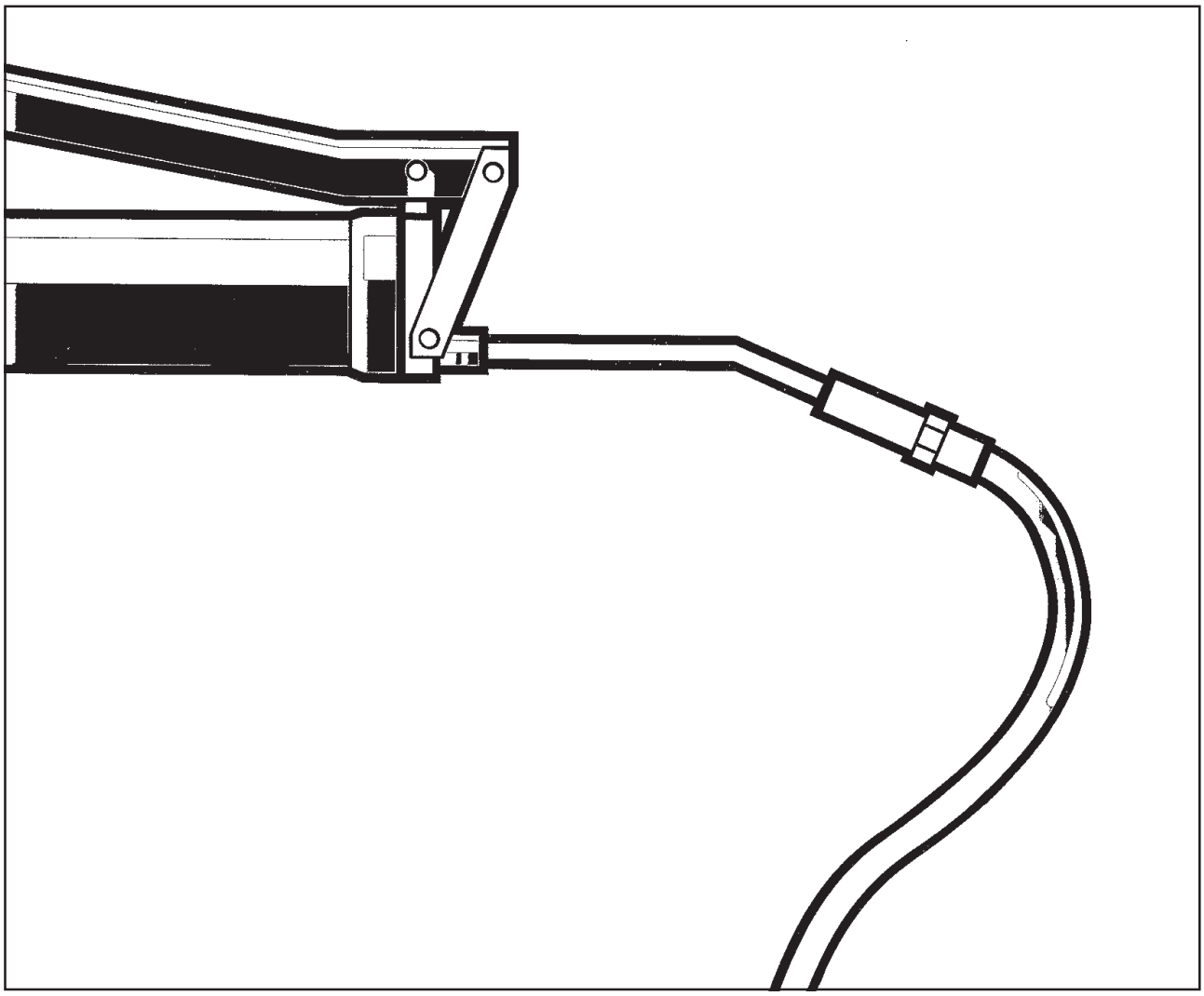
DYNAPAC
CP221/271
MAINTENANCE

M221EN5



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DYNAPAC

Pneumatic rollers
CP221/271

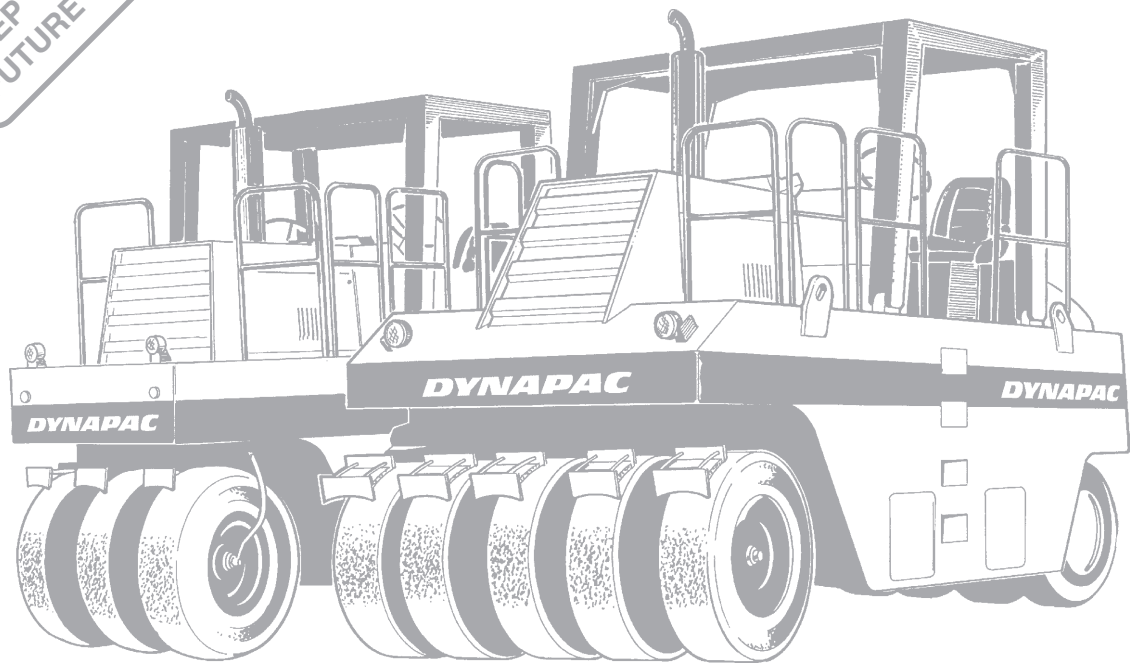
Maintenance
M221EN5, September 2004

Diesel engine:
Cummins 4B4.5 - 99C

These instructions apply from:

CP221	**PIN (S/N) *2262(BR)0600***
CP271	**PIN (S/N) *2362(BR)0700***

KEEP THIS MANUAL FOR FUTURE REFERENCE



CP221 and 271 are heavy pneumatic rollers designed for the surface sealing and compacting of asphalt together with steel-drum rollers. Due to their very high weight these pneumatic rollers are also suitable for the compacting of subbases and base courses.

CP221 has three steered wheels at the front and four drive wheels at the rear, mounted on a rigid axle.
CP271 has five wheels at the front and four at the rear, mounted on a rigid axle.

Reservation for changes.
Printed in Sweden.

CONTENTS

WARNING SYMBOLS

Safety instructions – Personal safety.

Special caution – Machine or component damage.

GENERAL

Read the entire manual before starting any service work.

Make sure that ventilation (extraction) is adequate if the engine is run indoors.

It is essential that the machine is properly cared for to ensure satisfactory operation. Keep the machine clean to facilitate quick and timely detection of any leakage, loose bolts and loose connections.

Make a habit each day, before starting up, of checking the roller to detect any leakage or damage. Also check the ground underneath the roller, where it is most often easier to detect any leakage.

PROTECT THE ENVIRONMENT!
Do not leave behind any oil, fuel or other substances that are harmful to the environment.

This manual contains instructions for periodic measures that should normally be performed by the operator.

