

Instruction manual

Operating & Maintenance
4812162701_B.pdf

Vibratory roller
CA1400

Engine
Kubota V3307-CR-TE4B-DYP-1

Serial number
10000169xxA016225 -



Translation of original instruction

Table of Contents

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

Working capacity	17
General	17
Tightening torque	19
ROPS - bolts	20
Hydraulic system	20
Machine description	21
Diesel engine	21
Electrical system	21
Propulsion system/Transmission	21
Brake system	21
Steering system	22
Vibration system.....	22
FOPS and ROPS	22
Identification	23
Product and component plates	23
Product identification number on the frame	23
Machine plate.....	24
Explanation of 17PIN serial number.....	24
Engine plates	25
Decals.....	26
Location - decals	26
Safety decals.....	27
Info decals	29
Instruments/Controls	30
Locations - Instruments and controls	30
Locations - Control panel and controls.....	31
Function description	32
Electrical system.....	35
Fuses	35
Main fuses.....	36

Relays on machine.....	36
Operation	39
Before starting	39
Master switch - Switching on.....	39
Operator's seat - Adjusting.....	39
Driver seat (Equipment status) - Adjustment	40
Parking brake	40
Instruments and lamps - Checking.....	41
Interlock.....	41
Operator position.....	42
View	42
Starting	43
Starting the engine	43
Driving	45
Operating the roller	45
Operation of strike-off blade (Equipment status)	46
Interlock/Emergency stop/Parking brake - Check	46
Regeneration of DPF filter.....	47
Vibration	48
Vibration On/Off	48
Vibration - Activation	49
Braking	49
Normal braking.....	49
.....	49
Emergency braking	50
Switching off.....	50
Parking	51
Chocking the drums	51
Master switch	51

Long-term parking.....	53
Engine	53
Battery.....	53
Air cleaner, exhaust pipe.....	53
Fuel tank	53
Hydraulic reservoir	53
Tires	53
Hoods, tarpaulin	54
Steering cylinder, hinges, etc.	54
Miscellaneous	55
Lifting	55
Locking the articulation	55
Lifting the roller.....	55
Unlocking the articulation	56
Towing	56
Short distance towing with the diesel engine switched off/not running	56
Brake disengagement pump.....	57
Towing the roller.....	59
Transport	59
Securing CA1400 for loading	60
Operating instructions - Summary	63
Preventive maintenance	65
Acceptance and delivery inspection.....	65
Warranty.....	65
Maintenance - Lubricants and symbols	67
Maintenance symbols	68
Maintenance - Maintenance schedule	69
Service and maintenance points	69
General	70
Every 10 hours of operation (Daily).....	70

After the FIRST 50 hours of operation	70
Every 50 hours of operation (Weekly)	71
Every 250 / 750 / 1250 / 1750 hours of operation	71
Every 500 hours of operation	72
Every 1000 hours of operation	73
Every 1500 hours of operation	74
Every 2000 hours of operation	75
Service - Checklist	76
Maintenance, 10h	77
Scrapers - Check, adjustment	77
Scrapers, Pad-drum	78
Air circulation - Check	78
Coolant level - Check	79
Fuel tank - Filling	79
Diesel engine Check oil level	80
Brakes - Check	80
Hydraulic reservoir - Check fluid level	81
Maintenance, first 50h	83
Hydraulic filter - Replacement	83
Tires - Air pressure - Wheel nuts - Tightening	85
Drum gear - Oil change	85
Drum gear - Oil filling	86
Maintenance - 50h	87
Scrapers - Check, adjustment	87
Scrapers, Pad-drum	88
Tires - Air pressure - Wheel nuts - Tightening	88
Air cleaner	
Check - Replacement of main filter	89
Air filter indicator - Resetting	89
Backup filter - Change	90

Air cleaner	
- Cleaning	90
Air cleaner	
- Check hoses and connections	90
Pre-fuel filter - Draining	91
Maintenance measures - 250 h	93
Rear axle differential - Check oil level	93
Rear axle pinion housing	
- Checking the oil level	93
Rear axle planetary gears - Check oil level	94
Drum - Checking the oil level	94
Drum gearbox - Checking the oil level	95
Coolers	
Checking - Cleaning	96
Bolted joints - Checking tightening torque	96
Rubber elements and fastening screws - Check	97
Battery - Check condition	97
Maintenance measures - 500 h	99
Rear axle differential - Check oil level	99
Rear axle pinion housing	
- Checking the oil level	100
Rear axle planetary gears - Check oil level	100
Drum - Checking the oil level	100
Coolers	
Checking - Cleaning	101
Bolted joints - Checking tightening torque	102
Rubber elements and fastening screws - Check	102
Battery - Check condition	103
The engine fuel filter - replacement/cleaning	103
Diesel engine - Oil- and Filter change	104
Forward/Reverse controls and joints	
- Check and lubrication	105

Controls and moving joints - Lubrication	106
Replacing the diesel engine's oil separator filter	107
Maintenance - 1000h	109
Drum - Checking the oil level	109
Drum gear - Oil change	110
Drum gear - Oil filling	111
Rubber elements and fastening screws - Check.....	111
Battery - Check condition	112
Coolers	
Checking - Cleaning	112
The engine fuel filter - replacement/cleaning	113
Forward/Reverse controls and joints	
- Check and lubrication	113
Controls and moving joints - Lubrication	114
Diesel engine - Oil- and Filter change	115
Hydraulic filter - Replacement	116
Fuel tank - Cleaning	117
Fuel tank - Draining (Equipment status).....	117
Hydraulic reservoir - Draining.....	118
Rear axle differential - Oil change	118
Rear axle pinion housing - Oil change	119
Rear axle planetary gear - Oil change	119
Bolted joints - Checking tightening torque.....	120
Maintenance - 2000h	121
Hydraulic reservoir - Oil change	121
Drum - Checking the oil level	122
Drum - Oil change	122
Drum gear - Oil change	123
Drum gear - Oil filling	123
Rubber elements and fastening screws - Check.....	124

Battery - Check condition	124
Coolers	
Checking - Cleaning	125
The engine fuel filter - replacement/cleaning	125
Diesel engine - Oil- and Filter change	126
Forward/Reverse controls and joints	
- Check and lubrication	127
Controls and moving joints - Lubrication	128
Hydraulic filter - Replacement	128
Fuel tank - Cleaning	130
Fuel tank - Draining (Equipment status)	130
Hydraulic reservoir - Draining	131
Rear axle differential - Oil change	131
Rear axle pinion housing - Oil change	132
Rear axle planetary gear - Oil change	132
Bolted joints - Checking tightening torque	133
Steering joint - Check	134

Introduction

The machine

Model CA1400 is one of Dynapac's earth compaction rollers. It is available in a D (smooth drum) and PD (padfoot) version.

Intended use

All types of base courses and subbase courses can be compacted. The PD version enables the use of either D or PD drums, which ensures greater flexibility for a wider range of applications.

Warning symbols



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



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

Safety information



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.



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



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

CALIFORNIA

Proposition 65 Warning

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

General

This manual contains instructions for machine operation and maintenance.

The machine must be correctly maintained for maximal performance.

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

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

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



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

This manual contains instructions for periodic maintenance, 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 carried out by the engine supplier's certified 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)



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

16. **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.**
17. **Do not make any changes or modifications to the roller that could affect safety. Changes are only to be made after written approval has been given by Dynapac.**
18. **Avoid using the roller before the hydraulic fluid has reached its normal working temperature. Braking distances can be longer than normal when the fluid is cold. See instructions in the STOP section.**
19. **For your own protection always wear:**
 - helmet
 - working boots with steel toecaps
 - ear protectors
 - reflecting clothing/high visibility jacket
 - working gloves

Safety - when operating



Prevent persons from entering or remaining in the danger area, 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.

Work driving

Avoid operating close to edges and ditches and the like as well as on poor ground conditions that influence 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.



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

Driving near edges



Never operate with roller outside the edge, if the substrate does not have full bearing strength or 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.

Strike-off blade



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



The strike-off blade must be retracted to the transport position at the end of each working period.

Security Warning - machinery




The pad shell scraper and strike-off blade must not be used in combination on this machine. This will exceed the weight limits that apply to this type of machine from a safety standpoint.

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 and hydraulic system can be run at this temperature using normal oil, but in other components that use transmission oil, AC Fluid Gearbox 100, API GL-5 or equivalent must be used.


High pressure cleaning

Do not spray directly onto electrical components.

 Do not use a high-pressure water jet on the instrument panel/display.

 Detergent that can destroy electrical parts, or which is conductive, must not be used.

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.

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.

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)



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



Never attempt to repair a damaged ROPS structure. This must be replaced with new ROPS structure.

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.**

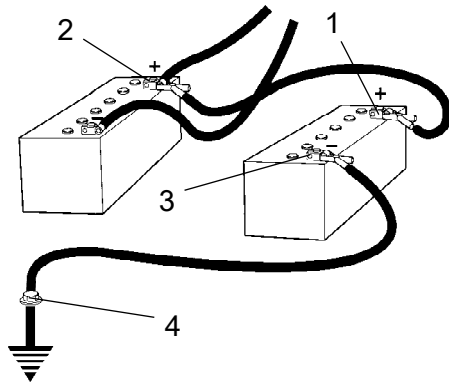


Fig. Jump starting

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)

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

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

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

Noise level

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

Guaranteed sound power level, L_{wA}	103	dB (A)
Sound pressure level at the operator's ear (platform), L_{pA}	80 ± 3	dB (A)

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

Electrical system

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



Max 20° or 36%

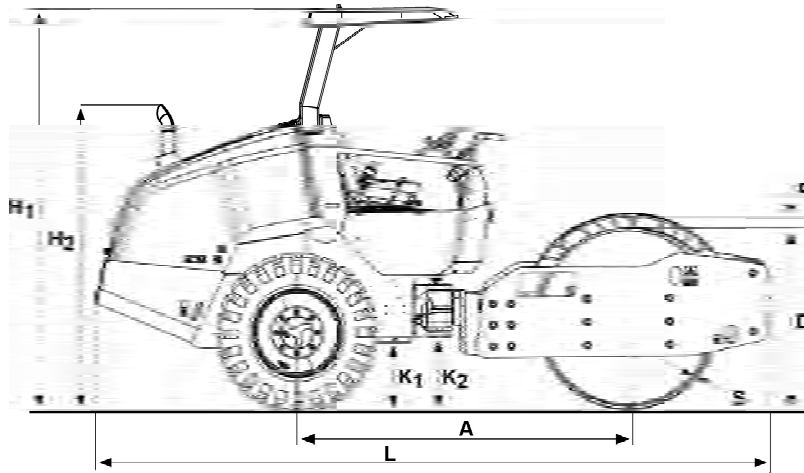
Slopes

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

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

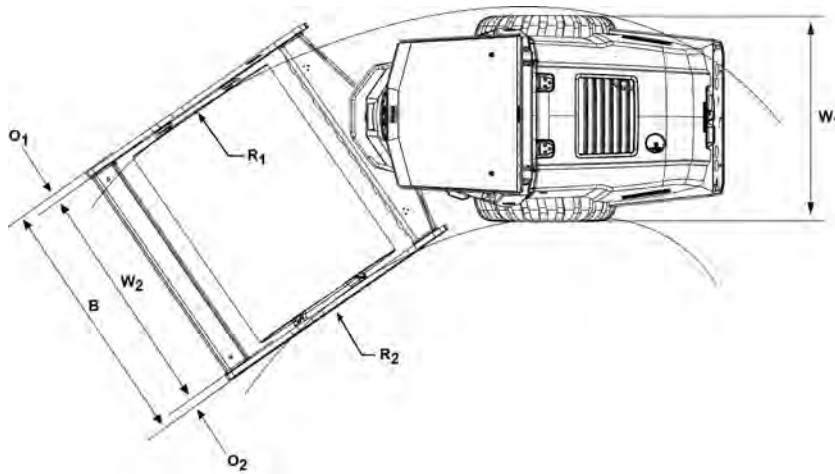
Always take into consideration that loose ground, steering the machine, vibration on, machine speed across the ground and raising the center of gravity can all cause the machine to topple at smaller slope angles than those specified here.

Dimensions, side view



	Dimensions	mm	in
A	Wheelbase, drum and wheel	2200	87
L	Length, standard equipped roller	4510	178
H ₁	Height with ROPS (D)	2700	106
H ₁	Height with ROPS (PD)	2710	107
H ₂	Height without ROPS (D)	1810	71
H ₂	Height without ROPS (PD)	1812	71
D	Diameter, drum (D)	1219	48
D	Diameter, drum (PD)	1209	47.6
S	Thickness, drum sweep, nominal (D)	22	0.9
S	Thickness, drum sweep, nominal (PD)	17	0.7
P	Height, pads (PD)	76	3
K ₁	Clearance, tractor frame	360	14
K ₂	Clearance, drum frame	360	14

Dimensions, top view



	Dimensions	mm	in
B	Width, standard equipped roller	1870	73
O ₁	Overhang, left frame side	95	4
O ₂	Overhang, right frame side	95	4
R ₁	Turn radius, external	4580	180
R ₂	Turning radius, inner	2900	114
W ₁	Width, tractor section	1530	60
W ₂	Width, drum	1676	66
α	Steering angle	± 33°	

Weights and volumes

Weights

Service weight, with ROPS + Ballast load (EN500) (D)	6 500 kg	14,350 lbs
Service weight with ROPS (EN500) (PD)	6 500 kg	14,350 lbs
Service weight, with ROPS + PD shell	7 325 kg	16,150 lbs
Service weight, with ROPS + Strike-off blade (PD)	6 765 kg	14,195 lbs

Fluid volumes

Fuel tank	117 liters	31 gal
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Working capacity

Compaction data

Static linear load with ROPS and Ballast weight (D)	20 kg/cm	114 pli
Static linear load with ROPS and Ballast weight (PD)	xx kg/cm	xx pli
Amplitude, Hi/Lo (D)	1.7 / 0.8 mm	0.067 / 0.032 in
Amplitude, Hi/Lo (PD)	1.6 / 0.8 mm	0.063 / 0.032 in
Vibration frequency, amplitude	32 Hz	1,920 rpm
Centrifugal force, amplitude (Hi/Lo) (D/PD)	114 / 55 kN	25,630 / 12,365 lb

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

Propulsion

Speed range	0 - 10	km/h	0 - 6.2	mph
Climbing capacity (theoretical)	up to 50	%		

General

Engine

Manufacturer/Model	Kubota V3307 CR-TE4	Turbo diesel
Power (SAE J1995)	55 kW	75 hp
Engine speed, idling	800 rpm	

Engine

Engine speed, ECO	1900 rpm
Engine speed, working/transport	2200 rpm

Electrical system

Battery	12V 100Ah
Alternator	12V 70A
Fuses	See the Electrical system section - fuses

Tire

Tire dimensions

Tire pressure

Flotation	400/60-22.5, 16 ply	150 kPa (2.0 kp/cm ²) (29 psi).
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Weight for complete, liquid filled tires is 241 kg (531 lbs/tire). When servicing, bear this extra weight in mind.

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 :	M16 (4700500082)
Strength class :	8.8
Tightening torque :	190 Nm

Hydraulic system

Opening pressure	MPa
Drive system	38.5
Supply system	2.0
Vibration system	36.5
Control systems	20.5

Release pressure	MPa
Brake release	1.5

Machine description

Diesel engine

The machine is equipped with a four-cylinder, water-cooled diesel engine with direct injection.

The engine is also equipped with a system for after-treatment of exhaust fumes (DPF Diesel Particle Filter).

Exhaust after-treatment system

To minimize particles and hydrocarbons, the engine is fitted with a diesel particle filter, as well as a control unit for after-treatment of exhaust fumes. The diesel particle filter incorporates active burnout.

When the engine is running, particles are collected in the DPF, and the particles have to be burned away in order to clean the filter.

During the burnout/regeneration process, the exhaust gas temperature increases significantly above the normal temperature in the exhaust pipe.

Electrical system

The machine has the following control units (ECU, Electronic Control Unit) and electronic units.

- Main ECU (for the machine)
- Diesel engine control unit (ECM)

Propulsion system/Transmission

The propulsion system is a hydrostatic system with a hydraulic pump supplying two motors connected in parallel, one for the rear axle and one for the drum.

The speed of the machine is proportional to the angle of the control lever (the deflection of the forward/reverse lever regulates the speed). A flow divider is available as an option.

Brake system

The brake system comprises a service brake, secondary brake and parking brake. The service brake system produces retardation of the propulsion system, i.e. hydrostatic braking.

Secondary/Parking brake

The secondary and parking brake system consists of sprung multiple disc brakes in the rear axle and the drum drive, which are released by hydraulic pressure.

Steering system

The control system is a mechanical-hydraulic system. The control valve on the steering column distributes the flow to the control cylinder at the articulation. The steering angle is proportional to the deflection of the steering wheel.

Vibration system

The vibration system is a hydrostatic system in which a hydraulic motor drives the eccentric shaft, which generates the drum's vibrations.

The amplitude is determined by the direction of rotation of the hydraulic motor.

FOPS and ROPS

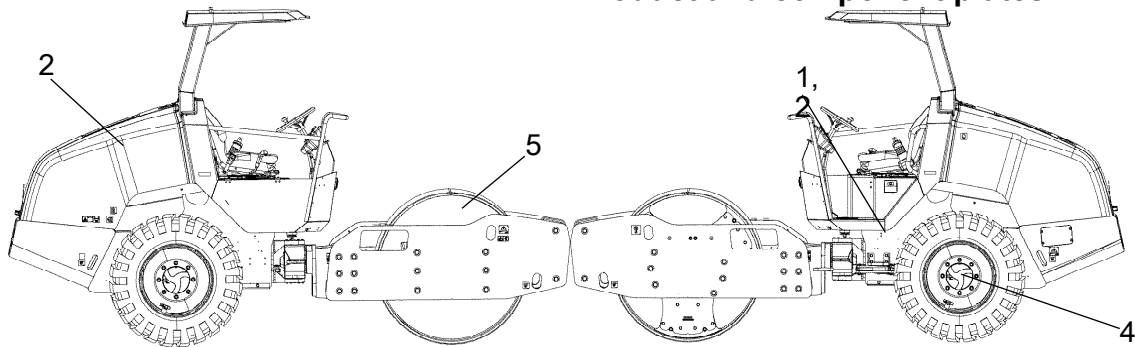
FOPS is the abbreviation for "Falling Object Protective Structure" (roof protection) and ROPS is the abbreviation for "Roll Over Protective Structure".

If any part of the protective construction on the cab or FOPS/ROPS structure reveals plastic deformation or cracking, the FOPS/ROPS structure must be replaced immediately.

Never undertake any modifications on the FOPS/ROPS structure without first having discussed the modification with Dynapac's production unit. Dynapac will resolve whether the modification would invalidate approval in line with FOPS/ROPS standards.

Identification

Product and component plates



1. Product plate - Product Identification Number (PIN), model/type designation
2. Engine plate - Type description, product and serial numbers
4. Component plate, rear axle - Product and serial numbers
5. Component plate, drum - 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 front frame or the upper edge of the right frameside.

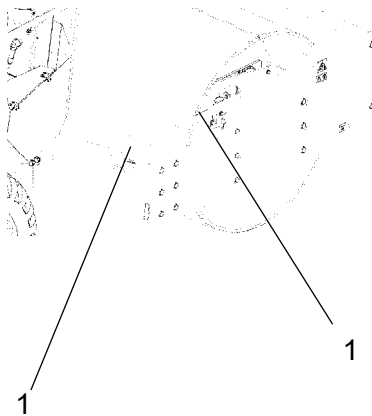


Fig. Front frame
1. PIN

Machine plate

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

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

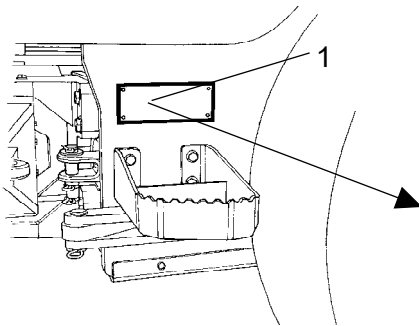





Fig. Operator platform
1. Machine plate

					
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					
<small>4811 0001 33</small>					

Please state the machine's PIN when ordering spares.

Explanation of 17PIN serial number

- A= Manufacturer
- B= Family/Model
- C= Check letter
- F= Serial number

100	00123	V	x	A	123456
A	B	C	F		

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.

