The CA51 family of vibration rollers consists of models CA 511D, CA 511PD and CA 551D, where CA 511D/551D is especially highly productive for the compaction of coarse blasted rock but is equally effective on other material, granular or cohesive.

The typical machine for cohesive material is the CA 511PD. This roller is also particularly suitable for the compaction of disintegrated stone material. Interchangeable drums, ie, smooth drum or padfoot, facilitate a wide range of application.

CA 511/551 is the basic version dealt with in these operating instructions. Separate information is available on request concerning additional equipment.

MAINTENANCE

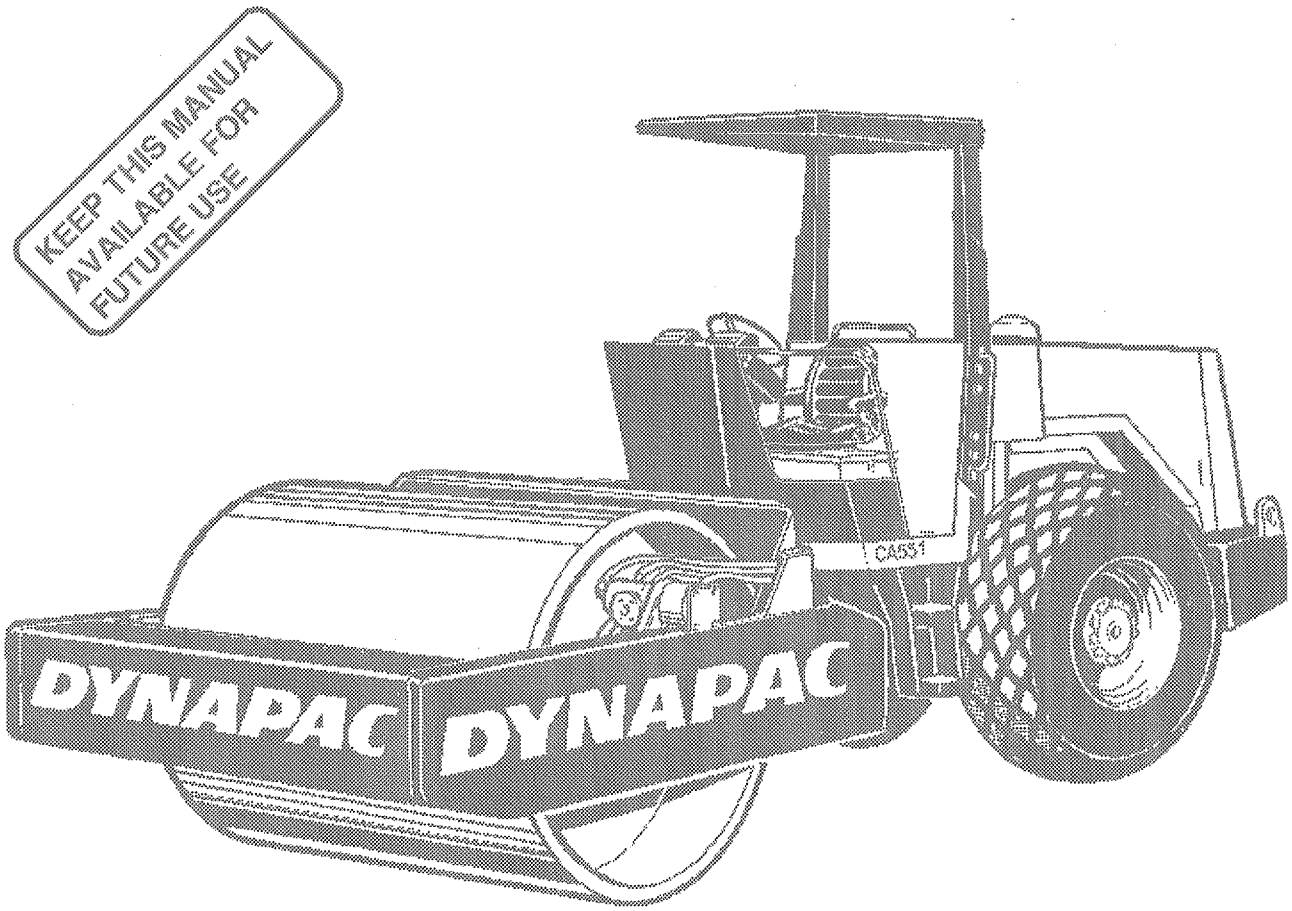
CA 511/551

VIBRATORY ROLLER

M511EN2, 961230

Diesel Engine:
Deutz BF6L 913

Operating Instructions apply for
CA 511: PIN (S/N) *61410001*
CA 551: PIN (S/N) *61410026*



SVEDALA DYNAPAC
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CONTENTS

WARNING SYMBOLS

WARNING

Warning - Personal safety may be involved.

CAUTION

Caution - Machine or component damage

GENERAL

WARNING

Read all the instructions thoroughly before carrying out any servicing operations.

WARNING

Ensure that ventilation (evacuation) is adequate if the engine is run indoors.

Proper care of the roller is essential to ensure satisfactory operation. Keep the machine clean so that any leakage, loose bolts or loose connections can be easily detected.

TAKE CARE OF THE ENVIRONMENT. Do not spill oil or fuel, or leave anything else that could be detrimental to the environment.

This manual includes instructions for periodic maintenance which should normally be carried out by the operator.

CAUTION

Instructions in the engine manufacturer's manual also apply. The manual is included in the product folder supplied with the roller.

CALIFORNIA

Proposition 65 Warning

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

LUBRICANTS AND SYMBOLS

CAUTION

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

ENGINE OIL, ambient temp. -10°C to +50°C (14°F to 122°F)	Shell Rimula SAE 15W/40 or equivalent. API Service CD/SE, CD/SF
HYDRAULIC FLUID, ambient temp. -10°C to +40°C (14°F to 104°F) **above +40°C (+104°F)**	Shell Tellus Oil TX68 or equivalent **Shell Tellus Oil T100 or equivalent**
TRANSMISSION OIL, ambient temp. -15°C to +40°C (5°F to 104°F) **above +40°C (+104°F)**	Shell Spirax SAE 80W/90, HD API, GL-5 **Shell Spirax HD85W/140 or equivalent**
DRUM OIL/CASSETTE OIL All temperatures	Synthetic oil, MOBIL SHC 629 or equivalent
GREASE	Shell Calithia EPT2 or equivalent
FUEL	See engine manual
COOLANT 50/50 mixture with water	Shell Anti Freeze 402 or equivalent. Freeze safe down to about -35°C (-31°F).

CAUTION

Other lubricants are required for operation in extremely high or extremely low ambient temperature. See, chapter "Special instructions", or get in touch with Dynapac.

Engine oil level	Air cleaner
Engine oil filter	Battery
Hydraulic reservoir level	Tyre pressure
Hydraulic fluid filter	Sprinkler
Transmission oil level	Sprinkler water
Lubricating oil	Coolant level
Fuel filter	Recyclable

Weight and dimensions	CA 511D	CA 511PD	CA 551D
Weight CECE, standard eq. roller incl. ROPS — kg (lbs)	15200* (33500)	15400* (33950)	15850* (34950)
Length, standard eq. roller — mm (in)	5772 (227)	5772 (227)	5772 (227)
Width, standard eq. roller — mm (in)	2425 (95)	2425 (95)	2425 (95)
Height, standard eq. roller incl. ROPS — mm (in)	2965 (117)	3015 (117)	2965 (117)
Height, w/o ROPS — mm (in)	2190 (86)	2245 (88)	2190 (86)
Height, with cabin — mm (in)	2820 (111)	2870 (113)	2820 (111)

WARNING

*** The total weight may not exceed 16500 kg (36380 lbs), including accessories, extra equipment or ballast.**

Fluid volumes — litres (US gallon)

Rear axle:
- Differential 12 (3,2)
- Planetary gears ..... 2,5 (0,7) each side

Pump drive/Transfer gearing 1,5 (0,4)
Drum drive/Drum gearing 12 (3,2)
Drum, vibrator ..... 2,7 (0,7) each side
Hydraulic reservoir 90 (23,8)
Hydraulic system 20 (5,3)
Diesel engine, Deutz 16 (4,2)
Fuel tank 265 (70,0)

Electrical system

Battery ..... 12 V, 160 Ah
Alternator ..... 12 V, 95 A
Fuses ..... See under main heading: Electrical system

Tires

Tires dimension ..... 23.1 x 26.0 8 Ply
Tire pressure ..... 0,11 - 0,15 MPa (1,1 - 1,5 kp/cm^2) (16-21 psi)

WARNING

Tires can be filled with liquid as an optional feature. In connection with service, remember the additional weight that this implies.