The manufacturer's instructions in the engine manual also apply. This is placed under a separate flap in the product folder for 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	Shell Rimula Super 15W/40 or equivalent. API CH-4
HYDRAULIC FLUID, ambient temp. -10°C to +40°C ambient temp. above +40°C	 Shell Tellus TX 68 or equivalent. Shell Tellus TX 100 or equivalent.
TRANSMISSION OIL, torque converter ambient temp.-15°C to +40°C	 Shell Donax TA or equivalent. ATF Dexron II D
TRANSMISSION OIL rear axle ambient temp.-15°C to +40°C ambient temp. above +40°C	 Shell Spirax AX 80W-90 or equivalent. Shell Spirax AX 85W-140 or equivalent. API GL-5
GREASE	Shell Retinax LX2 or equivalent
FUEL	See engine manual
COOLANT mixed 50/50 with water	GlycoShell or equivalent. Anti-freeze down to -37°C.
BRAKE FLUID	Shell Donax SB or equivalent.

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	Tire pressure
Hydraulic fluid, filter	Sprinkler
Transmission, oil level	Sprinkler water
Lubricating oil	Coolant, level
Fuel filter	Recyclable

TECHNICAL SPECIFICATIONS

Weights and dimensions	CP221	CP271
Service weight, standard equipped roller incl. ROPS, EN500 (kg/lbs)	8300/18,300	12400/27,300
Weight without ballast, (kg/lbs)	8000/17,600	12000/26,500
Weight with ballast wet sand, (kg/lbs)	18200/40,100	25500/56,200
Weight with max. ballast, (kg/lbs)	21000/46,300	27000/59,500
Length, standard equipped roller (mm/inch)	4750/187	5150/203
Width, standard equipped roller (mm/inch)	1820/72	2350/93
Height, standard equipped roller incl. ROPS (mm/inch)	3300/130	3470/137
Height, without ROPS (mm/inch)	2680/106	2790/110

Fluid volumes	Liters (gal or qts)
Hydraulic reservoir	8,6 l (9 qts)
Lubricating oil, engine	9,5 l (10 qts)
Coolant, engine	26 l (6.8 gal)
Fuel tank	120 l (31.7 gal)
Rear axle	17,5 l (4.6 gal)
Torque converter	18,5 l (4.9 gal)
Water tank:	
• CP221	415 l (109.5 gal)
• CP271	415 l (109.5 gal)
Ballast volume:	
• CP221	5,4 m^3 (191 cu feet)
• CP271	8,0 m^3 (282 cu feet)

Electrical system

Battery	12 V, 170 Ah
Alternator	14 V
Fuses	See under main heading: “Electrical system”

Tires (Standard)

Tire size	13/80 R20 Radial
Tire pressure:	
• Min	240 kPa (2,4 kp/cm^2) (35 psi)
• Max	830 kPa (8,3 kp/cm^2) (120 psi)

Brakes

Driving brake:	
• CP221	Pneumatic hydraulic on the four rear wheels
• CP271	Pneumatic hydraulic on the four rear wheels and two front wheels
Parking brake	Fail-safe disc brake on outgoing shaft from transmission.

TECHNICAL SPECIFICATIONS

Tightening torque

Tightening torque in Nm for oiled, bright galvanized bolts tightened with a torque wrench.

M thread	STRENGTH CLASS 8.8	10.9	12.9
M6	8,4	12	14,6
M8	21	28	34
M10	40	56	68
M12	70	98	117
M16	169	240	290
M20	330	470	560
M24	570	800	960
M30	1130	1580	1900
M36	1960	2800	–

ROPS

CAUTION

ROPS bolts shall always be torque tightened dry.

Bolt size:	1 1/8-7 UNC (P/N 90 44 37)
Strength class:	10.9
Tightening torque:	237 Nm

Vibrations – Drivers seat (ISO 2631)

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

Whole-body vibration is measured at less than the action value of 0.5 m/s^2 specified in EU directive 2002/44/EC. (The limit value is 1.15 m/s^2.)

Hand/arm vibration is measured at less than the action value of 2.5 m/s^2 specified in the same directive. (The limit value is 5 m/s^2.)

CAUTION

Vibration levels may vary when driving on different courses and with different seat positions.

Acoustic values

Sound levels have been measured according to the operational cycle described in the EU-directive 2004/14/EC on machines equipped for the EU-market with operator seat in transport position.

Model	Guaranteed acoustic power level dB(A)	Acoustic pressure level, operator's ear (platform)dB(A)	Acoustic pressure level, operator's ear (cab)dB(A)
CP221	106	88	-
CP271	106	88	-

CAUTION

Noise level can vary when driving on different courses and with different seat positions.

MAINTENANCE SCHEDULE

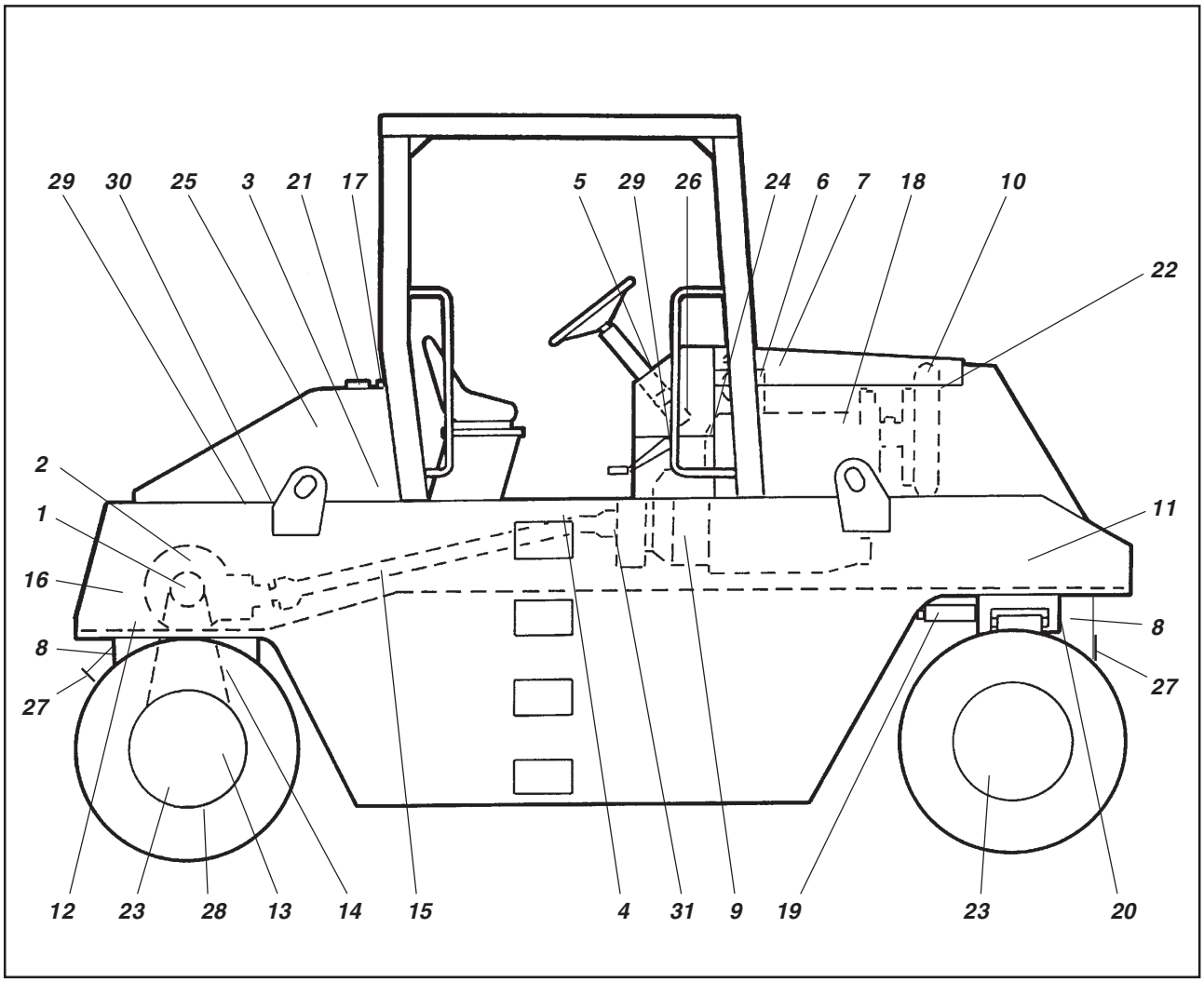


Fig. 1 Service points

1. *Differential axle*
2. *Differential axle, oil level*
3. *Fuel tank*
4. *Master brake cylinder, oil (2x)*
5. *Forward/reverse control*
6. *Hydraulic reservoir, level*
7. *Air cleaner*
8. *Sprinkler*
9. *Torque converter, oil filter*
10. *Radiator*
11. *Bearing housing, locking pin*
12. *Air tank, automatic discharge valve*
13. *Brakes*
14. *Drive chain*
15. *Drive shaft, lubrication*
16. *Battery, electrolyte level*
17. *Fuel tank, filling*
18. *Engine oil filter and fuel filter*
19. *Steering cylinder, lubricating grease*
20. *Front suspension, lubricating grease*
21. *Water tank, filling*
22. *Engine hood, lubricating grease*
23. *Wheel nut*
24. *Air compressor*
25. *Water tank, sprinkler*
26. *Steering chain, lubricationg*
27. *Scraper*
28. *Rear drive shaft*
29. *Water tank, plug*
30. *Fuel tank, plug*
31. *Brake adjustment (2x), parking brake*

MAINTENANCE MEASURES

The periodic measures are intended to be performed primarily with the specified hours of operation, secondarily for the periods: daily, weekly, etc.