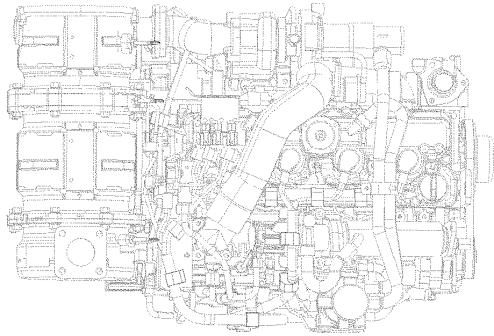


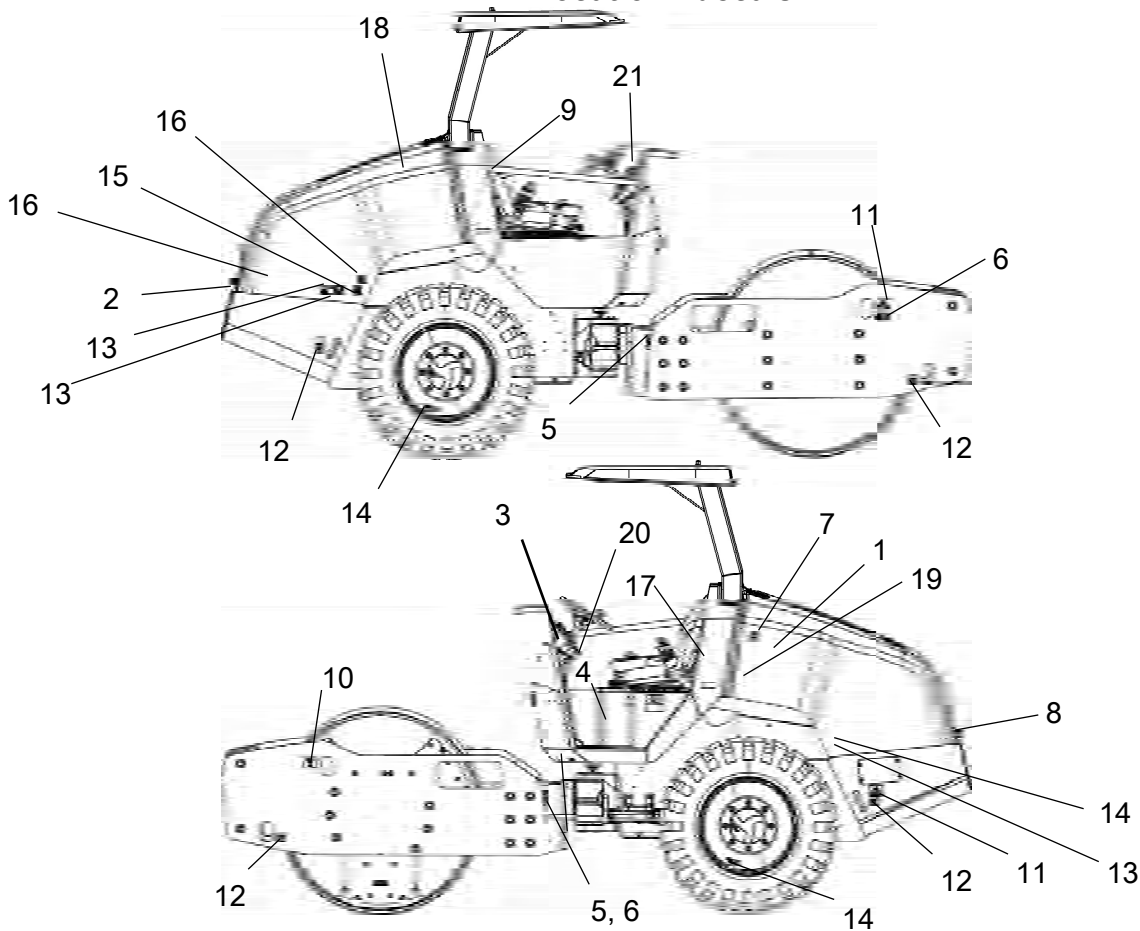
Fig. Engine
1. Type plate

TYPE :	#####
FAMILY :	#####
APPROVAL NUMBER:	###/###/#####
Kubota KUBOTA Corporation	
#####	

EMISSION CONTROL INFORMATION /	
THIS ENGINE MEETS 2012 ##### EMISSION REGULATIONS FOR U.S. EPA AND CALIFORNIA NONROAD ENGINES.	
Kubota KUBOTA Corporation	
MODEL :	##### ENGINE DISP. : #####
FAMILY :	C #####
POWER :	## kW / ### rpm CATEGORY: ## - ## kW
VALVE CLEARANCE (COLD):	IN ## mm EX ## mm
EDS:	### #####
ULTRA LOW SULFUR DIESEL FUEL ONLY	
DEL. ASSY:	#####

Decals

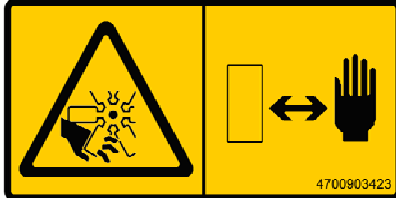
Location - decals



1. Diesel fuel	4811000345	8. Warning, Hot surfaces	4700903424	15. Hydraulic fluid level	4700272373
2. Warning, Rotating engine components	4700903423	9. Battery master switch	4700904835	16. Hydraulic fluid Bio hydraulic fluid	4700272372 4700792772
3. Warning, Read instruction manual	4700903459	10. Lift point	4700588176	17. Sound power level	4700791273
4. Handbook compartment	4700903425	11. Hoisting plate	4700904870	18. Warning, Starting gas	4700791642
5. Warning, Crush zone	4700903422	12. Tie down point	4700382751	19. Fuel with a low sulphur content	4811000344
6. Warning, Locking	4700908229 4812125363	13. Tire pressure	4812117438	20. Starting instructions	4812115918
7. Coolant	4700388449	14. Warning, Ballasted tires	4700903985	21. Warning lamps	4812117993
				22. Warning, Brake release	4700904895

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.



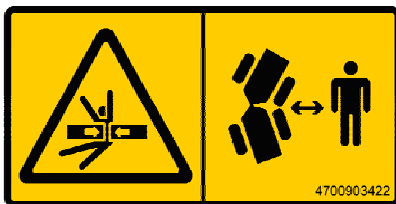
4700903423
Warning - Rotating engine components.

Keep your hands at a safe distance.



4700903459
Warning - Instruction manual

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



4700903422
Warning - Crush zone, articulation/drum.

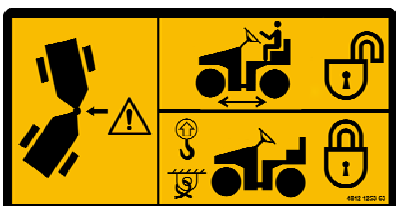
Maintain a safe distance from the crush zone.



470090229
Warning - Risk of crushing

The articulation must be locked when lifting.

Read the instruction manual.

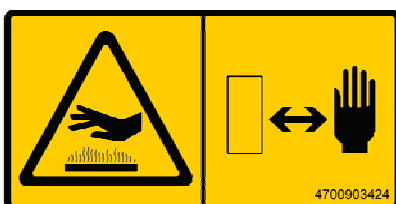


4812125363
Warning - Locking

The articulation must be locked during transport and lifting,

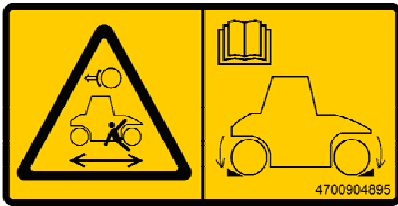
but be open during operation.

Read the instruction manual.



4700903424
Warning - Hot surfaces in the engine compartment.

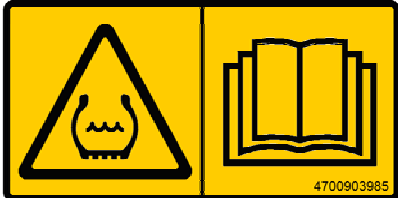
Keep your hands at a safe distance.



4700904895
Warning - Brake disengagement

Study the towing chapter before disengaging the brakes.

Danger of being crushed.



4700903985
Warning - Ballasted tire.

Read the instruction manual.

More information in section in Technical specifications.



4700791642
Warning - Starting gas

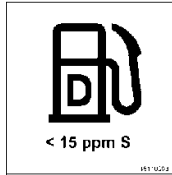
Starting gas is not to be used.

Info decals

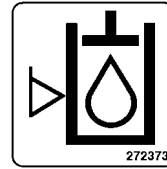
Fuel with a low sulphur content



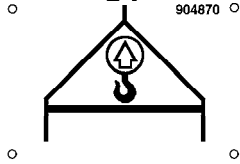
Diesel fuel



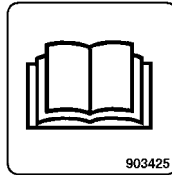
Hydraulic fluid level



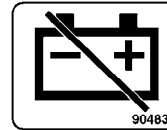
Hoisting plate



Handbook compartment



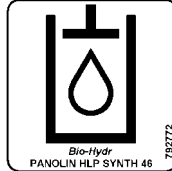
Master switch



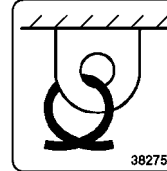
Hydraulic fluid



Biological hydraulic fluid



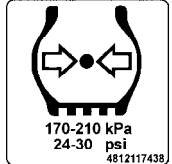
Tie down point



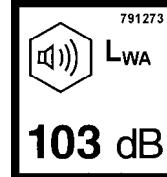
Lifting point



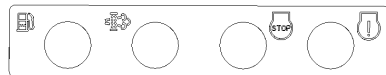
Tire pressure



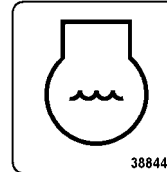
Sound power level



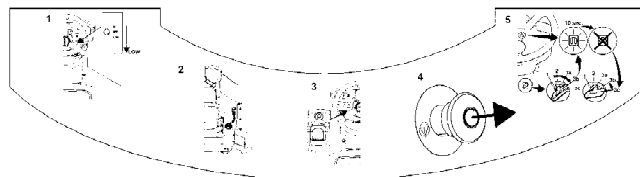
Warning lamps



Coolant



Starting instructions



Instruments/Controls

Locations - Instruments and controls

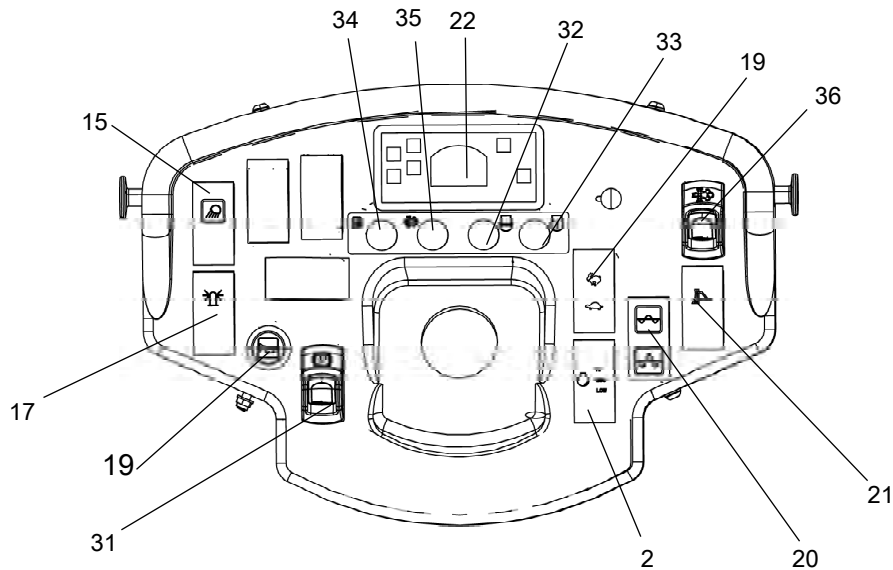


Fig. Instruments and control panel

2.	Speed selector, LO/ECO/Hi	31.	Parking brake On/Off
15.	Working lights *	32.	Motor diagnostics control light serious fault
17.	Rotating beacon *	33.	Motor diagnostics control light less serious fault
19.	Horn	34.	Control lamp, water separator
20.	Amplitude, Hi/Lo	35.	Control lamp, parked regeneration
21.	Strike-off blade *	36.	Switch, parked regeneration
22.	Control panel	37.	Hastighetsväljare, Hög/Låg

*) Depending on machine equipment status.

Locations - Control panel and controls

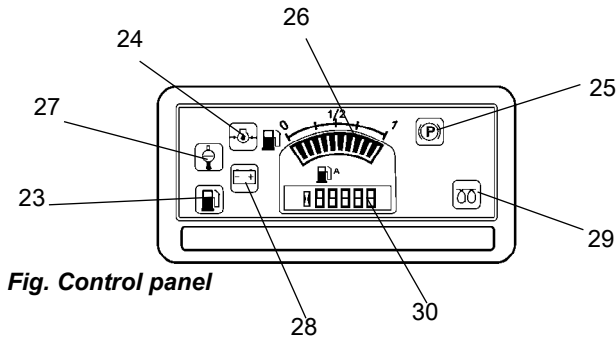


Fig. Control panel

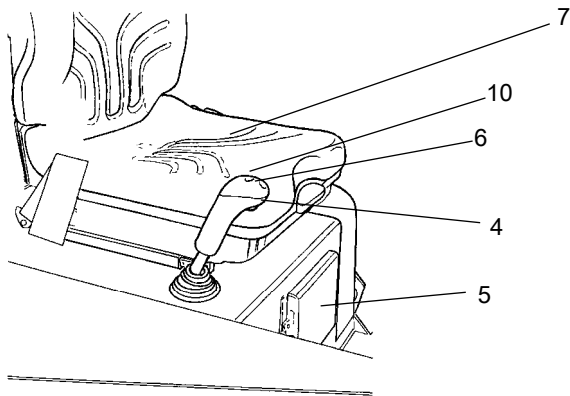


Fig. Operator position

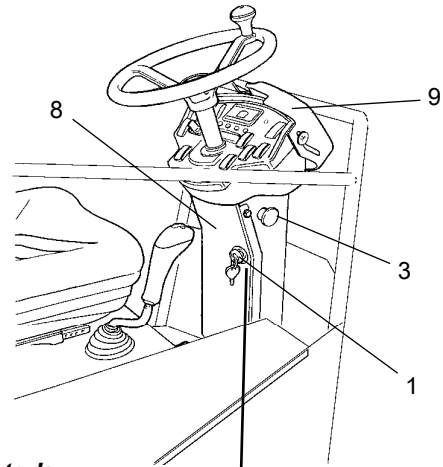
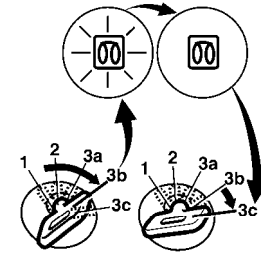











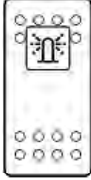

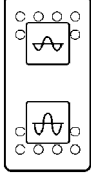
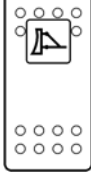








Fig. Operator's station

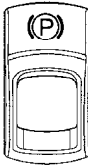




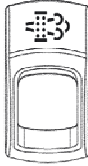



- | | | | |
|----|-----------------------|----|---------------------------|
| 1 | Starter switch | 23 | Low fuel level |
| 3 | Emergency stop | 24 | Oil pressure, engine |
| 4 | Vibration On/Off | 25 | Parking brake |
| 5 | Handbook compartment | 26 | Fuel level |
| 6 | Forward/reverse lever | 27 | Water temperature, engine |
| 7 | Seat switch | 28 | Battery/charging |
| 8 | Fuse box | 29 | Glow plug |
| 9 | Instrument cover | 30 | Hourmeter |
| 10 | Strike-off blade | | |

Function description

No	Designation	Symbol	Function
1.	Starter switch		<p>Positions 1-2: Shut off position, key can be removed.</p> <p>Position 3a: All instruments and electric controls are supplied with power.</p> <p>Position 3b: Glowing. Hold the starter switch in this position until the lamp goes out. The starter motor is activated in the next position.</p> <p>Position 3c: Starter motor activation.</p>
2.	Electronic speed control regulator		<p>Three-position switch for idling (LOW), fuel optimization (ECO) and working speed (HI). N.B. When starting the machine, the control must be in idling position (LOW). The diesel engine drops to even lower revs when stationary, more than approx. 10 seconds if the F&R lever is in neutral. If the F&B lever is moved out of neutral, the speed returns to the set speed again.</p>
3.	Emergency stop		<p>When pressed, the emergency stop is activated. Brakes the roller and switches off the engine. The power supply goes off. N.B. When starting the machine, the emergency stop must be inactive.</p>
4.	Vibration On/Off. Switch		<p>Press once and release to switch vibration on. Press again to switch the vibration off.</p>
5.	Handbook compartment		<p>Pull up and open the top of the compartment for access to handbooks.</p>
6.	Forward/Reverse lever		<p>The lever must be in neutral to start the diesel engine. The engine cannot be started if the lever is in any other position. The forward/reverse lever controls both the roller's driving direction and speed. When the lever is moved forward, the roller moves forward etc. The roller's speed is proportional to the distance the lever is from the neutral position. The further the lever is from the neutral position, the higher the speed.</p>
7.	Seat switch		<p>Remain seated at all times when operating the roller. If the operator stands up during operation, a buzzer sounds. After 3 seconds the brakes are activated and the engine stops.</p>
8.	Fuse box (on control column)		<p>Contains fuses for the electrical system. See under the heading 'Electrical system' for a description of fuse functions.</p>
9.	Instrument cover		<p>Lowered over the instrument plate to protect the instruments from the weather and sabotage. Lockable</p>

No	Designation	Symbol	Function
15.	Working lights, switch		When depressed, the working lights are on
17.	Hazard beacon, switch		Where depressed, the hazard beacon is on
19.	Horn, switch		Press to sound the horn.
20.	Amplitude selector, High/Low		The depressed upper position gives Low amplitude The depressed lower position gives High amplitude
21.	Strike-off blade, On/Off, switch		When pressed, the strike-off blade is activated. Controls the position of the strike-off blade.
22.	Control panel		
23.	Warning lamp, low fuel level		The lamp goes on if the fuel level in the diesel tank is low.
24.	Warning lamp, oil pressure		This lamp lights if the lubricating pressure in the engine is too low. Stop the engine immediately and locate the fault.
25.	Warning lamp, parking brake		The lamp lights when the parking brake is activated.
26.	Fuel level		Shows the fuel level in the diesel tank.
27.	Warning lamp, water temperature		The light comes on if the water temperature is too high.
28.	Warning lamp, battery charging		If the lamp lights while the engine is running the alternator is not charging. Stop the engine and locate the fault. At a voltage below 12.5 volts, the engine revs will automatically be set to 1300 revs to ensure sufficient charging of the battery. This only applies when the parking brake is activated.
29.	Warning lamp, glow plug		The lamp must go out before the starter switch is moved to position 3c for activation of the starter motor.

No	Designation	Symbol	Function
30.	Hourmeter		Displays the number of working hours for the engine. Any error codes from the diesel engine are also shown here.
31.	Parking brake		To activate the brakes, press the top of the switch to change the position of the lever. To disengage the brakes, press down the red part at the same time as the switch, and change the position of the lever. NOTE: When starting the machine, the parking brake must be activated.
32.	Motor diagnostics		Red control lamp. Serious fault: Switch off engine immediately! Error codes are displayed alternating with the hourmeter on the control panel. Rectify before restarting.
33.	Motor diagnostics		Yellow control lamp. Less serious fault Rectify as soon as possible. Error codes are displayed alternating with the hourmeter on the control panel
34.	Water separator		Yellow control lamp. If the lamp is lit, this indicates that there is water in the tank. Stop the roller and drain the fuel filter. (see chapter "Maintenance procedures 50h")
35.	Regeneration parked		Yellow control lamp. If the lamp flashes, start a parked regeneration.
36.	Regeneration parked, Switch		Parked regeneration is activated in pressed mode. If the indicator in the switch flashes, start a parked regeneration.
37.	Speed selector, High/Low		The depressed upper position gives Low speed The depressed lower position gives High speed

Electrical system

Fuses

The figure shows the position of the fuses.

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

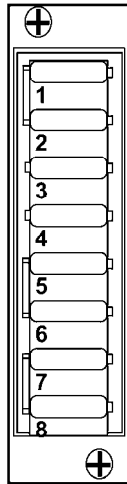


Fig. Fuse box

Fuse box

1.	Emergency stop, ECU, Backup alarm, Neutral position, Seat switch, Vibration	15A
2.	Horn, Summer, Instrument panel	10A
3.	Hazard beacon, Strike off blade	10A
4.	Working lights	20A
5.	Engine ECU, Ignition	5A
6.	Alternator, Indication, Preheater	5A
7.	EGR valve	5A
8.	Reserve	

Main fuses

There is one main fuse (2). It is located behind the battery disconnecter, on the right side inside the engine hood.

