

# Instructions manual

## Operating & Maintenance ICA250i-IN3EN1.pdf

Vibratory roller  
CA250 i

Engine  
KOEL 4R1040TA

Serial number  
10000154x0E001169 -



Original instruction

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*Reservation for changes  
Printed in India*



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## Introduction

### The machine

CA250i is one of Dynapac's medium-heavy soil compaction rollers. It is available in STD and D versions.

### Intended use

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

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

### Warning symbols



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



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

### Safety information



**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.***

### General

This manual contains instructions for machine operation and maintenance.

The machine must be correctly maintained for maximal performance.

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

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

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



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

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



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

### Safety - General instructions

(Also read the safety manual)



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

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

### Safety - when operating



**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 danger area, but should then observe caution and operate the machine only when the person is visible or has given clear indications of where he or she is.**

### Slopes

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

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

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



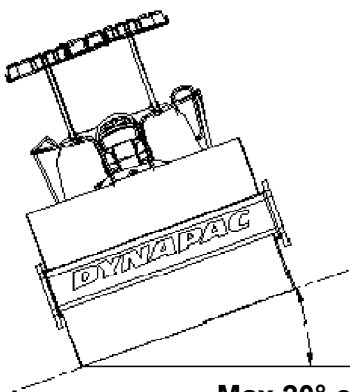
**To exit the cab in an emergency, release the hammer on the rear right post and break the rear window.**



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



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



Max 20° or 36%

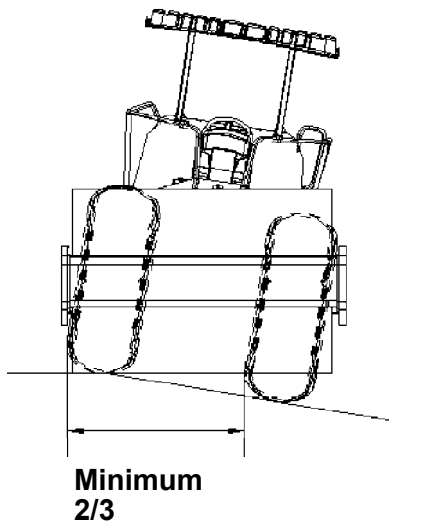
Fig. Operating on slopes

### Driving near edges

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



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



**Fig. Position of drum when driving near an edge**

## **Special instructions**

### **Standard lubricants and other recommended oils and fluids**

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

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

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

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

Hydraulic system - mineral oil Shell Tellus T100 or similar.

### **Temperatures**

The temperature limits apply to standard versions of rollers.

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

### **High pressure cleaning**

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

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



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

### **Fire fighting**

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

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

### Roll Over Protective Structure (ROPS), ROPS approved cab



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



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

### Battery handling



***When removing batteries, always disconnect the negative cable first.***



***When fitting batteries, always connect the positive cable first.***



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



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



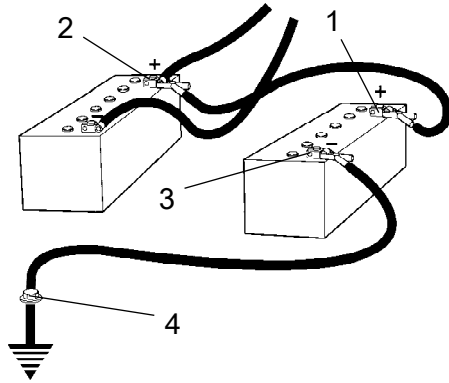
### Jump starting



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



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



**Fig. Jump starting**

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

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

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



## **Technical specifications**

### **Vibrations - Operator station (ISO 2631)**

<b>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.</b>
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Measured whole-body vibrations are below the action value of $0.5 \text{ m/s}^2$ as specified in Directive 2002/44/EC. (Limit is $1.15 \text{ m/s}^2$ )
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Measured hand/arm vibrations also were below the action level of $2.5 \text{ m/s}^2$ specified in the same directive. (Limit is $5 \text{ m/s}^2$ )
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### **Noise level**

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

Guaranteed sound power level,  $L_{WA}$  107 dB (A)

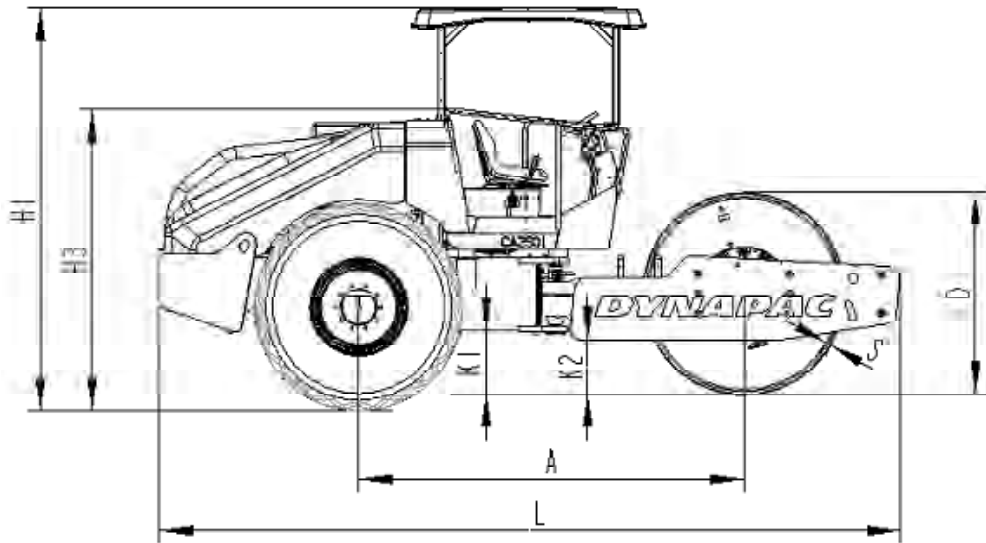
Sound pressure level at the operator's ear (platform),  $L_{pA}$  90  $\pm 3$  dB (A)

Sound pressure level at the operator's ear (cab),  $L_{pA}$  85  $\pm 3$  dB (A)

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

**Dimensions, side view**



	<b>Dimensions</b>	<b>mm</b>	<b>in</b>
A	Wheelbase, drum and wheel	2887	133.7
L	Length, standard equipped roller	5550	218.5
H1	Height, with ROPS (STD, D)	2905	114.4
H3	Height, without ROPS/cab (STD, D)	2266	89.2
D	Diameter, drum	1523	60
S	Thickness, drum sweep, nominal	25	1
K1	Clearance, tractor frame	453	17.8
K2	Clearance, drum frame (STD, D)	400	15.7

**Dimensions, top view**



	<b>Dimensions</b>	<b>mm</b>	<b>in</b>
B	Width, standard equipped roller	2384	93.9
O1	Overhang, left frame side	50	1.96
O2	Overhang, right frame side	50	1.96
R1	Turn radius, external	5400	212.6
R2	Turn radius, internal	3100	122
W1	Width, tractor section	2130	83.9
W2	Width, drum	2130	83.9

**Weights and volumes**

**Weights**

Service weight (STD)

- with ROPS	10 830 kg	23 880 lbs
- without ROPS	10 465 kg	23 075 lbs

Service weight (D)

- with ROPS	11 030 kg	24 320 lbs
- without ROPS	10 665 kg	23 520 lbs

**Fluid volumes**

Fuel tank	250 liters	66 gal
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**Working capacity****Compaction data**

Static linear load (STD)	29,6 kg/cm	165.8 pli
Static linear load (D)	30,5 kg/cm	170.8 pli
Amplitude, high (STD, D)	1,7 mm	0,07 in
Amplitude, low (STD, D)	0,8 mm	0,03 in
Vibration frequency, high amplitude (STD, D)	33 Hz	1980 vpm
Vibration frequency, low amplitude (STD, D)	33 Hz	1980 vpm
Centrifugal force, high amplitude (STD, D)	205 kN	46 125 lb
Centrifugal force, low amplitude (STD, D)	100 kN	22 500 lb

**General****Engine**

Manufacturer/Model	KOEL 4R1040TA	Water cooled turbo diesel
Power (SAE J1995)	78 kW	105 hp
Engine speed	2200 rpm	

**Electrical system**

Battery	12V 150Ah
Alternator	12V 65A
Fuses	See the Electrical system section - fuses

**Tire****Tire dimensions****Tire pressure**

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



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

### Hydraulic system

Opening pressure	MPa
Drive system	38,0
Supply system	2.0
Vibration system	32,5
Control systems	17,5
Brake release	1,4

### ROPS - bolts

Bolt dimensions :	M24 (PN 4700904562)
Strength class :	10.9
Tightening torque :	800 Nm (Dacromet treated)



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

### Tightening torque

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

**Metric coarse screw thread, bright galvanized (fzb):**

#### STRENGTH CLASS:

M - thread	8.8, Oiled	8.8, Dry	10.9, Oiled	10.9, Dry	12.9, Oiled	12.9, Dry
<b>M6</b>	8,4	9,4	12	13,4	14,6	16,3
<b>M8</b>	21	23	28	32	34	38
<b>M10</b>	40	45	56	62	68	76
<b>M12</b>	70	78	98	110	117	131
<b>M14</b>	110	123	156	174	187	208
<b>M16</b>	169	190	240	270	290	320
<b>M20</b>	330	370	470	520	560	620
<b>M22</b>	446	497	626	699	752	839
<b>M24</b>	570	640	800	900	960	1080
<b>M30</b>	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
<b>M6</b>	12,0	15,0	14,6	18,3
<b>M8</b>	28	36	34	43
<b>M10</b>	56	70	68	86
<b>M12</b>	98	124	117	147
<b>M14</b>	156	196	187	234
<b>M16</b>	240	304	290	360
<b>M20</b>	470	585	560	698
<b>M22</b>	626	786	752	944
<b>M24</b>	800	1010	960	1215
<b>M30</b>	1580	1990	1900	2360

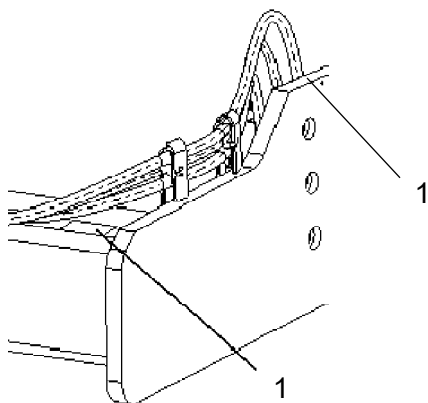


## Machine description

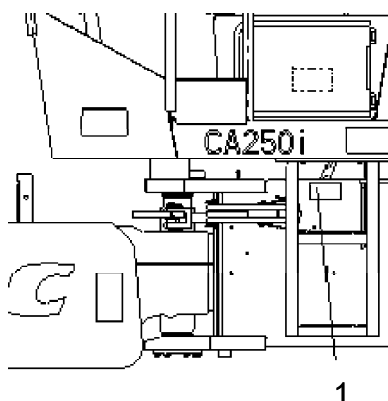
### Identification

#### Product identification number on the frame

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



**Fig. Front frame**  
**1. PIN**



**Fig. Machine plate**  
**1. Machine plate**

#### Machine plate

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

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

<b>DYNAPAC</b>			
Atlas Copco (India) LTD			
Plot No. 90, MIDC, Salpur, Nashik - 422007, India			
<b>Product Identification Number</b>			
Type	Rated Power	Max. axle load front / rear	
	kW	kg	
Gross machinery mass	Operating mass	Max. ballast	Year of Mfg
kg	kg	kg	
4811 0001 46			