CAUTION

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

CAUTION

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

Every 10 hours of operation (Daily)

Items in fig. 1	Action	See page	Comments
	Before starting each day		
7	Check the air pressure in the service brake system	9	
25	Fill the water tank	9	
3	Refuel	9	
6	Check level in hydraulic reservoir	10	
9	Check the oil level in the torque converter	10	
10	Check coolant level	10	
18	Check level of engine oil	11	
27	Check setting of scrapers	11	
	Check sprinkler system	11	

Every 50 hours of operation (Weekly)

Items in fig. 1	Action	See page	Comments
7	Check/clean the main filter in the air cleaner	12	
	Check the air intake system	13	
12	Check the air tank's automatic drain valve	13	
	Check the tire pressure	13	
23	Re-tighten the wheel nuts	14	
4	Check level of the master brake cylinder fluid	14	
19	Grease the steering cylinder mounts	14	

CAUTION

After the **first** 50 hours of operation, change all oil and hydraulic fluid filters and the lubricating oil, except the hydraulic filter and the hydraulic fluid. Also replace the engine fuel pre-filter.

MAINTENANCE MEASURES

Every 250 hours of operation (Monthly)

Items in fig. 1	Action	See page	Comments
7	Replace main filter and safety filter in the air cleaner	12	If required according to instruction
2	Check the oil level in the differential	15	
16	Check the battery	15	
	Grease the suspension	16	
10	Clean the radiator elements	16	
11	Grease the swivel pin of the bearing housing	17	

Every 500 hours of operation (Every three months)

Items in fig. 1	Action	See page	Comments
18	Change the engine oil and oil filter	17	See engine manual
	Clean the fuel pre-filter	18	
	Change the engine fuel filter and clean the fuel pump		See engine manual
	Check the engine V belt tension		See engine manual
26	Grease the steering chain	18	
9	Change the oil filter in the torque converter	18	
1	Grease both drive chains	19	
15	Grease the drive shaft	19	

Every 1000 hours of operation (Every six months)

Items in fig. 1	Action	See page	Comments
7	Replace main filter and backup filter in the air cleaner	20	
	Check engine valve clearance		See engine manual
9	Change torque converter oil and filter	20	
	Change oil in the differential	21	
	Adjust the service brake	21	

Every 2000 hours of operation (Yearly)

Items in fig. 1	Action	See page	Comments
10	Clean the cooling system		See engine manual
6	Change fluid and filter in the hydraulic reservoir	22	
14	Adjust the drive chain	22	
25	Check and clean the water tank	23	
3	Clean the fuel tank	23	
31	Check/adjust contact of the parking brake	23	

EVERY 10 HOURS OF OPERATION (Daily)

Air pressure in the service brake system – Check

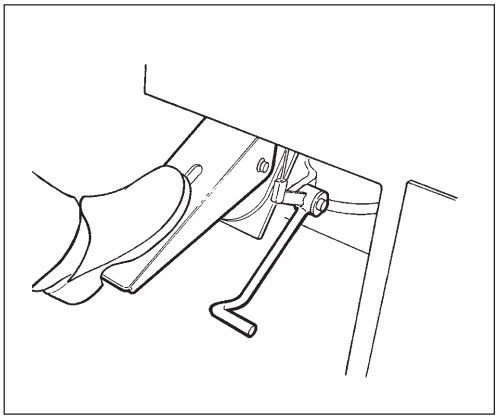


Fig. 2 Brake pedal

WARNING

Place the roller on a level base. The engine must be switched off and the reserve/ parking brake knob pushed in for all checking and adjustments on the roller unless otherwise specified.

Check by pressing the brake pedal. Air pressure should be 6,5 bar (94 psi). This is the maximum pressure.

WARNING

Do not move the roller before the system pressure has reached its specified operating level.

Water tank – Filling

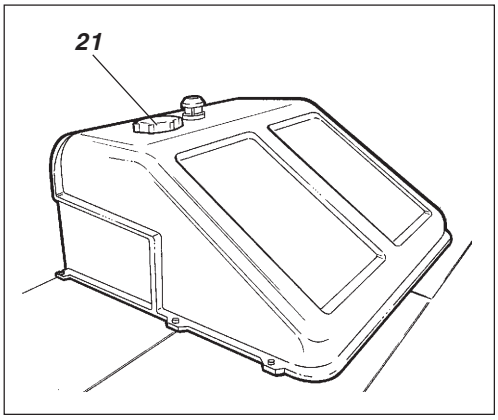


Fig. 3 Water tank
21. Tank cap

Watering is required until the tires reach working temperature when rolling asphalt compounds.

CAUTION

To keep the sprinkler free from contamination, use only pure water in the tank.

Screw off the tank cap (21) and fill with pure water; do not remove the strainer.

Check the sprinkler system before operation.

Sole additive: Small amount of environment-friendly antifreeze liquid.

Fuel tank – Refueling

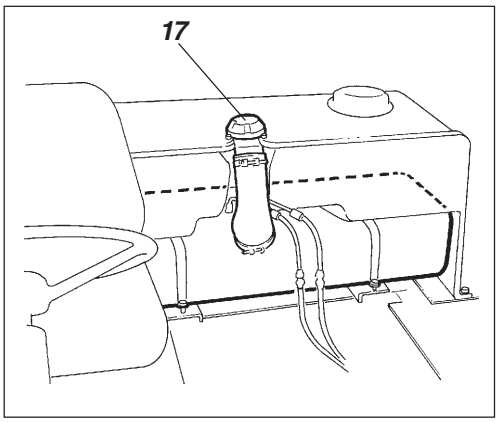


Fig. 4 Fuel tank
17. Filler pipe

Refuel every day with diesel oil up to the lower edge of the filler pipe (17).

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

EVERY 10 HOURS OF OPERATION (Daily)

Hydraulic reservoir – Level check/Filling

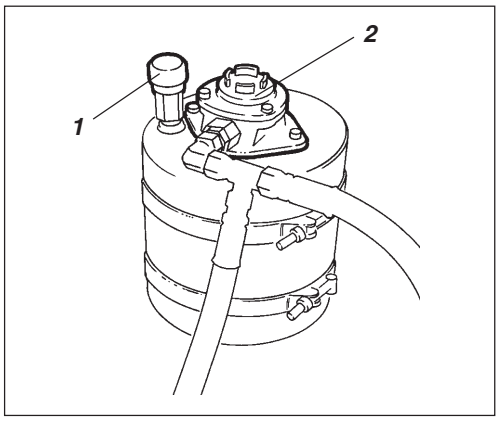


Fig. 5 Hydraulic reservoir
1. Dipstick
2. Cap

The hydraulic reservoir of the steering system is located to the left in the engine compartment.

Take out the dipstick (1) and check the level. The dipstick contains a ventilation valve which should be washed and blown clean with compressed air.

If the level is too low, screw off the cap (2) and top up to the max. mark on the dipstick (1).

WARNING

Wear protective goggles when using compressed air.