Vibration data		CA 511D	CA 511PD	CA 551D
Static linear load	kg/cm (pli)	49,1 (275)	-	55,3 (310)
Amplitude (High)	mm (in)	1,8 (0.071)	1,7 (0.067)	1,75 (0.069)
Amplitude (Low)	mm (in)	0,9 (0.035)	0,8 (0.031)	0,85 (0.033)
Frequency (High ampl.)	Hz (vpm)	27 (1,620)	27 (1,620)	27 (1,620)
Frequency (Low ampl.)	Hz (vpm)	32 (1,920)	32 (1,920)	32 (1,920)
Centrifugal force (High ampl.)	kN (lb)	258 (58,050)	258 (58,050)	258 (58,050)
Centrifugal force (Low ampl.)	kN (lb)	176 (39,600)	176 (39,600)	

Tightening torque

Tightening torque in Nm (ftlbs) for oiled bolts tightened with a torque wrench.

M thread	STRENGTH CLASS 8.8	10.9	12.9
M6	10 (7)	14 (10)	17 (12)
M8	24 (18)	33 (24)	40 (29)
M10	47 (35)	65 (48)	79 (58)
M12	81 (60)	114 (84)	136 (100)
M14	128 (94)	181 (133)	217 (160)
M16	197 (145)	277 (204)	333 (245)
M18	275 (202)	386 (284)	463 (340)
M20	385 (283)	541 (398)	649 (477)
M22	518 (381)	728 (535)	874 (643)
M24	665 (489)	935 (688)	1120 (824)
M27	961 (707)	1350 (993)	1620 (1191)
M30	1310 (963)	1840 (1353)	2210 (1625)

ROPS

Bolt size:	M24
Strength class:	8.8
Tightening torque:	640 Nm (472 ftlbs)

Hydraulic system

Relief pressure – MPa (psi)	
Traction system	35 (5,100
Charge relief	2 (290)
Vibration system	35 (5,100)
Steering system	14 (2,050)
Brake release	1.5 (220)

Noise level - Operator's position (ISO 6394)

Measured sound pressure level, LpA, on hard supporting surface and with vibration switched OFF:

LpA: 92 dB(A)
Machine with cab: LpA: 87 dB(A)

Sound effect level - Surroundings (SS 459 10 10)

Measured sound effect level, LwA, on hard supporting surface and with vibration switched OFF according to SS 459 10 10:

LwA: 110 dB(A)
Machine with cab: LwA: 109 dB(A)

Vibrations — Operator´s position (ISO 2631)

Measured with vibration switched on and on a foam rubber mat: (Limit value 0,5 m/s^2):		
Vibration level for machine	**Operator´s seat (m/s^2)***	**Floor of operator´s platform (m/s^2)****
CA 511/551Std/D	0,24	0,12
+ ROPS	0,33	0,65
+ cab	0,23	0,06
+ ROPS and cab	0,27	0,21

* Aggregate acceleration on operator's seat
** Maximum acceleration in z-axis of floor.

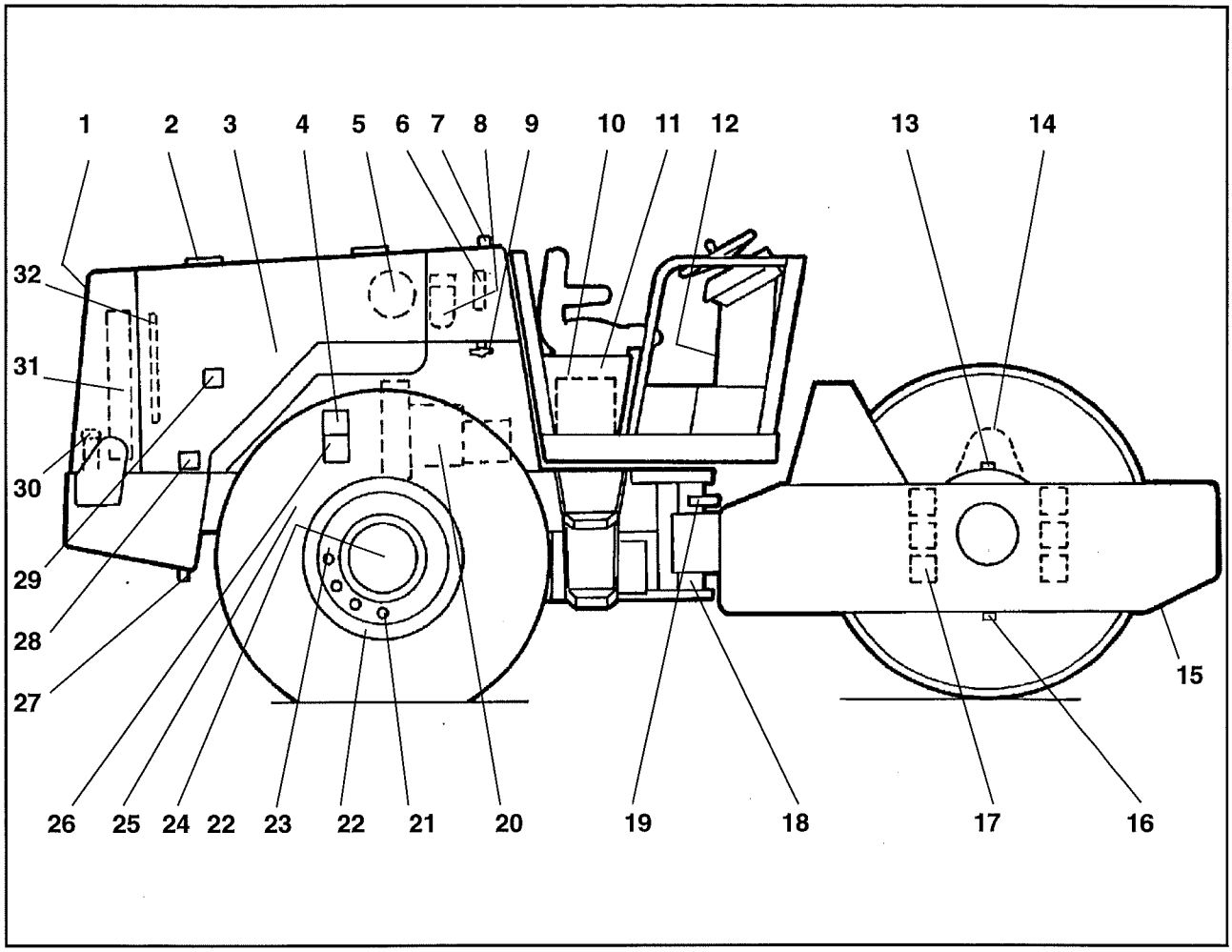

Fig. 1 Service points

1 Radiator grille
2 Engine cover, hinges
3 Oil level, engine
4 Fuel filter
5 Air cleaner
6 Hydraulic reservoir, sight glass
7 Venting filter
8 Hydraulic filter, 3 off
9 Drain, hydraulic reservoir
10 Battery
11 Hydraulic fluid, filling
12 Fuse box
13 Drum oil, filler plug, 2 off
14 Torque hub
15 Scraper
16 Drum oil, level plug, 2 off
17 Rubber elements and fastening bolts
18 Articulated steering
19 Steering cylinders, 2 off
20 Flywheel cover, hydraulic pumps
21 Wheel nuts
22 Tire pressure
23 Rear axle, differential
24 Rear axle, planetary gears, 2 off
25 Rear axle suspension, 2 sides
26 Oil filter, engine
27 Drain, fuel tank
28 Engine suspension, 4 off
29 Fuel pump
30 Diesel fuel, filling
31 Hydraulic fluid cooler
32 Drive belts, cooling, alternator

Periodical maintenance measures should be carried out immediately following the number of operating hours stated.

CAUTION

Always clean off the surrounding dirt before draining, filling or checking oil and fuel, and before lubricating with oil or grease.

CAUTION

Instructions in the engine manufacturer's manual also apply.

Every 10 hours of operation (Daily)

Item in Fig. 1	Procedure	See page	Note
	Before first start		
3	Check level of engine oil		See engine manual
15	Check scraper setting	10	
	Check the brakes	10	
1	Check that circulation of cooling air is free	10	
	On completion of the days work		
6	Check level of hydraulic reservoir,	11	
	drain and refill if fluid is to be changed	23	New or refurbished component only!
30	Refuel	11	

Every 50 hours of operation (Weekly)

Item in Fig. 1	Procedure	See page	Note
26	Change engine oil and oil filter		See engine manual
5	Clean air cleaner insert	12	
	Ensure that hoses and connections are tight		
10	Check the battery	13	
18	Lubricate the steering joints	14	
19	Lubricate the steering cylinder brackets	14	
21	Check tightening of wheel nuts	15	
22	Check tire pressure	15	
14	Change oil in torque hubs	17	New or refurbished component only!
13	Change oil in drum	23	

CAUTION

Change all lubricating oils, but not the hydraulic fluid, and all oil filters after the **first** 50 hours of operation.