**Fig. Machine plate**

**Please state the machine's PIN when ordering spares.**

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

### Explanation of 17PIN serial number

A= Manufacturer

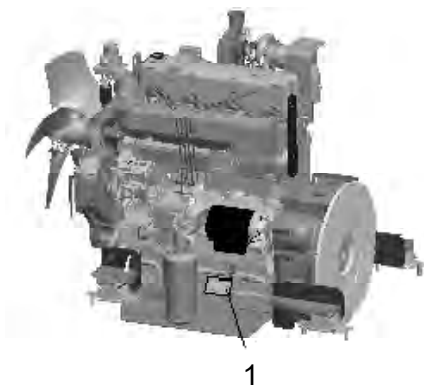
B= Family/Model

C= Check letter

D= No coding

E= Production unit

F= Serial number




**Fig. Engine**  
**1. Type plate**

### Engine plates

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

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

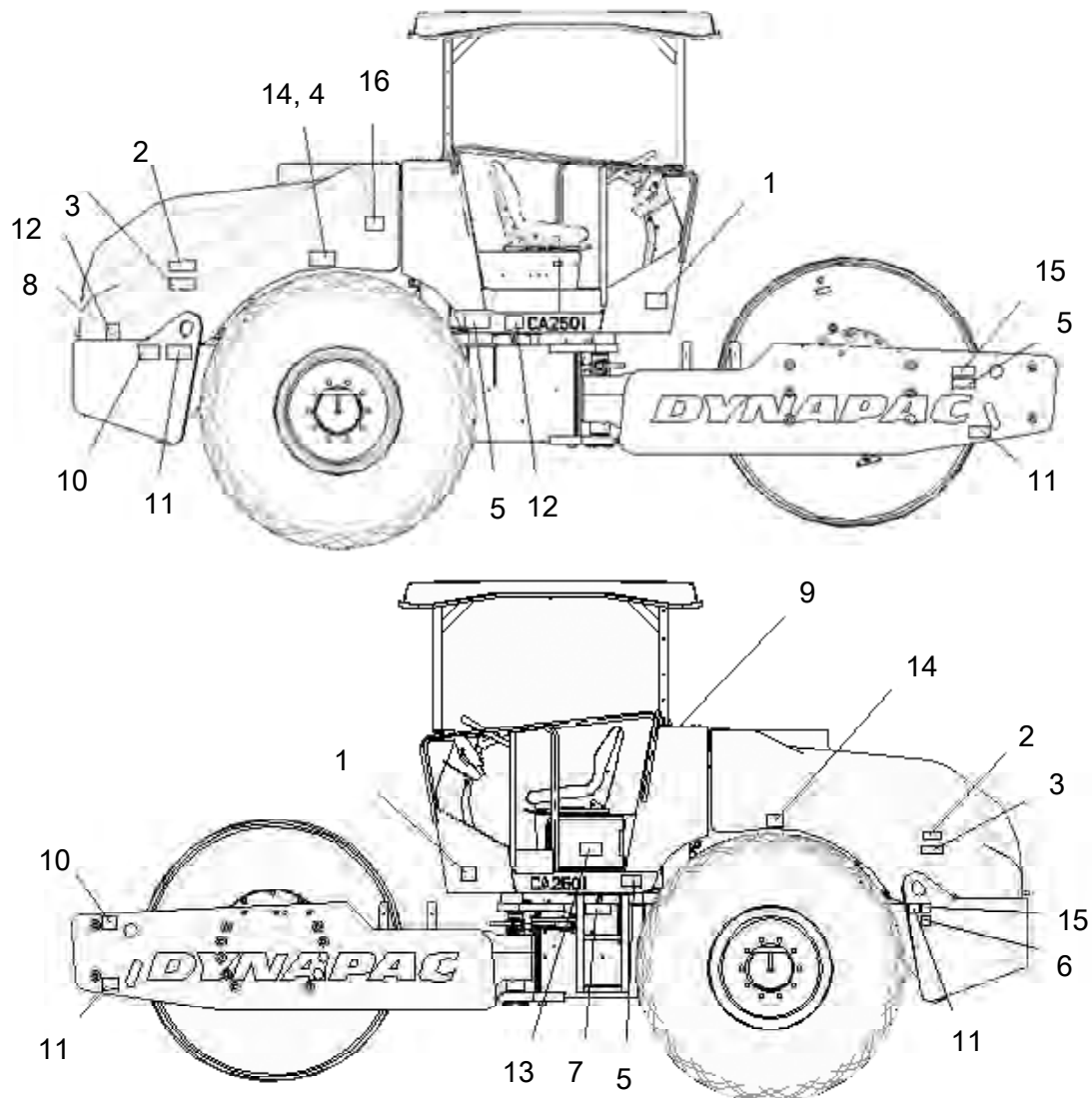
ENGINE TYPE		 <b>Enriching Lives</b>
RATING kW/hp	rpm	
RATING STD.		
GOVERNING CLASS		
ENGINE No.		
KIRLOSKAR OIL ENGINES LTD INDIA		

**Fig. Type plate**

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

## Decals

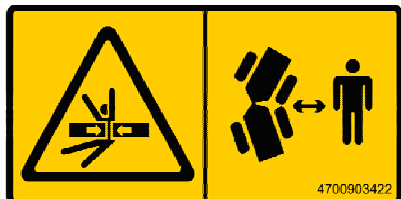
### Location - decals



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

### 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.

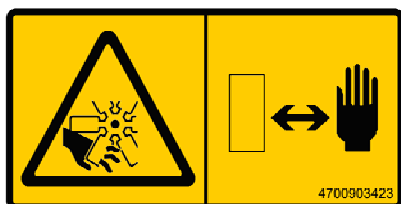


**4700903422**

**Warning - Crush zone, articulation/drum.**

**Maintain a safe distance from the crush zone.**

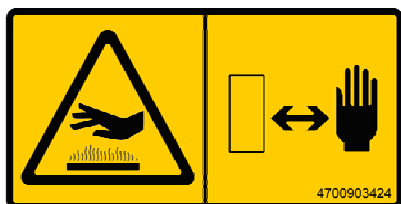
*(Two crush zones on machines fitted with pivotal steering)*



**4700903423**

**Warning - Rotating engine components.**

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



**4700903424**

**Warning - Hot surfaces in the engine compartment.**

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



**4700903459**

**Warning - Instruction manual**

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

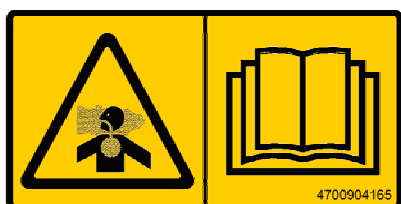


**4700908229**

**Warning - Risk of crushing**

**The articulation must be locked when lifting.**

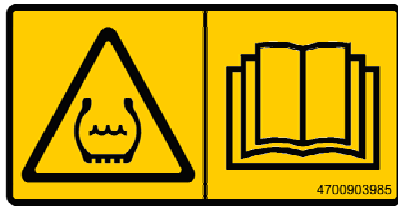
**Read the instruction manual.**



**4700904165**

**Warning - Toxic gas (option, ACC)**

**Read the instruction manual.**

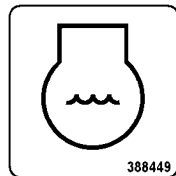


**4700903985**  
**Warning - Ballasted tire.**

Read the instruction manual.