Gearbox – Checking the oil level

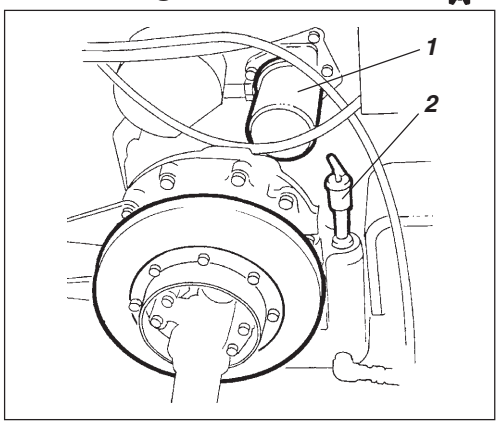


Fig. 6 Gearbox
1. Oil filter
2. Dipstick

Check the oil level with the engine idling (900–1000 r/min) and oil temperature at 80°C–95°C.

Top up with oil until it reaches the oil level plug or the lowest mark on the dipstick (2). When the oil is at operating temperature 80°C–95°C the level must be at the upper mark on the dipstick or at the upper level plug.

Use transmission oil according to the specification.

Coolant level – Checking

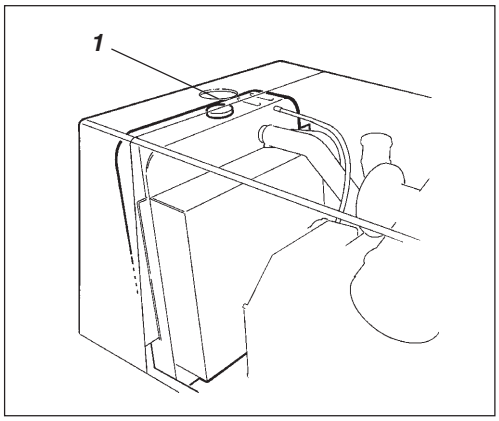


Fig. 7 Radiator
1. Filler pipe

Check that the coolant level is up to edge of the filler pipe (1).

WARNING

Take great care when opening the radiator cap when the engine is hot. There is danger of being scalded. Wear protective gloves and goggles.

When filling, use a coolant consisting of 50% water and 50% anti-freeze. See the specification in this manual and in the engine manual.

CAUTION

Change the coolant and flush the system every other year. Also ensure that air can flow freely through the radiator.

EVERY 10 HOURS OF OPERATION (Daily)

Diesel engine – Checking the oil level

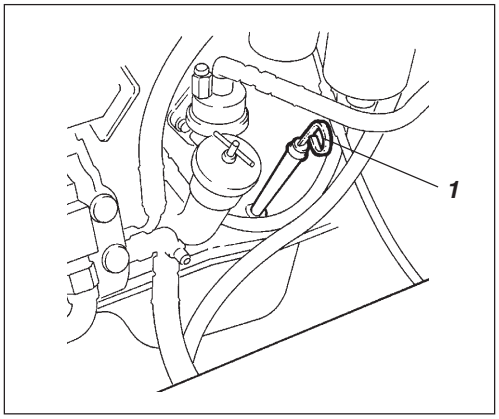


Fig. 8 Engine compartment
1. Dipstick

WARNING

Avoid any hot parts of the engine and hot radiator when using the dipstick. There is danger of being burned.

Pull up the dipstick (1) and ensure that the oil level is between the upper and lower level marks.

For further details, see the engine manual.

Scrapers – Check, Adjustment

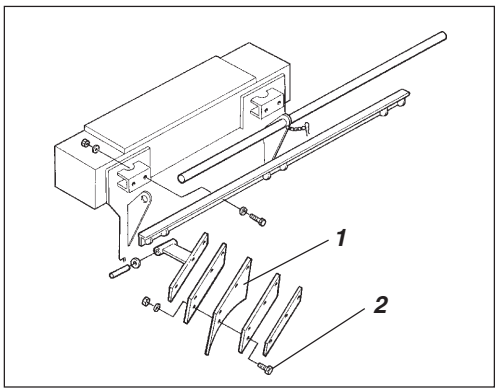


Fig. 9 Scrapers
1. Scraper blade
2. Adjustment screw

If required adjust the scrapers as follows:

Adjusting will be done in upper released position.

Loosen the four screws (2) for the scraper blade.

Adjust the scraper blade (1) downwards to get a wearing surface.

If the scraper blade is worn out, it has to be replaced by a new one.

Tighten the screws.

Adjust the other scraper blades the same way.

CAUTION

Inspect the tire tread now and then to detect asphalt compound that has fastened; this is likely until the tires are warm enough.

Sprinkler pipes – Cleaning

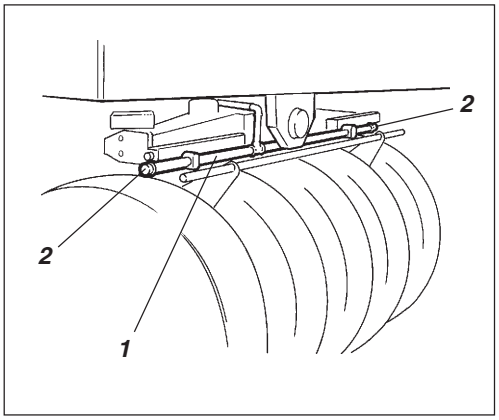


Fig. 10 Sprinkler
1. Sprinkler tube
2. Plugs

Make certain that the sprinkler pipes are kept clean. Remove the two end plugs (2) and flush the inside.

EVERY 50 HOURS OF OPERATION (Weekly)

Air cleaner Checking – Cleaning

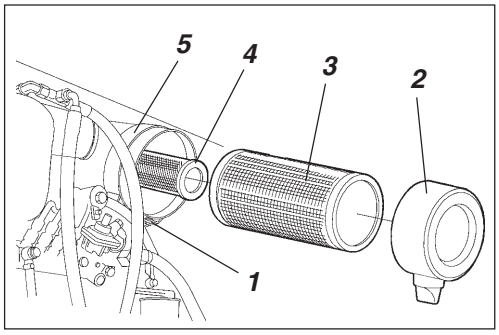


Fig. 11 Air cleaner
1. Locking flaps
2. Cover
3. Main filter
4. Saftey filter
5. Filter housing

WARNING

Place the roller on a level base. The engine must be switched off and the reserve/ parking brake knob pushed in for all checking and adjustments on the roller unless otherwise specified.

CAUTION

Replace or clean the main filter of the air cleaner when the warning lamp on the instrument panel lights at full engine revs.

Release the three locking catches (1), pull off the cover (2), and take out the main filter (3).

Do not remove the safety filter (4).

Main filter – Cleaning with compressed air

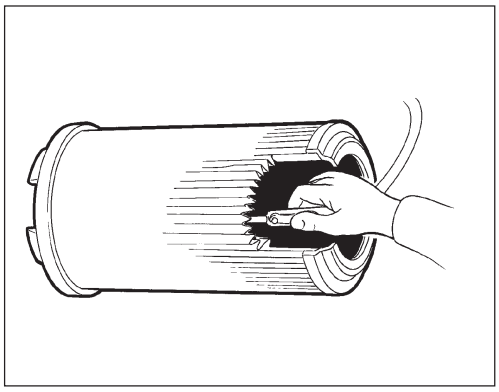


Fig. 12 Main filter

To clean the main filter, blow up and down along the paper pleats with compressed air at maximum 5 bar (72.5 psi) pressure.

Hold the nozzle at least 2–3 cm (0.8-1.2 in) from the paper pleats so as to avoid tearing the paper.

WARNING

Wear protective goggles when working with compressed air.

Wipe the inside of the cover (2) and filter housing (5).

CAUTION

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

CAUTION

Change the main filter at the latest after 5 cleanings.

Backup filter – Changing

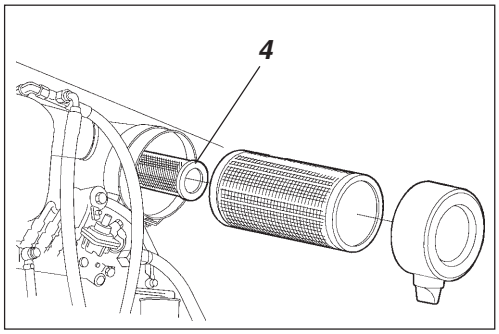


Fig. 13 Air filter
4. Saftey filter

Replace the safety filter with a new one after every fifth replacement or cleaning of the main filter. The secondary filter cannot be cleaned.

Dispose of used filters properly.

To change the saftey filter (4), pull the old filter out of its holder, insert a new one and reassemble the air cleaner in the reverse order.

