cleaning

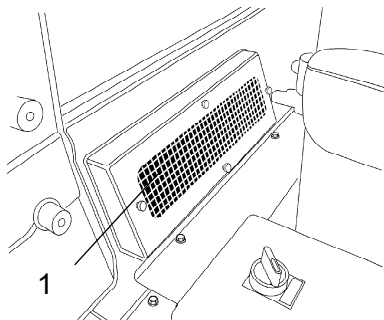


Fig. Cab
1. Condensor element

If there is a significant loss of cooling capacity, clean the condensor element (1) on the rear edge of the cab. Also clean the cooling unit in the cab.

Maintenance measures - 250 h

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



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



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

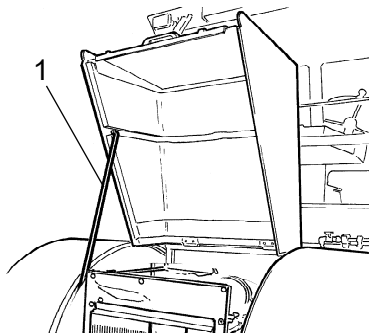


Fig. Engine compartment
1. Engine hood support

Engine hood support

**Ensure that the engine hood support is
securely in position for all work in the engine
compartment.**

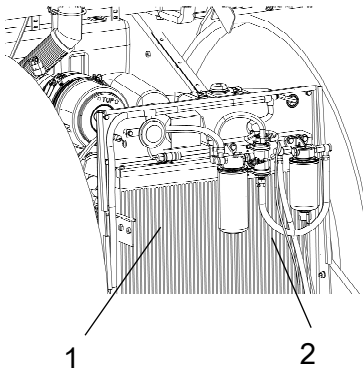


Fig. Engine compartment
1. Water cooler
2. Hydraulic oil cooler

Radiator - Check/Cleaning

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

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

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



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



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

Maintenance measures - 500 h

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



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



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

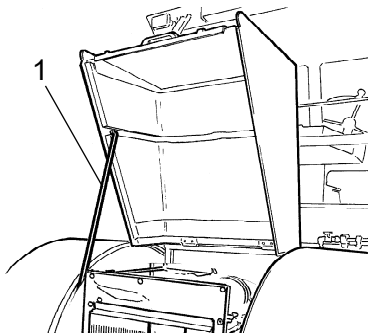


Fig. Engine compartment
1. Engine hood support

Engine hood support

**Ensure that the engine hood support is
securely in position for all work in the engine
compartment.**

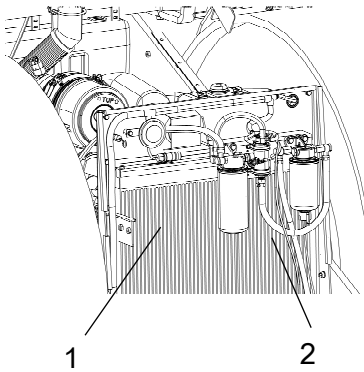


Fig. Engine compartment
 1. Water cooler
 2. Hydraulic oil cooler

Radiator - Check/Cleaning

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

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

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



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



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



Hinges, controls - Lubrication

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

Grease the hinges of the cab door in the same way.

Lubricate the hinges of the front and rear spotlight covers with a few drops of oil.

Lubricate the forward/reverse control wires by the control arm of the hydraulic pump. Apply a few drops of oil to the mouth of the control sleeve.

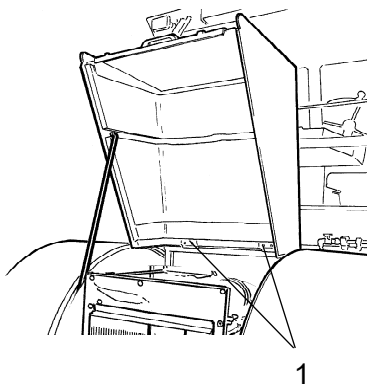


Fig. Engine compartment
 1. Hinge



Diesel engine - Oil change

Run the engine warm before draining the oil.