### Info decals

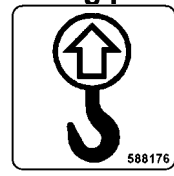
**Coolant**



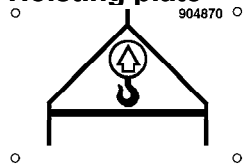
**Diesel fuel**



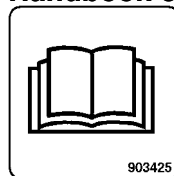
**Lifting point**



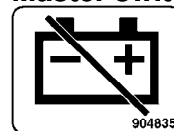
**Hoisting plate**



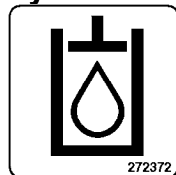
**Handbook compartment**



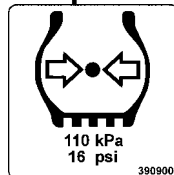
**Master switch**



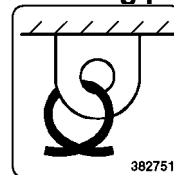
**Hydraulic fluid**



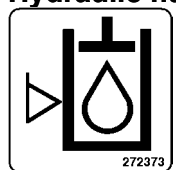
**Tire pressure**



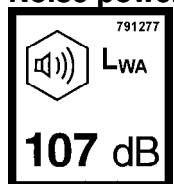
**Securing point**



**Hydraulic fluid level**

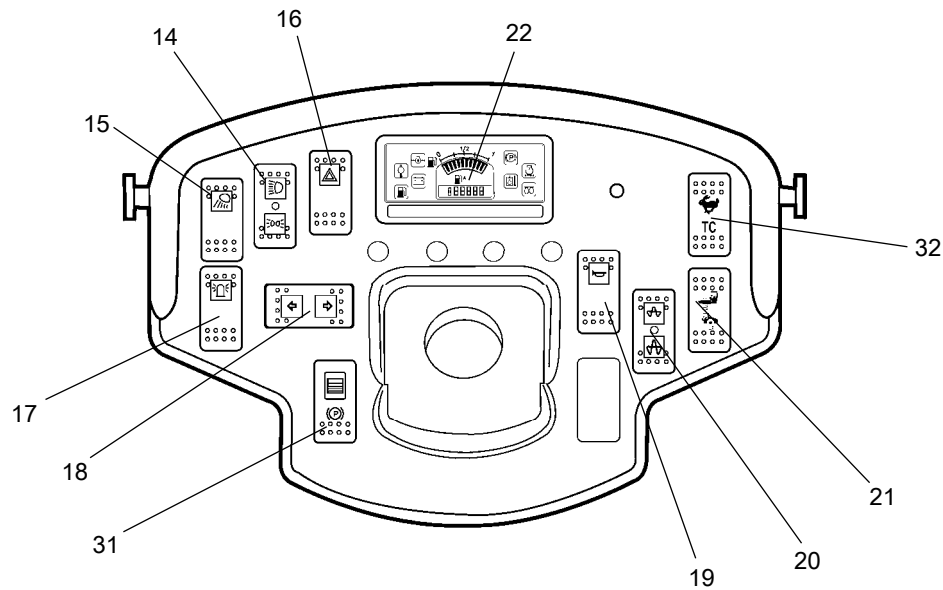


**Noise power level**



## Instruments/controls

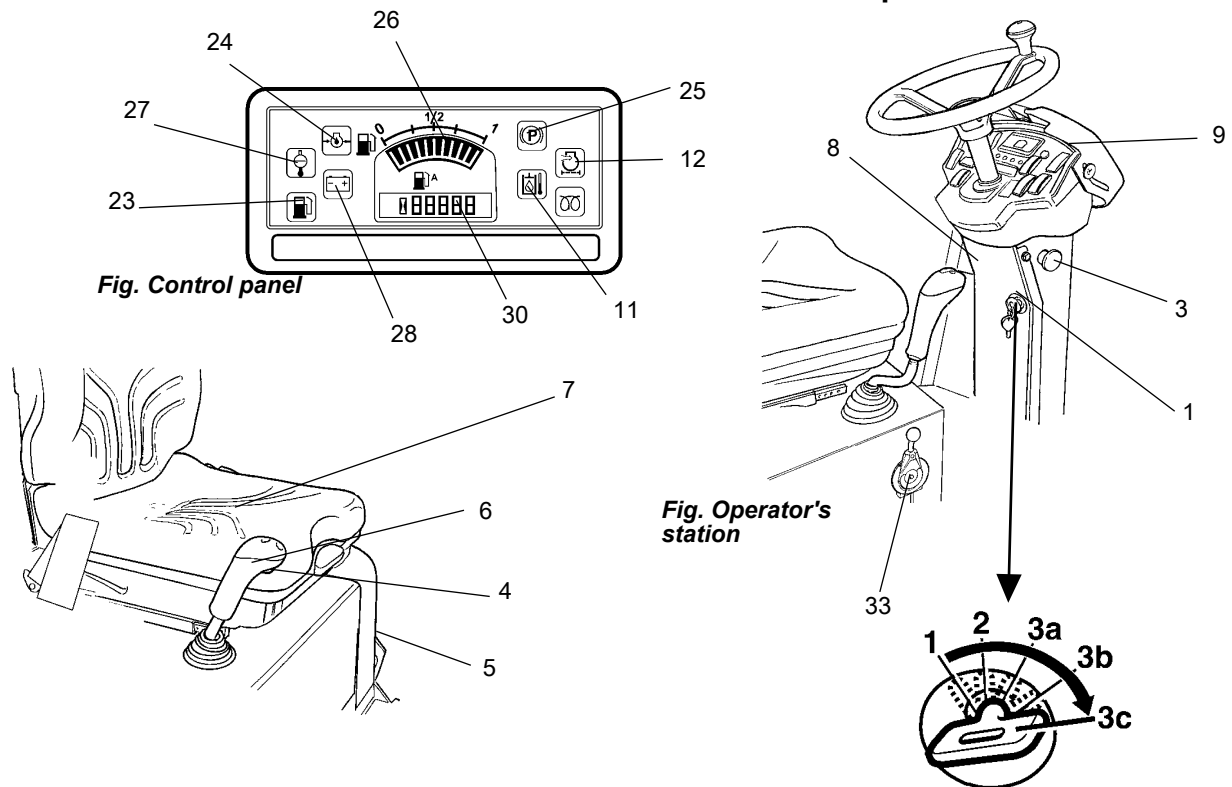
### Locations - Instruments and controls



**Fig. Instruments and control panel**

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












## Locations - Control panel and controls























**Fig. Operator position**

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

**Function description**

No	Designation	Symbol	Function
1.	Starter switch		Positions 1-2: Shut off position, key can be removed.  Position 3a: All instruments and electric controls are supplied with power.  Position 3c: Starter motor activation.
3.	Emergency stop		When pressed, the emergency stop is activated. The brake is applied and the engine stops. Brace yourself for a sudden stop.
4.	Vibration On/Off. Switch		When the circuit breaker is pressed in and released the vibrations are connected up. Press again and the vibrations are disconnected. High or low amplitude must first be chosen on the instrument panel.
5.	Handbook compartment		Pull up and open the top of the compartment for access to handbooks.
6.	Forward/Reverse lever		The lever must be in neutral to start the diesel engine. The engine cannot be started if the lever is in any other position. The forward/reverse lever controls both the roller's driving direction and speed. When the lever is moved forward, the roller moves forward etc. The roller's speed is proportional to the distance the lever is from the neutral position. The further the lever is from the neutral position, the higher the speed.
7.	Seat switch		Remain seated at all times when operating the roller. If the operator stands up during operation, a buzzer sounds. After 3 seconds the brakes are activated and the engine stops.
8.	Fuse box (on control column)		Contains fuses for the electrical system. See under the heading 'Electrical system' for a description of fuse functions.
9.	Instrument cover		Lowered over the instrument plate to protect the instruments from the weather and sabotage. Lockable
11.	Temperature gauge, hydraulic fluid.		Shows hydraulic fluid temperature. Normal temperature range is 65°-80°C (149°-176°F). Stop the engine if the gauge shows a temperature of more than 85°C (185°F). Locate the fault.
12.	Warning lamp, air filter		If the lamp comes on while the engine is running at full speed, the air filter must be cleaned or replaced.
14.	Driving lights, low beam, switch (Optional)		When depressed, the driving lights low beam are on.
15.	Driving lights, high beam, switch (Optional)		When depressed, the driving lights high beam are on.
16.	Hazard warning lights, switch (Optional)		Where depressed, the hazard warning lights are on



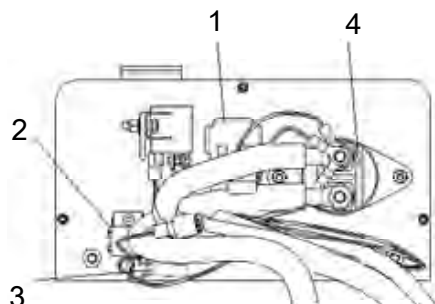
No	Designation	Symbol	Function
17.	Hazard beacon, switch (Optional)		When depressed, the hazard beacon is on
18.	Direction indicators, switch (Optional)		When depressed to the left, the left direction indicators are on etc. In the middle position the function is shut off.
19.	Horn, switch		Press to sound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

## Electrical system

### Main fuses

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

Main fuse      40A (Orange)

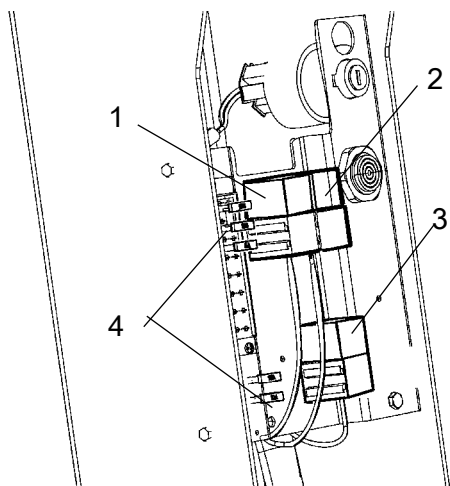


**Fig. Engine house**

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

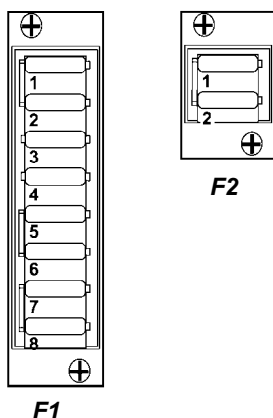
### Relays

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



**Fig. Control column**

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



**Fig. Fuses boxes.**

## Fuses

The figure shows the position of the fuses.

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

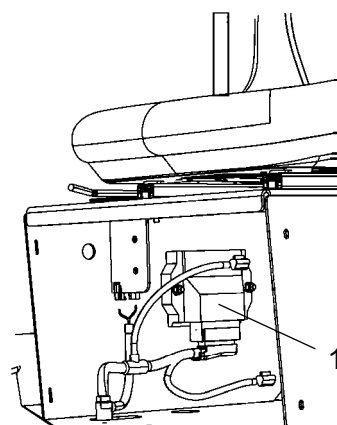
The machine is equipped with a 12V electrical system and an AC alternator.

### Fuses in boxes F1

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

### Fuses in boxes F2

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



**Fig. Driving compartment**  
**1 Control unit (ECU)**

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

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



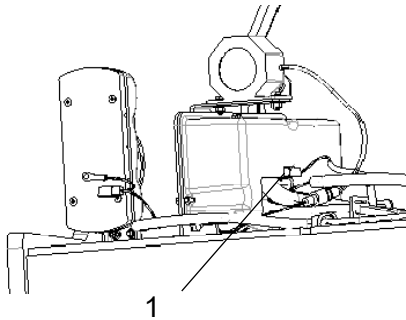
## Operation

### Before starting

#### Master switch - Switching on

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

The master switch is located in the engine compartment. Open the engine cover and set the key (1) to the ON position. The entire roller is now supplied with power.



**Fig. Engine house**  
**1. Battery Master switch**

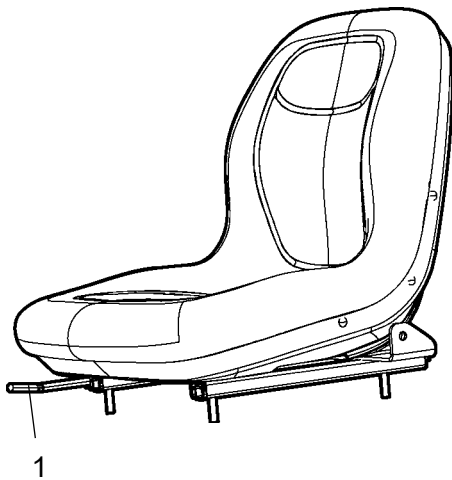


***The engine hood must be unlocked when operating, so that the battery can be quickly disconnected if necessary.***

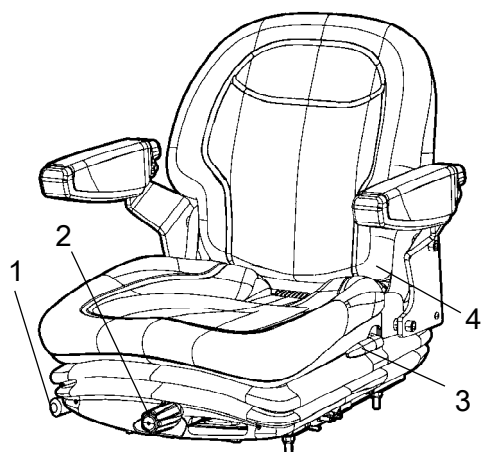
#### Driver seat (Std.) - Adjustment

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

The seat can be adjusted lengthways (1).



**Fig. Operator's seat**  
**1. Length adjustment**



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

### Driver seat (Option)- Adjustment

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

The seat can be adjusted as follows.

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



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

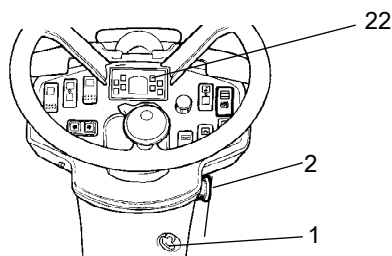


***Do not forget to use the seat belt (4).***

### Instruments and lamps - Checking



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



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

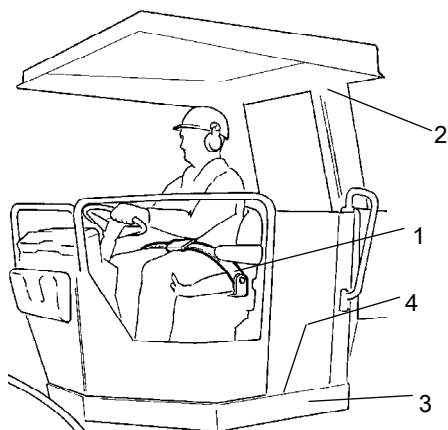
Pull out the emergency stop (2).

Turn the switch (1) to position 3a.