The fuse is of the flat pin type.

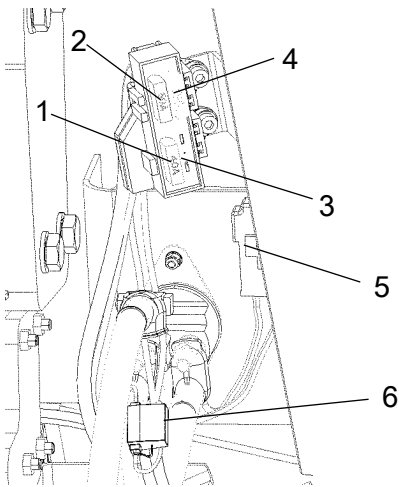


Fig. Engine compartment

1. Fuse, starter relay (40A)(F4.4)
2. Main fuse (50A) (F4.1)
3. Reserve
4. Fuse, preheating relay (80A) (F4.2)
5. Fuse, engine ECU (20A) (F8)
6. Fuse, 12V socket (10A) (F5)

Relays on machine

Engine room

- | | | |
|----|-----|---------------------|
| 1. | K1 | Starting |
| 2. | K2 | ECU |
| 3. | K5 | Preheating |
| 4. | K24 | Preheating / Lights |

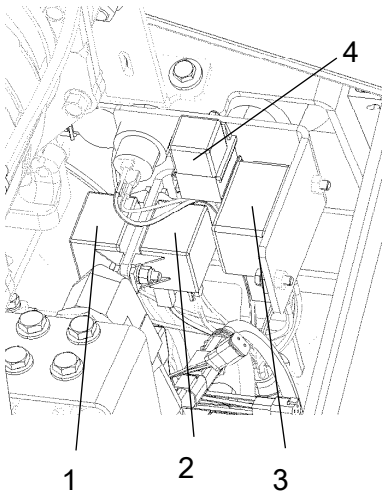
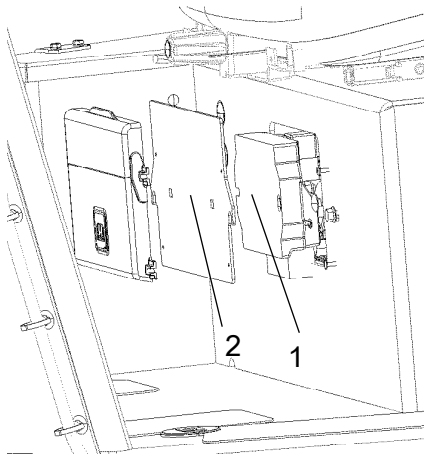


Fig. Relays Engine room



The control unit (ECU) (1) is located behind the cover (2) under the operator seat.

This control unit looks after the electrical drive control, including vibration, start-stop.

Fig. Operator station
1. Control unit (ECU)
2. Cover

Operation

Before starting

Master switch - Switching on

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

The master switch is located on the right side of the operator platform. Turn the key (1) to the On position. The roller is now supplied with power.

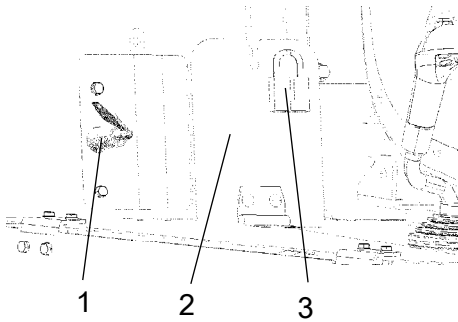


Fig. Master switch

- 1. Key
- 2. Cover
- 3. Padlock

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 lengthways (1).

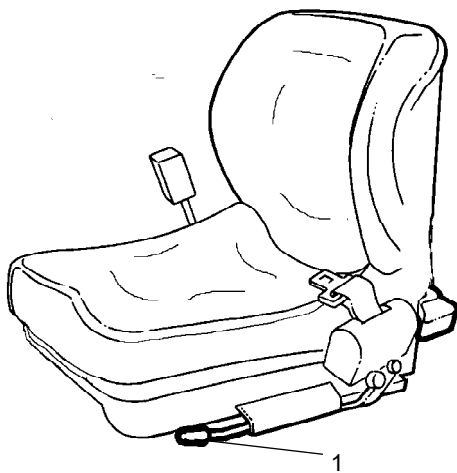


Fig. Operator's seat
1. Length adjustment

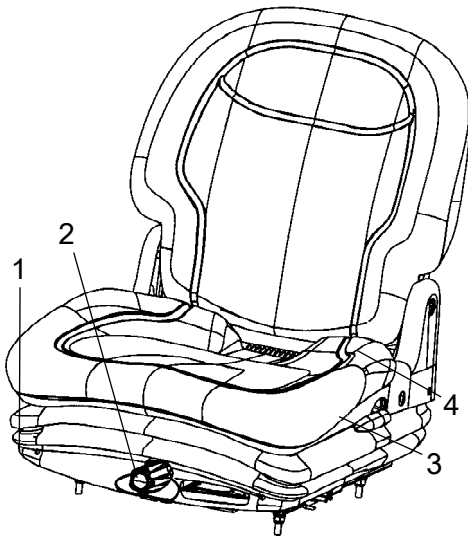


Fig. Driver seat
1. Lock lever - Length adjustment
2. Weight adjustment
3. Back support angle
4. Seat belt

Driver seat (Equipment status) - Adjustment

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

The seat can be adjusted as follows.

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



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



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

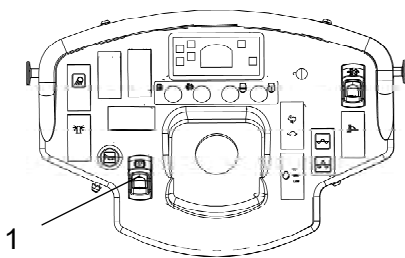


Fig. Control panel
1. Parking brake

Parking brake



Ensure that the parking brake (1) is definitely switched on.

Brake is always activated in Neutral position.
(automatic 1.5 sec.)

The parking brake must be activated to start the machine!

Instruments and lamps - Checking

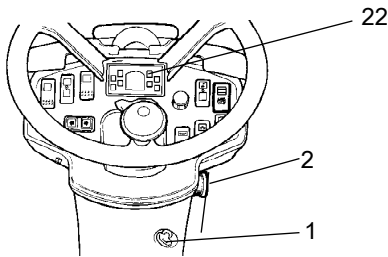


Fig. Instrument panel
1. Starter switch
2. Emergency stop
22. Warning panel



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

Pull out the emergency stop (2).

Turn the switch (1) to position 3a.

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

Interlock

The roller is equipped with Interlock.

The diesel engine will switch off after 4 seconds if the operator gets off the seat when going forwards/backwards.

If the control is in neutral when the operator stands up a buzzer will go on until the parking brake is activated.

If the parking brake is activated, the diesel engine will not stop if the forward/reverse lever is moved out of neutral.

The diesel engine will switch off immediately if for any reason the forward/reverse lever is moved out of neutral when the operator is not sitting down and the parking brake has not been activated.



Sit down for all operations!

Operator position

If a ROPS (2) (Roll Over Protective Structure) is fitted on the roller, always wear the seat belt (1) provided and wear a protective helmet.



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



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



Ensure that the anti-slip (4) on the platform is in good condition. Replace where anti-slip friction is poor.

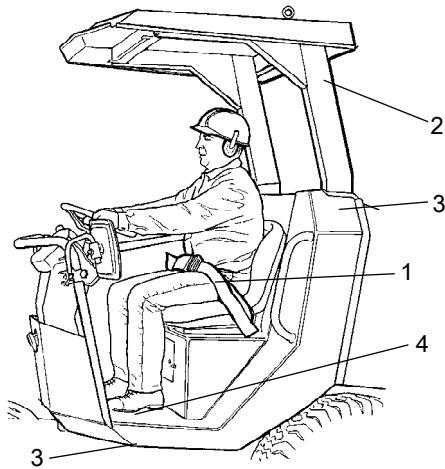


Fig. Driver's seat
 1. Seat belt
 2. ROPS
 3. Rubber element
 4. Anti-slip

View

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

The rear view mirrors (depending on roller equipment status) should be adjusted for a good rear view.

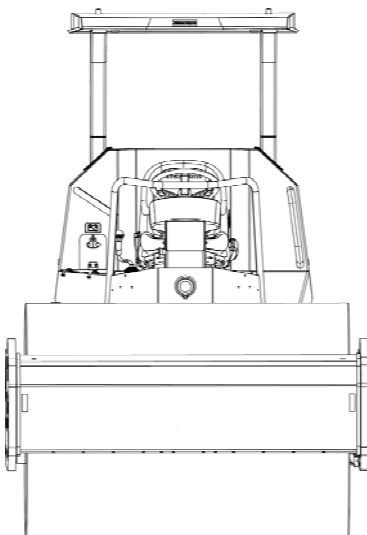


Fig. view

Starting

Starting the engine

Make sure that the emergency stop (3) is pulled out and the parking brake (31) is activated.

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

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

Set the speed control (2) to idling: Low.

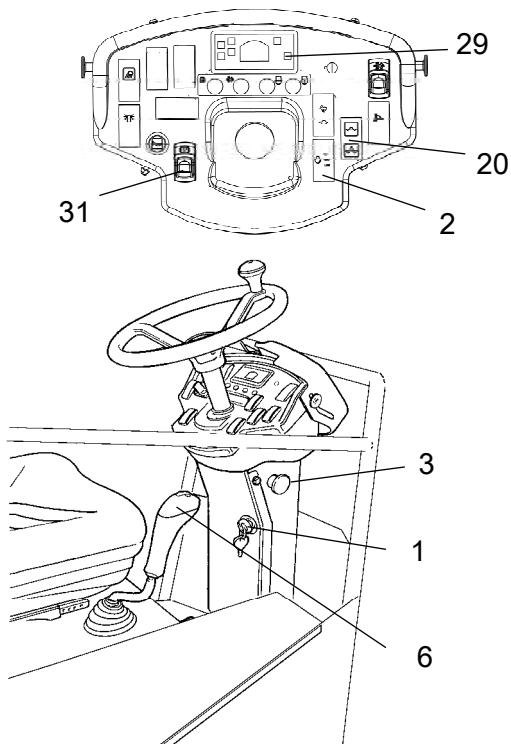
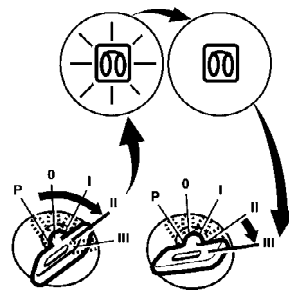


Fig. Control panel

- 1. Starter switch
- 2. Engine speed control
- 3. Emergency stop
- 6. Forward/Reverse lever
- 20. Vibration switch
- 29. Glow lamp
- 31. Parking brake



Preheating: Turn the ignition key to position II. When the glow lamp (29) goes out, turn the Turn the ignition key to position III.

As soon as the engine has started, release the ignition key.



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

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

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

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

The warning lamp (25) should remain on.

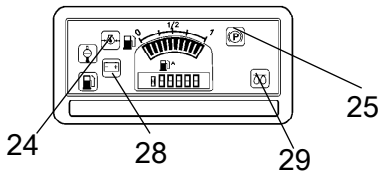


Fig. Control panel
28. Charging lamp
24. Oil pressure lamp
25. Brake lamp
29. Glow plug lamp




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.



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

Driving

Operating the roller

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

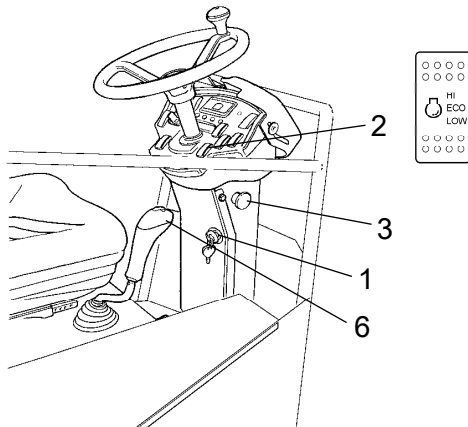


Fig. Instrument panel
1. Starter switch
2. Engine speed control
3. Emergency stop
6. Forward/Reverse lever


Set the speed control (2) in working position: High or Eco.

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.**

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

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

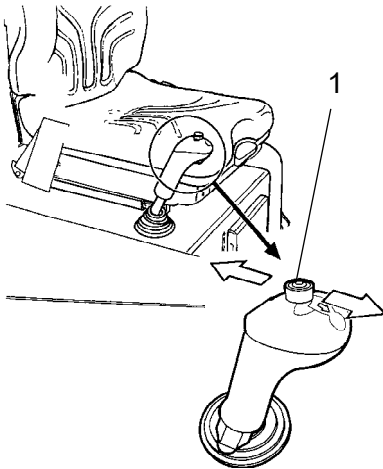
 **Test the emergency stop by pressing the emergency stop button (3) while the roller is moving slowly forward. Brace yourself for a sudden stop. The engine will be switched off and the brakes activated.**

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

Operation of strike-off blade (Equipment status)



Before driving, make certain that the blade is in its uppermost position (raised). Inspect the condition of the ground before using the blade.



The joystick (1) has five positions.

Middle - Neutral.

Back - Lifting of blade.

Forward - Lowering of blade.

Lower the blade to the ground before leaving or parking the roller.

**Fig. Forward/reverse lever
1. Joystick, strike-off blade**

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.

Regeneration of DPF filter

The machine is equipped with a diesel particle filter (DPF filter).

The diesel engine does an automatic burnout of carbon when necessary and no indication is shown during normal operation.

If the machine is run frequently with partial load, starting and stopping, and at low temperatures etc., a **parked** regeneration may need to be done.

This is indicated by the lamp for **Parked regen (regeneration) requires (Parked Regen Requested) (35)** starts to flash parallel with the switch (36).

The operator should park the machine at a suitable place and allow the engine to run.

The parking brake should be activated, the machine should be stationary, and the control lever should be in neutral.

The engine should be warm.

To start the parked regeneration, press the switch for **Parked Regen Requested (36)**.

This is done by moving up the yellow lock and pressing the switch. The switch will spring back afterwards.

The speed of the engine increases and the lamp stops flashing but remains on **Parked regen (regeneration) in progress (Parked Regen Requested) 35**.

The regeneration of the DPF filter takes about 20 minutes, after which the engine returns to low speed and the lamp goes off.

When the regeneration is finished and if the machine is going to be used again, disable the parking brake.

The machine can now be used.

If it is not possible to do a parked regeneration, because the place is not suitable or because the working conditions will not permit this, do as follows:

- Drive the roller as soon as possible to a suitable place.
- Park the roller, enable the parking brake and carry out a parked regeneration.

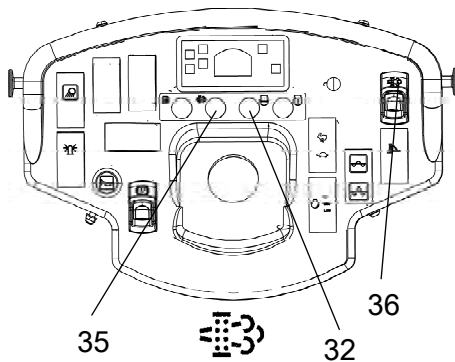


Fig. Control panel

- 32. Control lamp, fatal error
- 35. Control lamp, parked regen (regeneration)
- 36. Switch for parked regen (regeneration) of the DPF filter



If the yellow flashing indicators on parked regeneration (35, 36) are ignored, error codes will be displayed and the engine power will be reduced. If the indicators continue to be ignored the red control lamp (32) will go on. Switch off the engine immediately, enable the parking brake and contact a service technician at once.



At a voltage below 12.5 volts, the engine revs will automatically be set to 1300 revs to ensure sufficient charging of the battery. This only applies when the parking brake is activated.



Ensure there is space for good ventilation around the machine. Temperatures in the region of 350°C (662°F) can be generated at the exhaust pipe when performing regen (regeneration) of the DPF filter.



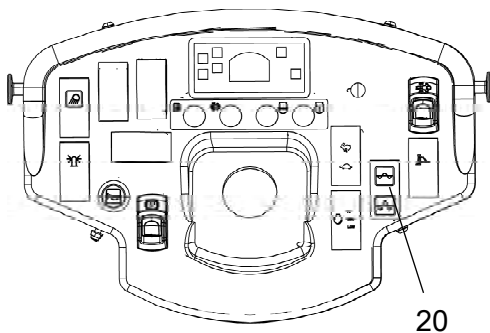
The engine hood should be kept closed while the regeneration is in progress.

Vibration

Vibration On/Off

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

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



**Fig. Instrument panel
20. Vibration switch.**

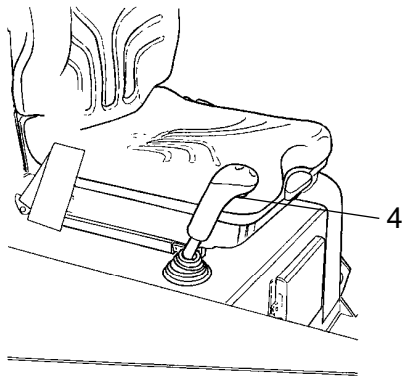


Fig. Forward/Reverse lever
4. Switch, vibration On/Off

Vibration - Activation



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

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

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

Braking

Normal braking

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

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

Set the speed control (2) to idling position: Low.

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

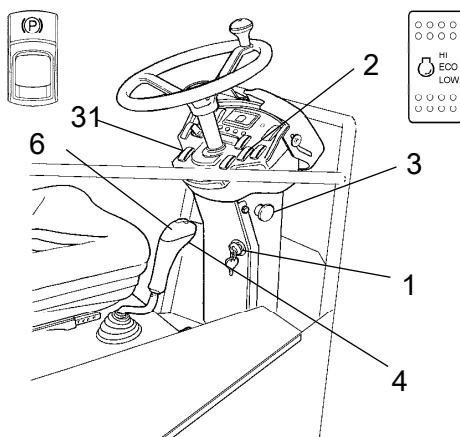


Fig. Instrument panel

- 1. Key
- 2. Engine speed control
- 3. Emergency stop
- 4. Vibration On/Off
- 6. Forward/reverse lever
- 31. Parking brake



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



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

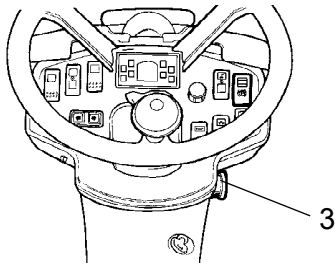


Fig. Instrument panel
3. Emergency stop

Emergency braking

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

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



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

After emergency braking, return the forward/reverse lever to neutral and pull out the emergency stop (3).

Enable the parking brake (31) and set the speed control (2) to Low.

The roller is equipped with an Interlock and therefore the operator must sit in the seat to start the engine.

Switching off

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

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

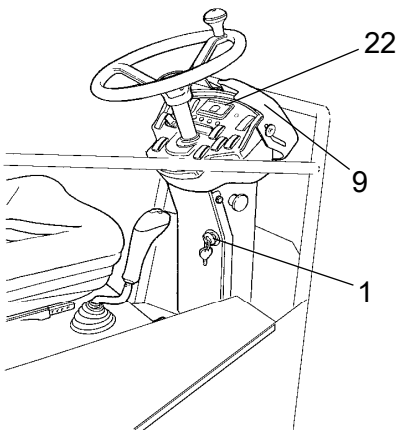


Fig. Instrument panel
1. Starter switch
9. Instrument guard
22. Panel for warning lamps

Parking

Chocking the drums



Never leave the roller when the engine is running without enabling 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.

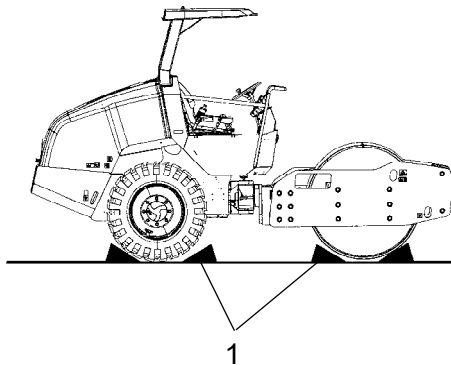


Fig. Arrangement
1. Chock

Master switch

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

This will prevent the battery discharging and will also make it difficult for unauthorized persons to start and operate the machine. Lock also the cover for the master switch.