Every 250 hours of operation (Monthly)

Item in Fig. 1	Procedure	See page	Note
-	Clean engine cooling fins		See engine manual
32	Check the belt-tension monitor		See engine manual
32	Check belt tension on fan and alternator		See engine manual
24	Check oil level in rear axle/planetary gearing	16	
20	Check oil level in transfer gearbox	16	
14	Check oil level in drum gearbox	17	
14	Lubricate drum gearbox	17	
14	Check the brake on drum gearbox	17	
14	Drain torque hub brake	18	
31	Clean the hydraulic fluid cooler	18	
2	Lubricate controls and moving joints	18	
16	Check oil level in drum	19	
20, 25	Check tightening torque	19	New or refurbished component only!
17	Check rubber elements and bolted joints	19	

Every 500 hours of operation (Every three months)

Item in Fig. 1	Procedure	See page	Note
8	Change hydraulic filter	20	
26	Change engine oil and filter		See engine manual
	Check engine valve clearance		See engine manual

Every 1000 hours of operation (Every six months)

Item in Fig. 1	Procedure	See page	Note
9	Drain condensed water from the hydraulic reservoir	21	
7	Change the venting filter on hydraulic reservoir	21	
27	Drain condensed water from the fuel tank	21	
5	Change main filter of air cleaner	22	
4	Change the fuel filter		See engine manual
29	Clean the supply pump strainer		See engine manual
-	Check the engine valve clearance		See engine manual

Every 2000 hours of operation (Yearly)

Item in Fig. 1	Procedure	See page	Note
9	Clean inside of reservoir and change the fluid	23	
20	Change oil in the pump drive	23	
13, 16	Change oil in the drum	23	
23	Change oil in rear axle differential	24	
24	Change oil in rear axle planetary gearing	24	
14	Change oil in the drum gearbox	17	

Scrapers, Checking - Adjustment

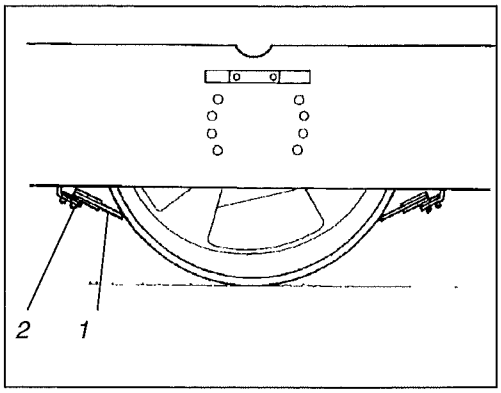

Fig. 2 Scrapers
1 Scraper blade
2 Fastening bolts

If necessary, adjust distance to the drum as follows:

1. Loosen the four fastening bolts (2).
2. Adjust the scraper blade (1) about 10 mm (3/8 in) from the drum and tighten the fastening bolts.
3. Adjust the other scraper blade in the same way.

Brakes - Test

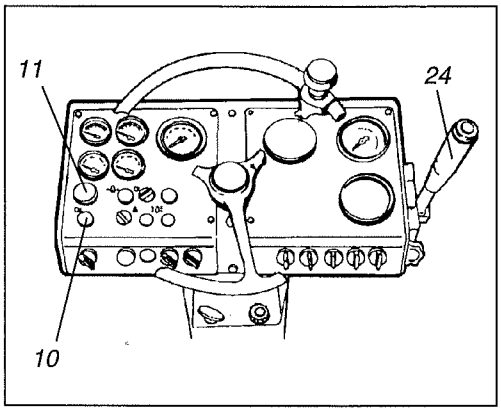

Fig. 3 Instrument panel
10 Brake warning lamp
11 Emergency stop
24 Forward/reverse lever

WARNING

Check operation of the brakes as follows:

1. Drive the roller **slowly** forward.
2. Press the emergency stop knob (11). The brake warning lamp (10) should light and the roller should slow down.
3. On completion of the test, put the forward/reverse control (24) in neutral before resetting the emergency stop.
4. Pull out the emergency stop knob.

Air circulation - Checking

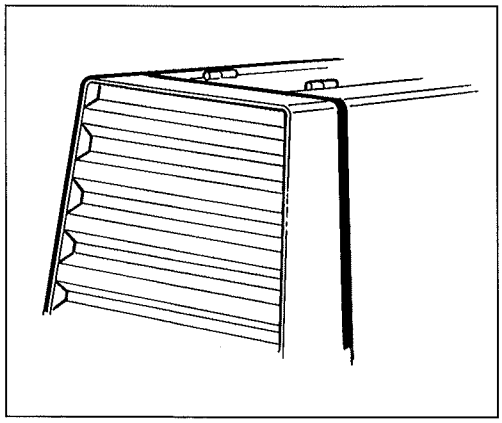

Fig. 4 Radiator grille

Make sure that air can flow freely through the radiator grille into the engine compartment.

Hydraulic reservoir - Checking the level

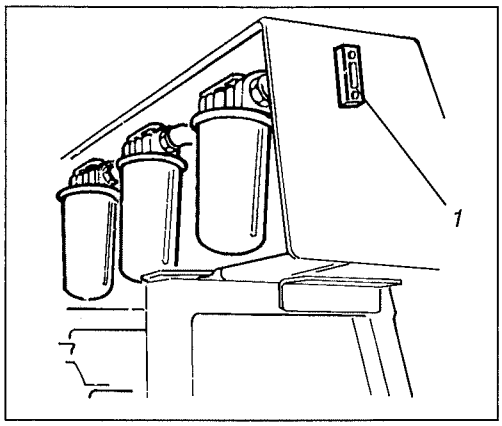

Fig. 5 Hydraulic reservoir
1 Sight glass

1. Position the roller on a level surface and check the sight glass reading (1).
2. Top off with hydraulic fluid, see Lubricant Specification on page 3, if the level is 20 mm (3/4 in) or more below the upper edge of the glass.

Hydraulic reservoir, filling

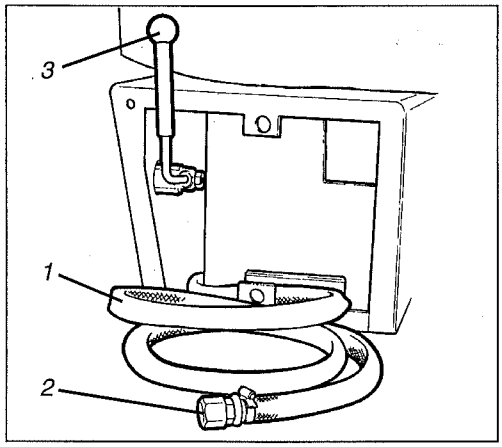

Fig. 6 Battery box
1. Suction hose
2. Protective plug
3. Pump lever

1. Take off the cover on the right side underneath the operator's seat.
2. Take out the suction hose (1).
3. Clean the hose and screw off the protective plug (2).
4. Insert the hose in a drum of fresh hydraulic fluid.
5. Fit the pump lever (3), and pump with the lever and fill the reservoir to the level on the sight glass. The fluid is pumped via a filter to the reservoir so always follow this procedure when filling.

Fuel tank, refuelling

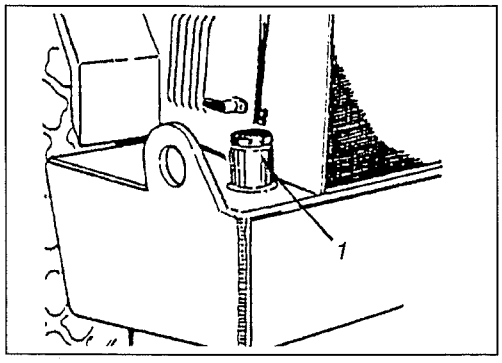

Fig. 7 Fuel tank
1. Filler pipe

Refuel with diesel fuel up to the lower edge of the filler pipe daily at the end of operations.

WARNING **Stop the engine. Ground the refuelling nozzle by touching it against a non-insulated part of the roller before refuelling, and keep the nozzle against the inside of the filler pipe (1) while filling the tank.**

(See the engine manufacturer's instructions with regard to quality of diesel fuel.)