Make sure that ventilation (extraction) is adequate if the engine is run indoors. (Risk of carbon monoxide poisoning).



Switch off the engine and activate the parking brake.



Place a receptacle that is capable of holding at least 19 liters (5 gallons) under the drain plug. Hand in the drained oil and filter to an environment-friendly waste disposal station.



Observe care when draining hot engine oil. Wear protective gloves and goggles.

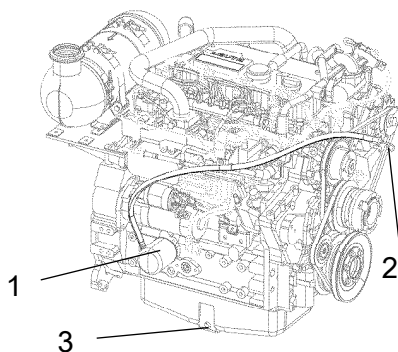


Fig. Oil filter
1. Oil filter
2. Dipstick
3. Drain plug

Remove the drain plug (3). Allow all of the oil to drain off and refit the plug.

Change the engine oil filter (1). See engine instruction manual.

Fill with fresh engine oil; see Lubricant specification for the correct grade of oil.

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



Hydraulic reservoir cap - Check

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

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



Use protective goggles when working with compressed air.

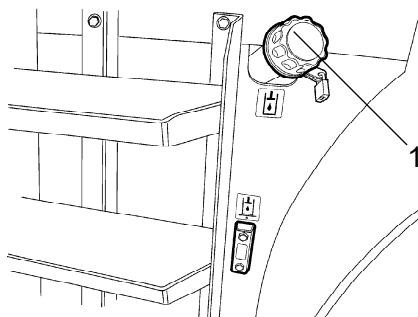


Fig. Hydraulic reservoir
1. Tank cap

Maintenance - 1000h

Performed after 1000 operating hours (each year)



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



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

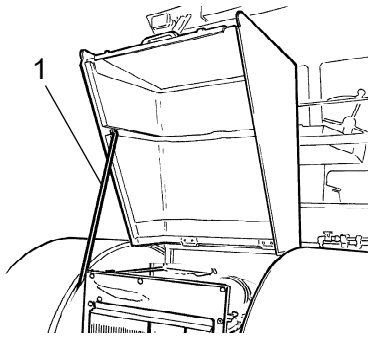


Fig. Engine compartment
1. Engine hood support

Engine hood support



**Ensure that the engine hood support is
securely in position for all work in the engine
compartment.**

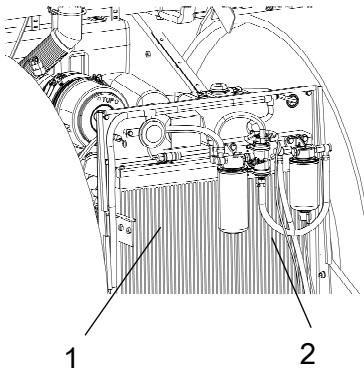


Fig. Engine compartment
 1. Water cooler
 2. Hydraulic oil cooler

Radiator - Check/Cleaning

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

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

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



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



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



Hinges, controls - Lubrication

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

Grease the hinges of the cab door in the same way.

Lubricate the hinges of the front and rear spotlight covers with a few drops of oil.

Lubricate the forward/reverse control wires by the control arm of the hydraulic pump. Apply a few drops of oil to the mouth of the control sleeve.

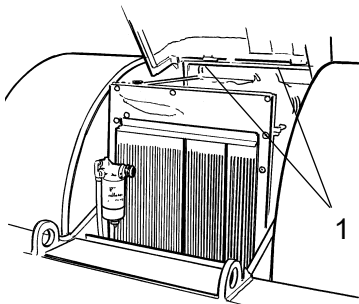


Fig. Engine compartment
 1. Hinge



Diesel engine - Oil change

Run the engine warm before draining the oil.