EVERY 50 HOURS OF OPERATION (Weekly)

Air intake system – Checking

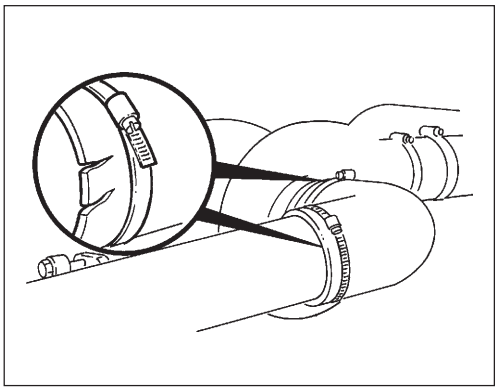


Fig. 14 Hoses

Inspect the intake pipes for cracks, loose clamps or punctures that could damage the engine.

Tighten or replace parts as required so that the intake system does not leak.

Automatic drain valve, air tank – Checking

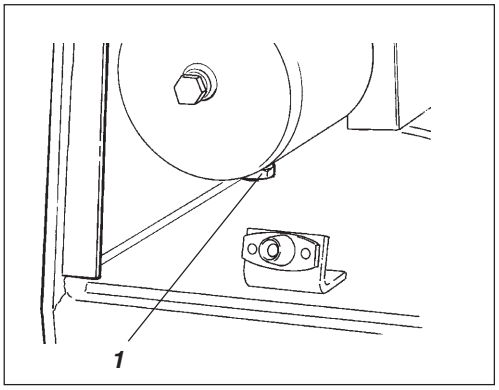


Fig. 15 Air tank
1. Drain valve

The air tank could also contain water due to condensation. The condensation water removes by the drain valve (1), which activates automatically when its opening pressure reaches.

CAUTION

If a lot of water is drained, the system must be inspected and any faulty parts should be replaced.

Tire pressure – Checking (Optional)

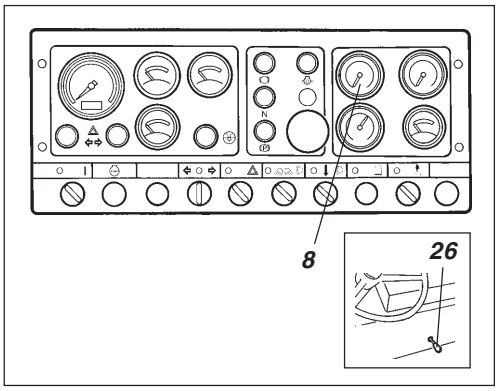


Fig. 16 Instrument panel
8. Tire pressure gauge
26. Tire pressure control valve

Adjust the tire pressure with the control valve (26). Compacting pressure should be as high as possible according to the tire pressure gauge (8), max. 8.5 bar (120 psi).

Inspect the air leads and correct any leakage.

CAUTION

Higher tire pressure gives higher contact pressure on the ground. High tire pressure gives smaller contact surface against the ground.

EVERY 50 HOURS OF OPERATION (Weekly)

Wheel nuts – Re-tightening

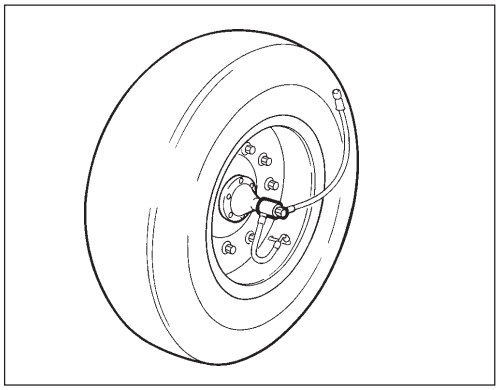


Fig. 17 Wheel

Check the tightening torque of the wheel nuts 370 Nm (37 kpm).
Check all wheels and all nuts (only on new machine or newly fitted wheels).

Master cylinder – Checking the fluid level

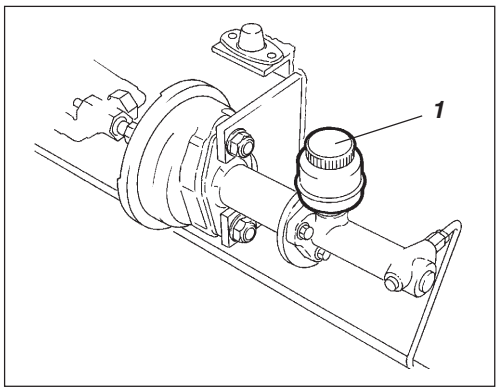


Fig. 18 Brake fluid bottle
1. Plastic bottle

Remove the floor plate and check the level of fluid in the plastic bottle (1). Minimum and maximum levels are marked on the bottle. Check both bottles.

Steering cylinder – Lubrication

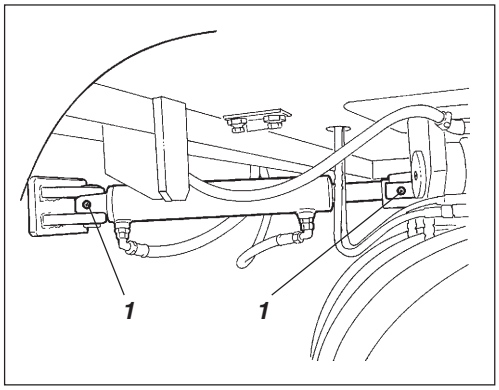


Fig. 19 Steering cylinder
1. Lubricating nipples

Lubricate the ends of the steering cylinders with two strokes of the grease gun.

Check the screws of the securing plates holding the guide pin. Clean the piston rod to avoid scratches and marks. Use high-pressure cleaning to remove dirt and contamination.

CAUTION

Never use abrasive material or a knife for cleaning. Apply a thin coat of engine oil as protection after cleaning.

Differential oil level – Checking

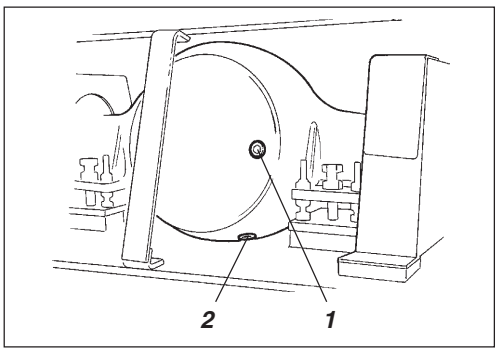


Fig. 20 Rear axle differential
1. Level plug
2. Drain plug

WARNING

Place the roller on a level base. The engine must be switched off and the reserve/ parking brake knob pushed in for all checking and adjustments on the roller unless otherwise specified.

Remove the level plug (1).

The level is correct if oil runs out of the hole.

Ensure that viscosity of the oil is unchanged. Thick oil implies that grease from the axle ends has penetrated into the housing. If so, the axles must be dismantled for a complete overhaul.

Battery – Checking the electrolyte level

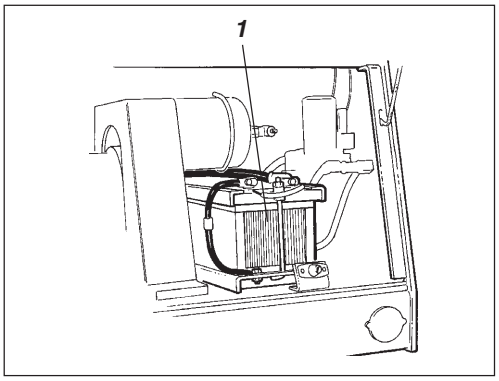


Fig. 21 Battery box
1. Battery

WARNING

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

Raise the rear right hood.

WARNING

Latch the hood, so that it does not close inadvertently.

Wipe the top of the battery.

WARNING

Wear protective goggles. The battery contains aggressive acid. Rinse with water if acid comes into contact with the body.