Air Cleaner - cleaning the Primary filter

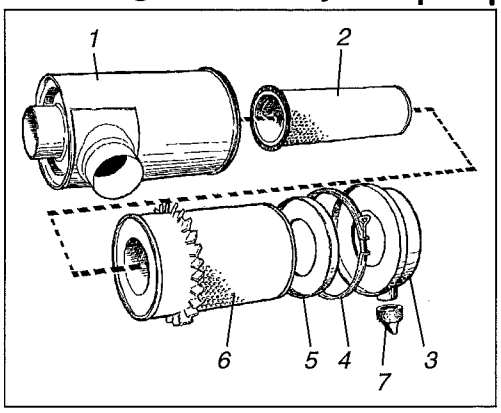

Fig. 8 Air cleaner

1. *Filter housing*
2. *Secondary filter*
3. *Dust trap*
4. *Clamp*
5. *Inner cover*
6. *Primary filter*
7. *Emptying slit*

CAUTION Change or clean the Primary filter of the air cleaner when the warning lamp on the instrument panel lights at full revs of the diesel engine.

1. Loosen the clamp (4) and remove the dust trap (3).
2. Screw off the wing-nut at the center of the filter and take off the inner cover (5). Clean inside the dust trap with a clean rag.
3. Screw off the wing-nut and pull out the Primary filter (6).
4. Wipe the inside of the filter housing (1) and intake pipes with a clean rag.
5. Check that hoses and connections between the filter housing and engine are intact and tight.
6. Clean the emptying slits (7) of the dust trap.

Cleaning with compressed air

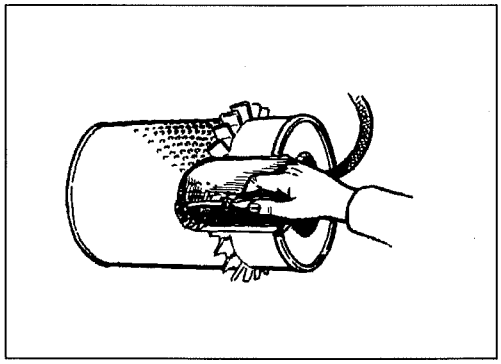

Fig. 9 Primary filter

CAUTION Replace the Secondary filter (2) with a new one every third time the Primary filter is changed or cleaned. The Secondary filter cannot be cleaned and reused.

Use compressed air at a maximum pressure of 0.7 MPa (7 kp/cm^2) (100 psi)

Blow up and down along the paper pleats on the inside of the filter element. Hold the nozzle at least 10 mm (0.4") from the pleats to avoid tearing the paper.

CAUTION Change the Primary filter after cleaning it five times.

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

Battery - Checking the electrolyte level

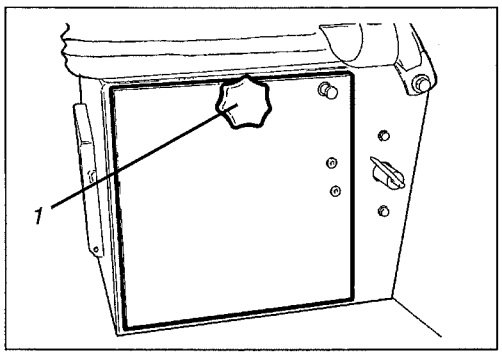

Fig. 10 Battery shelf
1. Knob

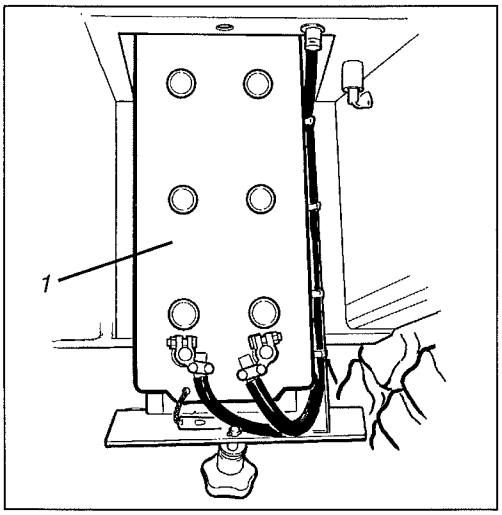

Fig. 11 Battery shelf
1. Knob

Battery cell

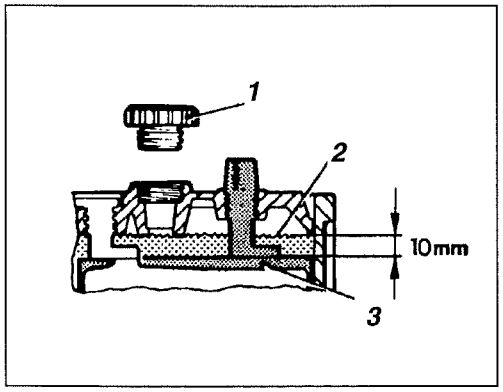

Fig. 12 Electrolyte level in battery
1. Cell cap
2. Electrolyte level
3. Plate

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

1. Turn the knob (1).

2. Pull out the battery shelf.

3. Wipe the top of the battery.

WARNING **Wear protective goggles. The battery contains corrosive acid. Flush with water in the event of contact with the skin.**

3. Take off the cell caps and check that electrolyte level is about 10 mm (0.4") above the plates. Check the level of all cells, and top up with distilled water as required to the correct level. If ambient temperature is below zero, the engine should be run for a while after topping up with distilled water, ie, there is otherwise a risk that the battery fluid will freeze.

4. Make sure the venting holes in the cell caps are not clogged. Refit the caps.

5. Battery terminals must be clean and well tightened. Clean the terminals if corroded and grease them with acid-free Vaseline.

WARNING **Always ensure that the battery box is closed and latched when driving.**

CAUTION When removing the battery, always disconnect the negative cable first.
When fitting the battery, always connect the positive cable first.

Take care of the battery after changing. The battery contains lead which contaminates the environment unless it is treated properly.

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

Articulated Steering - Steering Cylinders Lubrication

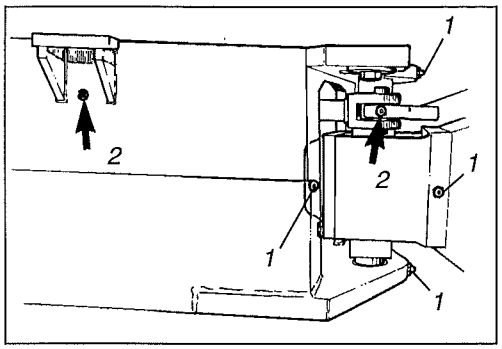

Fig. 13 Steering joint, right side
1 Lubricating nipples, steering joint
2 Lubricating nipples, steering cylinders

WARNING **Risk of injury. Keep everyone clear of the articulated steering mechanism while the engine is running.**

Turn the steering wheel fully to the left to gain access to all six lubricating nipples on the right-hand side of the machine.

CAUTION Use grease recommended in Lubricant Specification on page 3.

Articulated Steering - Lubrication

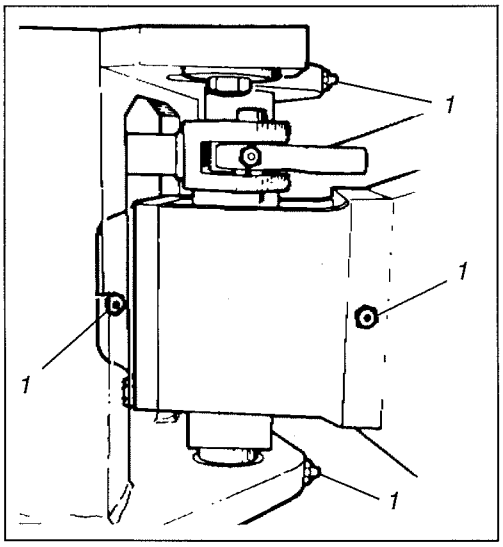

Fig. 14 Steering joint, right side
1 Lubricating Nipples

1. Wipe all the nipples clean from dirt and grease.
2. Lubricate each nipple (1) with five strokes of the grease gun. Make sure that grease penetrates the bearings.
3. If grease does not penetrate the bearings it may be necessary to relieve the articulated joint with a jack and repeat the greasing procedure.

Steering Cylinders - Lubrication

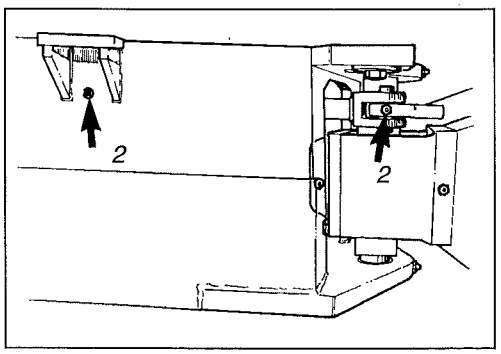

Fig. 15 Steering cylinders, right side
2 Lubricating nipples, cylinder brackets

1. Wipe nipples clean from dirt and grease.
2. Lubricate each nipple (2) with two strokes of the grease gun.
3. Turn the steering wheel fully to the right and grease the nipples on the left steering cylinder. Leave a little grease on the nipples after greasing. This will prevent dirt from entering the nipples.