Make sure that ventilation (extraction) is adequate if the engine is run indoors. (Risk of carbon monoxide poisoning).



Switch off the engine and activate the parking brake.



Place a receptacle that is capable of holding at least 19 liters (5 gallons) under the drain plug. Hand in the drained oil and filter to an environment-friendly waste disposal station.



Observe care when draining hot engine oil. Wear protective gloves and goggles.

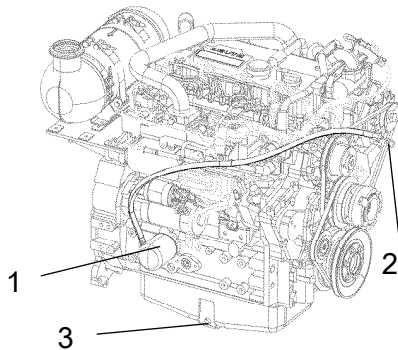


Fig. Oil filter
1. Oil filter
2. Dipstick
3. Drain plug

Remove the drain plug (3). Allow all of the oil to drain off and refit the plug.

Change the engine oil filter (1). See engine instruction manual.

Fill with fresh engine oil; see Lubricant specification for the correct grade of oil.

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



Replacing the fuel filter / fuel prefilter

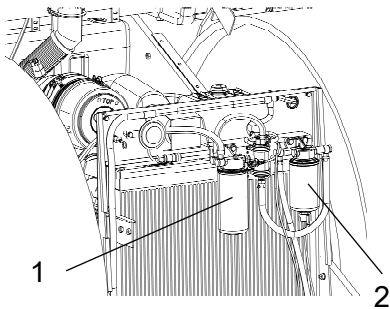


Fig. Engine compartment
 1. Fuel filter
 2. Fuel prefilter

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

Loosen and unscrew the fuel filter (1).

Replace the filter unit.

Unscrew the lower part of the fuel filter (2) and drain off any water, and then replace the filter unit.

The filters are of the disposable type and cannot be cleaned. Hand in to environment-friendly station.



The fuel should be taken to an environment-friendly waste disposal station.



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

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



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

NOTE! The new fuel filters must not under any circumstances be pre-filled with fuel due to the purity requirements of the fuel system.



Hydraulic reservoir cap - Check

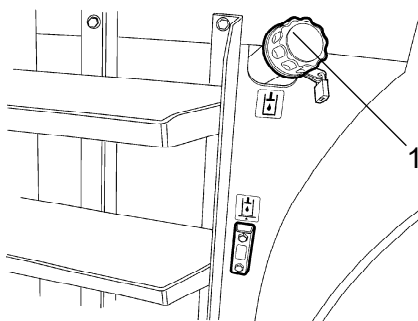


Fig. Hydraulic reservoir
 1. Tank cap

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

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



Use protective goggles when working with compressed air.



Hydraulic fluid filter - Replacement

The filter is located on the left side of the frame.

Clean thoroughly around the oil filter.



Remove the oil filter (1) and discard it in a safe manner. The filter is of the expendable type and cannot be cleaned.



Make sure that the old sealing ring is not left on the filter holder, as this could cause leakage between the new and old gaskets.

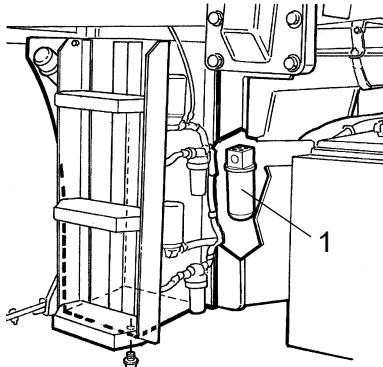


Fig. Hydraulic fluid filter
1. Fluid filter

Thoroughly clean the sealing surface of the filter holder.