Battery cell

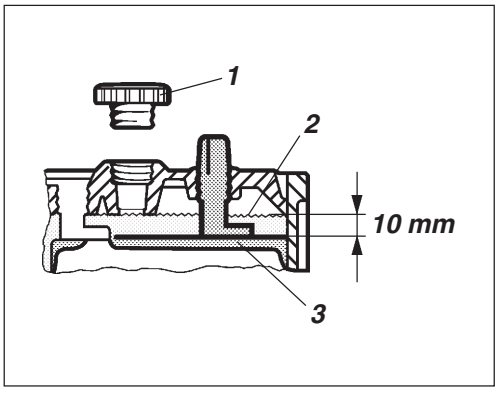


Fig. 22 Electrolyte level in battery
1. Cell cap
2. Electrolyte level
3. Plate

Take off the cell caps and make sure that electrolyte is about 10 mm (0.4 in) above the plates. Check the level of all cells. Top off with distilled water to the right level if the level is low. The engine should be run for a while before topping off with distilled water if the ambient temperature is below freezing. 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.

CAUTION

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

Dispose of the old battery properly when replacing it. The battery contains lead, which is harmful to the environment.

WARNING

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

EVERY 250 HOURS OF OPERATION (Monthly)

Front suspension – Greasing

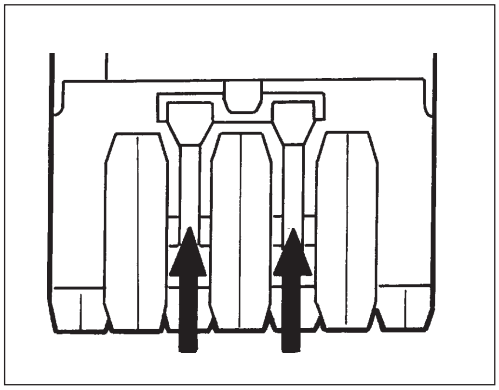


Fig. 23 Grease points on the CP221

CP221:

Grease each nipple of the front suspension with three strokes of a grease gun.

Front suspension – Greasing

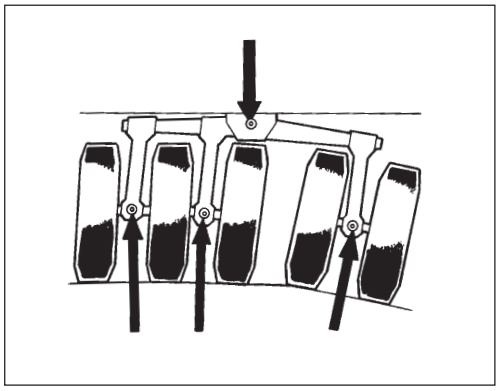


Fig. 24 Grease points on the CP271

CP271:

Grease each nipple of the front suspension with three strokes of a grease gun.

Radiator – Checking/Cleaning

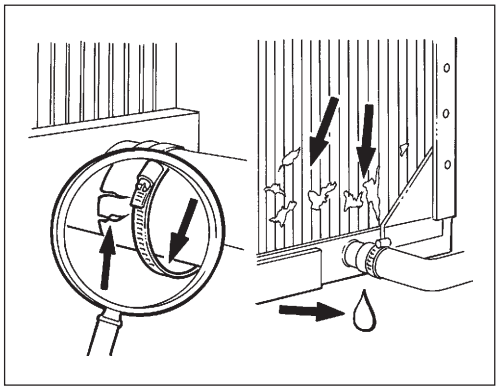


Fig. 25 Radiator

Check the radiator for leakage, damage or accumulation of dirt.

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

Blow or wash the radiator in the opposite direction to that of the cooling air.

CAUTION

Take care when using a high-pressure water jet; do not hold the nozzle too near the radiator.

WARNING

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

Swivel pin – Greasing

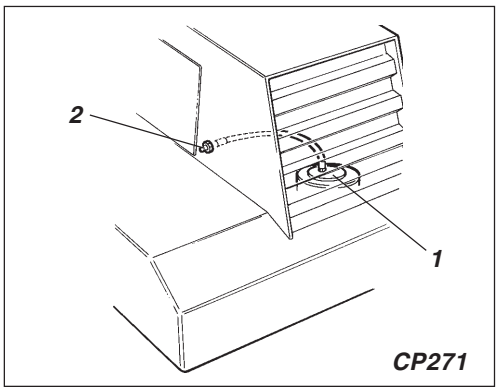


Fig. 26 Swivel pin
1. Swivel pin
2. Lubrication nipple

Grease the swivel pin (1) with 10 strokes of the grease gun.

Engine oil – Change

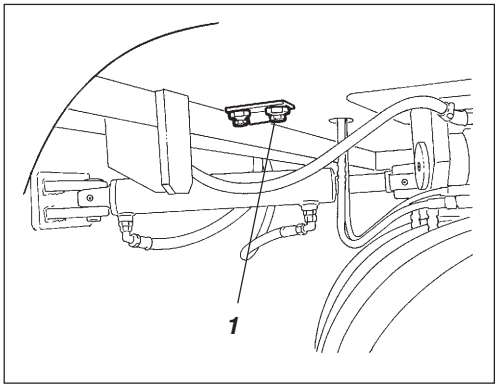


Fig. 27 Crankcase external drain plug
1. Drain plug

Run the engine warm before draining the oil.

WARNING

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

WARNING

Switch off the engine and apply the parking brake.

Place a receptacle that holds at least 15 liters of under the drain plug. Save the oil and deposit it in an approved manner.

WARNING

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

Oil filter – Changing

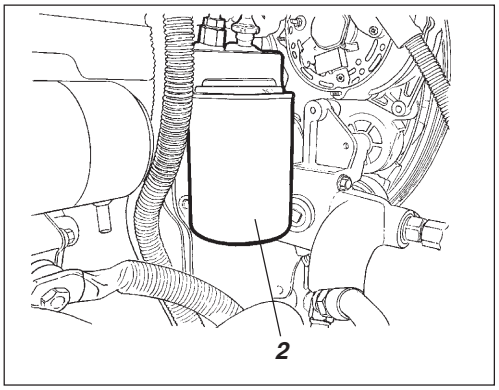


Fig. 28 Diesel engine oil filter
2. Oil filter

Remove the oil drain plug (1) and oil filter (2). Check and clean the threads and sealing surfaces of the oil drain plug. Allow all of the oil to drain off and refit the plug. Torque tighten to 8 Nm (5.9 foot-pounds). Wipe off the sealing surface on the filter holder.

Mount a new oil filter with lubricated sealing.

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

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

EVERY 500 HOURS OF OPERATION (Every three months)

Fuel pre-filter – Cleaning

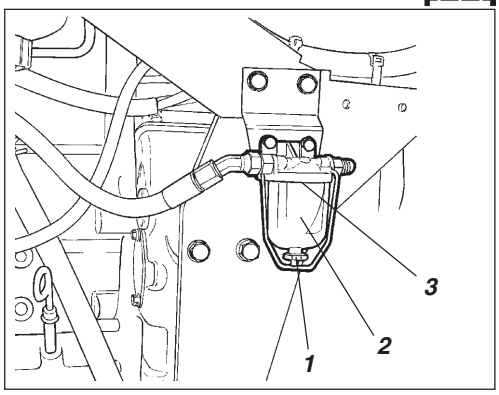


Fig. 29 Diesel engine
1. Screw
2. Glass bowl
3. Filter

WARNING

Place the machine on a level surface. Aktivate the parking brake and shut off the engine.

Open left hood of engine compartment.
Undo the screw (1) and remove the glass bowl (2) and the filter (3). Clean the bowl and the filter with an appropriate non-inflammable liquid.

Collect the diesel and cleaning liquid to environmentally correct handling.

Reassemble in reverse order.
Start the engine and check that the pre-filter does not leak.

WARNING

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

Steering chain – Greasing

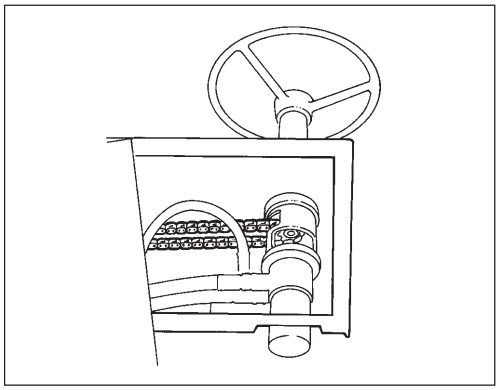


Fig. 30 Steering chain

Inspect the sprocket. Clean with kerosene. Wipe dry and apply grease.