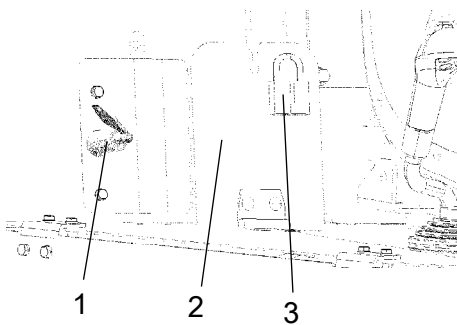


Fig. Master switch
1. Key
2. Cover
3. Padlock

Long-term parking

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

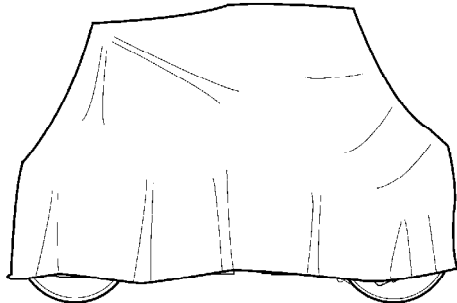


Fig. Roller weather protection

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, grease the cable connectors (terminals) and trickle charge the battery once a month. The battery is otherwise maintenance free.

Air cleaner, exhaust pipe

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

Fuel tank

Fill the fuel tank completely full to prevent condensation.

Hydraulic reservoir

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

Tires

Check that the tire pressure is 150 kPa (2,0 kp/cm²).

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.

Steering cylinder, hinges, etc.

Grease the steering cylinder piston with conservation grease.

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

Miscellaneous

Lifting

Locking the articulation



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

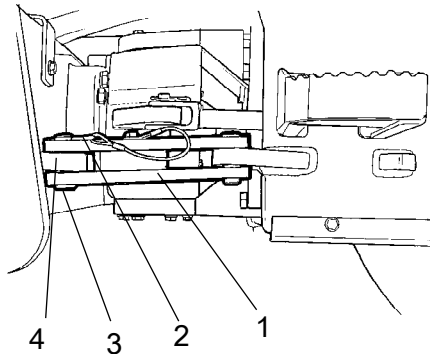


Fig. Articulation in the locked position

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

Weight: refer to the hoisting plate on the roller

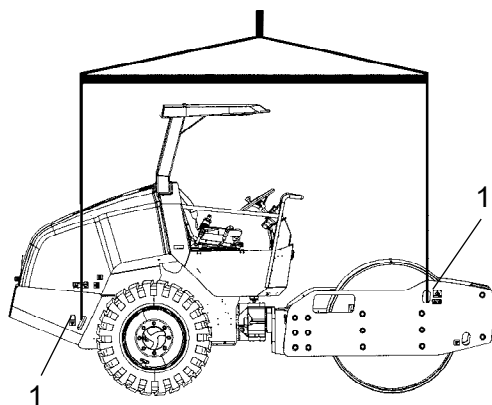


Fig. Roller prepared for lifting
1. Hoisting plate

Turn the steering wheel to the straight ahead position. Enable the parking brake (31).

Pull out the locking pin (2) fitted with a wire, and pull up the stud (3).

Fold out the locking arm (1) and place it over the locking lug (4) on the drum frame.

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

Lifting the roller



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



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



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

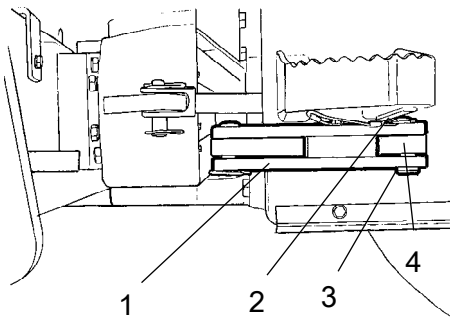


Fig. Articulation in the open position

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

Unlocking the articulation



Remember to unlock the articulation before operating.

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

Towing

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

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



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

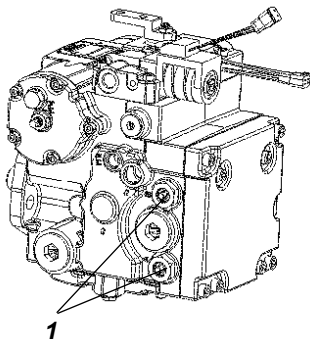


Fig. Propulsion pump

1. By-pass piston

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

On the pump there are two by-pass pistons (1), which should be pressed in 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 pistons (1) are automatically reset when the engine is started and the feed pressure builds up.

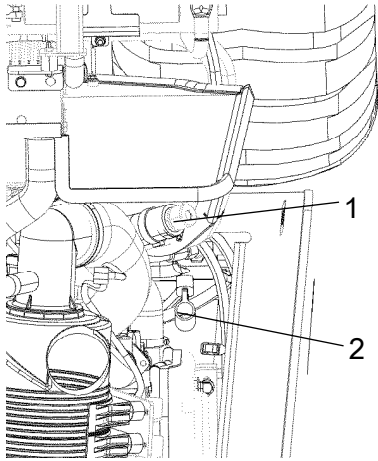


Fig. Engine compartment
1. Filler cap for the hydraulic reservoir
2. Pump lever

Brake disengagement pump

Insert a steel bar into the pump lever (2), which is located under the filler cap (1), on the right side of the engine compartment.

Pump by moving the bar up and down until the brakes release or until a certain amount of hydraulic resistance can be felt.

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

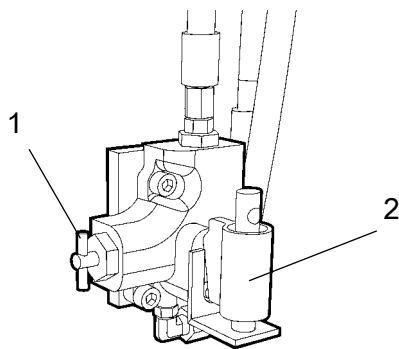


Fig. Pump for releasing the brake
1. Handle for activating the brake
2. Pump lever



After towing. Pull the lever (1) to activate the brake.



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

Brake disengagement pump

The release pump for the brakes is located in the engine compartment, right side.

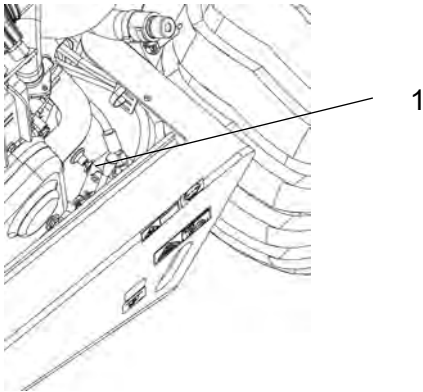


Fig. Engine compartment, right side
1. Brake disengagement pump

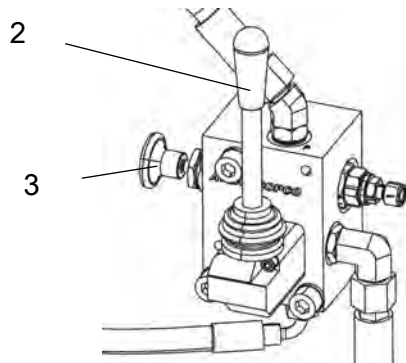


Fig. Brake disengagement pump
2. Pump arm
3. Brake release button

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.

Towing the roller

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

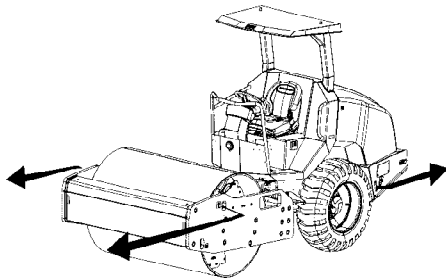




Fig. Towing

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

When towing/retrieving a machine, the towing device must be connected to both lifting holes. The pulling force shall act longitudinally on the machine as shown in the figure. Maximum total pulling force 96 kN (21,600 lbf).

 Reset the towing procedures described on the previous pages.

Transport

Tie-down and secure the machine according to the Cargo Securing Certificate for the specific machine if this is available and applicable.

If not, tie down and secure the machine according to the cargo securing rules that are valid for the country where the transport takes place.

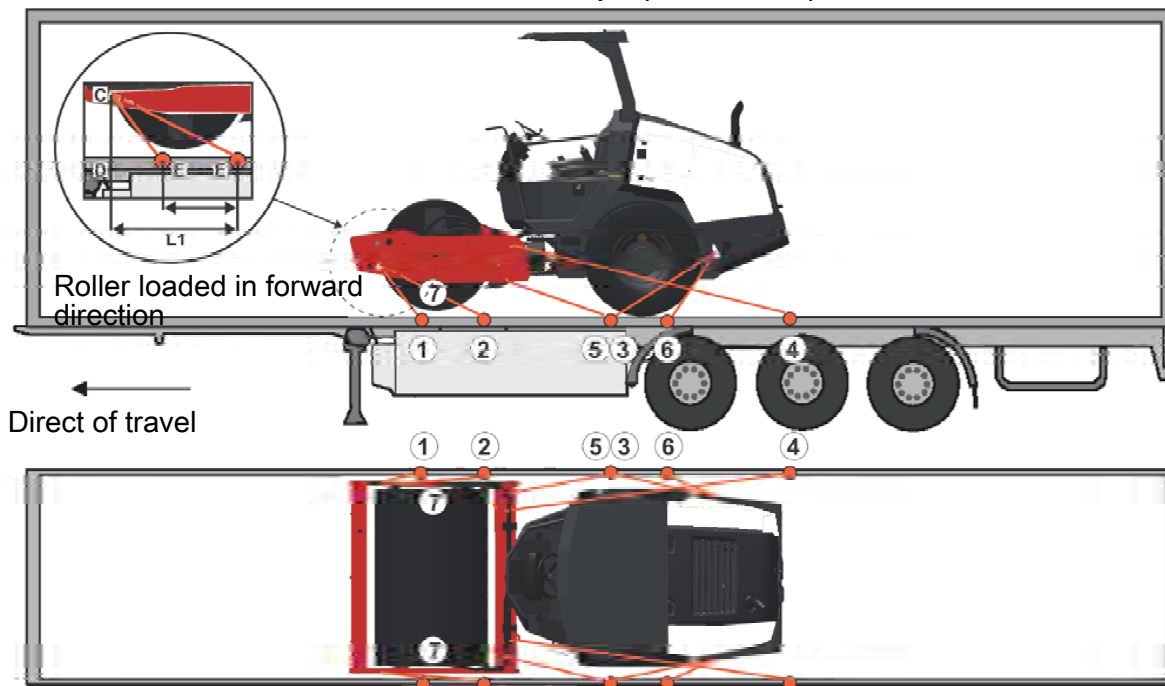
 **Never lash over the machine's articulated joint, nor over the machine's operator platform.**

Before securing the machine ensure that :

- the parking brake is applied and in good working condition
- the articulated joint is in closed position
- the machine is centered laterally on the platform
- the lashings are in good condition and fulfills the corresponding rules for transport securing.

Securing CA1400 for loading

Securing the CA1400D/PD vibratory roller from Dynapac for transport.



- 1 - 2 = double lashings, i.e. one lashing with two parts secured to two different lashing mounts,
- 3 - 4 symmetrically located on the right and left sides.
- 5 - 6
- 4 = rubber

The lashings' permitted distance interval in meters		
(1 - 6: Double lashings, LC at least 1.7 tonnes (1700 daN), S _{TF} 300 kg (300daN))		
Double L ₁ - L ₂	Double L ₃ - L ₄	Double L ₅ - L ₆
1.2 - 3.0	1.1 - 3.0	0.3 - 3.0

The distance L_1 above is between points D and E . D is the projected point directly at right angles laterally in relation to the edge of the platform from the lashing mount C on the roller. E is the lashing mount at the edge of the platform. $L_2 - L_3$ have a corresponding relationship.

Load carrier

- When loaded, the vibratory roller is centered laterally on the platform (± 5 cm).
- The parking brake is applied and in good working condition, and the articulated joint lock is closed.
- The drum is placed on a rubber liner, so that the static friction between the surfaces is at least 0.6.
- The contact surfaces must be clean, wet or dry, and free from frost, ice and snow.
- The lashing mounts on the load carrier have LC/MSL at least 2 tonnes.

Lashings

- The lashings comprise a lashing strap or chain with a permitted load (LC/MSL) of at least 1.7 tonnes (1,700 daN) and a pre-tension S_{TF} of at least 300 kg (300 daN). The lashings are re-tightened as required.
- Each of lashings 1-3 is either a double or two single lashings. A double lashing runs in a sling through a lashing point or around a machine part and down into two different mounts on the platform.
- Lashings in the same direction are placed in different lashing mounts on the trailer. Lashings that are pulled in opposite directions may be placed in the same lashing mount, however.
- The lashings are as short as possible.
- The lashing hooks must not lose grip if the lashings become slack.
- The lashings are protected against sharp edges and corners.
- The lashings are located symmetrically in pairs on the right and left sides.

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 battery disconnecter to ON and ensure that the articulated joint lock is open.
4. Move the forward/reverse lever to the NEUTRAL position.
5. Set the vibration switch in position 0.
6. Set the speed control in the idling position (LOW).
7. Set the emergency stop in the pulled out position.
8. Start the engine and allow it to warm up.
9. Set the speed control to the operating position (ECO or HI).



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



11. **Test the brakes. Remember that the braking distance will be longer if the roller is cold.**

12. Use vibration only when the roller is in motion.



13. **IN AN EMERGENCY:**
 - Press the emergency stop
 - Hold the steering wheel firmly.
 - Brace yourself for a sudden stop.
14. When parking:
 - Press the emergency stop.
 - Chock the drum and wheels.
15. When lifting: - Refer to the relevant section in the Instruction Manual.
16. When towing: - Refer to the relevant section in the Instruction Manual.
17. When transporting: - Refer to the relevant section in the Instruction Manual.
18. When recovering - Refer to the relevant section in the Instruction Manual.

Preventive maintenance

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

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

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

Acceptance and delivery inspection

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

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

Any transport damage must be 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 authorisation.

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





Rear axle		
- Differential	4.5 liters	4.8 qts
- Planetary gear	0.9 liters/side	0.95 qts/side
- Pinion housing	0.3 liters	0.32 qts
Drum		
- Drum	10.5 liters	11.1 qts
- Drum gear	1.1 liters	1.2 qts
Hydraulic reservoir	32 liters	8.5 gal
Oil in hydraulic system	52 liters	13.7 gal
Diesel engine		
- Lubricating oil (incl. change of engine oil filters)	11.7 liters	12.3 qts
- Coolant	10.0 liters	12.7 qts
















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)
	HYDRAULIC FLUID	Air temperature -15°C - +50°C (5°F-104°F)	Dynapac Hydraulic 300	P/N 4812161868 (20 liters) P/N 4812161869 (209 liters)
		Air temperature over +50°C (104°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)	
	DRUM OIL	Air temp. -15°C - +40°C (5°F-104°F)	Dynapac Drum Oil 1000	P/N 4812161887 (5 liters)

Maintenance - Lubricants and symbols

	GREASE	Air temp. 0°C (32°F) - above +40°C (104°F)	Shell Spirax AX 85W/140, API GL-5	Dynapac Roller Grease (0.4kg), P/N 4812030096
	FUEL	See engine manual.	-	-
	TRANSMISSION OIL	Air temperature -15°C - +40°C (5°F-104°F)	Dynapac Gear Oil 200	P/N 4812161879 (5 liters), P/N 4812161880 (20 liters)
	COOLANT	Air temperature 0°C (32°F) - above +40°C (104°F)	Shell Spirax AX 85W/140, API GL-5	
		Anti-freeze protection down to about -37°C (-34.6°F)	GlycoShell/Carcoolant 774C (mixed 50/50 with water)	

Maintenance symbols

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

Maintenance - Maintenance schedule

Service and maintenance points

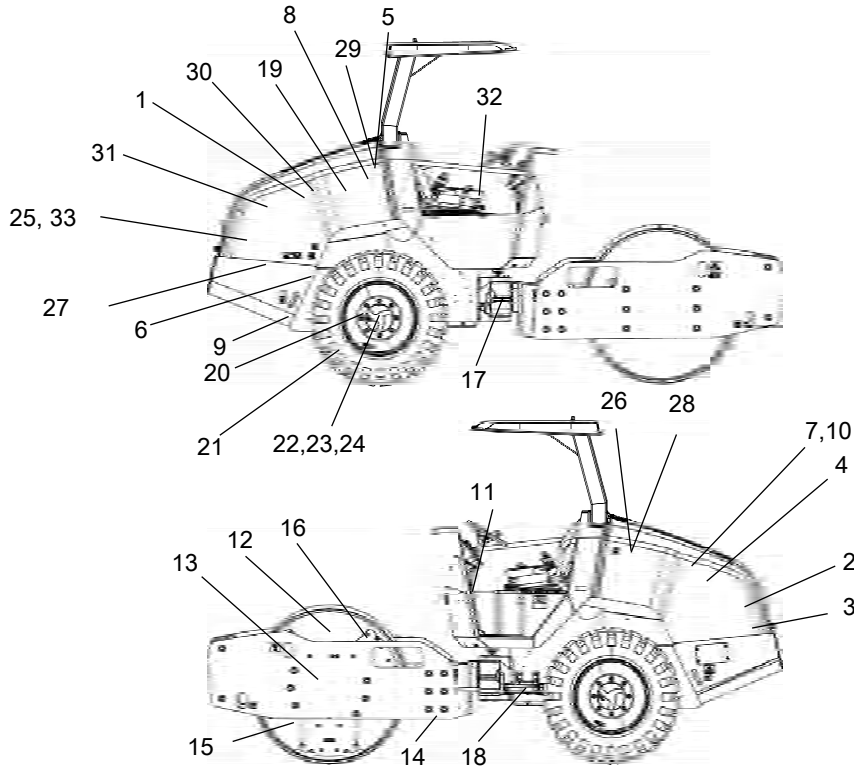




Fig. Service and maintenance points

- | | | |
|--|--|----------------------------------|
| 1. Radiator grille | 14. Scraper | 27. Engine suspension, 4 pcs. |
| 2. Oil level, diesel engine | 15. Drum oil, level plug, 1 pc. | 28. Diesel fuel, filler |
| 3. Fuel filter | 16. Rubber elements and fastening screws | 29. Battery |
| 4. Air filter | 17. Steering joint | 30. Radiator |
| 5. Engine cover, hinges | 18. Steering cylinder, 1 pc. | 31. Drive belt, alternator |
| 6. Hydraulic reservoir, sight glass | 19. Flywheel casing, hydraulic pumps | 32. Forward/reverse lever |
| 7. Bleeding filter | 20. Wheel nuts | 33. Oil separator, diesel engine |
| 8. Hydraulic filter, 1 pcs. | 21. Tires, pressure | |
| 9. Drainage, hydraulic fluid reservoir | 22. Rear axle, differential and pinion housing | |
| 10. Hydraulic fluid, filling | 23. Rear axle, planetary gears, 2 pcs. | |
| 11. Fuse box | 24. Rear axle suspension, 2 sides | |
| 12. Drum oil, filling | 25. Oil filter, diesel engine | |
| 13. Drum gear | 26. Cleaning, fuel tank | |

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 for free circulation of cooling air	
30	Check coolant level	
2	Check the engine oil level	Refer to the engine manual
28	Refuel	
6	Check fluid level in hydraulic reservoir	
	Test the brakes	
	Check the drive belt	Refer to the Instruction manual for the engine

After the FIRST 50 hours of operation

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

Pos. in fig	Action	Comment
8	Change the hydraulic fluid filter	
20	Check the wheel-nuts are tightened	
21	Check the tire pressure	
13	Change the oil in the drum gearbox	

Every 50 hours of operation (Weekly)

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

Pos. in fig	Action	Comment
14	Check the scraper setting	
20	Check the wheel-nuts are tightened	
21	Check the tire pressure	
4	Check the air cleaner	Replace as required
	Check that hoses and couplings are not leaking	
3	Draining the fuel prefilter	Performed if the control lamp for the water separator lights on the instrument panel.