Apply a thin coat of fresh hydraulic fluid on the rubber gasket of the new filter. Screw on the filter by hand.



First screw on until the filter seal lies against the filter holder. Then screw a further half turn. Do not tighten the filter too hard as this could damage the gasket.

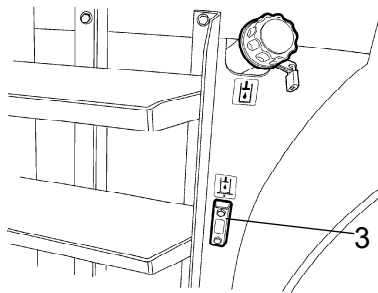


Fig. Hydraulic reservoir
3. Sight glass, hydraulic fluid

Start the engine and check that the filter does not leak. Check the hydraulic fluid level in the sight glass (3) and top off as required.



Make sure that ventilation (extraction) is adequate if the engine is run indoors. Risk of carbon monoxide poisoning.



Fresh air filter - Replacement

The fresh air intake is located behind the back of the left seat.

Replace the fresh air filter (1) and clean the fresh air compartment.

Restore.

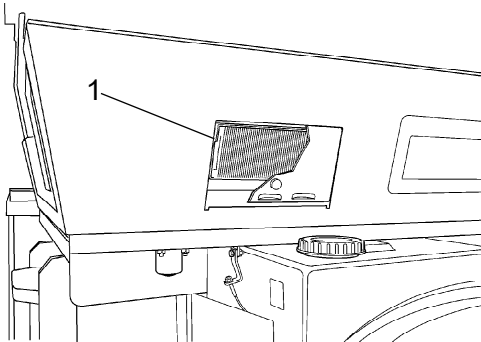


Fig. Fresh air intake
1. Fresh air filter



Fuel tank - Draining off water

Water can be drained via the drain plug at the bottom of the tank. Draining should be done when the roller has been standing still for some time, eg, overnight.

Unscrew the drain plug (1) and allow water and sediment to drain off until only pure fuel runs out.

Tighten the drain plug. If the tank is emptied completely then the fuel system must be vented. See engine service manual

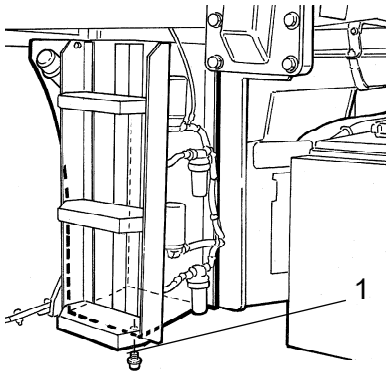


Fig. Fuel tank
1. Drain plug



Hydraulic reservoir - Draining

Drain condensation water via the drain plug (1) at the bottom of the tank. Draining should be done when the roller has been standing still for some time, eg, overnight.

Drain as follows:

Put a can underneath the drain plug (1).

Loosen the drain plug (1) and allow any condensation water to run out.

Tighten the drain plug.

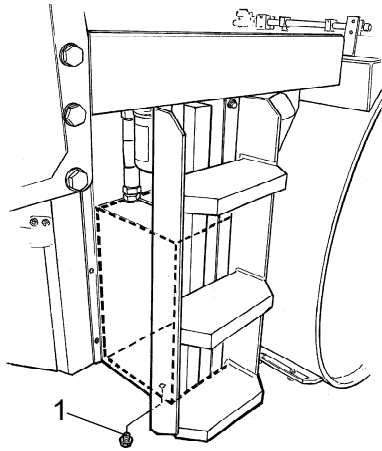


Fig. Hydraulic reservoir
1. Drain plug

Maintenance - 2000h

Performed after 2000 operating hours (every two years)