Tire Pressure
Wheel Nuts - Tightening

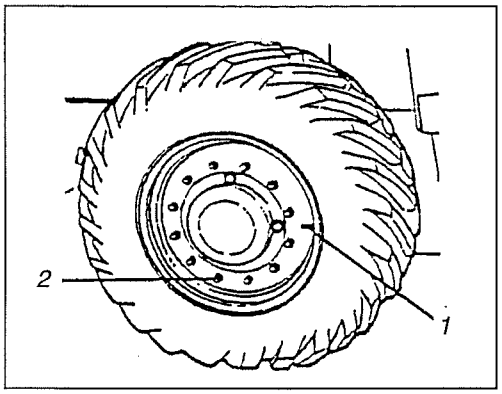

Fig. 16 Wheel
1 Air valve
2 Wheel nut

Check the tires with a pressure gauge. Minimum tire pressure 0.11 MPa (1.1 kp/cm²) (16 psi).

Max. tire pressure 0.15 MPa (1.5 kp/cm²) (21 psi).
Check both tires.

CAUTION

When changing tires it is essential that both tires have the same rolling radius.

Check the tightening torque of the wheel nuts at 550 Nm (55 kpm).
Check both wheels and all nuts.

Rear Axle Differential - Checking the Oil Level

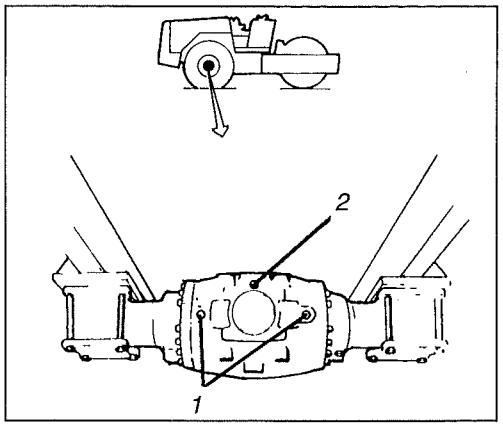

Fig. 17 Level check - differential housing
1 Level plugs
2 Filler plug

WARNING **Never work under the machine while the engine is running. Always park the machine on level ground and chock the wheels.**

1. Make sure the roller is level.
2. Unscrew the level plugs and check that oil level is up to the lower edge of the plug hole. Top off with oil through the filler plug as required to the correct level. Use transmission oil. See Lubricant Specification on page 3.

Rear Axle Planetary Gearing - Checking the Oil Level

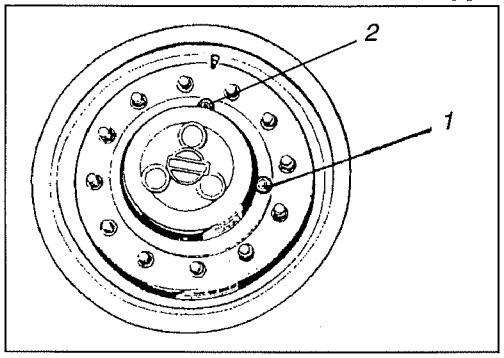

Fig. 18 Level check - planetary gearing
1 Level plug
2 Filler plug

1. Position the roller on a level surface with one plug of the planetary gearing straight up, the other one will then be horizontal.
2. Unscrew the plugs and check that oil level is up to the lower edge of the plug hole. Top off with oil through the filler plug as required to the correct level. Use transmission oil. See Lubricant Specification on page 3.
3. Check oil level of the other planetary gearing of the rear axle in the same way.

Transfer Gearbox - Checking the Oil Level

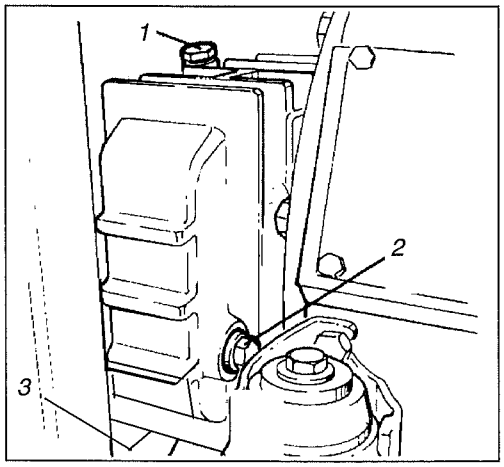

Fig. 19 Level Control
1 Filler plug
2 Level plug
3 Drain plug

1. Make sure the roller is level.
2. Wipe clean around the level plug (2) and loosen it a few turns. Oil should run out from the plug if oil level is correct.
3. If required, top up via the filler plug (1) until oil runs from the level plug (2). Wipe clean around the filler plug before unscrewing it. Use transmission oil. See Lubricant Specification on page 3.

CAUTION A level plug is fitted on both sides of the transfer gearbox. The level need only be checked on one side.

Torque Hub - Checking Oil Level

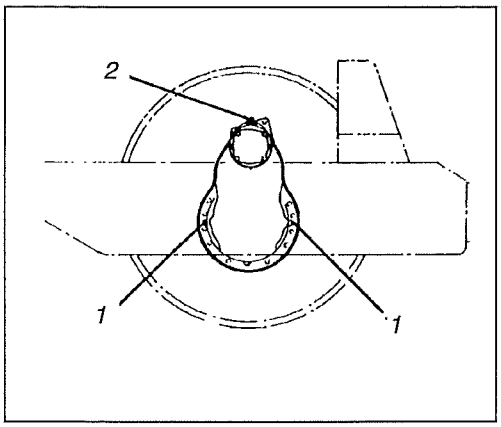

Fig. 20 Level check - Funk torque hub
1 Level plug
2 Filler plug

1. Make sure the roller is level.
2. Wipe clean around the level plug (1) and loosen it three turns.
3. Oil should run out from the plug if oil level is correct.
4. If required, top off with transmission oil, see Lubricant Specification on page 3.
5. Refit the plugs.

Torque Hub Funk - Lubrication of Seal

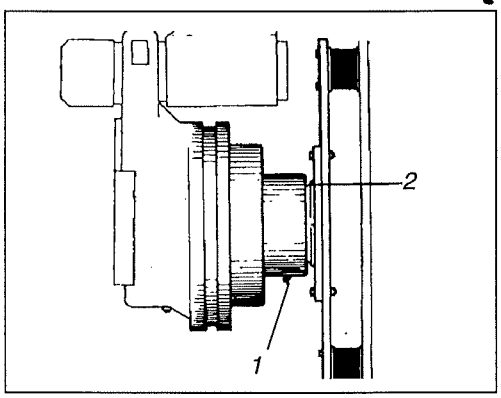

Fig. 21 Torque Hub - Function
1 Lubricating nipple
2 Seal

The outgoing axle seal must be lubricated.

1. Wipe clean around the lubricating nipple.
2. Lubricate with three strokes of the grease gun. See Lubricant Specification on page 3.
3. Make sure that grease is forced through the seal.

Torque hub - Brake Check

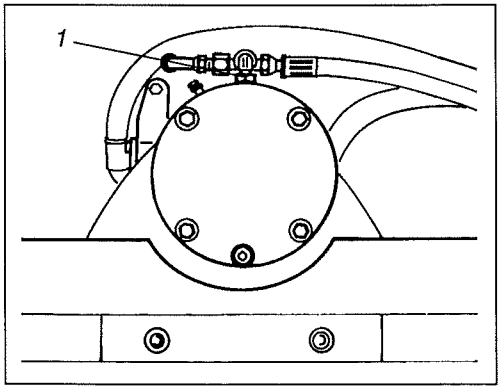

Fig. 22 Torque hub - Function
1 Supply pressure connection

1. Wipe clean around the brake connection.
2. Disconnect the hydraulic hose and plug it with a JIC 37°, 7/16-20 UNF (1).
3. Start the engine and run at 1200 r/min.
4. Set the roller drive in the HIGH mode.
5. Move the forward/reverse lever both reverse and forward.
6. The roller should stand still. The brake is working satisfactorily if the above condition is fulfilled. I.e. the braking force is greater than or equal to the tractive force.
7. Refit the hydraulic hose.

Brake - Drain Function - Torque Hub

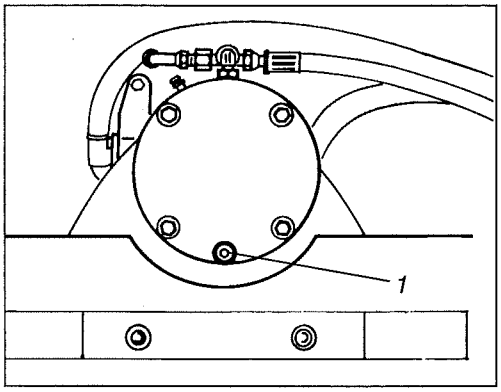

Fig. 23 Brake on torque hub
1 Drain plug

Loosen the drain plug (1) and drain off any leak fluid.