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

### Operator position

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



**Fig. Operator's station**

- 1. Seat belt
- 2. ROPS
- 3. Rubber element
- 4. Anti-slip



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



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



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

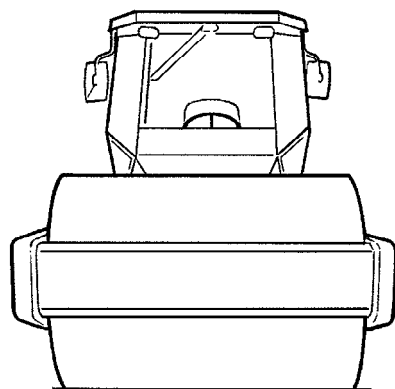


**If the machine is fitted with a cab, make sure that the door is closed when in motion.**

### View

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

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



**Fig. view**

## Interlock

The roller is equipped with Interlock.

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

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

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



**Sit down for all operations!**

## Starting

### Start of diesel motor

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

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

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

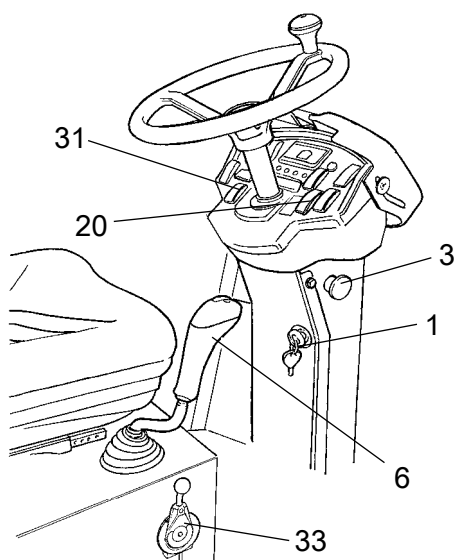
Turn the vibration switch (20) to the Off position (position O).

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

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



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



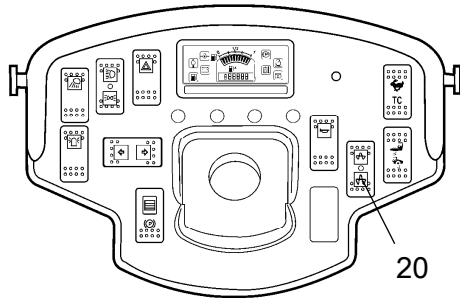
**Fig. Control panel**

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

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

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





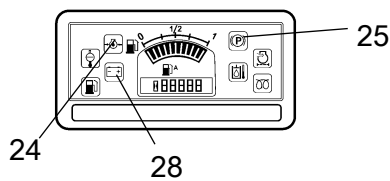
**Fig. Instrument panel**  
**20. Vibration switch**

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

The warning lamp (25) should remain on.



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



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



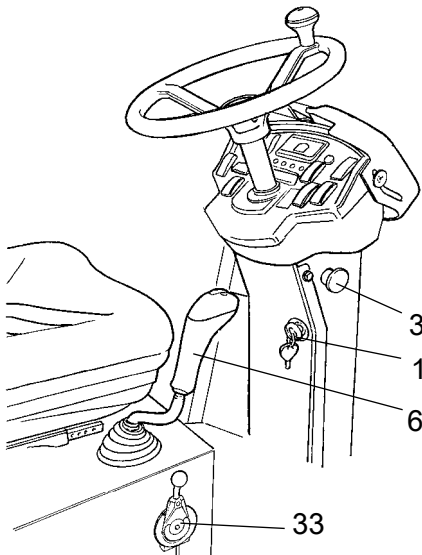
**Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.**

## Operating

### Operating the roller



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



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

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

Check that the steering is working correctly by turning the steering wheel once to the right and once to the left while the roller is stationary.



***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.



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



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

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



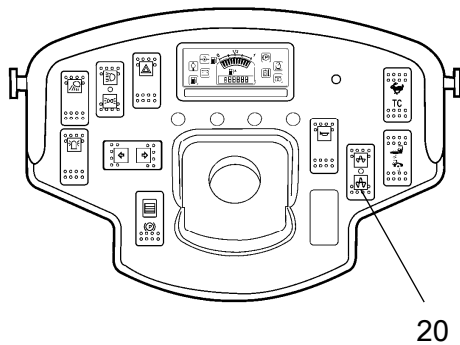
***If the engine is overheated or if the oil pressure is too low then the buzzer sounds for 10 seconds and the engine shuts off. Brace yourself for a sudden stop.***

### Vibration

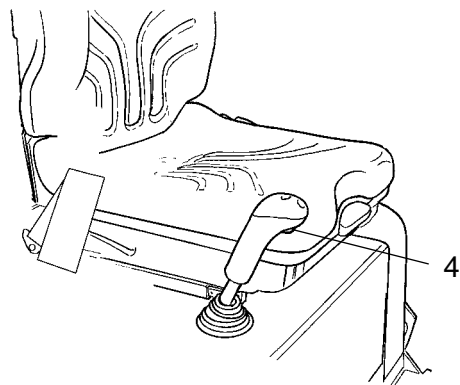
#### Vibration On/Off

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

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



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



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

#### Vibration - Activation



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

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

Vibration can only be engaged at low and high speed.

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

## 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.

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

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

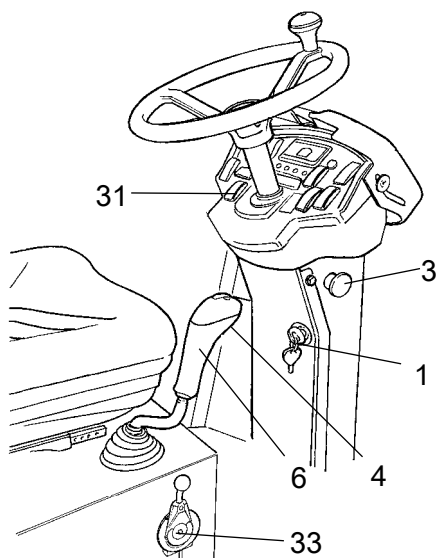


Fig. Control panel

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



**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.**

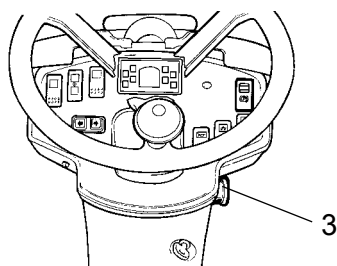


Fig. Instrument panel  
3. Emergency stop

### Emergency braking

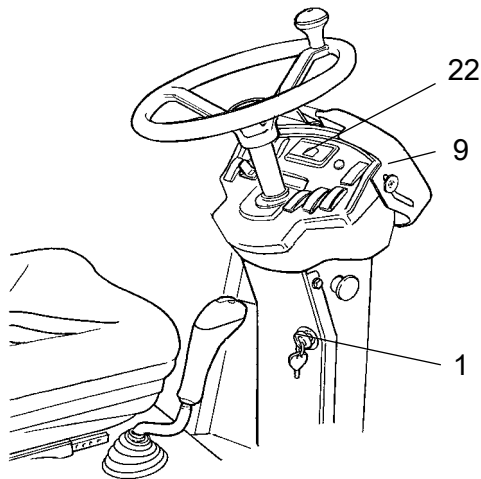
Braking is normally activated using the forward/reverse lever. The hydrostatic transmission brakes the roller when the lever is moved towards the neutral position.

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 position and pull out the emergency stop (3). When the roller is fitted with an Interlock it is necessary to sit down in the driver seat to restart the engine.

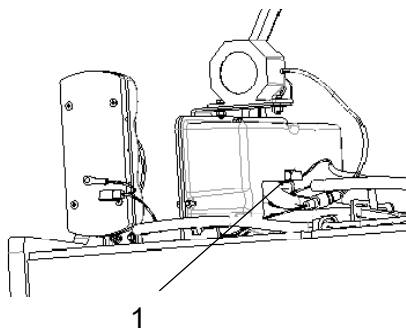


**Fig. Instrument panel**  
**1. Starter switch**  
**9. Instrument guard**  
**22. Panel for warning lamps**

### Switching off

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

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



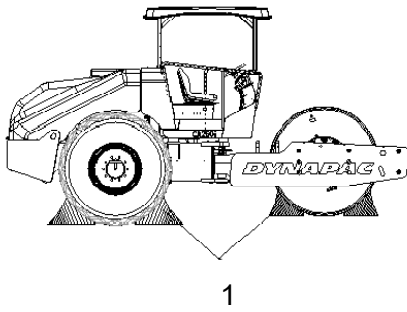
**Fig. Engine compartment**  
**1. Master switch**

### Parking

#### Master switch

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

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



**Fig. Arrangement**  
**1. Chock**

### Chocking the drums



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



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

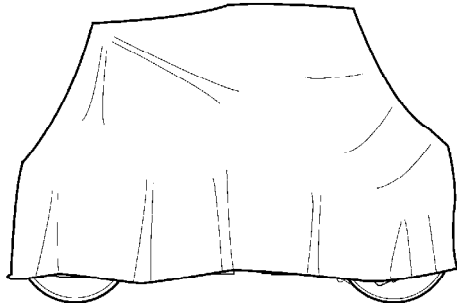


**Keep in mind that there is a risk of freezing during the winter. Fill the engine cooling system and the screenwash bottle in the cab with suitable anti-freeze mixtures. See also the maintenance instructions.**

### Long-term parking



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



**Fig. Roller weather protection**

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

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

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

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

### Engine

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

### Battery

\* Remove the battery from the machine. Clean the battery, check that the electrolyte level is correct (see under the heading 'Every 50 hours of operation') and trickle-charge the battery once a month.

### Air cleaner, exhaust pipe

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

### Fuel tank

Fill the fuel tank completely full to prevent condensation.

### Hydraulic reservoir

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

### **Steering cylinder, hinges, etc.**

Lubricate the articulation bearing with grease (see under the heading "Every 50 hours of operation").

Grease the steering cylinder piston with conservation grease.

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

### **Hoods, tarpaulin**

\* Lower the instrument cover over the instrument panel.

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

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

### **Tires (All-weather)**

Check that tire pressure is 110 kPa (1.1 kp/cm<sup>2</sup>), (16 psi).



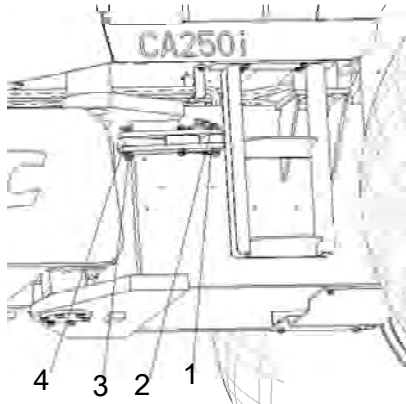
## Miscellaneous

### Lifting

#### Locking the articulation



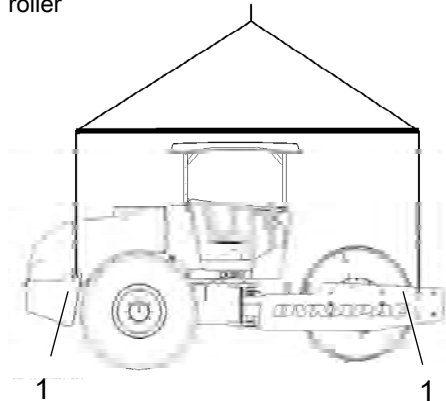
**Articulation must be locked to prevent inadvertent turning before lifting the roller.**



**Fig. Articulation in the locked position**

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

Weight: refer to the hoisting plate on the roller



**Fig. Roller prepared for lifting**  
1. Hoisting plate

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

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

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

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

#### Lifting the roller



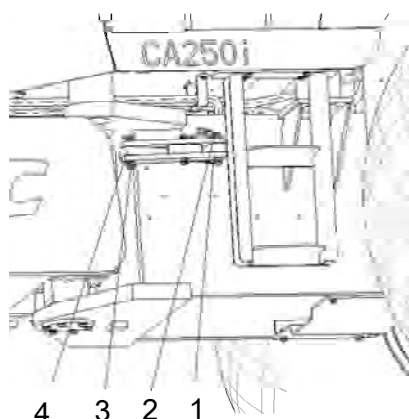
**The machine's gross weight is specified on the hoisting plate (1). Refer also to the Technical specifications.**



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



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



**Fig. Articulation in the open position**

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

## Unlocking the articulation



Remember to unlock the articulation before operating.