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



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

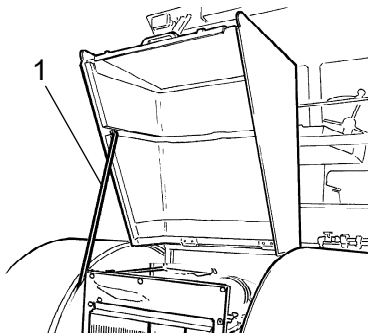


Fig. Engine compartment
1. Engine hood support

Engine hood support

**Ensure that the engine hood support is
securely in position for all work in the engine
compartment.**

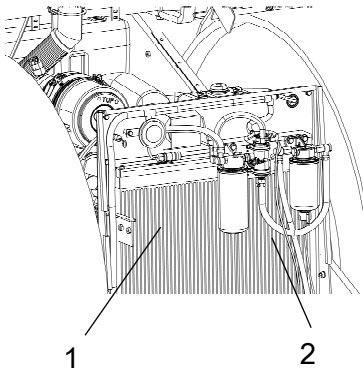


Fig. Engine compartment
 1. Water cooler
 2. Hydraulic oil cooler

Radiator - Check/Cleaning

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

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

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



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



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



Hinges, controls - Lubrication

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

Grease the hinges of the cab door in the same way.

Lubricate the hinges of the front and rear spotlight covers with a few drops of oil.

Lubricate the forward/reverse control wires by the control arm of the hydraulic pump. Apply a few drops of oil to the mouth of the control sleeve.

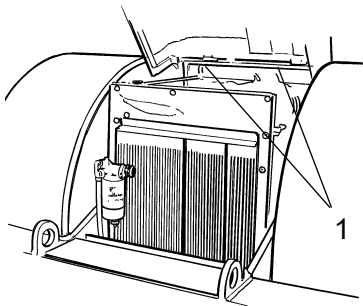


Fig. Engine compartment
 1. Hinge



Diesel engine - Oil change

Run the engine warm before draining the oil.



Make sure that ventilation (extraction) is adequate if the engine is run indoors. (Risk of carbon monoxide poisoning).



Switch off the engine and activate the parking brake.



Place a receptacle that is capable of holding at least 19 liters (5 gallons) under the drain plug. Hand in the drained oil and filter to an environment-friendly waste disposal station.



Observe care when draining hot engine oil. Wear protective gloves and goggles.

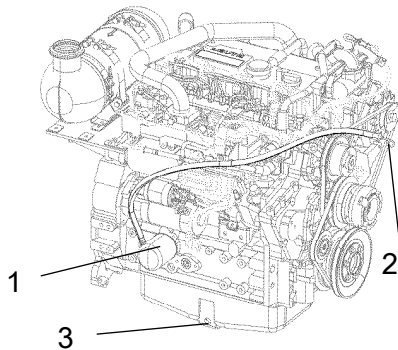


Fig. Oil filter
1. Oil filter
2. Dipstick
3. Drain plug

Remove the drain plug (3). Allow all of the oil to drain off and refit the plug.

Change the engine oil filter (1). See engine instruction manual.

Fill with fresh engine oil; see Lubricant specification for the correct grade of oil.

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



Replacing the fuel filter / fuel prefilter

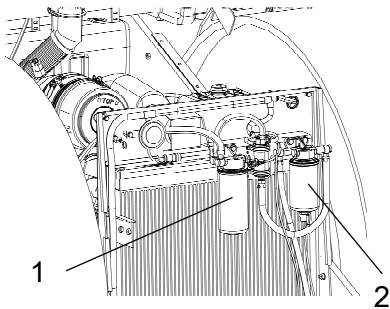


Fig. Engine compartment
 1. Fuel filter
 2. Fuel prefilter

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

Loosen and unscrew the fuel filter (1).

Replace the filter unit.

Unscrew the lower part of the fuel filter (2) and drain off any water, and then replace the filter unit.

The filters are of the disposable type and cannot be cleaned. Hand in to environment-friendly station.