Torque converter – Changing the oil filter

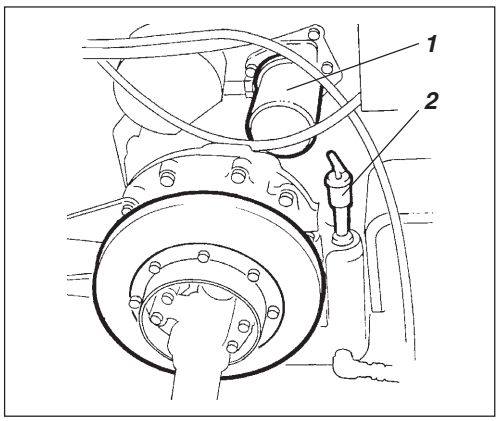


Fig. 31 Torque converter
1. Oil filter
2. Dipstick / Filling

Clean the area around the oil filter. Remove the filter. Lubricate the gasket of the new filter with a little oil before fitting. Fill with fresh oil according to the lubricant specification.

Dispose of used filters properly.

Fill up to the lowest mark on the dipstick (2). Run the engine at 900–1000 r/min to fill the system.
Check the oil level again while the engine is running at 900–1000 r/min. Fill oil up to the lowest mark on the dipstick. When the oil has reached a working temperature of 80–95°C (176–203°F), the level should be at the upper mark on the dipstick.

EVERY 500 HOURS OF OPERATION (Every three months)

Drive chains – Greasing

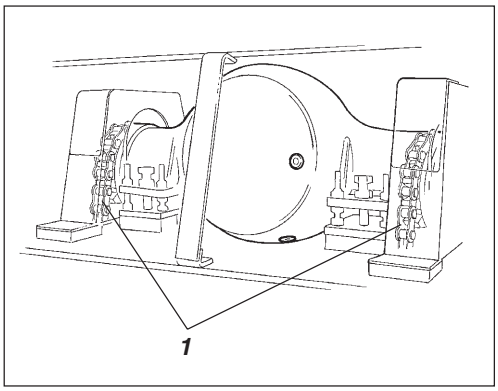


Fig. 32 Differential
1. Drive chains

Lubricate the drive chains with the grease gun.

Drive shaft – Greasing

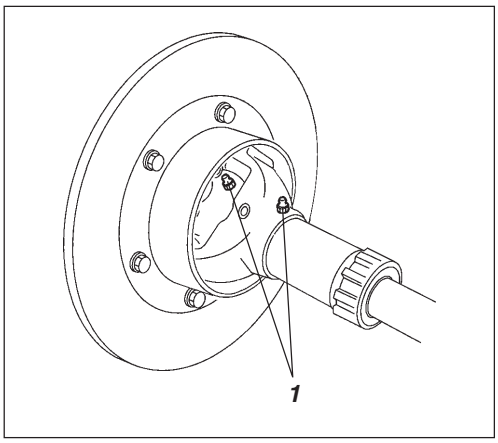


Fig. 33 Universal joint (gearbox)
1. Grease nipples

Lubricate the universal joint at the gearbox output with grease.

Lubricate the universal joint at the differential with grease.

EVERY 1000 HOURS OF OPERATION (Every six months)

Air filter – Changing

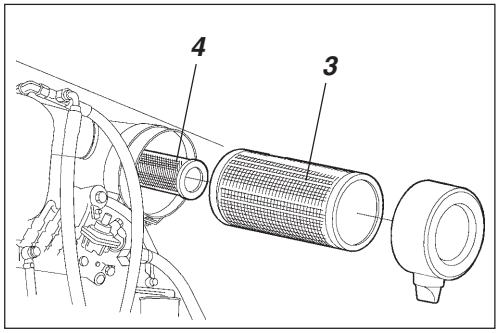


Fig. 34 Air cleaner
3. Main filter
4. Saftey filter

Replace the main filter (3) of the air cleaner even if it has not yet been cleaned five times; see under the heading ”Every 50 hours of operation” for changing the filter.

CAUTION

If the filter is not replaced when clogged, the engine will emit smoke and lose power and there will be serious risk of damage to the engine.

Also change the safety filter (4).

Torque converter – Oil change

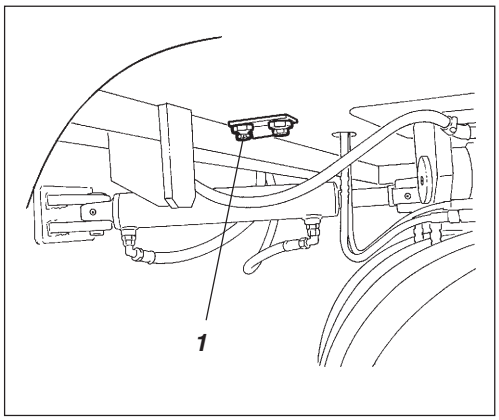


Fig. 35 Torque converter
1. Remote drain plug

Remove the torque converter dipstick/cap. Remove the filter cassette.

Place a vessel underneath the oil drain plug. Save the oil and dispose of it properly.

Unscrew the oil drain plug (1). Allow all of the oil to drain off.

Refit the plug.

Torque converter – Changing the oil and oil filter

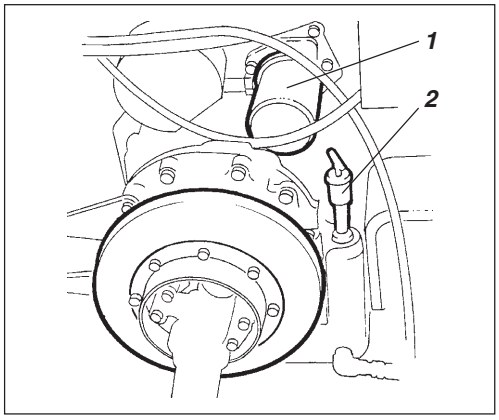


Fig. 36 Torque converter
1. Oil filter
2. Dipstick / Filling

Clean the area around the oil filter. Remove the filter. Lubricate the gasket of the new filter with a little oil before fitting. Fill with fresh oil according to the lubricant specification.

Dispose of used filters properly.

Fill up to the lowest mark on the dipstick (2). Run the engine at 900–1000 r/min to fill the system.
Check the oil level again while the engine is running at 900–1000 r/min. Fill oil up to the lowest mark on the dipstick. When the oil has reached a working temperature of 80–95°C (176–203°F), the level should be at the upper mark on the dipstick.

EVERY 1000 HOURS OF OPERATION (Every six months)

Differential – Oil change

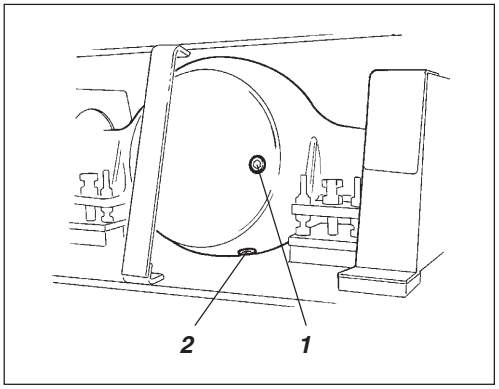


Fig. 37 Rear axle differential
1. Level plug
2. Drain plug

Remove the level plug (1). Place a collecting tray under the rear axle differential and remove the drain plug (2).

Save the oil and dispose of it properly.

Ensure that viscosity of the oil is unchanged. Thick oil implies that grease from the axle ends has penetrated into the housing. If so, the axles must be dismantled for a complete overhaul.

Refit the drain plug (2). Fill with fresh oil according to the lubricant specification. Make sure that oil runs out from the level hole.
Refit the level plug (1).

Service brake – Adjustment

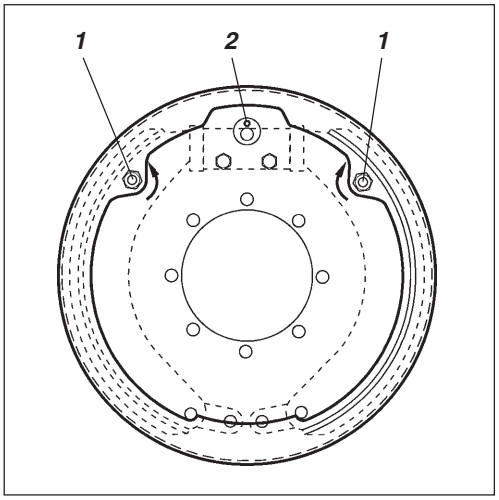


Fig. 38 Service brake
1. Adjusting cam
2. Valve

Adjust the cams (1) as illustrated, moving the brake shoes toward the drum.