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

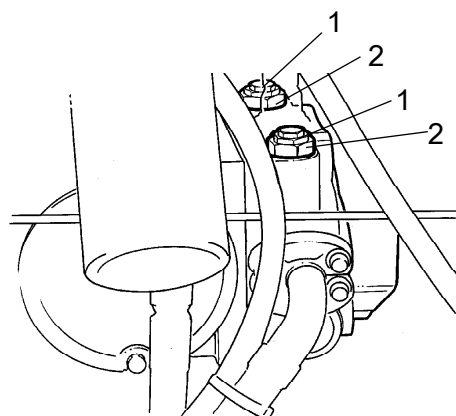
## Towing/Recovering

### Alternative 1

#### Short distance towing with the engine running



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



**Fig. Propulsion pump**

- 1. Towing valve
- 2. Locknut

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

Start the engine and allow it to idle.

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

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

## Alternative 2

### Towing short distances when the engine is inoperative

First release both towing valves as per alternative 1.



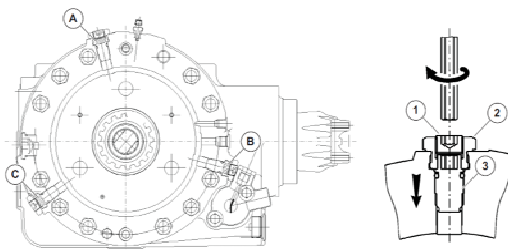
**Chock the drums to prevent the roller from moving when the brakes are mechanically disengaged.**

### Rear axle brake

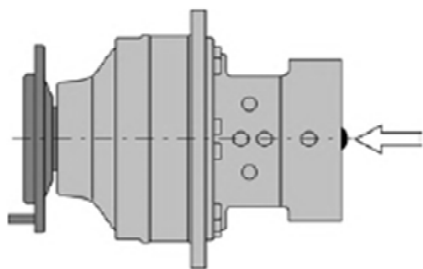
On both sides remove the lock screws (1)

Screw in the brake release bolts (3), 1/2 turn at a time, in sequence (A, B, C) until the torque drops off sharply (4-5 turns).

Clear the area of any personnel before removing the stop blocks on the drum and two wheels, and then tow the machine to a safe location.

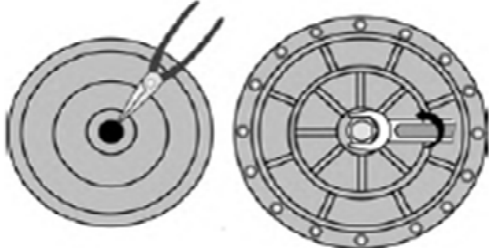
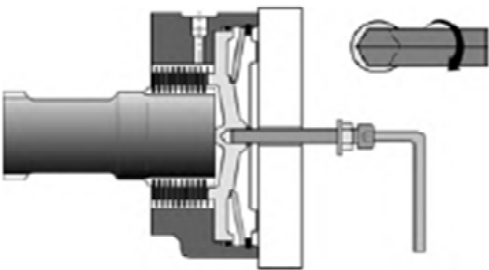
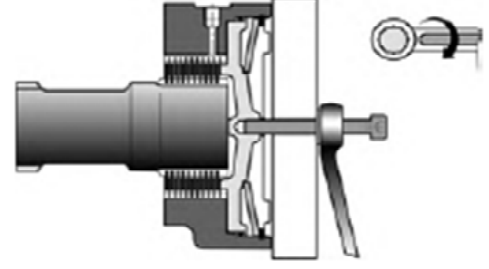


**Fig. Rear axle**  
**1. Lock screw**  
**2. Lock nut**  
**3. Brake release screw**



## Releasing the parking brake in the drum

Fig. Drum motor

1		Remove and dispose of the rubber plug from the brake protector. Loosen the metallic plug.
2		Use a screw fitted with a nut and washer. Tighten to the bottom of the threading into the piston without blocking the screw.
3		Then tighten the nut until the motor shaft turns freely, while holding the screw.

The brake is now disengaged and the machine can be towed.



Reset the drum motor brake after towing.

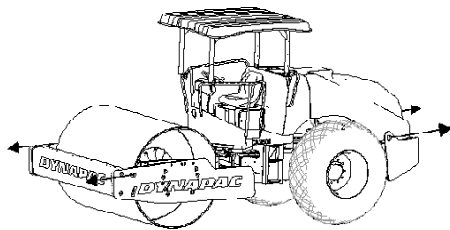
### Towing the roller



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



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



**Fig. Towing**

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

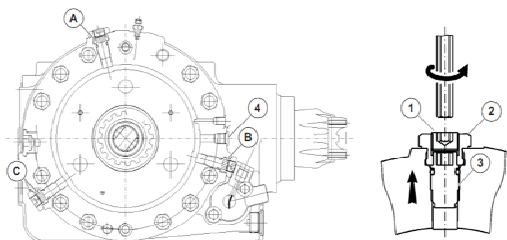


Restore the items for towing according to alternative 1 or 2 on the preceding pages.

### Re-activating the rear axle brake



**Chock the drum and wheels to prevent the roller from moving when the brakes are mechanically disengaged.**



**Fig. Rear axle**  
1. Lock screw  
2. Locknut  
3. Brake release bolt  
4. Brake port (rear axle)

Apply pressure (13 bar) into the parking brake ports (4).

Remove the lock screws (1) and unscrew all the brake release screws (3) on both sides until the end of stroke has been reached.

**NOTE!** Do not move the lock nuts (2).

Release the pressure at the parking brake ports (4).

Apply sealant on the lock screws (1) and refit the lock nuts (2).

Hold the lock nuts (2) and tighten the screws (1) with torque (140Nm). The same procedure on both sides of the rear axle

The parking brakes should now be re-activated and the wheels are locked.

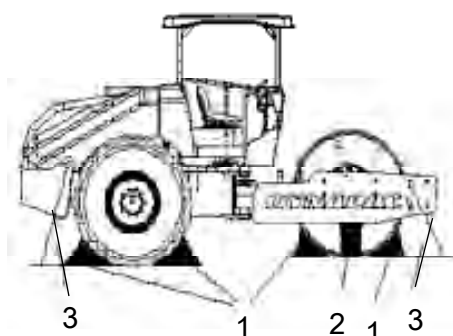
Clear the area of any personnel and that the parking brakes work properly before removing the stop blocks from drum and wheels.

Remove any warning tags from the ignition key and from the steering wheel.

### Roller prepared for transport



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



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

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

Block up under the drum frame (2), to avoid overload on the rubber suspension of the drum when lashing.

Clamp down the roller with lashing strap at all four corners; decals (3) indicate the fixing points.



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

### Operating instructions - Summary



1. **Follow the SAFETY INSTRUCTIONS specified in the Safety Manual.**
2. Make sure that all instructions in the MAINTENANCE section are followed.
3. Turn the master switch to the ON position.
4. Move the forward/reverse lever to the NEUTRAL position.
5. Set the switch for Manual/Automatic vibration to the 0 position.
6. Set the engine speed control to idle.
7. Start the engine and allow it to warm up.
8. Set the engine speed control to the operating position.
9. Set the emergency/parking brake knob in the pulled-out position.



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



11. **Test the brakes. Remember that the braking distance will be longer if the roller is cold.**
12. Use vibration only when the roller is in motion.



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





### Preventive maintenance

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

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

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

### Acceptance and delivery inspection

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

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

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

### Warranty

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

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



### Maintenance - Lubricants and symbols








#### Fluid volumes

Rear axle (Carraro)	
- Differential	14,5 ±0,5 liter
- Planet gear	1,3 ±0,1 liters/side
- Transmission box	0,5 ±0,1 liters
Drum	15 liter
Hydraulic reservoir	52 liters
Oil in hydraulic system	23 liters
Lubrication oil, diesel engine	11 liter
Coolant, diesel engine	24 liter



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

#### DYNAPAC/AtlasCopco














	ENGINE OIL	Air temperature -15°C - +50°C (5°F-122°F)	K-Oil premium (SAE 15 W40)	
	HYDRAULIC FLUID	Air temperature -15°C - +50°C (5°F-122°F)	Shell Tellus S2 V68 or equivalent.	<b>AtlasCopco Hydraulic 300</b> , P/N D971800001 (20 liters)
		Air temperature over +40°C (104°F)	Shell Tellus S2 V100 or equivalent.	
	DRUM OIL		Shell Omala HD 150	<b>Dynapac Drum Oil 1000</b> ,@@P/N 4812156456 (5 liters)
	GREASE		Shell Retinax LX2 or equivalent.	<b>Dynapac Roller Grease</b> (0.4kg), P/N 4812030095
	GREASE		SKF LGHB2 (NLGI-Klass 2) or equivalent for the steering hitch.	<b>Dynapac Roller Grease</b> (0.4kg), P/N 4812030096
	FUEL	See engine manual.	-	-
	TRANSMISSION OIL		Shell Spirax S4 TXM SAE 10W30, API GL-4 or equivalent	
	COOLANT	Anti-freeze protection down to about -37°C (-34.6°F)	K-COOL SUPERPLUS or equivalent, (mixed 50/50 with water)	

## Maintenance - Lubricants and symbols



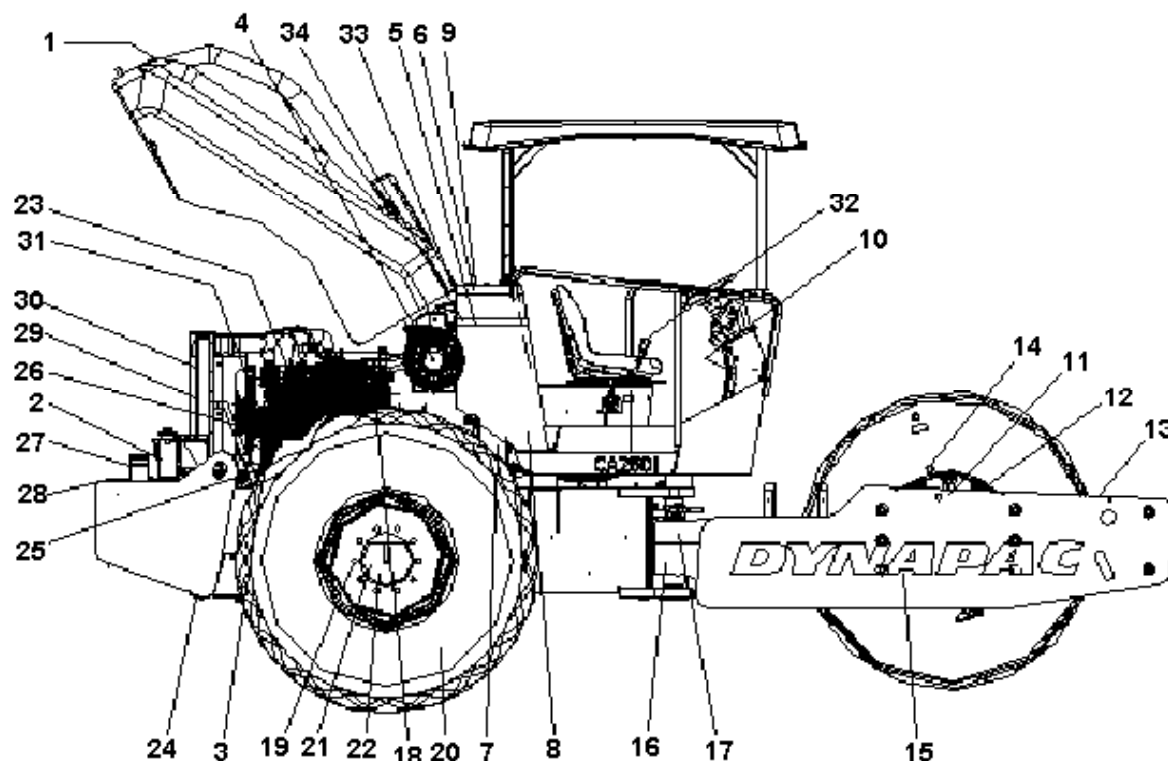
Other fuel and lubricants are required when operating in areas with extremely high or extremely low ambient temperatures. See the 'Special instructions' chapter, or consult Dynapac.