The fuel should be taken to an environment-friendly waste disposal station.



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

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



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

NOTE! The new fuel filters must not under any circumstances be pre-filled with fuel due to the purity requirements of the fuel system.



Hydraulic reservoir cap - Check

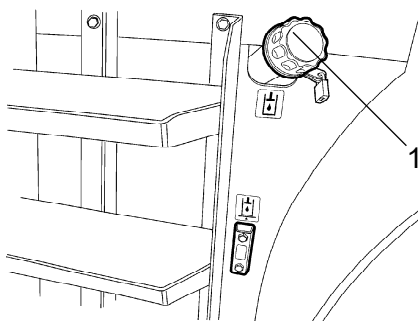


Fig. Hydraulic reservoir
 1. Tank cap

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

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



Use protective goggles when working with compressed air.



Hydraulic fluid filter - Replacement

The filter is located on the left side of the frame.

Clean thoroughly around the oil filter.



Remove the oil filter (1) and discard it in a safe manner. The filter is of the expendable type and cannot be cleaned.



Make sure that the old sealing ring is not left on the filter holder, as this could cause leakage between the new and old gaskets.

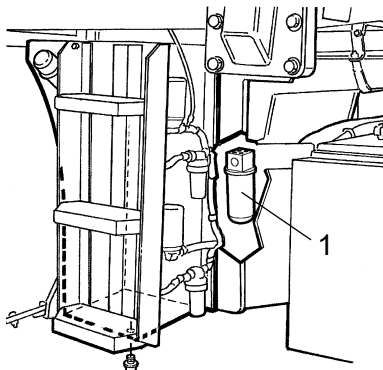


Fig. Hydraulic fluid filter
1. Fluid filter

Thoroughly clean the sealing surface of the filter holder.

Apply a thin coat of fresh hydraulic fluid on the rubber gasket of the new filter. Screw on the filter by hand.



First screw on until the filter seal lies against the filter holder. Then screw a further half turn. Do not tighten the filter too hard as this could damage the gasket.

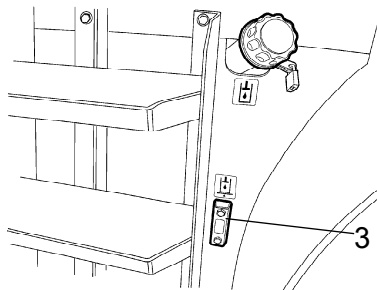


Fig. Hydraulic reservoir
3. Sight glass, hydraulic fluid

Start the engine and check that the filter does not leak. Check the hydraulic fluid level in the sight glass (3) and top off as required.



Make sure that ventilation (extraction) is adequate if the engine is run indoors. Risk of carbon monoxide poisoning.



Fresh air filter - Replacement

The fresh air intake is located behind the back of the left seat.

Replace the fresh air filter (1) and clean the fresh air compartment.

Restore.

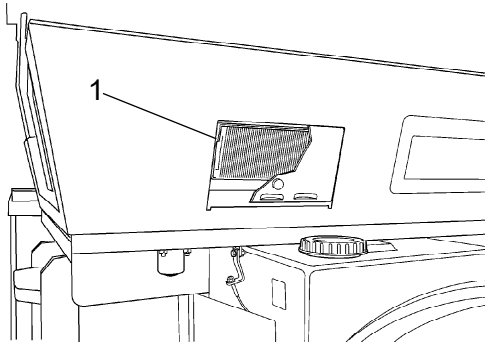


Fig. Fresh air intake
1. Fresh air filter



Fuel tank - Draining off water

Water can be drained via the drain plug at the bottom of the tank. Draining should be done when the roller has been standing still for some time, eg, overnight.

Unscrew the drain plug (1) and allow water and sediment to drain off until only pure fuel runs out.