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
23	Check oil level in rear axle/planetary gearing	
22	Check the oil level in the rear axle pinion housing	
15	Check the oil level in the drum	
13	Check the oil level in the drum gear	
30	Clean coolers	
	Adjust the engine drive belt	Refer to the engine manual
	Check the air intake hoses	
16	Check rubber elements and bolted joints	
29	Check battery	

Every 500 hours of operation

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

Pos. in fig	Action	Comment
23	Check oil level in rear axle/planetary gearing	
22	Check oil level in the rear axle pinion housing	
15	Check oil level in the drum	
13	Check the oil level in the drum gear	
30	Clean coolers	
16	Check rubber elements and bolted joints	
29	Check battery	
3	Replace fuel filter	Also refer to the engine manual
25	Change the engine oil and oil filter	Also refer to the engine manual
31	Adjust the belt tension for the drive system	Refer to the engine manual
	Replace the belt for the drive system	Refer to the engine manual
32	Lubricate controls and joints	
7	Check air cleaner on 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
15	Check oil level in the drum	
13	Change oil in the drum gear	
30	Check coolers	
	Replace the belt for the drive system	Refer to the engine manual
	Valve adjustment, engine	Refer to the engine manual
16	Check rubber elements and bolted joints	
29	Check battery	
3	Replace fuel filter	Also refer to the engine manual
32	Lubricate controls and joints	
25	Change the engine oil and oil filter	Also refer to the engine manual
7	Check air cleaner on hydraulic reservoir	
31	Check the belt tension for the drive system	Refer to the engine manual
8	Change hydraulic fluid filter	
9	Drain the condensate from hydraulic reservoir	
26	Drain condensate from fuel tank	
22	Change oil in rear axle differential	
22	Change the oil in the rear axle pinion housing	
23	Change oil in the rear axle planetary gearing	

Maintenance - Maintenance schedule

Every 1500 hours of operation

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

Pos. in fig	Action	Comment
23	Check oil level in rear axle/planetary gearing	
22	Check oil level in the rear axle pinion housing	
15	Check the oil level in the drum	
13	Check the oil level in the drum gear	
30	Clean coolers	
	Cleaning the water separator	
16	Check rubber elements and bolted joints	
29	Check battery	
3	Replace fuel filter	Also refer to the engine manual
32	Lubricate controls and joints	
25	Change the engine oil and oil filter	Also refer to the engine manual
7	Check air cleaner on hydraulic reservoir	
31	Adjust the belt tension for the drive system	Refer to the engine manual
31	Replace the belt for the drive system	Refer to the engine manual
33	Change oil separator element	Also refer to the engine manual

Every 2000 hours of operation

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

Pos. in fig	Action	Comment
10	Change the hydraulic fluid	
12	Change the oil in the drum	
13	Change the oil in the drum gear	
16	Check rubber elements and bolted joints	
29	Check battery	
30	Clean coolers	
3	Replace fuel filter	Refer also to the Instruction Manual for the engine.
25	Change the engine oil and oil filter	Refer also to the Instruction Manual for the engine.
31	Check the belt tension for the drive system	Refer also to the Instruction Manual for the engine.
	Replace the belt for the drive system	Refer also to the Instruction Manual for the engine.
32	Lubricate controls and joints	
7	Check air cleaner on hydraulic reservoir	
8	Change hydraulic oil filter	
9	Drain the condensate from hydraulic reservoir	
26	Drain the condensate from fuel tank	
22	Change oil in rear axle differential	
22	Change oil in the rear axle pinion housing	
23	Change oil in the rear axle planetary gearing	
20, 24	Check bolted joints	Applies to new or reconditioned components only.
17	Check the steering joint	

Service - Checklist

Pos	Action	Frequency										NOTE					
		After the first 50 hours of operation (DAM)	Every 50 hours of operation (Weekly)	Every 100 hours of operation	Every 150 hours of operation	Every 200 hours of operation	Every 250 hours of operation	Every 300 hours of operation	Every 350 hours of operation	Every 400 hours of operation	Every 450 hours of operation						
1	Check for free circulation of cooling air	○															
30	Check coolant level	○															Also refer to the engine manual
2	Check the engine oil level	○															
6	Check fluid level in hydraulic reservoir	○															
	Test the brakes	○															
8	Change the hydraulic fluid filter	●															
13	Change oil in the drum gear	○															
	Check that hoses and couplings are not leaking	○															
14	Check the scraper setting	○															
4	Inspect/clean the filter element in the air cleaner	○															
20	Check the wheel-nuts are tightened	○															Replace as required
21	Check the tire pressure	○															
3	Drain the prefuel filter	○															
23	Check the oil level/Change the oil in rear axle/planetary gears	○															
22	Check the oil level/Change the oil in the rear axle pinion housing	○															
15/12	Check the oil level/Change the oil in the drum	○															
30	Clean the coolers	○															
31	Adjust the engine drive belt	○															
	Check the air intake hoses	○															
16	Check rubber elements and bolted joints	○															
3	Replace the fuel filter	○															Also refer to the engine manual
3	Replace the prefuel filter	○															Also refer to the engine manual
	Change the engine oil	○															Also refer to the engine manual
25	Change the engine oil filter	○															Also refer to the engine manual
31	Change drive belt	○															Refer to the engine manual
	Lubricate controls and joints	○															
7	Check/Change bleeder filter on hydraulic reservoir	○															
31	Check belt tension in drive belt system	○															
30	Check coolant freeze point / Change coolant	○															
9	Drain the condensate from hydraulic reservoir	○															
26	Drain condensate from fuel tank	○															
22	Change oil in rear axle differential	○															
	Valve adjustment, engine	○															
33	Change oil separator element	○															Refer to the engine manual
3	Cleaning the water separator	○															Also refer to the engine manual
10	Change hydraulic oil in hydraulic reservoir	○															
17	Check the steering joint	○															

○ 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.***

Scrapers - Check, adjustment



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

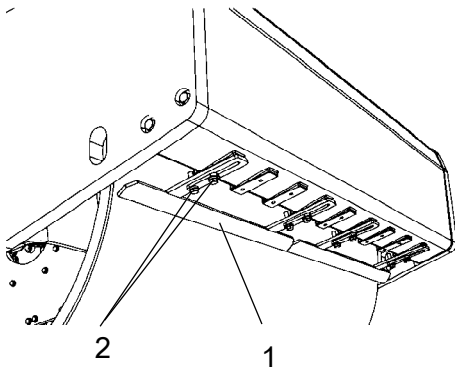


Fig. Scrapers
1. Scraper blade (x 4)
2. Screws

If necessary, adjust distance to the drum as follows:

Loosen the screws (2) on the scraper attachment.

Then adjust the scraper blade (1) to 25 mm (1 in) from the drum.

Tighten the screws (2).

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

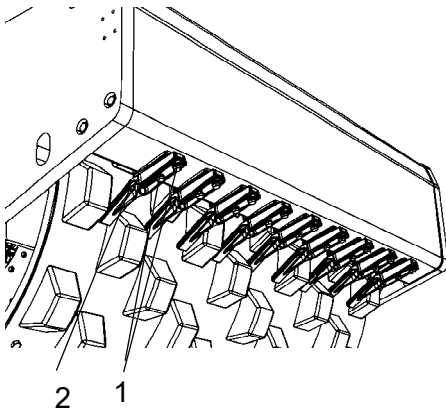


Fig. Scrapers

1. Screws
2. Scraper teeth (x 18)

Scrapers, Pad-drum

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

Center each scraper tooth (2) between the pads.

Tighten the screws (1).

Air circulation - Check

Ensure that the engine has free circulation of cooling air through the protective grille (2) in the hood.

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



If the gas-spring for the hood is disengaged and the hood is raised to its upper position - block the hood so that it cannot fall.

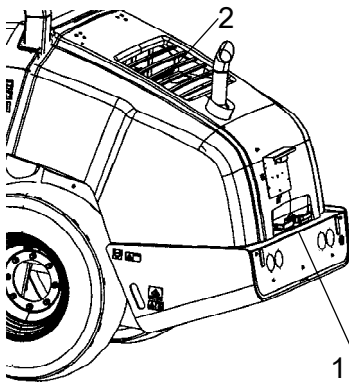


Fig. Engine hood

1. Hood lock
2. Protective grille



Coolant level - Check

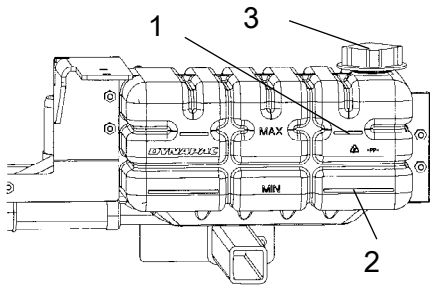


Fig. Water tank
1. Max. level
2. Min. level
3. Filler cap

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



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

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



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



Fuel tank - Filling

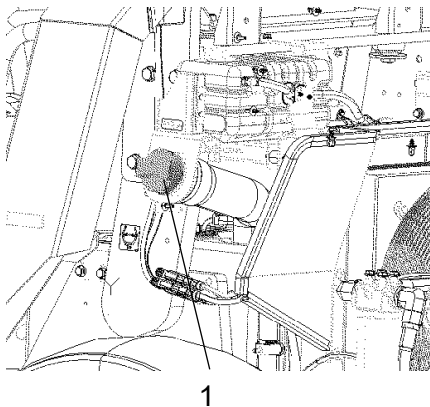


Fig. Filling with fuel
1. Filler pipe

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



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



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

The tank holds 117 liters (31.7 gal) of fuel.



Diesel engine Check oil level

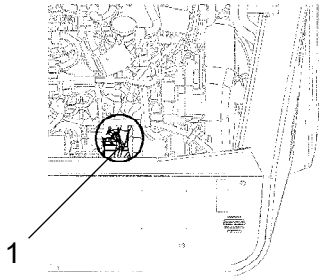


Fig. Engine compartment
1. Dipstick



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 right side of the engine.

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.

Brakes - Check



Check operation of the brakes as follows:



Checking the emergency stop

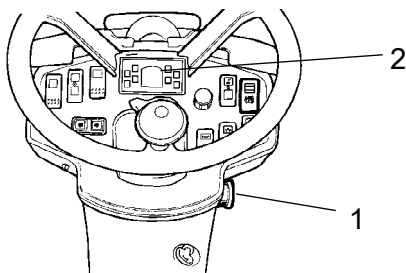


Fig. Instrument panel
1. Emergency stop
2. Parking brake lamp

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

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

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

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

The roller is now ready for operation.

Refer also to the section in the manual on operation.

Brakes - Check



Check operation of the brakes as follows:



Checking the parking brake

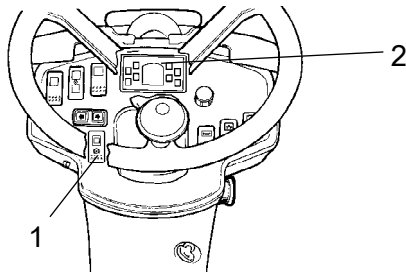


Fig. Instrument panel
1. Parking brake
2. Parking brake lamp

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

Enable the parking brake (1). The roller should stop immediately with the engine running.

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

Reset the parking brake (1).

The roller is now ready for operation.

Refer also to the section in the manual on operation.



Hydraulic reservoir - Check fluid level

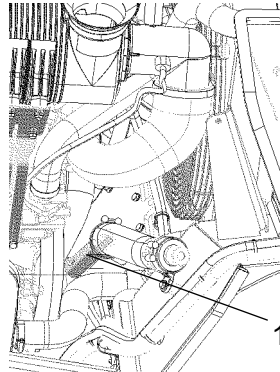


Fig. Sight glass hydraulic reservoir
1. Sight glass

The sight glass is located on the hydraulic tank in the engine compartment. It is accessible and visible from the right side of the roller.

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

Maintenance, first 50h



***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.



Hydraulic filter - Replacement

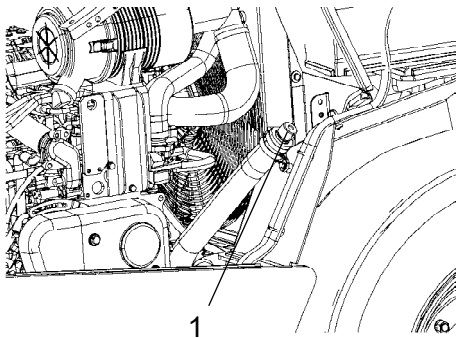


Fig. Hydraulic reservoir
1. Filler cap/Breather filter

Release the filler cap/breather filter (1) so that any overpressure inside the reservoir is eliminated.

Check that the breather filter (1) is not clogged. Air should be able to pass freely through the cap in both directions.

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



Wear protective goggles when working with compressed air.

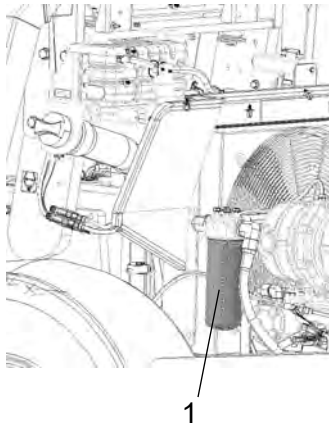


Fig. Engine compartment
1. Hydraulic fluid filter (1pc).

Carefully clean round the filter.



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



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

Thoroughly clean the sealing surfaces on the filter holder.

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



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

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check the fluid level in the sight glass and top up if necessary.



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



Tires - Air pressure - Wheel nuts - Tightening

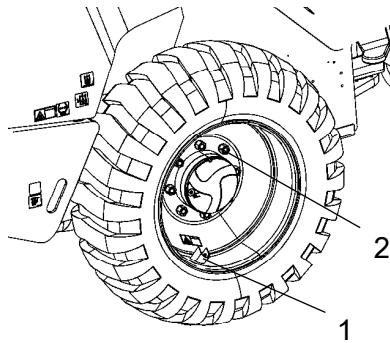


Fig. Wheels
1. Air valve
2. Wheel nuts

Check the tire pressures using a pressure gauge.

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

Recommended pressure: See Technical Specifications.

Check the tire pressure.



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

Check the tightening torque on the wheel nuts (2) with 253 Nm (26 kpm).

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



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



Drum gear - Oil change

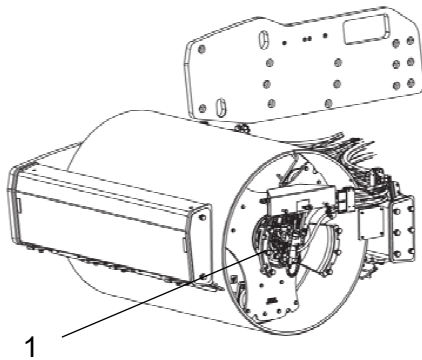


Fig. Oil change - drum gear
1. Drum gear

Place the roller on a level surface so the drain/ventilating plugs are in location for drain.

Wipe clean, unscrew the plugs (2, 3) and drain the oil into a suitable receptacle, capacity about 2 liters (0.5 gal.).

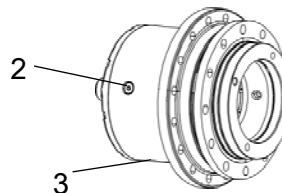


Fig. Drum gear

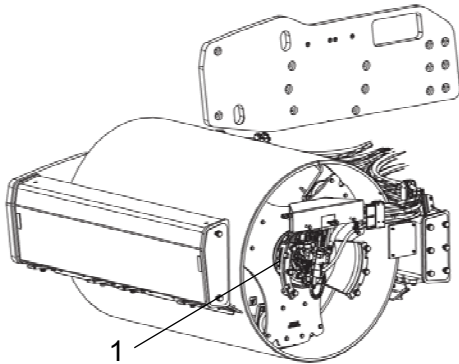


Fig. Oil filling - drum gear
1. Drum gear

Drum gear - Oil filling

Move the machine until the inspection/filling holes are in position for filling.

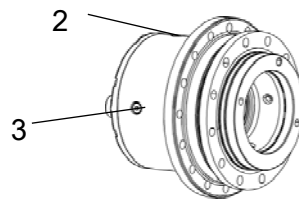


Fig. Drum gear

Refill with new oil, about 1,4 l (1.5 qts). Use transmission oil according to the lubricant specification.

Ensure that the oil level reaches up to the lower edge of the plug hole (3).

Clean and refit the plugs.

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.***

Scrapers - Check, adjustment



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

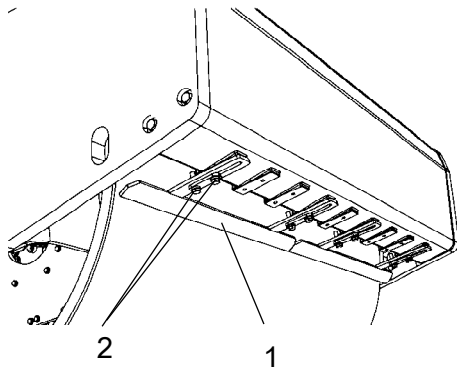


Fig. Scrapers
1. Scraper blade (x 4)
2. Screws

If necessary, adjust distance to the drum as follows:

Loosen the screws (2) on the scraper attachment.

Then adjust the scraper blade (1) to 25 mm (1 in) from the drum.

Tighten the screws (2).

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

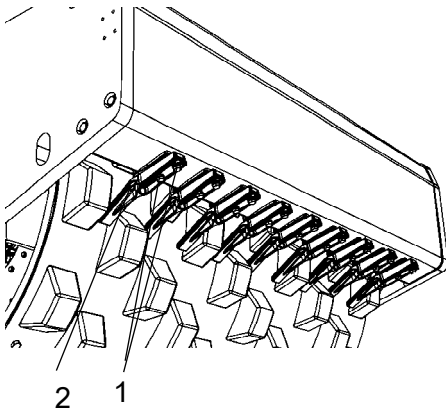


Fig. Scrapers

- 1. Screws
- 2. Scraper teeth (x 18)

Scrapers, Pad-drum

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

Center each scraper tooth (2) between the pads.

Tighten the screws (1).



Tires - Air pressure - Wheel nuts - Tightening

Check the tire pressures using a pressure gauge.

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

Recommended pressure: See Technical Specifications.

Check the tire pressure.



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

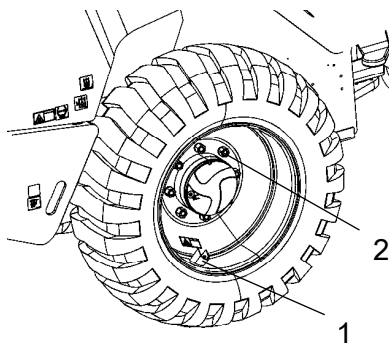


Fig. Wheels
1. Air valve
2. Wheel nuts

Check the tightening torque on the wheel nuts (2) with 253 Nm (26 kpm).

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



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



Air cleaner Check - Replacement of main filter

! Replace the air cleaner's main filter when the indicator shows red. The indicator is mounted on the air cleaner's connecting pipe.

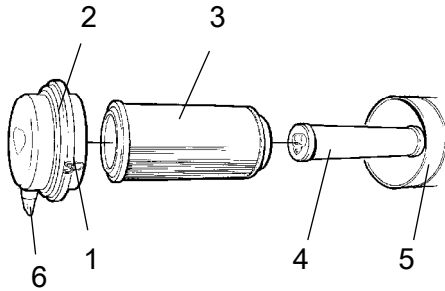


Fig. Air cleaner
1. Clips
2. Cover
3. Main filter
4. Backup filter
5. Filter housing
6. Dust valve

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.

Air filter indicator - Resetting

The air filter indicator is located on the filter, or in its immediate vicinity.

The air filter indicator must be reset after replacing the air filter.

Press the "button" (1) on the top of the indicator to reset.

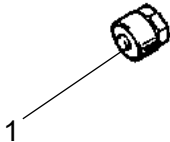


Fig. Indicator
1. Button



Backup filter - Change

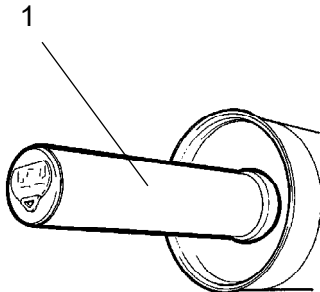


Fig. Air filter
1. Backup filter

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

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

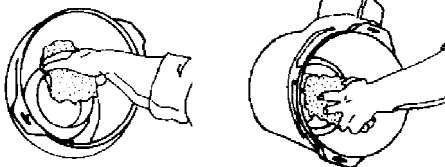
Clean the air cleaner if necessary, see section Air cleaner - Cleaning.



Air cleaner - Cleaning

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

Wipe clean on both sides of the outlet pipe.



Inner edge of outlet pipe.

Outer edge of outlet pipe.

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



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



Air cleaner - Check hoses and connections

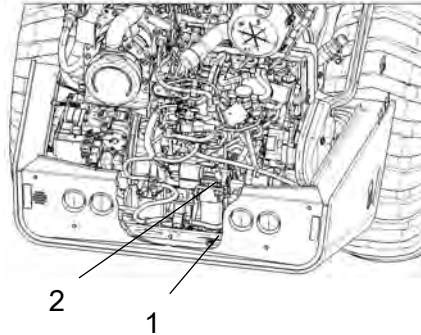


Check that the hose clamps between the filter housing and the suction hose are tight and that the hoses are intact. Inspect the entire hose system, all the way to the engine.