### Maintenance symbols

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

## Maintenance - Maintenance schedule

### Service and maintenance points



**Fig. Service and maintenance points**

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

### General

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

## Maintenance - Maintenance schedule



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



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

### Every 10 hours of operation (Daily)

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

Pos. in fig	Action	Comment
	<b>Before starting up for the first time on that day</b>	
13	Check the scraper setting	
1	Check for free circulation of cooling air	
34	Check coolant level	Refer to the engine manual
3	Check the engine oil level	Refer to the engine manual
27	Refuel	
5	Check the hydraulic reservoir level	
	Test the brakes	
17	Grease the steering cylinder bearings	

### 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
3,23	Change the engine oil and oil filter	Refer to the engine manual
3	Change the fuel filter	Refer to the engine manual
8	Change the hydraulic fluid filter	
21	Change oil in rear axle differential	
22	Change oil in the rear axle planetary gearing	

### Every 50 hours of operation (Weekly)

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

Pos. in fig	Action	Comment
	Check that hoses and couplings are not leaking	
4	Inspect/clean the filter element in the air cleaner	Replace as required
16	Lubricate the articulation	
17	Check that the guiding cylinders are tight	
19	Check the wheel-nuts are tightened	
20	Check the tire pressure	

### Every 250 hours of operation (Monthly)

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

Pos. in fig	Action	Comment
22	Check oil level in rear axle/planetary gearing	
14	Check oil level in the drum	
30	Clean the coolers	
19	Check the bolted joints	The above applies to new or reconditioned components only
15	Check rubber elements and bolted joints	
28	Check battery	

### Every 500 hours of operation (Every three months)

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

Pos. in fig	Action	Comment
2	Replace the fuel filter, mud filter	Refer to the engine manual
6	Check bleeder filter on hydraulic reservoir	
3,23	Change the engine oil and oil filter	Refer to the engine

## Maintenance - Maintenance schedule

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### Every 1000 hours of operation (Every six months)

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

Pos. in fig	Action	Comment
7	Change the hydraulic fluid filter	
8	Drain the condensate from hydraulic reservoir	
24	Drain condensate from fuel tank	
21	Change oil in rear axle differential	
22	Change oil in the rear axle planetary gearing	
	Check engine valve clearances	Refer to the engine manual
31	Check belt tension for drive system	Refer to the engine manual

### Every 2000 hours of operation (Yearly)

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

Pos. in fig	Action	Comment
8, 9	Change the hydraulic fluid	
11	Change the oil in the drum	
32	Lubricate the Forward/Reverse lever	



## Maintenance, 10h



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

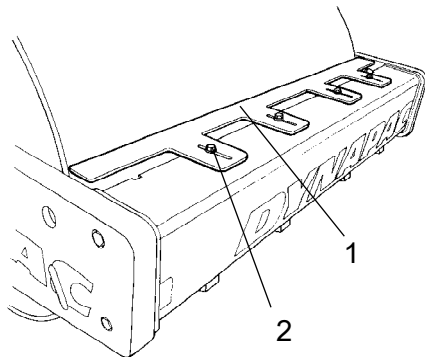


***Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***

### Scrapers - Check, adjustment



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



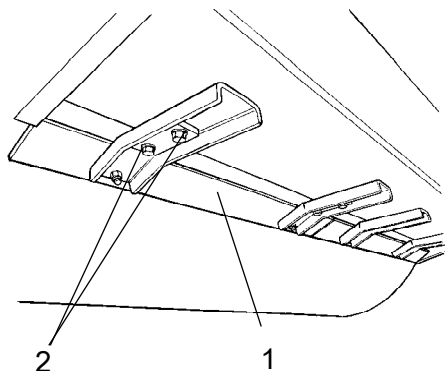
**Fig. Scrapers**  
**1. Scraper blades**  
**2. Screws (4)**

If necessary, adjust distance to the drum as follows:

Undo the screws (2) on the scraper attachment.

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

Tighten the screws (2).



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

### **Steel scrapers (Optional)**

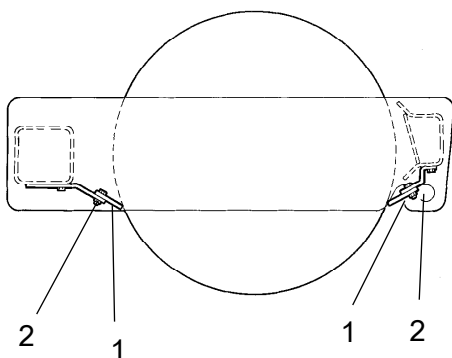
If necessary, adjust distance to the drum as follows:

Undo the screws (2) on the scraper attachment.

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

Tighten the screws (2).

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



**Fig. Scrapers**  
1. Scraper blade  
2. Screws

### **Soften scrapers (Optional)**

Loosen the screws (2).

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

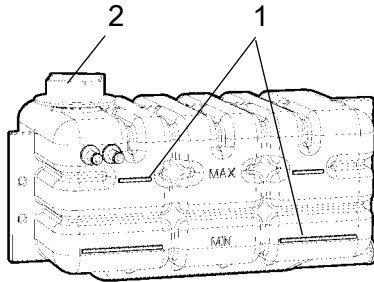
Tighten the screws (2).



### Coolant level - Check

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

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



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

Check the coolant level with the engine stopped and cold.

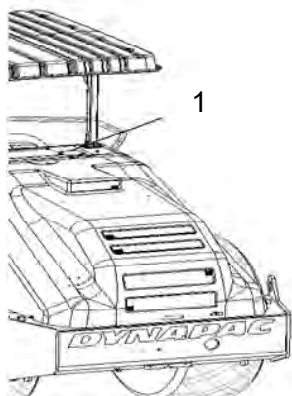
Check that the coolant level is between the max/min markings (1).

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



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

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



**Fig. Cooler grille**  
**1. Filler cap, coolant**

### Air circulation - Check

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



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



### Fuel tank - Filling

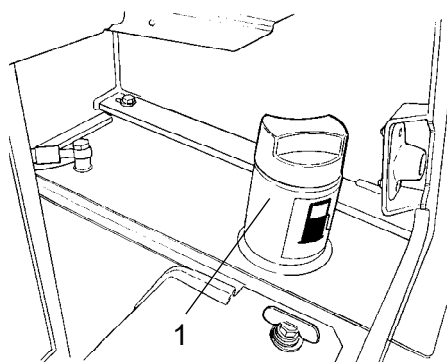
Refuel daily with diesel fuel up to the lower edge of the filler pipe (1). Follow the engine manufacturer's specification with regard to the quality of diesel fuel.



**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.**



**Fig. Filling with fuel**  
**1. Filler pipe**

The tank holds 250 liters of fuel.



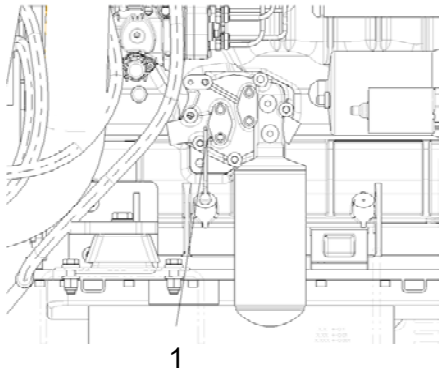
## Diesel engine Check oil level



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

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

Pull up the dipstick (1) and check that the oil level is between the upper and lower marks. For further details, refer to the engine's instruction manual.



**Fig. Engine compartment**  
**1. Dipstick**

## Brakes - Check



**Check operation of the brakes as follows:**



## Checking the emergency stop

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

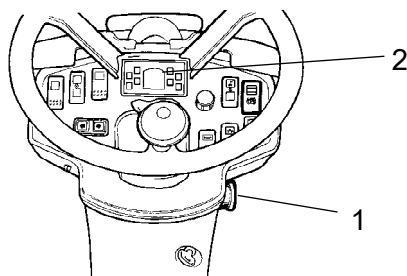
Press the emergency stop (1). The roller will stop abruptly and the engine will be switched off.

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

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

The roller is now ready for operation.

**Refer also to the section in the manual on operation.**



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

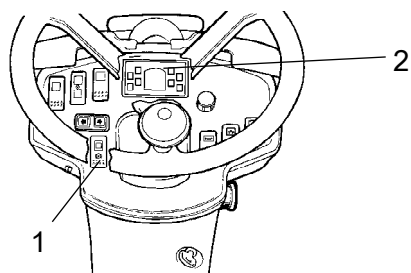
## Brakes - Check



**Check operation of the brakes as follows:**



### Checking the parking brake



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

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

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

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

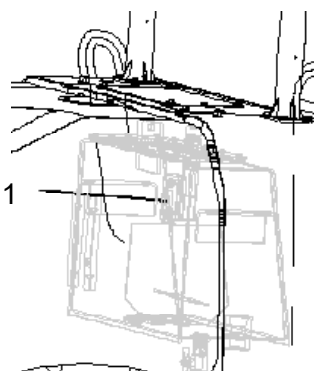
Reset the parking brake switch (1).

The roller is now ready for operation.

**Refer also to the section in the manual on operation.**



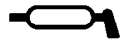
### Hydraulic reservoir - Check fluid level



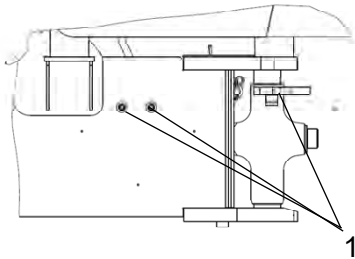
**Fig. Sight glass hydraulic reservoir**  
1. Sight glass

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

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



## Steering cylinder - Lubrication



**Fig. Tractor frame/Steering hitch**  
**1. Grease nipples**

Wipe off any dirt and grease from the nipples.

Grease each nipple (1) with three strokes of a hand-operated grease gun.

Leave a small amount of grease on the nipples following lubrication to prevent dirt from penetrating in.