Tighten the drain plug. If the tank is emptied completely then the fuel system must be vented. See engine service manual

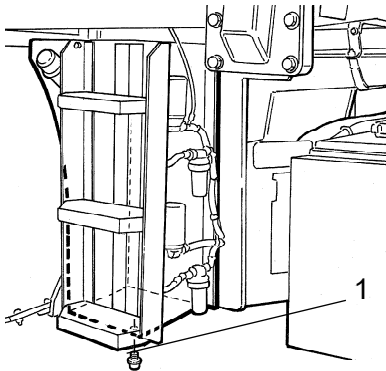


Fig. Fuel tank
1. Drain plug



Hydraulic reservoir - Changing the fluid



Danger of being burned when draining hot oil. Protect your hands.



Place a receptacle that will hold at least 50 liters under the drain plug. Save the oil and dispose of it in an approved manner.

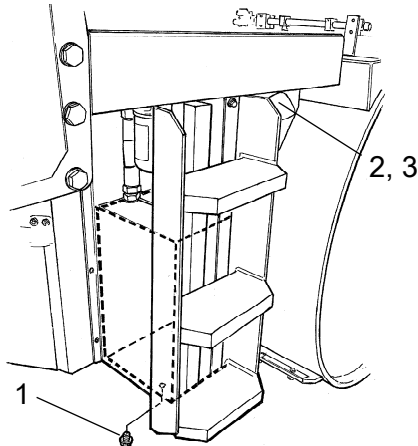


Fig. Hydraulic reservoir

- 1. Drain plug
- 2. Filler cap
- 3. Strainer

Remove the drain plug (1) and allow all the oil to run out, wipe and refit the drain plug.

Wash the filler cap (3) and the strainer (4) using a cleaning agent and blow them dry.



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

Replace the hydraulic filter as described under the heading "Every 1000 hours of operation."

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



Fuel tank - Cleaning

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



Place a receptacle that will hold at least 50 liters under the drain plug. Save the fuel and dispose of it properly.

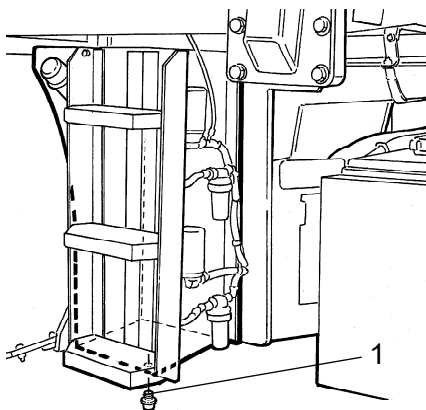


Fig. Fuel tank

- 1. Drain plug

Remove the drain plug (1) and allow all the fuel to run out. To get rid of more of the silt you can fill the tank with two liters of diesel and let it run through the tank. Wipe and put back the drain plug.



Keep in mind fire risk when handling fuel.



Water tank - Cleaning

Draining the tanks

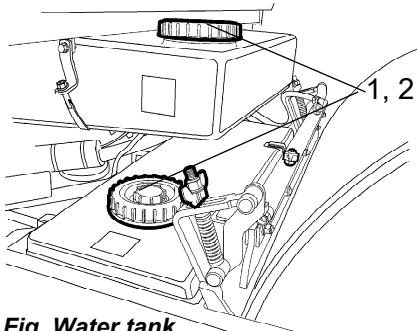


Fig. Water tank
 1. Cover
 2. Filter

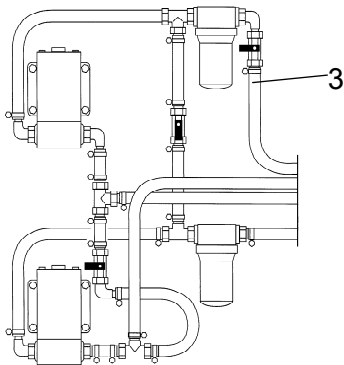


Fig. Sprinkler system
 3. Hose from water tank

The rear (lower) tank's drain plug is placed to the left under the tank. The front (upper) tank is drained via the sprinkler system by disconnecting the filter from the water hose (3) to the tank.