Replace if necessary, as damage to hoses/hose clamps can seriously damage the engine



Pre-fuel filter - Draining



Unscrew the drain plug (1) at the bottom of the fuel prefilter.

With the aid of the secondary hand-operated pump, make certain that all sediment comes out.

Tighten the drain plug as soon as uncontaminated fuel runs out.

Figure. Pre-fuel filter
1. Drain plug
2. Hand pump

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.*



Rear axle differential - Check oil level

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

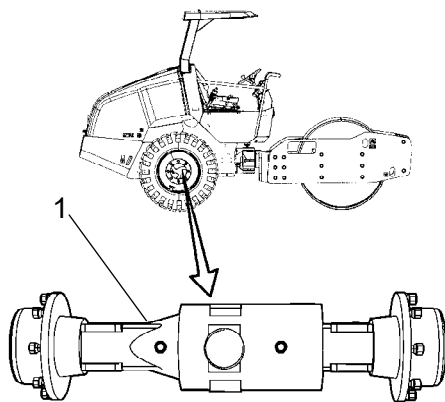


Fig. Level check - differential housing
1. Level/Filler plug

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

Clean and refit the plug.



Rear axle pinion housing - Checking the oil level

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

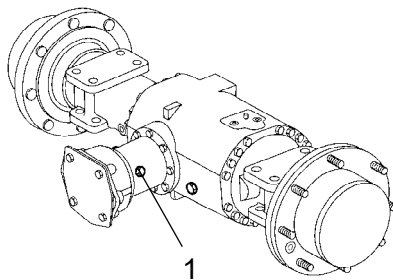


Fig. Level check - Pinion housing
1. Level/Filler plug

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

Clean and refit the plug.



Rear axle planetary gears - Check oil level

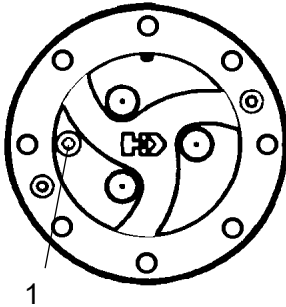


Fig. Level check - planetary gear
1. Level/Filler plug

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

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

Clean and refit the plug.

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



Drum - Checking the oil level

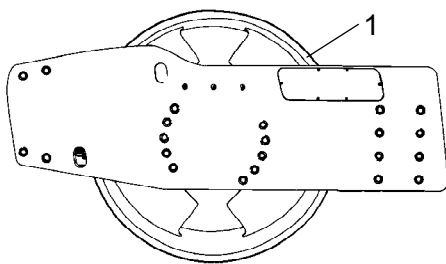
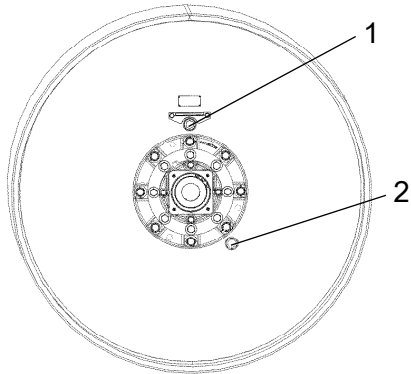


Fig. Left drum side
1. Groove

Position the roller on a flat surface with the groove (1) on the inside of the drum aligned with the top of the drum frame.



The oil should now come up to the sight glass (2).



If necessary, release the filler plug (1) and fill to half the sight glass (2).



Do not overfill with oil - risk of overheating.



Ensure only AC Fluid Gearbox 100 is used in the drum.

Fig. Drum, right side
1. Filler plug
2. Level glass

Clean and refit filler plug (1).

Drum gearbox - Checking the oil level

Move the machine until the level/filling holes are in position for check/filling.

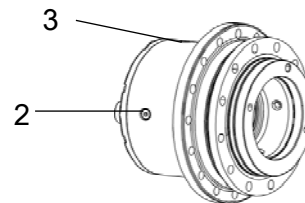
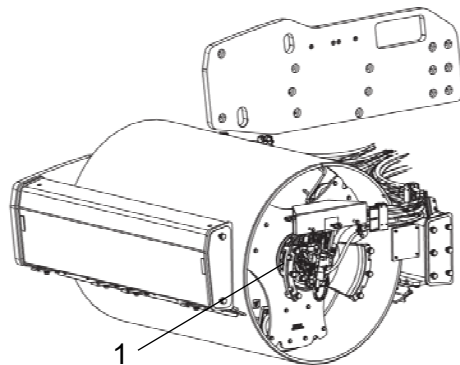


Fig. Drum gear

Fig. Checking the oil level - Drum gearbox
1. Drum gearbox

Clean the area around the level plug (2) and loosen the plug.

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

At low oil level fill oil through the filler hole (3) up to the right level. Use transmission oil, see lubricant specification.

Clean and refit the plugs.



Coolers Checking - Cleaning

Make sure that the air flow through the coolers (1) and (2) is unobstructed. Dirty coolers are blown clean with compressed air or washed clean using a high-pressure water cleaner.

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



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



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

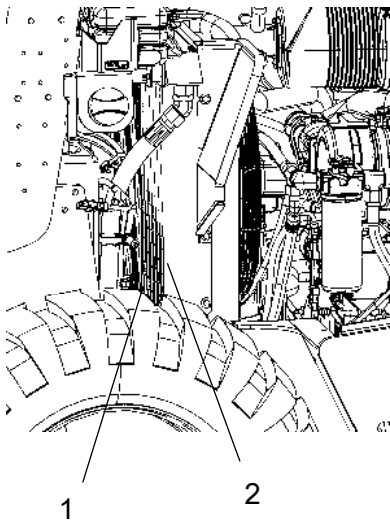


Fig. Engine compartment
1. Water cooler
2. Hydraulic fluid cooler

Bolted joints - Checking tightening torque

Check that all the bolts for the suspension of the engine and the drive unit are tightened, see under Specifications - tightening torque.

Check the bolted joint between the motor and the pump drive, and that all the hydraulic components are tightened to the set tightening torque.

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

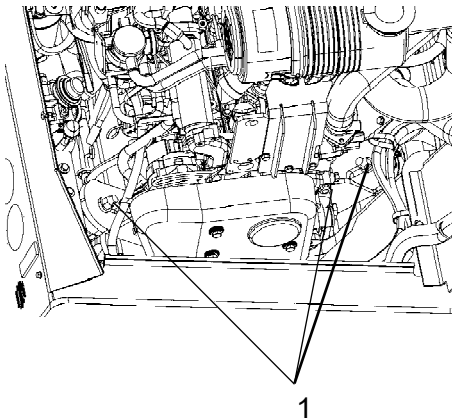


Fig. Engine suspension
1. Bolted joint

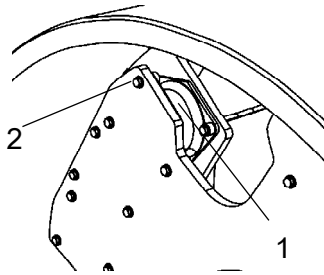


Fig. Drum, drive side
1. Rubber element
2. Attachment screws

Rubber elements and fastening screws - Check

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

Check using a knife blade or pointed object.

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



Battery - Check condition

The batteries are sealed and maintenance-free.



Make sure there is no open flame in the vicinity when checking the electrolyte level. Explosive gas is formed when the alternator charges the battery.



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

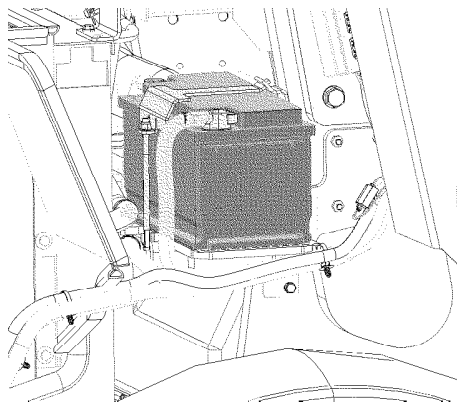



Fig. Battery


The cable shoes should be clean and tightened. Corroded cable shoes should be cleaned and greased with acid-proof Vaseline.

Wipe the top of the battery.

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.**



Rear axle differential - Check oil level

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

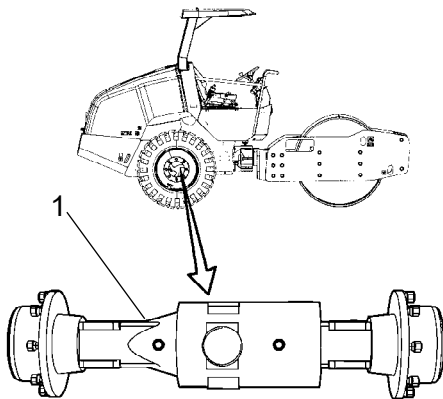


Fig. Level check - differential housing
1. Level/Filler plug

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

Clean and refit the plug.



Rear axle pinion housing - Checking the oil level



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

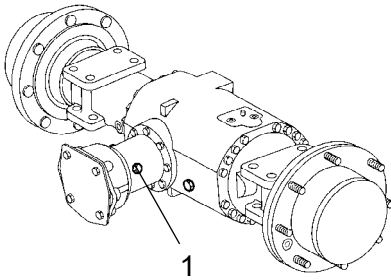


Fig. Level check - Pinion housing
1. Level/Filler plug

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

Clean and refit the plug.



Rear axle planetary gears - Check oil level

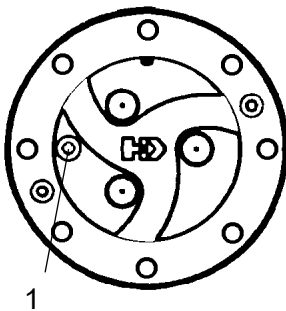


Fig. Level check - planetary gear
1. Level/Filler plug

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

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

Clean and refit the plug.

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



Drum - Checking the oil level

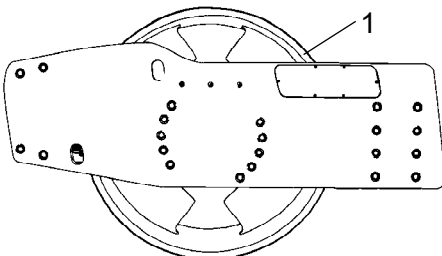
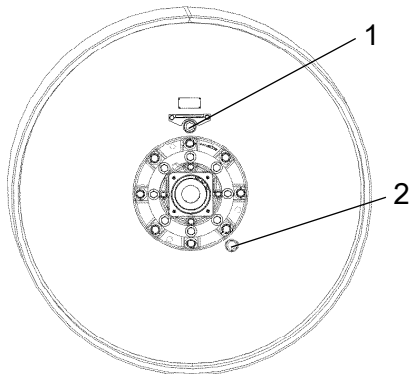


Fig. Left drum side
1. Groove

Position the roller on a flat surface with the groove (1) on the inside of the drum aligned with the top of the drum frame.



The oil should now come up to the sight glass (2).



If necessary, release the filler plug (1) and fill to half the sight glass (2).



Do not overfill with oil - risk of overheating.



Ensure only AC Fluid Gearbox 100 is used in the drum.

Fig. Drum, right side

- 1. Filler plug
- 2. Level glass

Clean and refit filler plug (1).



Coolers Checking - Cleaning

Make sure that the air flow through the coolers (1) and (2) is unobstructed. Dirty coolers are blown clean with compressed air or washed clean using a high-pressure water cleaner.

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



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



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

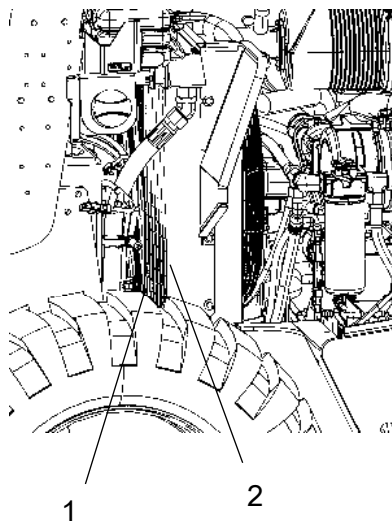


Fig. Engine compartment

- 1. Water cooler
- 2. Hydraulic fluid cooler

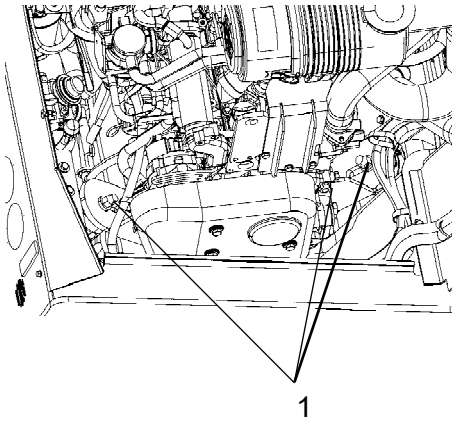


Fig. Engine suspension
1. Bolted joint

Bolted joints - Checking tightening torque

Check that all the bolts for the suspension of the engine and the drive unit are tightened, see under Specifications - tightening torque.

Check the bolted joint between the motor and the pump drive, and that all the hydraulic components are tightened to the set tightening torque.

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

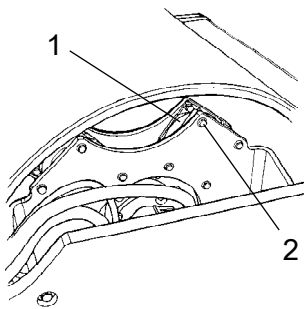


Fig. Drum, vibration side
1. Rubber element
2. Screws

Rubber elements and fastening screws - Check

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

Check using a knife blade or pointed object.

Check also that the screws (2) are tightened.



Battery - Check condition

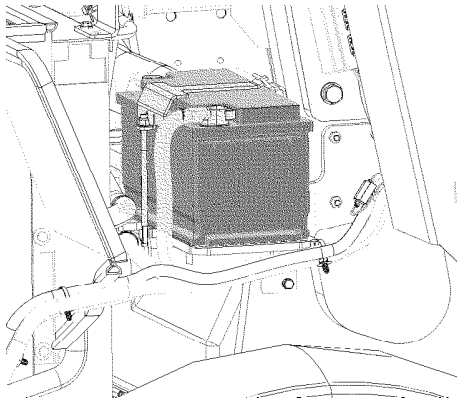


Fig. Battery

The batteries are sealed and maintenance-free.



Make sure there is no open flame in the vicinity when checking the electrolyte level. Explosive gas is formed when the alternator charges the battery.



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

The cable shoes should be clean and tightened. Corroded cable shoes should be cleaned and greased with acid-proof Vaseline.

Wipe the top of the battery.



The engine fuel filter - replacement/cleaning



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

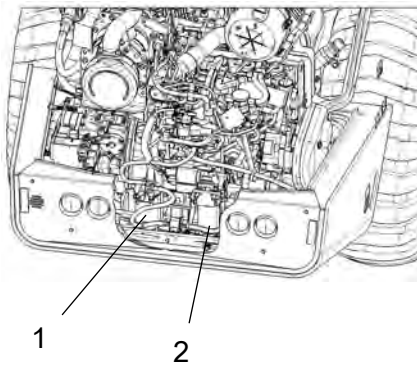


Fig. Engine compartment
1. Fuel filter
2. Fuel prefilter

Screw off the fuel filter (1). The filter is of the disposable type and cannot be cleaned. Hand in to environment-friendly station.



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

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

Start the engine and check that the fuel filters are tight.

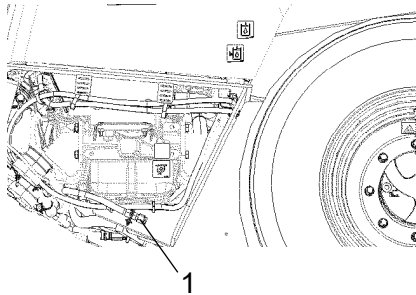
N.B. Under no circumstances may new fuel filters be pre-filled with fuel before assembly due to the demands on the cleanliness of the fuel system. Use the hand pump on the fuel prefilter to fill from the machine's fuel system.



Diesel engine - Oil- and Filter change



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



**Fig. Right side of engine
1. Drain plug**

The oil plug (1) is most easily accessible from the underside of the engine, and is fitted with a hose on the tractor frame.

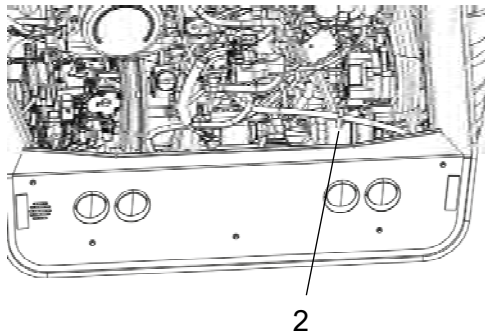
Place a receptacle that holds 15 liters (4 gal) under the drain plug.

Release the hose from its attachment and pull it forward to the tie-down hole.

Loosen the drain plug (1) and drain the oil, when the engine is warm.

Screw back the plug again and refit the hose in its attachment.

Change the engine oil filter (2) at the same time. Refer also to the Instruction Manual for the engine.



**Fig. Engine compartment
2. Oil filter**



Hand in the drained oil and filter to an environment-friendly waste disposal station.



Forward/Reverse controls and joints - Check and lubrication

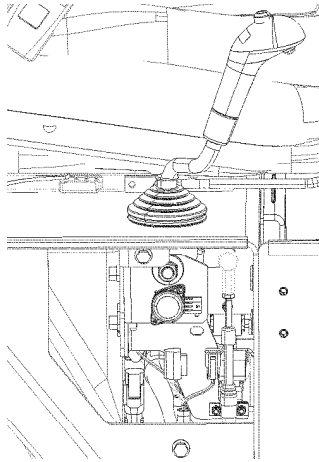


Fig. Forward/reverse lever

The forward/reverse lever joints are best accessed via the compartment for the manual on the right side of the operator station. Check the friction on the forward/reverse lever. The friction screws should be applied sufficiently hard that the forward/reverse lever remains in the set position during operation. The lever's 0-position is determined by the screw that grips in the groove on the axle between the lever.

If the lever begins to become stiff after prolonged used, lubricate the lever at the control cable with a few drops of oil at each point.

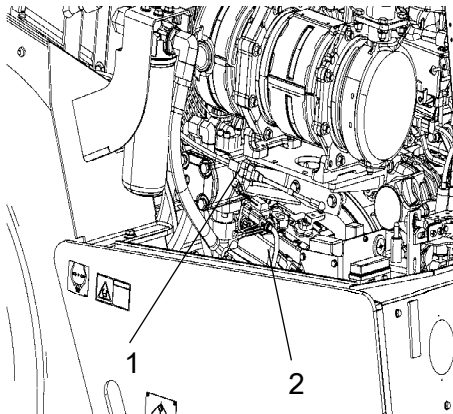
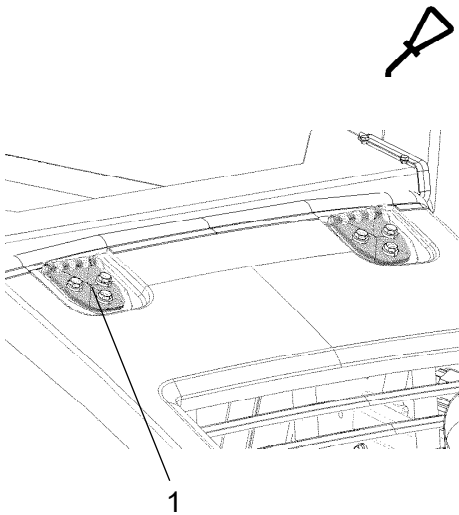


Fig. Engine compartment
1. Forward/Reverse-control cable
2. Propulsion pump

If the forward/reverse lever still is stiff after the above adjustments, lubricate the other end of the control cable with a few drops of oil. The cable is located on the top of the propulsion pump.



Controls and moving joints - Lubrication

Lubricate the engine hood hinges (1) with grease, the other joints and controls are lubricated with oil. See lubricant specification.

Fig. Engine hood
1. Hinge



Replacing the diesel engine's oil separator filter

(applies to 1500h)

N.B. The engine must be switched off when changing the filter.

Loosen the filter's bottom cover (2) and remove the filter insert and O-ring (3).

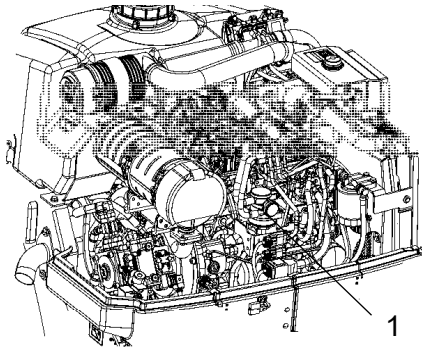


Fig. Engine compartment
1. Oil separator filter



Remove the filter insert (3) and hand in to a waste disposal station. This is a disposable filter and cannot be cleaned.