Use grease as per the lubricant specification.





## Maintenance - 50h



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



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

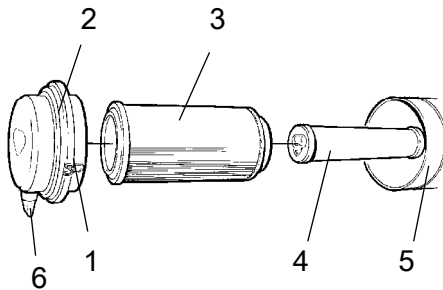


### Air cleaner

#### Checking - Change the main air filter



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



**Fig. Air cleaner**

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

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

Do not remove the backup filter (4).

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

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

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

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

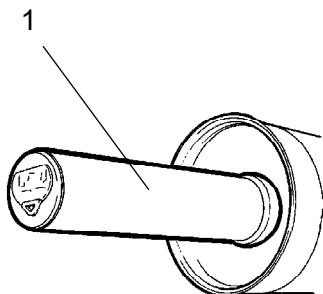


## Backup filter - Change

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

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

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



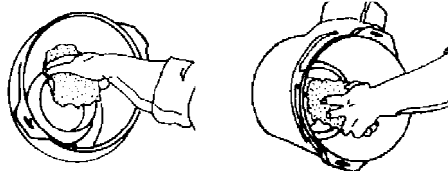
**Fig. Air filter**  
**1. Backup filter**



## Air cleaner - Cleaning

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

Wipe clean on both sides of the outlet pipe.



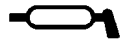
Inner edge of  
outlet pipe.

Outer edge of outlet  
pipe.

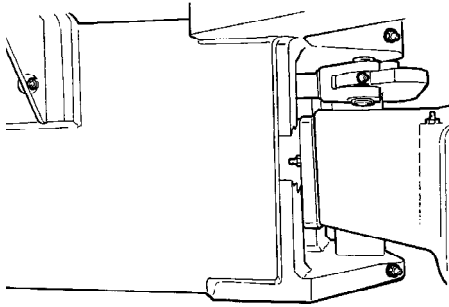
Wipe also both surfaces for the outlet pipe; see adjacent figure.



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



## Articulation - Lubrication



**Fig. Steering hitch right side**

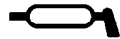


**Do not allow anyone to remain in the vicinity of the steering joint when the engine is running. Risk of being crushed when the steering is operated. Press the emergency/parking brake knob before lubricating.**

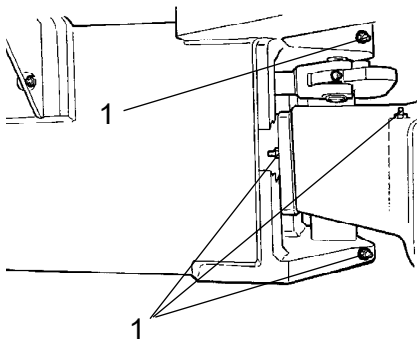
Turn the steering wheel fully to the left to gain access to all the steering system's lubricating nipples (4) on the right-hand side of the machine.



**Use grease as per the lubricant specification**



## Steering joint - Lubrication



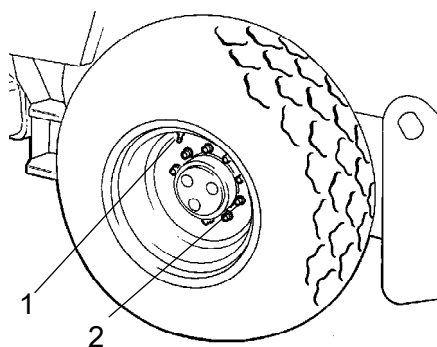
**Fig. Articulation, right side**  
**1. Lubricating nipples, articulation (4 pcs)**

Wipe off any dirt and grease from the nipples.

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



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



**Fig. Wheels**  
**1. Air valve**  
**2. Wheel nut**

## **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 anti-slip in the rear axle.

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

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



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

## Maintenance - 250h



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



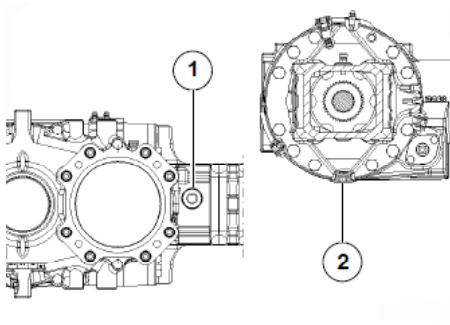
***Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***



### Rear axle differential - Check oil level



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



***Fig. Check level - differential housing  
1. Level/Filler plug***

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

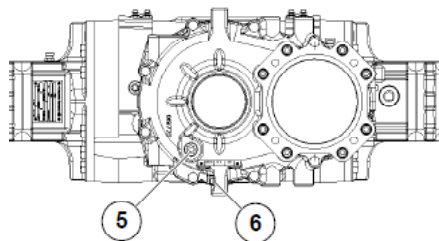
Clean and refit the plug.



## Rear axle transmission box - Check oil level



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



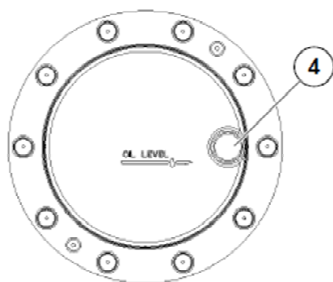
**Fig. Level check - transmission box**  
5. Level/Filler plug  
6. Drain plug

Wipe clean and remove the level plug (5) and check that the oil level reaches the lower edge of the plug hole. Top up with oil to the right level if the level is low. Use transmission oil, see lubricant specification.

Clean and refit the plug.



## Rear axle planetary gears - Check oil level



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

Position the roller with the plug in the planetary gear (4) in the "3 o'clock" position.

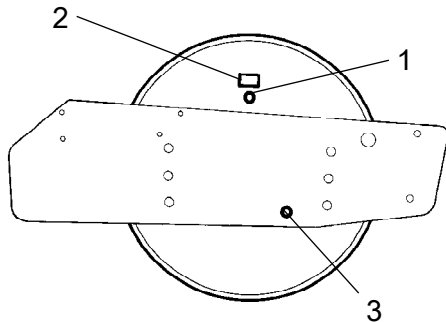
Wipe clean and remove the level plug (4) and check that the oil level reaches the lower edge of the plug hole. Top off with oil to the right level if the level is low. Use transmission oil. See lubrication specification.

Clean and refit the plug.

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



## Drum - Checking the oil level



**Fig. Roller, right-hand side**

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

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

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

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

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

See the lubrication specification for the correct oil grade.



**Do not overfill with oil - risk for overheating.**

## Radiator - Check/Cleaning

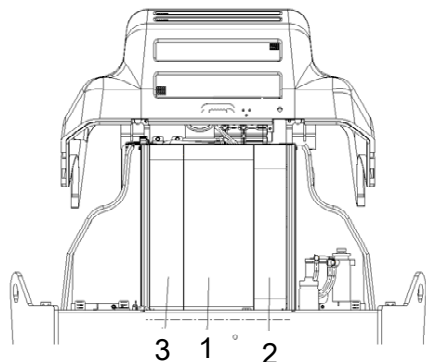
Check that air can pass unobstructed through the radiators (1) and (2).

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

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



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

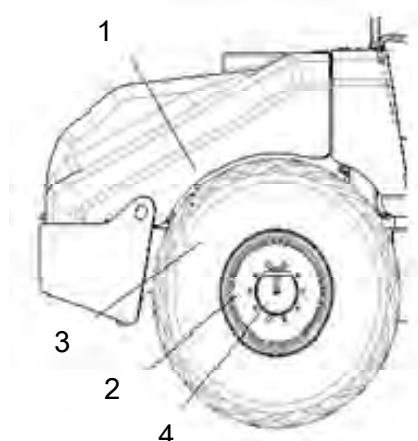


**Fig. Engine compartment**

- 1. Water cooler
- 2. Hydraulic fluid cooler
- 3. Charge air cooler



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



**Fig. Right side of machine**

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

### **Bolted joints - Checking tightening torque**

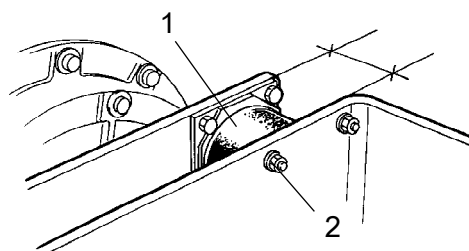
Steering pump to diesel engine (1) 55 Nm, lightly oiled

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

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

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

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



**Fig. Drum, vibration side**

- 1. Rubber element
- 2. Fastening screws

### **Rubber elements and fastening screws - Check**

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

Check using a knife blade or pointed object.

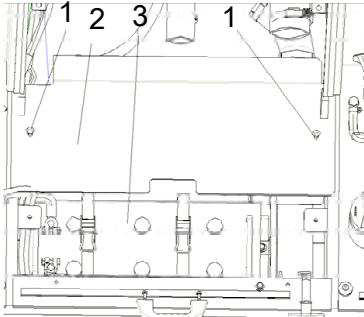
Check also that the screw fasteners (2) are tightened.

Drum rubber elements change is 18 months or 2000h, which is earliest.





## Battery - Check electrolyte level



**Fig. Battery shelf**  
1. Wing nuts/Studs  
2. Battery cover  
3. Battery



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

Open the engine cover and undo the wing nuts/studs (1).

Raise the battery cover (2).

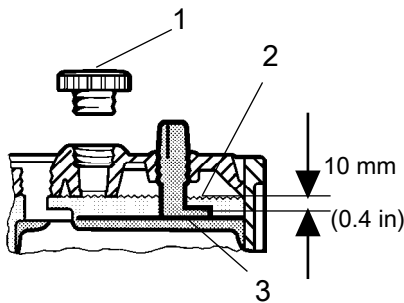
Wipe the top of the battery.



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



## Battery cell



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

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

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

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

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



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



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



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



## Maintenance - 500h



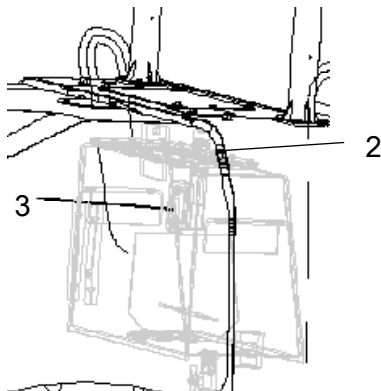
***Park the roller on a level surface.  
When checking and making adjustments, the engine should be switched off and the emergency/parking brake should be applied, if not otherwise specified.***



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



### Bleeder filter - Inspection/Cleaning



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

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



***Always wear protective goggles when working with compressed air.***

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

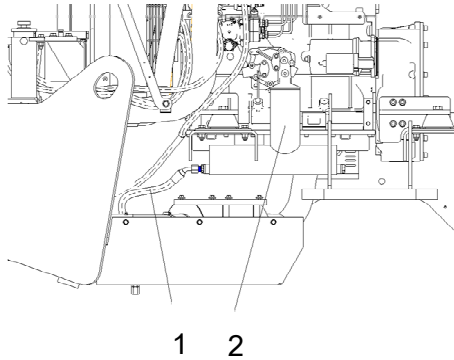
Start the engine and check that there is no leakage of hydraulic fluid from the filter. Check level of fluid in the sight glass (3) and top up as required.