When the tanks are clean, replace the drain plug (1) and hose (3), and put back the filter (2) in the filling holes. Fill the tanks, screw on the cap (1) and check for leaks.



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

Steering joint - Check

Inspect the steering joint to detect any damage or cracks.

Check and tighten any loose bolts.

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

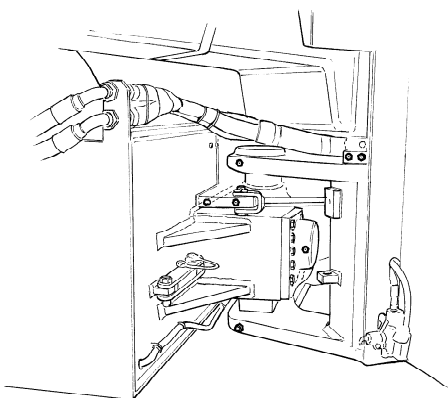


Fig. Articulation joint

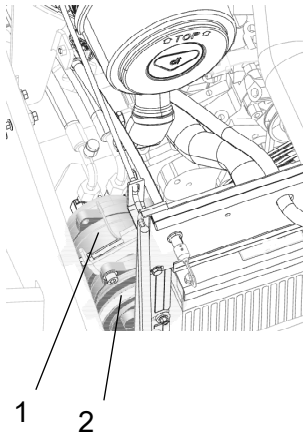


Fig. Engine compartment
1. Compressor
2. Drive belt

Compressor - Check (Optional)

Inspect the attachment of the compressor (1).

The compressor is located below the air filter in the engine compartment.

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.

Air conditioning (Optional)

Drying filter - Inspection

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

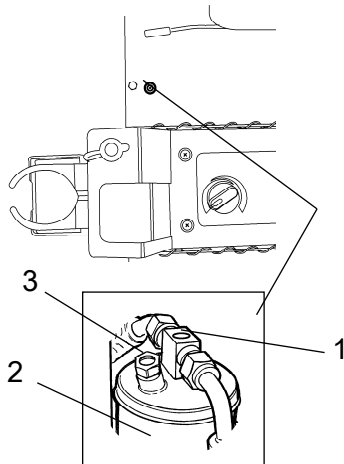


Fig. Drying filter
1. Sight glass
2. Filter holder



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

The filter is located inside the box placed under the seats, close to the left of the right seat. The hole in the box is covered with a rubber cover. See the illustration. If bubbles are visible in the sight glass, this indicates that the refrigerant level is too low. Shut off the unit, as it can be damaged if it is run with insufficient refrigerant. Fill with refrigerant.

Check the moisture indicator (3). It should be blue. If it is beige, the dryer cartridge should be changed by an authorized service company.



The refrigerant circuit is only to be worked on by authorized companies.



Hydraulic reservoir - Draining

Drain condensation water via the drain plug (1) at the bottom of the tank. Draining should be done when the roller has been standing still for some time, eg, overnight.

Drain as follows:

Put a can underneath the drain plug (1).

Loosen the drain plug (1) and allow any condensation water to run out.

Tighten the drain plug.

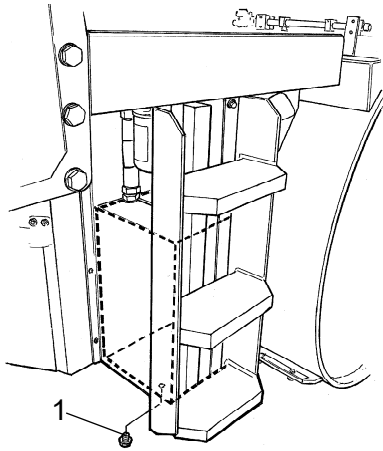


Fig. Hydraulic reservoir
1. Drain plug