Hydraulic fluid cooler - External Cleaning

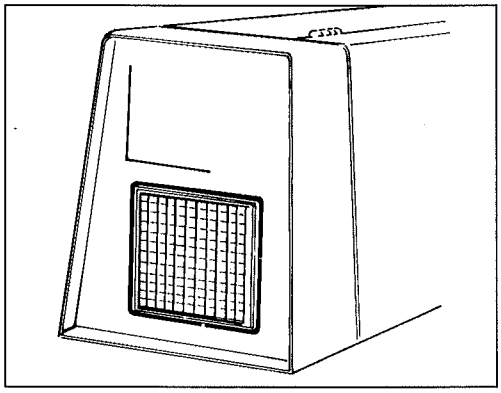

Fig. 24 Hydraulic fluid cooler

Ensure that air can flow freely through the cooler without obstruction. A dirty cooler should be cleaned with water or compressed air.

Flush or blow the cooler clean in the opposite direction, if possible, to the normal flow of air. Cover electrical components when using water to clean.

Ensure after cleaning that seals and noise absorbers are undamaged.

WARNING **Always wear protective goggles when working with compressed air or high-pressure washing jet.**

Controls and Moving Joints Lubrication

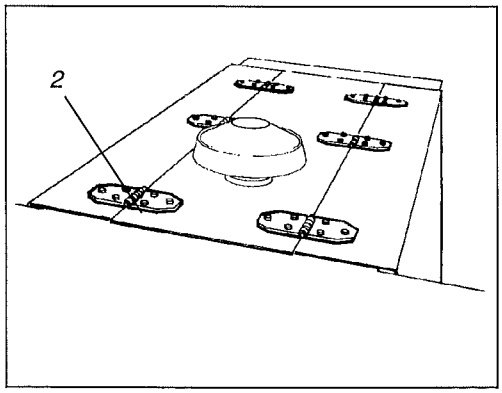

Fig. 25 Engine cover
2 Hinge

Lubricate engine cover hinges with grease and all other joints and controls with oil. See Lubricant Specification on page 3.

Checking Tightening Torque of Bolted Joints

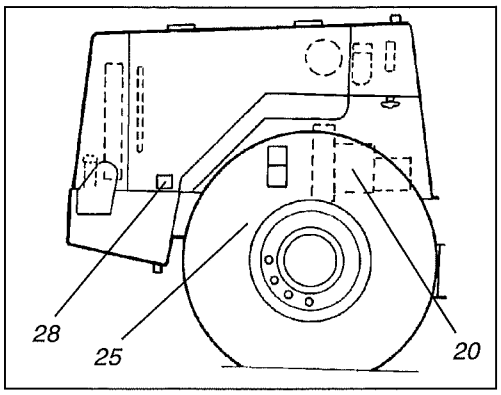

Fig. 26 Right side of machine
20 Hydraulic pumps
25 Rear axle
28 Engine suspension

1. Rear axle suspension (25) 434 Nm (320 ftlbs).
2. Steering pump against propulsion pump (20) 38 Nm (28 ftlbs).
3. Engine suspension (28). Check that all bolts are tightened, 90 Nm (66 ftlbs).
4. Wheel nuts (23). Check that all the nuts are tight, 550 Nm (406 ftlbs) tightening torque.

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

Drum - Checking the Oil Level

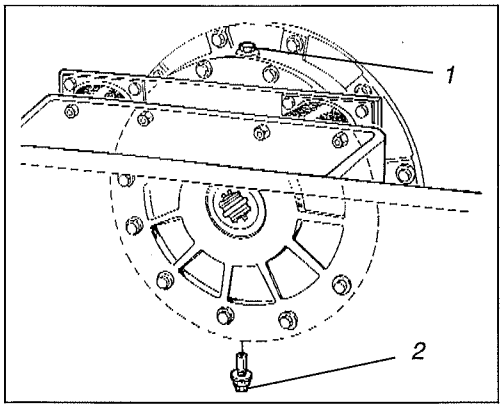

Fig. 27 Right side of drum
1 Filling/drain plug
2 Level plug

1. Position the roller on a flat surface with the filler plug (1) (large plug width across flats 24 mm) at the top and screw off the plug.
2. Screw out the level plug (2) (small plug width across flats 13 mm) and oil should flow from the plug hole. Oil level is correct when the flow stops. If oil does not run out, top up through the plug hole (1).

CAUTION ! A small amount of oil may run out as the plug (2) is screwed out, this is oil from the level tube and does not necessarily indicate that the level is correct.

3. Fill as required with synthetic oil Mobil SHC 629 or equivalent. Do not overfill with oil, risk of overheating.
4. Wipe any metal particles from the magnetic filler plug (1) before refitting.
5. Repeat the above items 1 to 4 on the other side of the drum.

CAUTION !

Never overfill with oil, danger of overheating.

Rubber elements and fastening bolts - Checking

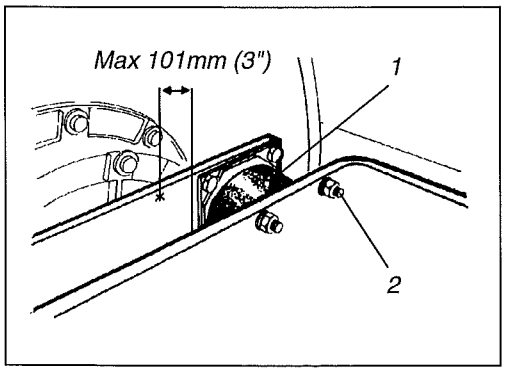

Fig. 28 Drum, vibration side
1. Rubber element
2. Fastening bolts

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

Use a knife, or similar tool, to check depth of cracks.

Check that the fastening bolts (2) are tightened.

CAUTION ! Using a vernier gauge, measure the length of the rubber element, including the mounting plates. See separate workshop instructions if the size is greater than 101 mm (3").

Hydraulic fluid filter - changing

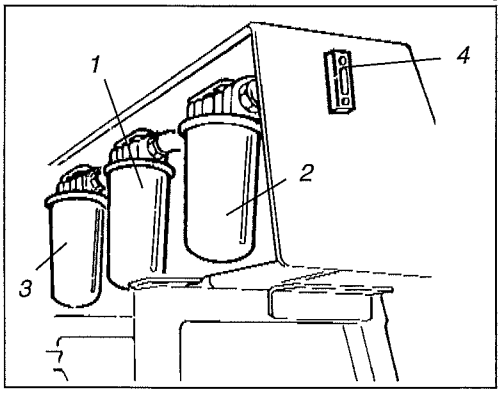

Fig. 29 ***Hydraulic reservoir***
1. Suction filter, drive
2. Suction filter, vibr.
3. Return filter, cooling system
4. Level glass

1. Loosen the venting filter to release any over-pressure in the reservoir.

2. Remove the hydraulic filters (1), (2) and (3) and discard them. They are of the disposable type and cannot be cleaned and reused.

CAUTION Ensure that the previous sealing rings are removed. Leakage will otherwise occur between the old and new sealing rings.

3. Thoroughly clean the sealing surfaces of the filter holders.

4. Apply a thin coat of fresh hydraulic fluid to the sealing rings of the new filters.

5. Screw on the filters firmly by hand.

CAUTION Screw on until the seal makes contact with the seating and then screw half a turn further. Do not tighten too hard, the seal may otherwise be damaged.

6. Start the engine and check for any leakage from the filters.

WARNING **Ensure that ventilation (evacuation) is adequate if the engine is run indoors. (Risk of carbon monoxide poisoning).**

7. Check fluid level in the sight glass (4) and top off as required.

Hydraulic Reservoir - Draining

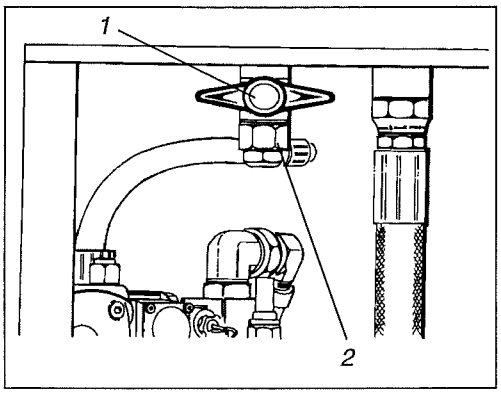

Fig. 30 Hydraulic reservoir, underneath
1 Drain cock
2 Plug

Drain off condensed water from the hydraulic reservoir via the drain plug (1).

Drain after the roller has stood still for a long period, eg, overnight.