Wipe out any deposits in the bottom cover (2) and filter housing (4).

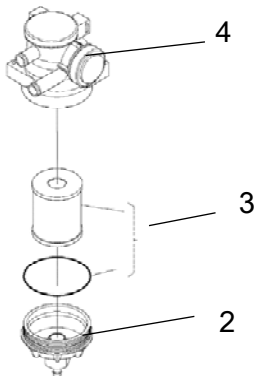



Fig. Oil separator filter
2. Cover
3. Filter insert and O-ring
4. Filter housing


Fit the new filter insert with O-ring (3) and refit the bottom cover (2).

Start the diesel engine and allow it to run at full revs for 30 seconds. Check that the filter cap (2) is tight.

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.**



Drum - Checking the oil level

Position the roller on a flat surface with the groove (1) on the inside of the drum aligned with the top of the drum frame.

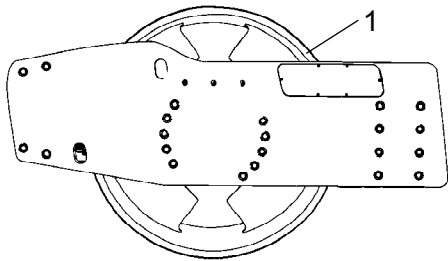
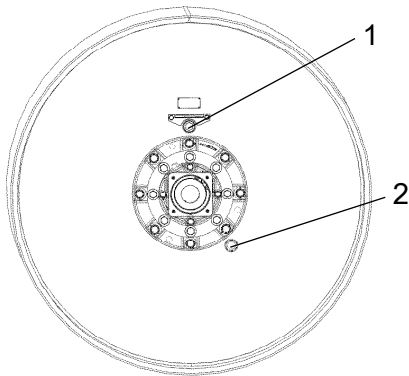


Fig. Left drum side
1. Groove



The oil should now come up to the sight glass (2).



If necessary, release the filler plug (1) and fill to half the sight glass (2).



Do not overfill with oil - risk of overheating.



Ensure only AC Fluid Gearbox 100 is used in the drum.

Fig. Drum, right side
1. Filler plug
2. Level glass

Clean and refit filler plug (1).



Drum gear - Oil change

Place the roller on a level surface so the drain/ventilating plugs are in location for drain.

Wipe clean, unscrew the plugs (2, 3) and drain the oil into a suitable receptacle, capacity about 2 liters (0.5 gal.).

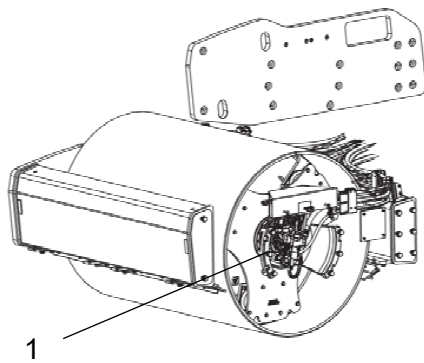


Fig. Oil change - drum gear
1. Drum gear

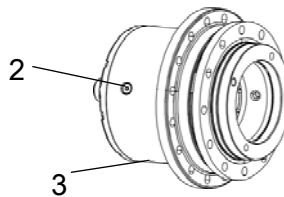


Fig. Drum gear

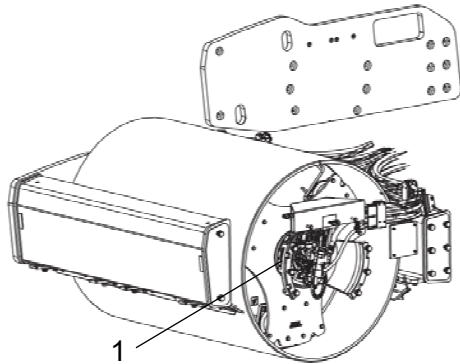


Fig. Oil filling - drum gear
1. Drum gear

Drum gear - Oil filling

Move the machine until the inspection/filling holes are in position for filling.

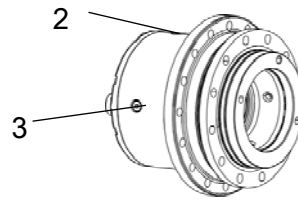


Fig. Drum gear

Refill with new oil, about 1,4 l (1.5 qts). Use transmission oil according to the lubricant specification.

Ensure that the oil level reaches up to the lower edge of the plug hole (3).

Clean and refit the plugs.

Rubber elements and fastening screws - Check

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

Check using a knife blade or pointed object.

Check also that the screws (2) are tightened.

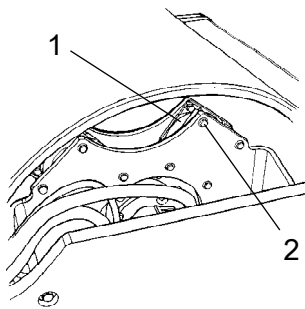


Fig. Drum, vibration side
1. Rubber element
2. Screws



Battery - Check condition

The batteries are sealed and maintenance-free.



Make sure there is no open flame in the vicinity when checking the electrolyte level. Explosive gas is formed when the alternator charges the battery.



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

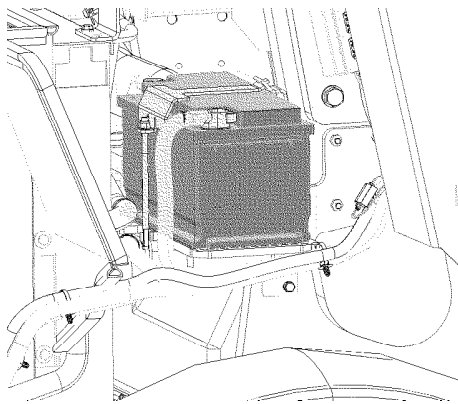


Fig. Battery

The cable shoes should be clean and tightened. Corroded cable shoes should be cleaned and greased with acid-proof Vaseline.

Wipe the top of the battery.



Coolers Checking - Cleaning

Make sure that the air flow through the coolers (1) and (2) is unobstructed. Dirty coolers are blown clean with compressed air or washed clean using a high-pressure water cleaner.

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



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



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

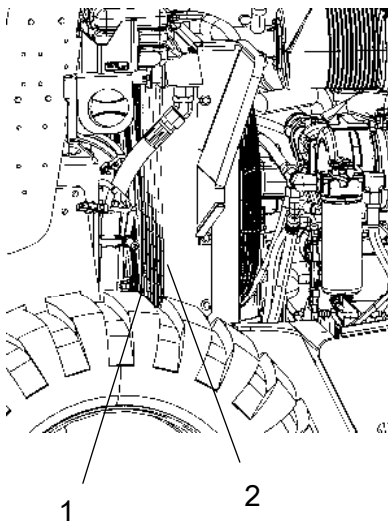


Fig. Engine compartment
1. Water cooler
2. Hydraulic fluid cooler



The engine fuel filter - replacement/cleaning



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

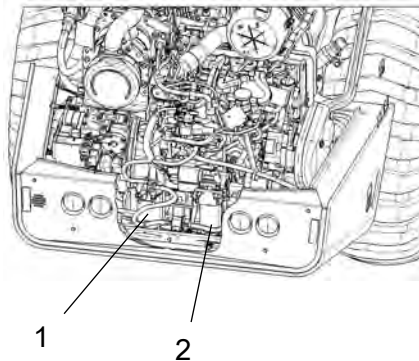


Fig. Engine compartment
1. Fuel filter
2. Fuel prefilter

Screw off the fuel filter (1). The filter is of the disposable type and cannot be cleaned. Hand in to environment-friendly station.



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

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

Start the engine and check that the fuel filters are tight.

N.B. Under no circumstances may new fuel filters be pre-filled with fuel before assembly due to the demands on the cleanliness of the fuel system. Use the hand pump on the fuel prefilter to fill from the machine's fuel system.



Forward/Reverse controls and joints - Check and lubrication

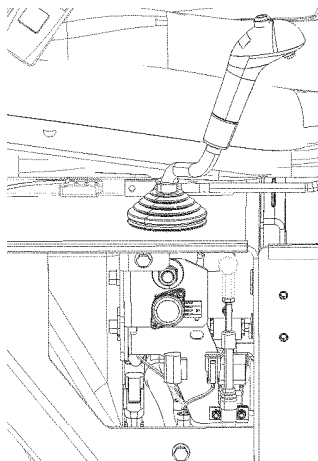


Fig. Forward/reverse lever

The forward/reverse lever joints are best accessed via the compartment for the manual on the right side of the operator station. Check the friction on the forward/reverse lever. The friction screws should be applied sufficiently hard that the forward/reverse lever remains in the set position during operation. The lever's 0-position is determined by the screw that grips in the groove on the axle between the lever.

If the lever begins to become stiff after prolonged use, lubricate the lever at the control cable with a few drops of oil at each point.

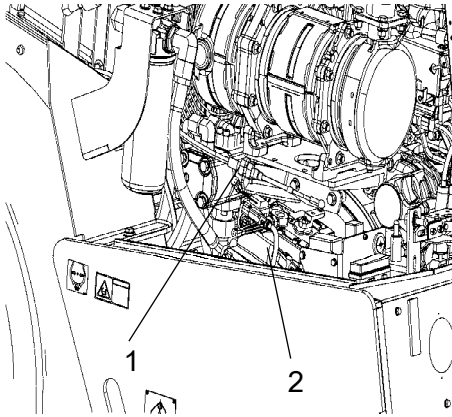


Fig. Engine compartment
1. Forward/Reverse-control cable
2. Propulsion pump

If the forward/reverse lever still is stiff after the above adjustments, lubricate the other end of the control cable with a few drops of oil. The cable is located on the top of the propulsion pump.

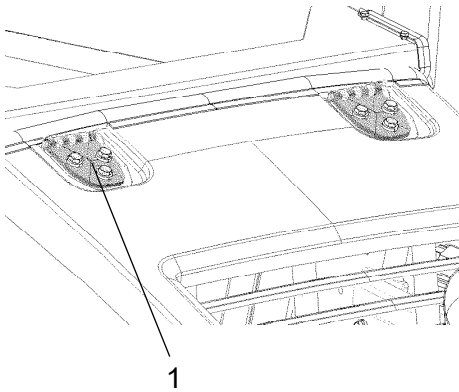


Fig. Engine hood
1. Hinge

Controls and moving joints - Lubrication

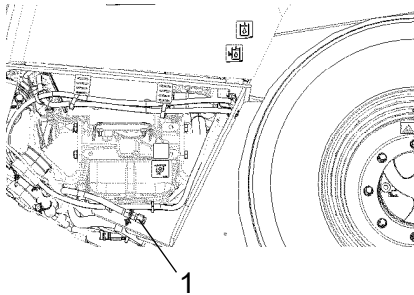
Lubricate the engine hood hinges (1) with grease, the other joints and controls are lubricated with oil. See lubricant specification.



Diesel engine - Oil- and Filter change



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



**Fig. Right side of engine
1. Drain plug**

The oil plug (1) is most easily accessible from the underside of the engine, and is fitted with a hose on the tractor frame.

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

Release the hose from its attachment and pull it forward to the tie-down hole.

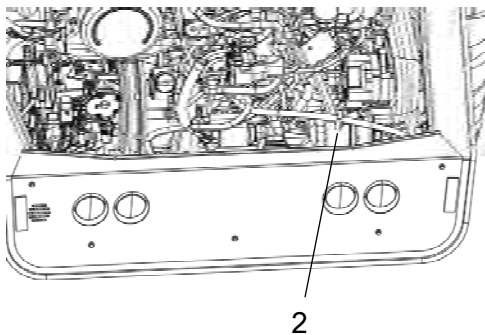
Loosen the drain plug (1) and drain the oil, when the engine is warm.

Screw back the plug again and refit the hose in its attachment.

Change the engine oil filter (2) at the same time. Refer also to the Instruction Manual for the engine.



Hand in the drained oil and filter to an environment-friendly waste disposal station.



**Fig. Engine compartment
2. Oil filter**



Hydraulic filter - Replacement

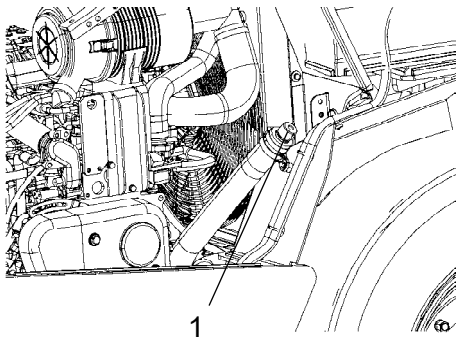


Fig. Hydraulic reservoir
1. Filler cap/Breather filter

Release the filler cap/breather filter (1) so that any overpressure inside the reservoir is eliminated.

Check that the breather filter (1) is not clogged. Air should be able to pass freely through the cap in both directions.

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



Wear protective goggles when working with compressed air.

Carefully clean round the filter.



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



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

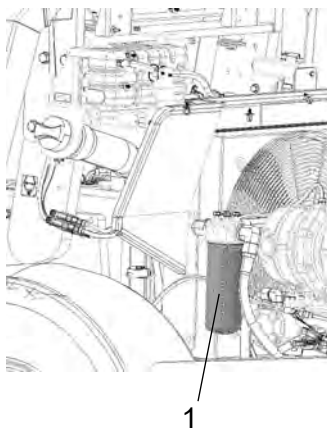


Fig. Engine compartment
1. Hydraulic fluid filter (1pc).

Thoroughly clean the sealing surfaces on the filter holder.

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



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

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check the fluid level in the sight glass and top up if necessary.



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



Fuel tank - Cleaning

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

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



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



Keep in mind fire risk when handling fuel.



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

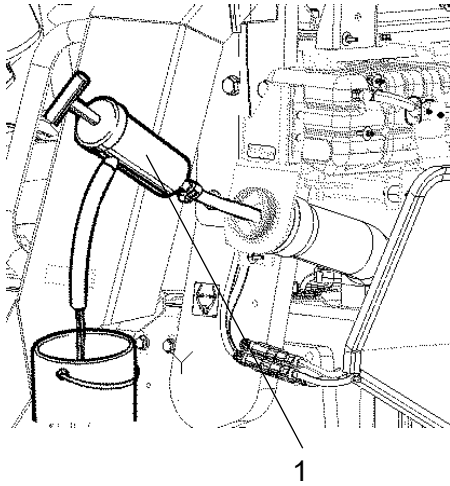


Fig. Fuel tank
1. Oil drain pump



Fuel tank - Draining (Equipment status)

Water and sediment in the fuel tank are drained out via the drain plug (1) in the bottom of the fuel tank.



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

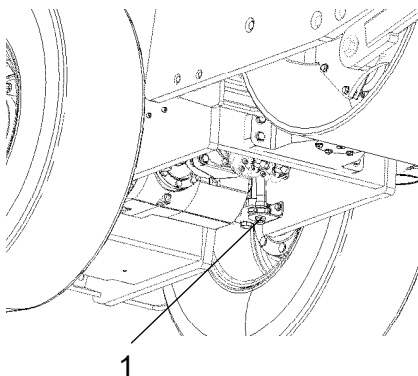


Fig. Left underside of the machine
1. Drain plug

Drain the roller after it has been stationary for a long time, e.g. after standing overnight. The fuel level should be as low as possible.

The roller should preferably have been standing with the drain plug somewhat lower, so that water and sediment collect at the drain plug (1). Drain as follows:

Place a container under the plug (1).

Undo the drain plug (1) and drain out water and sediment until only pure diesel fuel comes out at the plug. Screw in the plug again.



Hydraulic reservoir - Draining

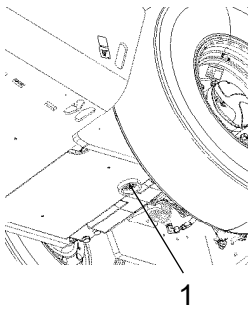


Fig. Hydraulic reservoir, bottom
1. Drain plug

Condensate in the hydraulic reservoir is drained via the drain plug (1).

Drain the roller after it has been stationary for a long time, e.g. after standing overnight. Drain as follows:

Place a container under the drain hole.

Remove the plug (1).

Drain off any condensate.

Refit the plug.



Rear axle differential - Oil change



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

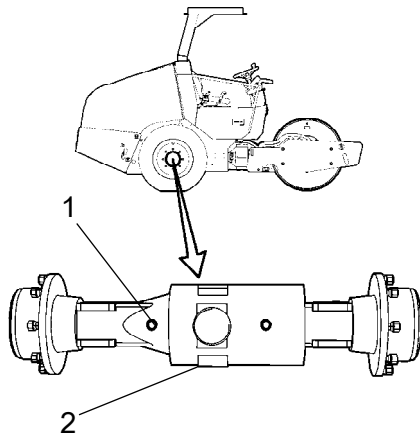


Fig. Rear axle
1. Level/Filler plug
2. Drain plug

Wipe clean and remove the filler/level plug (1) and the drain plug (2). The drain plug (2) is on the back of the shaft. Drain the oil into a container. The volume is approx. 4.5 liters (4.2 qts).



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

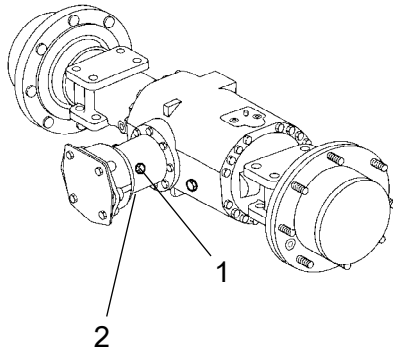
Replace the drain plug and top up with fresh oil to the correct level. Replace the level/filler plug. Use transmission oil, see the lubricant specification.



Rear axle pinion housing - Oil change



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



Wipe clean and remove the level/filler plug (1) and the drain plug (2). The drain plug (2) is on the underside of the pinion housing. Drain off the oil into a container. The volume is approx. 0.3 liters (0.32 qts).



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

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

Replace the drain plug and top up with fresh oil to the correct level. Replace the level/filler plug. Use transmission oil, see the lubricant specification.



Rear axle planetary gear - Oil change

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

Wipe clean, unscrew the plug (1) and drain the oil into a suitable receptacle. The volume is approx. 0,9 liters (0,95 qts)/side.



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

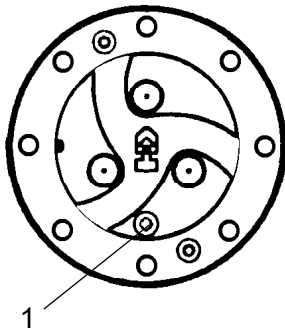
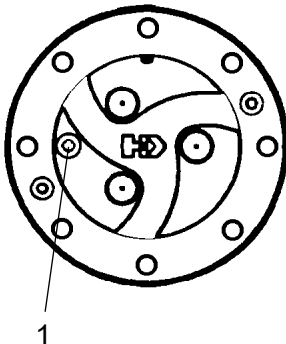


Fig. Planetary gear/drainage position
1. Plug



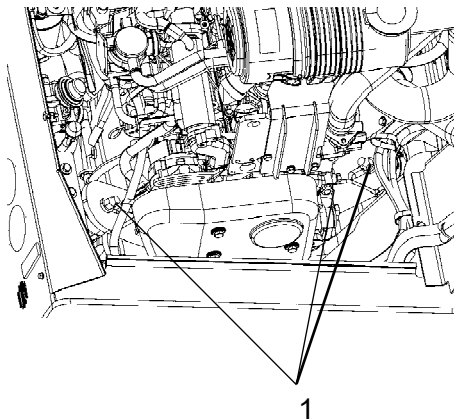
Position the roller with the plug (1) in the planetary gear in the "9 o'clock" position.

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

Clean and refit the plug.

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

Fig. Planetary gear/filling position
1. Plug



Bolted joints - Checking tightening torque

Check that all the bolts for the suspension of the engine and the drive unit are tightened, see under Specifications - tightening torque.

Check the bolted joint between the motor and the pump drive, and that all the hydraulic components are tightened to the set tightening torque.

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

Fig. Engine suspension
1. Bolted joint

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.

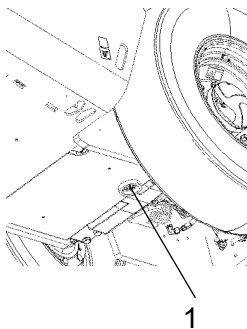


Hydraulic reservoir - Oil change

Use a container to collect the used fluid. The container should hold at least 45 liters (11.8 gal).



Observe caution when draining hot hydraulic fluid. Wear protective gloves and goggles.