## Diesel engine - Oil and Filter change



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



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

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

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



**Deliver the drained oil and filter to environmentally correct handling.**

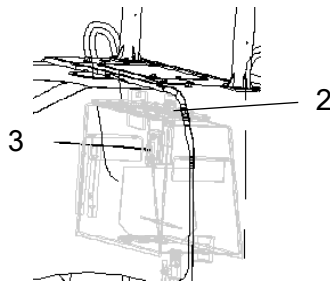
## Maintenance - 1000h



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



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



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

### Hydraulic fluid filter - Replacement

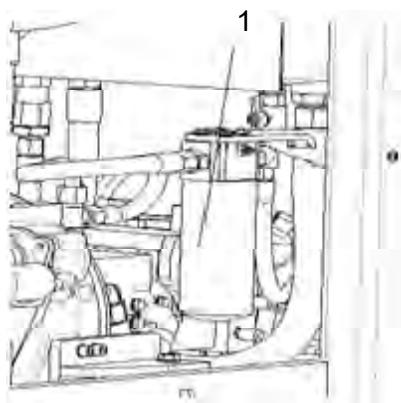
Undo the cover/bleeder filter (2) on top of the reservoir so that over-pressure inside the reservoir can be eliminated.

Check that the bleeder filter (2) is not clogged, air must flow through the cap in both directions.

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



**Wear protective goggles when working with compressed air.**



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

Carefully clean round the hydraulic filter.



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



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

Thoroughly clean the sealing surfaces on the filter head.

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



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

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



### Hydraulic fluid reservoir - Draining

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

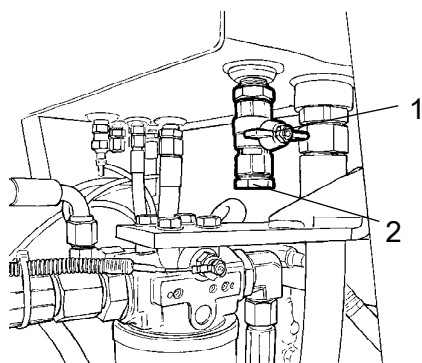
Drainage must be performed when the roller has been stationary for an extended period, e.g. after being stationary overnight.

Drain as follows:

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



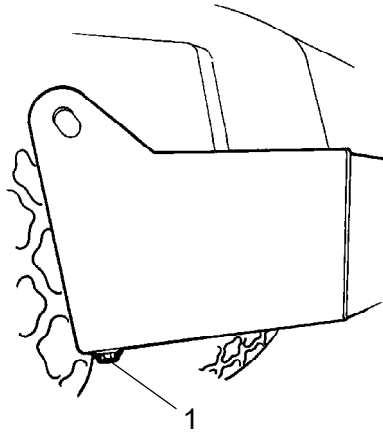
Save the condensate and hydraulic fluid and hand it in to an environment-friendly waste disposal station.



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



## Fuel tank - Drainage



**Fig. Fuel tank**  
**1. Drainage plug**

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



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

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

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



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

Drain as follows:

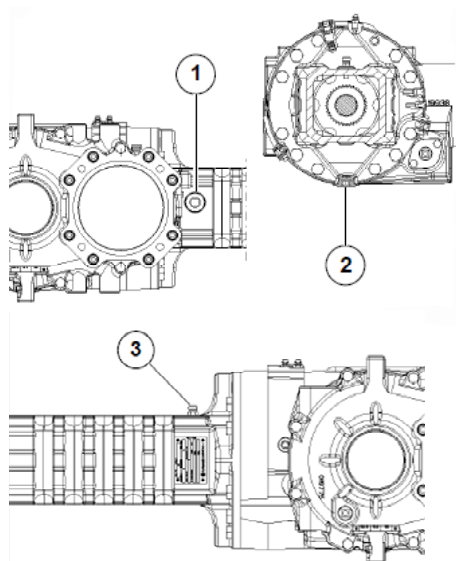
- Place a container under the plug (1).
- Remove the plug (1).
- Drain out the condensate and sediment until only pure fuel emerges at the plug.
- Screw in the plug again.



## Rear axle differential - Oil change

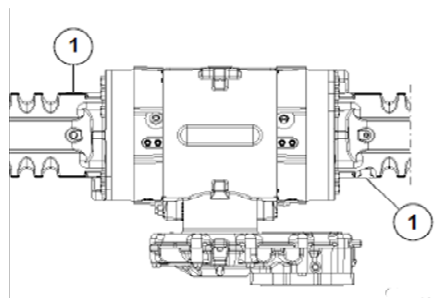


**Never work under the roller when the engine is running. Park on a level surface. Block the wheels securely.**



**Fig. Differential - Draining**

- 1. Level/Filler plug**
- 2. Drain plugs**
- 3. Breather**



**Fig. Differential - filling**

- 1. Level/Filler plugs**

Before draining the oil, use the breather (3) to release possible internal pressure.

Wipe clean and remove one of the two level/filler plugs (1) and the drain plug (2) and drain the oil into a suitable receptacle. The volume is approximately 15 liters (16 qts).



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

Clean and refit the drainage plug (2) and tighten with torque (60Nm)

Fill with fresh oil in the level/filler hole until the oil level reaches the lower edge of the plug hole. Use transmission oil, see lubricant specification.

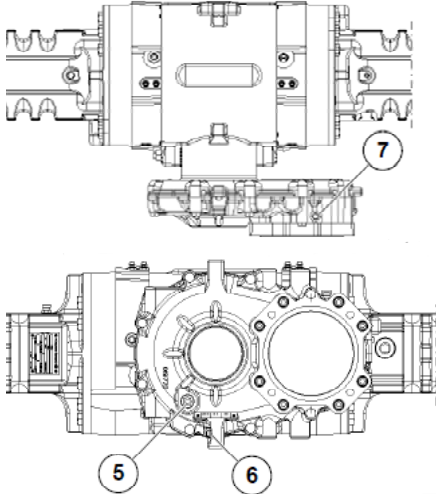
Note that it takes a while for the oil to be distributed in the axle. Do not fill the entire volume at once.

Refit the level/filler plug (1) and tighten with torque (25Nm).





## Rear axle transmission - Oil change



**Fig. Rear axle - draining**  
5. Level/Filler plug  
6. Drain plug  
7. Breather

Before draining the oil, use the breather (7) to release possible internal pressure.

Wipe clean and remove one of the two level/filler plugs (5) and the drain plug (6) and drain the oil into a suitable receptacle. The volume is approximately 1 liter (1.1 qts).



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

Clean and refit the drainage plug (6) and tighten with torque (60Nm).

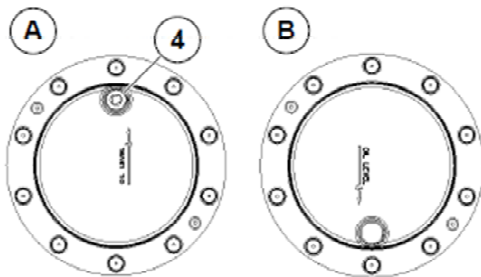
Fill with fresh oil in the level/filler hole until the oil level reaches the lower edge of the plug hole. Use transmission oil, see lubricant specification.

Use transmission oil, see lubricant specification.

Refit the level/filler plug (5) and tighten with torque (60Nm).



## Rear axle's planetary gears - Draining the oil



**Fig. Oil drain - planet gear**  
4. Level/Filler plug

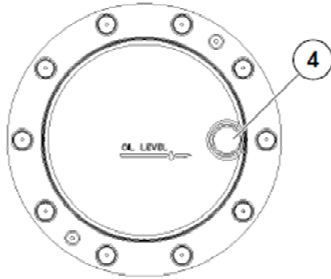
Before draining the oil rotate the wheel so that the plug (4) is at the highest positions (pos.A) and partially unscrew the plug to release possible pressure.

Then rotate the wheel so that the plug (4) is at its lowest position (pos.B).

Wipe clean and remove the plug (4) and drain the oil into a receptacle. The volume is approx. 2 liters (2.1 qts).



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



**Fig. Oil filling - planet gear**  
**4. Level/Filler plug**

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

Set the roller so that the plug (4) in the planetary gear is at "3 o' clock".

Wipe clean and remove the plug (4).

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

Clean and refit the plug (4).

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

## Maintenance - 2000h



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



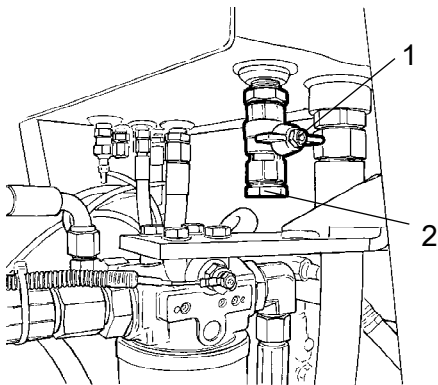
***Ensure that there is good ventilation (air extraction) if the engine is run indoors. Risk of carbon monoxide poisoning.***



### Hydraulic reservoir - Changing the fluid



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



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

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

Unscrew the drain plug (2).

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

Refit the plug.



**Deliver the drained fluid to environmentally correct handling.**

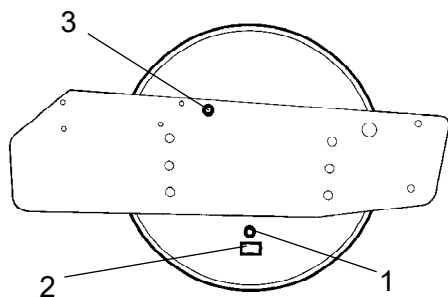
Fill with fresh hydraulic fluid. Refer to the lubricants specification for grade information.

Change the hydraulic fluid filter as described under the heading 'Every 1000 hours of operation'.

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



## Drum - Oil change



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

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

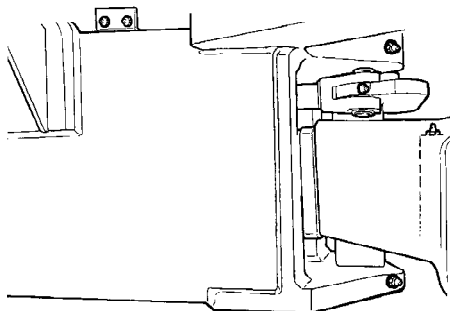


Save the oil and dispose of it in an approved manner.

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



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



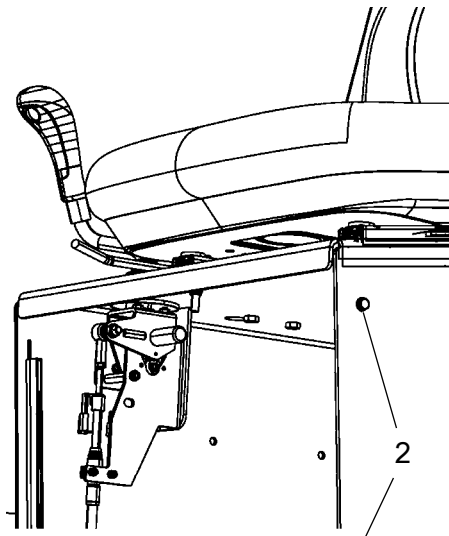
**Fig. Steering hitch**

## Steering hitch - Check

Inspect the steering hitch to detect any damage or cracks.

Check and tighten any loose bolts.

Check also for any stiffness and play.



**Fig. F/B control**  
**2. Screws**

### **Controls - Lubrication**

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

Refit the hatch.

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