Drain as follows:
1. Hold a can underneath the cock.
2. Remove the plug (2).
3. Open the cock and allow any water to run out.
4. Close the drain cock.
5. Refit the plug.

Hydraulic Reservoir - Venting Filter

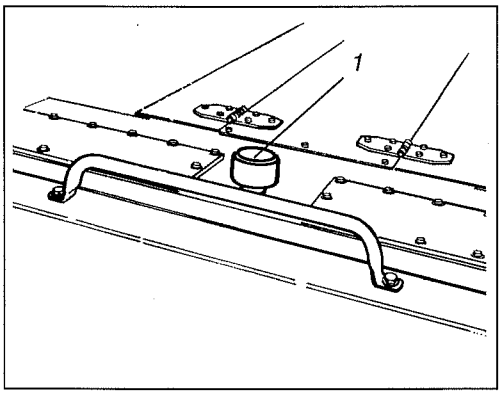

Fig. 31 Hydraulic reservoir
1 Venting filter

Screw off the venting filter, discard it and fit a new one.

Fuel Tank - Draining

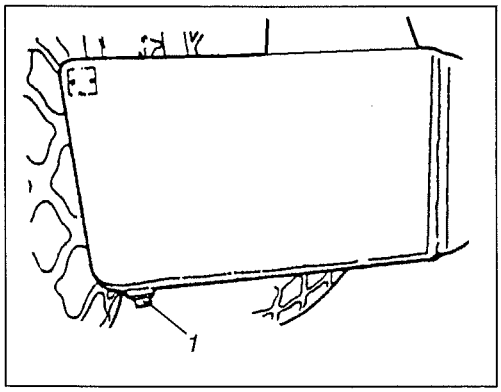

Fig. 32 Fuel tank
1 Drain plug

Drain off sediment and condensed water through the drain plug located underneath the fuel tank.

CAUTION

Be very careful when draining not to drop the plug or allow fuel to run out.

Draining should be done after the roller has stood still for a long period, eg, overnight, preferably at an incline with the drain plug down low, which will allow sediment and water to collect near the plug.

Drain as follows:

1. Hold a can underneath the plug (1).

2. Loosen the plug and allow all sediment and water to run out until pure diesel fuel starts to pour. Tighten the plug.

Air cleaner
- changing the main filter

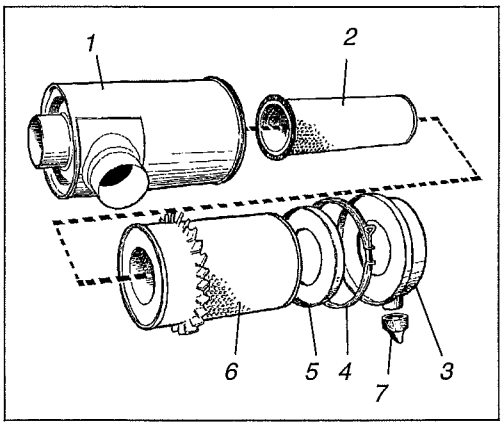

Fig. 33 Air cleaner

1. Filter housing
2. Secondary filter
3. Dust trap
4. Clamp
5. Inner cover
6. Primary filter
7. Emptying slit

Change the primary filter of the air cleaner even if it has not been cleaned the permitted 5 times, see page 12, Air cleaner.

Hydraulic Reservoir - Changing the Fluid

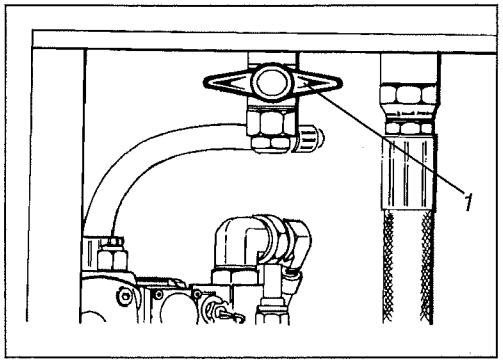

Fig. 34 Hydraulic reservoir, underneath
1 Shut-off cock

1. Place a suitable receptacle for at least 100 litres (26.4 US gallon) at the side of the machine, eg, an empty oil drum.
   Connect a hose to the drain cock (1) and empty the contents of the reservoir into the receptacle.

2. Remove the covers on top of the reservoir and clean the inside. Refit the covers.

3. Change the hydraulic filters and fill the reservoir with fresh hydraulic fluid, in accordance with the filling instructions on page 11.

4. Start the engine and run the various hydraulic functions.

WARNING **Ensure that ventilation (evacuation) is adequate if the engine is run indoors. (Risk of carbon monoxide poisoning).**

5. Check the fluid level and top up if necessary.

Transfer Gearbox - Changing the Oil

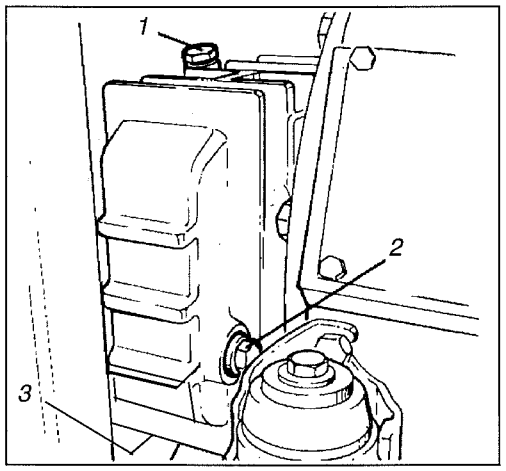

Fig. 35 Transfer gearbox, left side
1 Filler plug
2 Level plug
3 Drain plug

WARNING **Never work under the roller while the engine is running. Park on a level surface. Chock the drum and wheels.**

1. Loosen the drain plug (3) and drain off the oil.

2. Refit the plug.

3. Remove the level plug (2) and fill with fresh gearbox oil through the filler hole (1). Fill slowly to allow the oil to level out.

4. Fit the plugs (1 and 2) back again at the right oil level.

Drum - Changing the Oil

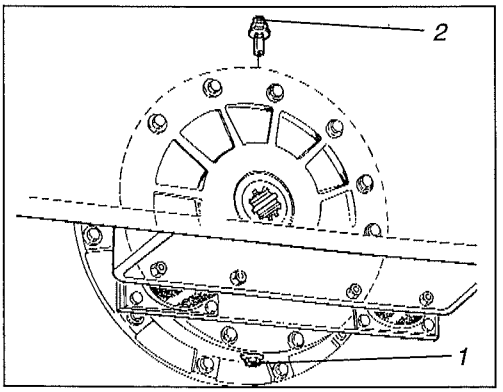

Fig. 36 Drum, right side
1 Drain/Filler plug
2 Level plug

1. Position the roller on a level surface with the drain plug (1) (large plug width across flat 24 mm) at the bottom. Place a receptacle for about 4 litres (4,3 qts) underneath the plug.

2. Loosen the level plug (2) (small plug width across flat 13 mm). Screw out the drain plug (1).

3. Allow all the oil to run out and repeat the procedure on the other side of the drum.

4. Fill with synthetic oil in accordance with instructions on page 19. See under heading, Drum - Checking the Oil Level.

Rear Axle Differential - Changing the Oil

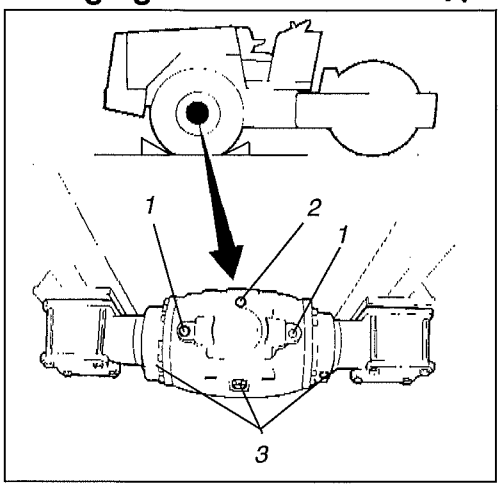

Fig. 37
1 Level plugs
2 Filler plug
3 Drain plugs

WARNING **Never work under the roller while the engine is running. Park on a level surface. Chock the drum and wheels.**

1. Position the roller level.
2. Remove all three drain plugs (3) and empty the oil into a can. Also remove the filler plug (2) and the level plugs (1).
3. Refit the drain plugs and fill with fresh oil up to the correct level. Refit the filler plug and level plugs. Use transmission oil, see Lubricant Specification on page 3.