**Fig. Hydraulic reservoir, bottom
1. Drain plug**

Place the container under the hydraulic reservoir. Remove the drain plug (1) and allow the fluid to run down into the container. Wipe clean and replace the drain plug (1) in the hydraulic reservoir.



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

Fill up with fresh hydraulic fluid as per the instructions under the heading "Hydraulic reservoir - Check fluid level". Replace the hydraulic fluid filter at the same time.

Start the diesel engine and operate the various hydraulic functions.

Check the fluid level and top up if necessary.



Drum - Checking the oil level

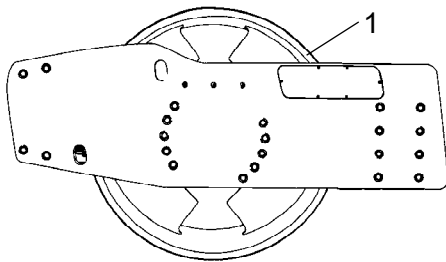


Fig. Left drum side
1. Groove

Position the roller on a flat surface with the groove (1) on the inside of the drum aligned with the top of the drum frame.



Drum - Oil change

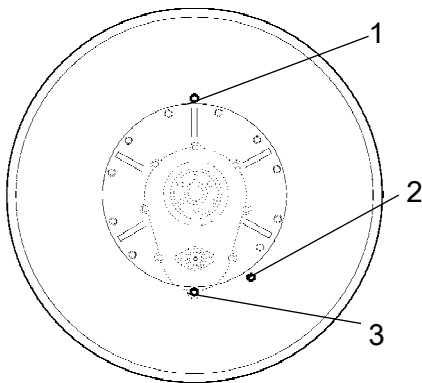


Fig. Drum, right side
1. Filler plug
2. Level glass
3. Drain plug

Ensure that the drum's plugs and level glass are positioned as in Fig 2.

Place a vessel capable of holding at least 20 liters (5.3 gal) under drain plug (3).

Remove and clean filler plug (1) and drain plug (3).

Allow all the oil to drain out. Clean and refit drain plug (3) and fill with new oil according to the lubricant specification. The total volume of oil in the drum must be 15 liters (4.0 gal).



Deliver the drain oil to environmentally correct handling.



Make sure to only use AC Fluid Gearbox 100 in the drum.

Clean and refit filler plug (1).



Drum gear - Oil change

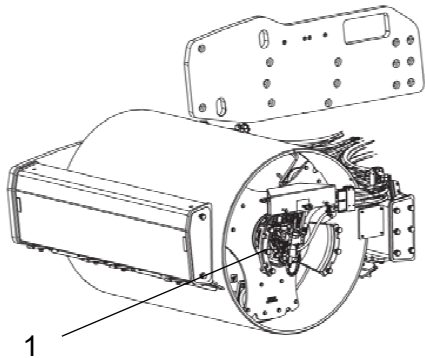


Fig. Oil change - drum gear
1. Drum gear

Place the roller on a level surface so the drain/ventilating plugs are in location for drain.

Wipe clean, unscrew the plugs (2, 3) and drain the oil into a suitable receptacle, capacity about 2 liters (0.5 gal.).

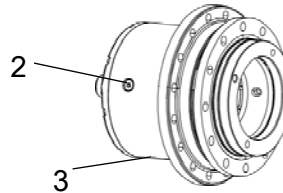


Fig. Drum gear

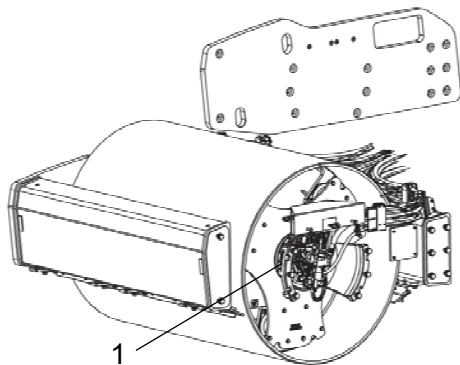


Fig. Oil filling - drum gear
1. Drum gear

Drum gear - Oil filling

Move the machine until the inspection/filling holes are in position for filling.

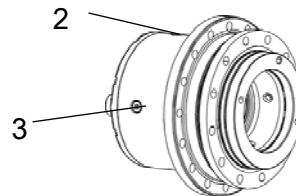


Fig. Drum gear

Refill with new oil, about 1,4 l (1.5 qts). Use transmission oil according to the lubricant specification.

Ensure that the oil level reaches up to the lower edge of the plug hole (3).

Clean and refit the plugs.

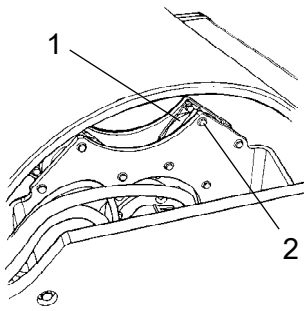


Fig. Drum, vibration side
1. Rubber element
2. Screws

Rubber elements and fastening screws - Check

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

Check using a knife blade or pointed object.

Check also that the screws (2) are tightened.



Battery - Check condition

The batteries are sealed and maintenance-free.



Make sure there is no open flame in the vicinity when checking the electrolyte level. Explosive gas is formed when the alternator charges the battery.



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

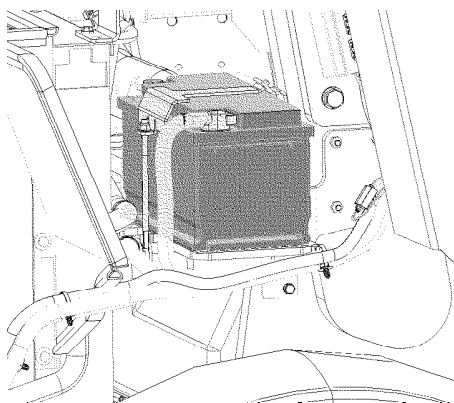


Fig. Battery

The cable shoes should be clean and tightened. Corroded cable shoes should be cleaned and greased with acid-proof Vaseline.

Wipe the top of the battery.



Coolers Checking - Cleaning

Make sure that the air flow through the coolers (1) and (2) is unobstructed. Dirty coolers are blown clean with compressed air or washed clean using a high-pressure water cleaner.

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

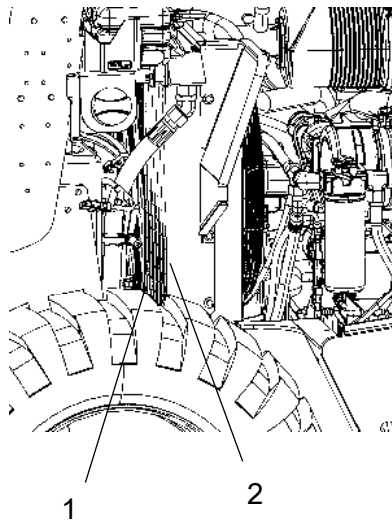


Fig. Engine compartment
1. Water cooler
2. Hydraulic fluid cooler



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



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



The engine fuel filter - replacement/cleaning



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

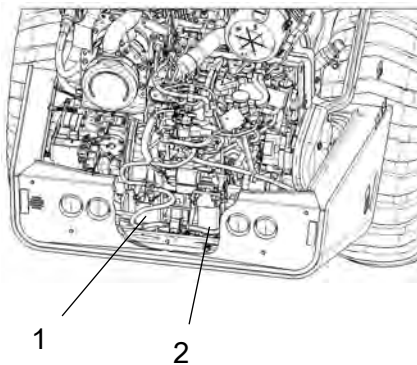


Fig. Engine compartment
1. Fuel filter
2. Fuel prefilter

Screw off the fuel filter (1). The filter is of the disposable type and cannot be cleaned. Hand in to environment-friendly station.



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

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

Start the engine and check that the fuel filters are tight.

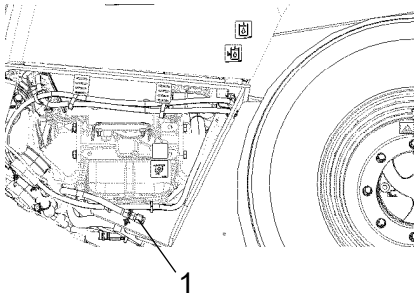
N.B. Under no circumstances may new fuel filters be pre-filled with fuel before assembly due to the demands on the cleanliness of the fuel system. Use the hand pump on the fuel prefilter to fill from the machine's fuel system.



Diesel engine - Oil- and Filter change



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



**Fig. Right side of engine
1. Drain plug**

The oil plug (1) is most easily accessible from the underside of the engine, and is fitted with a hose on the tractor frame.

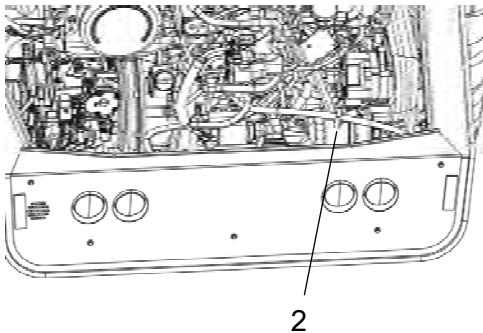
Place a receptacle that holds 15 liters (4 gal) under the drain plug.

Release the hose from its attachment and pull it forward to the tie-down hole.

Loosen the drain plug (1) and drain the oil, when the engine is warm.

Screw back the plug again and refit the hose in its attachment.

Change the engine oil filter (2) at the same time. Refer also to the Instruction Manual for the engine.



**Fig. Engine compartment
2. Oil filter**



**Hand in the drained oil and filter to an
environment-friendly waste disposal station.**



Forward/Reverse controls and joints - Check and lubrication

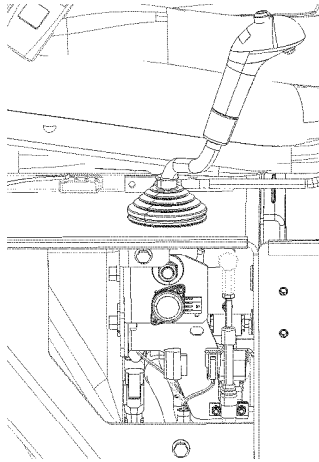


Fig. Forward/reverse lever

The forward/reverse lever joints are best accessed via the compartment for the manual on the right side of the operator station. Check the friction on the forward/reverse lever. The friction screws should be applied sufficiently hard that the forward/reverse lever remains in the set position during operation. The lever's 0-position is determined by the screw that grips in the groove on the axle between the lever.

If the lever begins to become stiff after prolonged used, lubricate the lever at the control cable with a few drops of oil at each point.

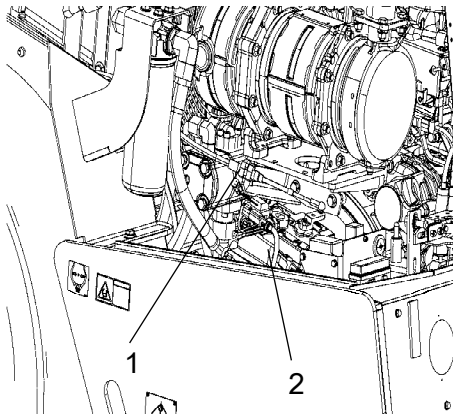


Fig. Engine compartment
1. Forward/Reverse-control cable
2. Propulsion pump

If the forward/reverse lever still is stiff after the above adjustments, lubricate the other end of the control cable with a few drops of oil. The cable is located on the top of the propulsion pump.



Controls and moving joints - Lubrication

Lubricate the engine hood hinges (1) with grease, the other joints and controls are lubricated with oil. See lubricant specification.

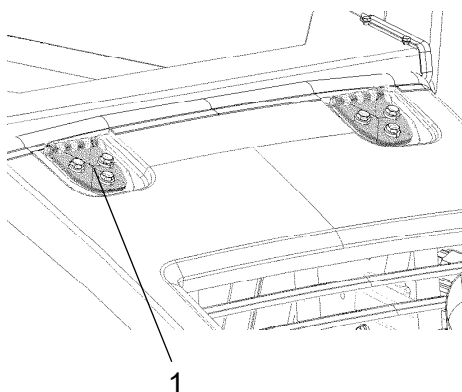


Fig. Engine hood
1. Hinge



Hydraulic filter - Replacement

Release the filler cap/breather filter (1) so that any overpressure inside the reservoir is eliminated.

Check that the breather filter (1) is not clogged. Air should be able to pass freely through the cap in both directions.

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



Wear protective goggles when working with compressed air.

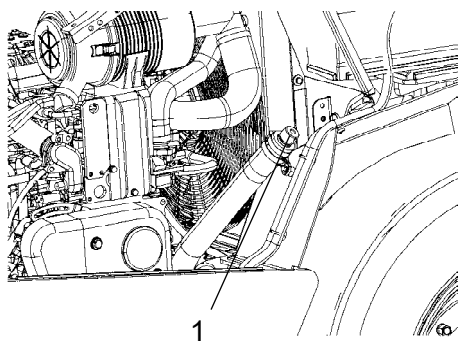


Fig. Hydraulic reservoir
1. Filler cap/Breather filter

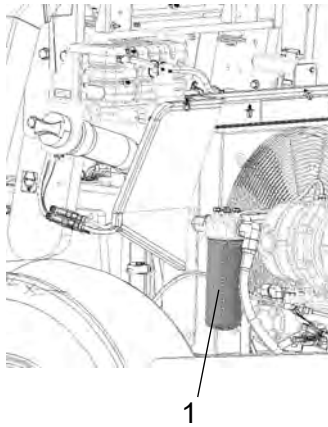


Fig. Engine compartment
1. Hydraulic fluid filter (1pc).

Carefully clean round the filter.



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



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

Thoroughly clean the sealing surfaces on the filter holder.

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



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

Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check the fluid level in the sight glass and top up if necessary.



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



Fuel tank - Cleaning

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

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



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



Keep in mind fire risk when handling fuel.



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

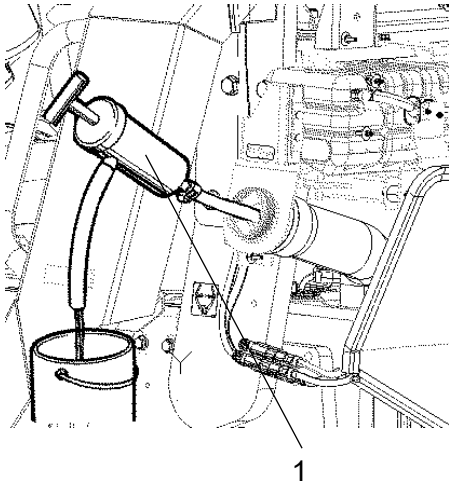


Fig. Fuel tank
1. Oil drain pump



Fuel tank - Draining (Equipment status)

Water and sediment in the fuel tank are drained out via the drain plug (1) in the bottom of the fuel tank.



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

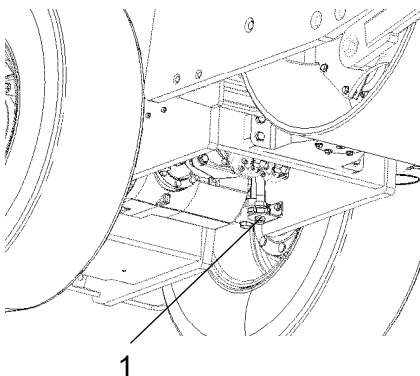


Fig. Left underside of the machine
1. Drain plug

Drain the roller after it has been stationary for a long time, e.g. after standing overnight. The fuel level should be as low as possible.

The roller should preferably have been standing with the drain plug somewhat lower, so that water and sediment collect at the drain plug (1). Drain as follows:

Place a container under the plug (1).

Undo the drain plug (1) and drain out water and sediment until only pure diesel fuel comes out at the plug. Screw in the plug again.



Hydraulic reservoir - Draining

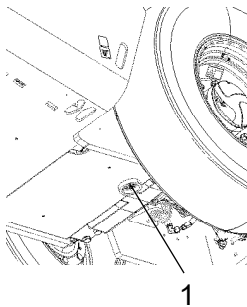


Fig. Hydraulic reservoir, bottom
1. Drain plug

Condensate in the hydraulic reservoir is drained via the drain plug (1).

Drain the roller after it has been stationary for a long time, e.g. after standing overnight. Drain as follows:

Place a container under the drain hole.

Remove the plug (1).

Drain off any condensate.

Refit the plug.



Rear axle differential - Oil change



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

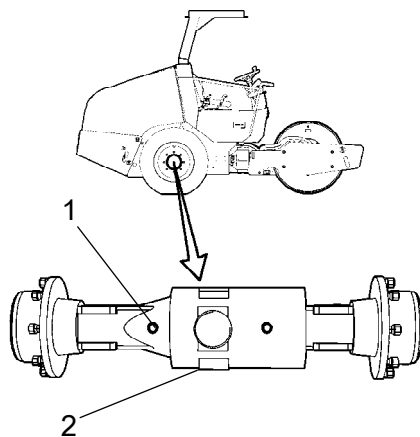


Fig. Rear axle
1. Level/Filler plug
2. Drain plug

Wipe clean and remove the filler/level plug (1) and the drain plug (2). The drain plug (2) is on the back of the shaft. Drain the oil into a container. The volume is approx. 4.5 liters (4.2 qts).



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

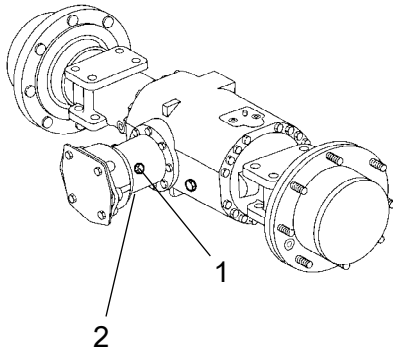
Replace the drain plug and top up with fresh oil to the correct level. Replace the level/filler plug. Use transmission oil, see the lubricant specification.



Rear axle pinion housing - Oil change



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



Wipe clean and remove the level/filler plug (1) and the drain plug (2). The drain plug (2) is on the underside of the pinion housing. Drain off the oil into a container. The volume is approx. 0.3 liters (0.32 qts).



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

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

Replace the drain plug and top up with fresh oil to the correct level. Replace the level/filler plug. Use transmission oil, see the lubricant specification.



Rear axle planetary gear - Oil change

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

Wipe clean, unscrew the plug (1) and drain the oil into a suitable receptacle. The volume is approx. 0,9 liters (0,95 qts)/side.



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

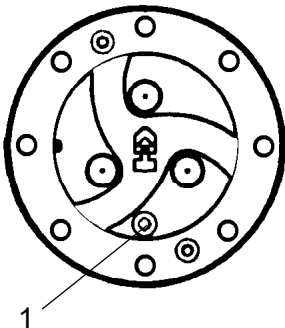


Fig. Planetary gear/drainage position
1. Plug

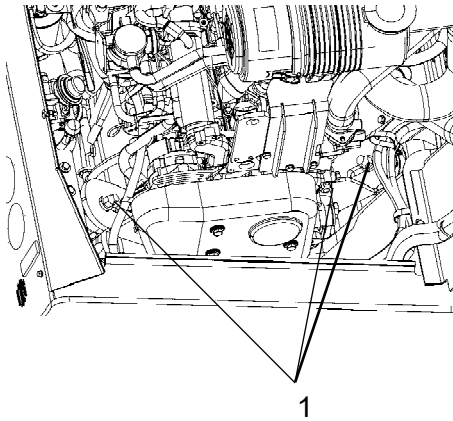


Fig. Engine suspension
1. Bolted joint

Bolted joints - Checking tightening torque

Check that all the bolts for the suspension of the engine and the drive unit are tightened, see under Specifications - tightening torque.

Check the bolted joint between the motor and the pump drive, and that all the hydraulic components are tightened to the set tightening torque.

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

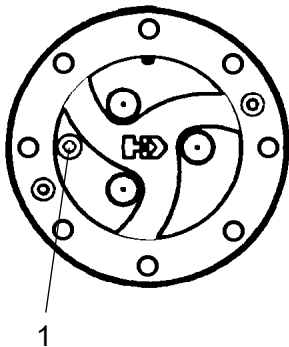


Fig. Planetary gear/filling position
1. Plug

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

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

Clean and refit the plug.

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

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.

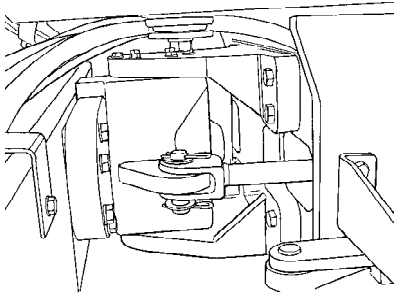


Fig. Steering joint