Rear Axle Planetary Gearing - Changing the Oil

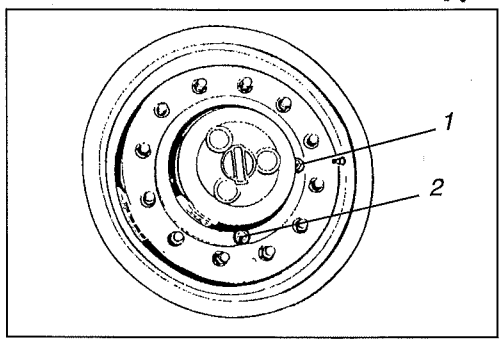

Fig. 38 Planetary gearing / position for draining
1 Level plug
2 Drain plug

1. Position the roller on a level surface with one of the plugs straight down.
2. Unscrew this plug and drain off the oil into a can. Loosen the other plug to speed up the flow of oil.
3. Run the roller to position one of the plugs at the top and the other horizontally.
4. Fill with oil through the upper hole (2) until it runs out at the lower hole.
5. Refit the plugs and repeat the procedure in the same way on the other side. Use transmission oil, see Lubricant Specification on page 3.

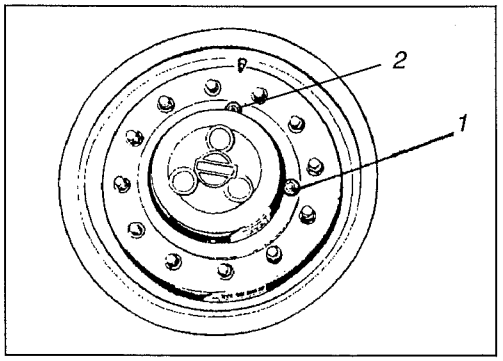

Fig. 39 Planetary gearing / position for filling
1 Level plug
2 Filler plug

LONG-TERM PARKING

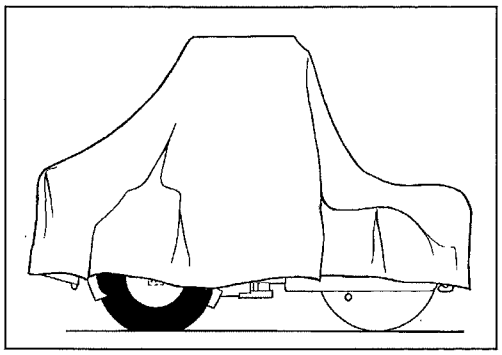

Fig. 40 Weather protection

CAUTION ! The following instructions must be complied with when parking or storing the roller longer than one month.

The measures stipulated apply for a standstill up to 6 months.

The measures marked ✻ must be taken before using the roller again.

Diesel engine

✻ See the manufacturer´s instructions in the engine manual that accompanies the roller.

Battery

✻ Remove the battery from the roller, clean it, check that electrolyte level is correct and charge the battery once every month.

Air cleaner, exhaust pipe

✻ Cover the air cleaner or its intake opening with plastic foil or tape. The opening of the exhaust pipe must also be covered. This is necessary to prevent moisture from getting into the engine.

Fuel tank

Fill the fuel tank completely, ie, to prevent condensation and corrosion.

Hydraulic reservoir

Drain off any condensed water from the hydraulic reservoir.

Steering cylinder, hinges, etc.

Lubricate the steering articulation bearings and both bearings of the steering cylinder with grease.
Grease the piston rod of the steering cylinder with rust inhibiting grease.
Grease the engine hood hinges, seat slide rails, revs control, and mechanism of the forward/reverse control.

Tires

Ensure that tire pressure is at least 150 kPa (1.5 kp/cm^2).

Covers, tarpaulin

✻ Close the instrument protection cover on the steering column. Cover the entire roller with tarpaulin.
NOTE. The tarpaulin must be kept clear of the ground. If possible, park the roller indoors, preferably in a building with even temperature.

Standard oils and other recommended fluids

On leaving the factory the various systems and components are filled with oil or fluid as indicated in Lubricant Specification, and are thus suitable for operation in ambient temperatures between -10°C (14°F) and +40°C (104°F). The following recommendations apply for operation in higher ambient temperatures up to a maximum of +50°C (122°F):

Higher ambient temperature, max. +50°C (122°F)

The engine can be used at this temperature using normal oil but for other components the following fluids must be used:
Hydraulic system: Shell Tellus Oil T100, or equivalent.
Other components using transmission oil: Shell Spirax HD 85W/140, or equivalent.

Temperature

The temperature limits apply to standard versions of the roller.

Rollers that are fitted with additional equipment, such as noise suppression, etc, may require extra observation in the higher temperature ranges.

High pressure washing

CAUTION

A water jet should not be aimed directly at the cap of the fuel tank or hydraulic reservoir. This is especially important when using a high-pressure jet.

Place a plastic bag over the cap and secure it with a rubber band. This will avoid water entering the venting hole in the filler cap, which would otherwise cause operational disturbance and a clogged filter. Do not spray electric components or the instrument panel.

Fire fighting

In the event of fire in the machine, use an ABE-powder fire extinguisher if possible. A BE type carbon dioxide fire extinguisher may also be used.

Roll over protecting structure (ROPS)

Absolutely no welding or drilling of holes is permitted on the roll over protecting structure (ROPS). Never repair a damaged structure, replace it with a new ROPS.

Starting aid

When using an auxiliary battery, ie, in addition to the one installed on the roller, to assist starting, always connect the positive terminal of the auxiliary battery to the positive terminal of the roller battery, and negative to negative.

Fuses

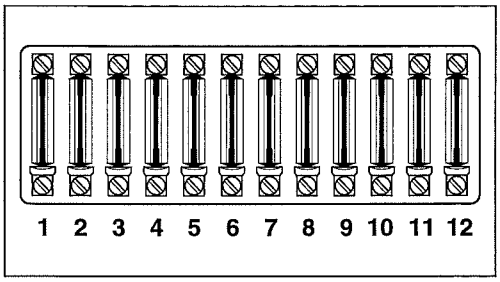

Fig. 41 ***Fuse boxes***

1. Vibration relay
2. Instruments
3. Horn/V-belt monitor
4. -
5. Hazard beacon
6. Pneumatically cushioned operator seat
7. Brake valve
8. Gear selector
9. -
10. Vibration/Brake/Start relay
11. Working lights, front
12. Working lights, rear

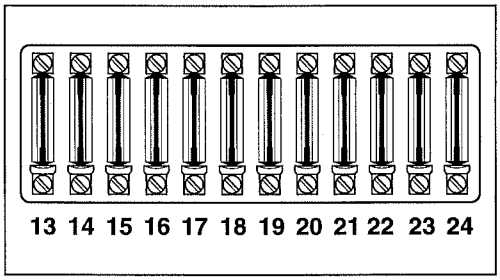

Fig. 42 ***Lower fuse box (optional)***

13. Working lights, rear
14. Parking lights, left
15. Parking lights, right
16. Direction indicator/left
17. Direction indicator/right
18. Low beam, left
19. Low beam, right
20. High beam, left
21. High beam, right
22. Brake lights, right
23. Brake lights, left
24. -

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

CAUTION Connect the battery to the correct polarity. Negative to ground. The cable between the alternator and battery must not be disconnected when the engine is running.

CAUTION Before carrying out any electric welding on the machine, disconnect the battery grounding cable and then all terminals to the alternator.

The electrical regulating and control system is protected against overload by 8 A fuses, which are located in fuse boxes on the steering column, see maintenance diagram.

The lower fuse box is only fitted on rollers that are equipped with driving lights, direction indicators and rear working lights.

Fig. 43 illustrates the fuse boxes that are fitted in the cab, ie, in cases where this is relevant.

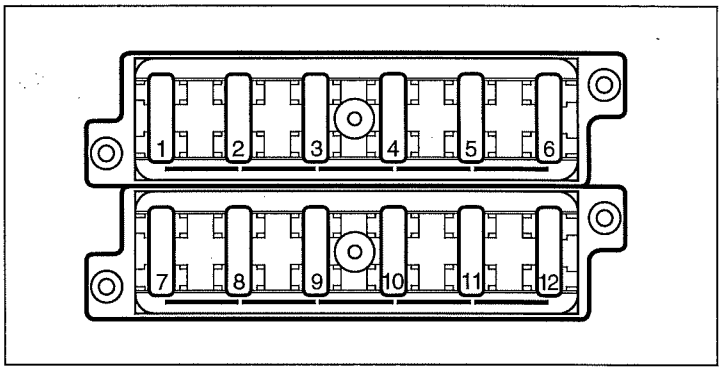

Fig. 43 Fuse box in cab (optional)

10A	*1. Front working lights*
10A	*2. Rear working lights*
3A	*3. Front spraying*
15A	*4. Fan*
15A	*5. Front wiper*
15A	*6. Rear wiper*
3A	*7. Interior lighting, Radio*
7.5A	*8. Air conditioner*
	9. -
	10. -
3A	*11. Hazard beacon*
25A	*12. Cab heater*