– Lift the wheels from the ground.

– Screw the adjusting cams so that the brake shoes move away from the drum.

– Screw the right adjusting cam until the brake shoe lies against the drum. Screw back a quarter of a turn.

– Repeat the procedure with the left adjusting cam.

EVERY 2000 HOURS OF OPERATION (Yearly)

Hydraulic reservoir – Fluid and filter change

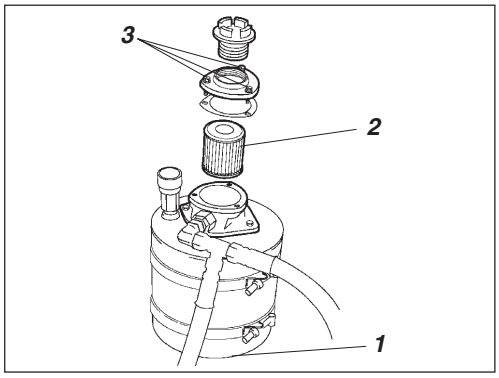


Fig. 39 Hydraulic reservoir
1. Drain plug
2. Filter
3. Screws (3 pcs.)

Drain the oil into a suitable receptacle, volume about 9 liters (8.5 qts), and dispose of it properly.

Unscrew the screws (3) and replace the filter insert (2) with a new one.

Dispose of used filters properly.

CAUTION

Hydraulic fluid must never be filled without a filter.

Fill with hydraulic fluid according to the lubricant specification.

Start the engine and turn the steering wheel left and right several times. The steering cylinder must be purged of air if steering is sluggish.

Drive chain – Adjustment

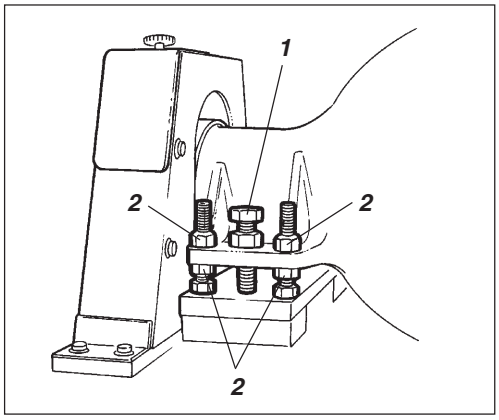


Fig. 40 Drive chain
1. Stretching bolt
2. Locking bolts

Jack up the rear wheels so that they can rotate freely.

Loosen the three lock nuts on both sides of the locking bolts (2).

Turn the stretching bolt (1) while rotating the wheel until the increase in tension slows the wheel down.

Check the distance between the two plates. Turn the stretching bolt (1) to reduce the distance by 19 mm to obtain the right chain tension.

Tighten the lock nuts on the locking bolts (2).

Repeat the procedure on the other side.

Water tank – Cleaning

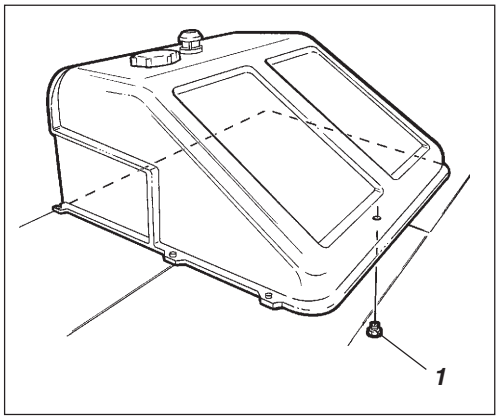


Fig. 41 Water tank
1. Drain plug

CAUTION

Remember the danger of freezing in the winter. Drain the tank, pump and piping.

Remove the drain plug (1) and empty the water.

Clean the inside of the tank with water and a suitable detergent for plastic material.

Refit the plug and check for tightness.

The water tank is made of recyclable plastic (polyethylene).

Fuel tank – Draining

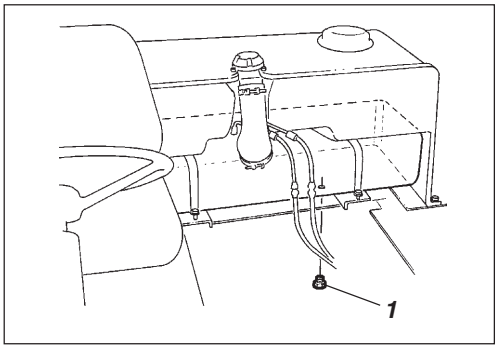


Fig. 42 Fuel tank
1. Drain plug

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

Place a receptacle under the fuel tank and remove the drain plug (1).

WARNING

Remember the danger of fire when handling fuel.

Place a receptacle under the fuel tank and remove the drain plug (1).

Dispose of the contents properly.

Brake yoke – Checking/Adjusting

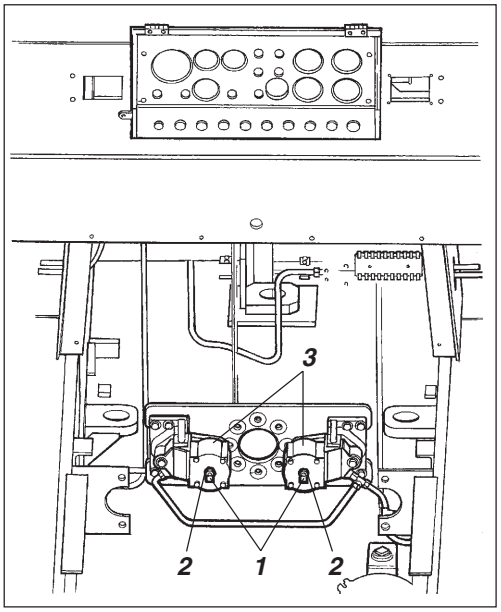


Fig. 43 Service cover, under operator's station
1. Adjusting screw (2x)
2. Lock nut (2x)
3. Brake yoke (2x)

The brake disc is located below the service cover in the platform floor.

If adjustment is required, loosen the lock nut (2) and the adjusting screw (1) on both brake yokes (3).

Place a 0,3 mm (0.012 in) thick shim between the transmission disc and one of the brake linings.

Tighten the adjusting screw (1) until it is just possible to remove the shim. Tighten the lock nut (2).

Repeat the procedure on the other brake yoke.

LONG-TERM PARKING

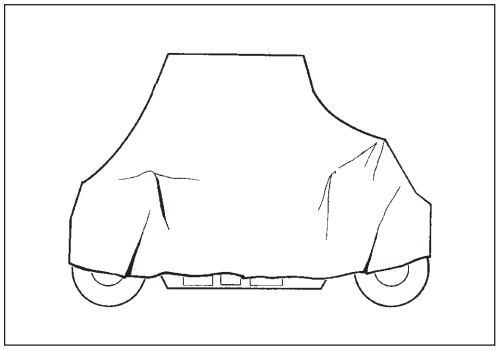


Fig. 44 Weather protection

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 of 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 instruction manual, which is supplied together with the roller.

Battery

* Remove the battery from the roller, clean it's exterior, check its electrolyte level and recharge it once a month.

Air cleaner, exhaust pipe

* Cover the air cleaner or its opening with plastic or tape, and cover also the exhaust pipe's opening. This is done so as to prevent moisture from penetrating into the engine.

Fuel tank

Fill the fuel tank fully to prevent condensation and corrosion.

Hydraulic reservoir

Drain off any condensation water and fill the hydraulic reservoir to the uppermost level mark.

Steering cylinder, hinges, etc.

Grease the steering-joint bearings and both bearings of the steering cylinder. Grease the piston rod of the steering cylinder with inhibitor grease. Also grease the engine hood hinges, seat guides, rev control and the forward/reverse control mechanism.

Tires

Jack up the frame, so that the tires do not take any load.

Covers, tarpaulin

* Place the instrument cover on the steering column. Cover the entire machine with a tarpaulin, which should hand some way off the ground. If possible, store the roller indoors, preferably in a building with a uniform temperature.

Sprinkler system

* Drain the water tank and hoses completely. The filter housing and the water pump must be emptied. Remove all the sprinkler nozzles.

Standard oils and other recommended fluids

On leaving the factory, the systems and components are filled with oil or fluid as indicated on page 3 and are thus suitable for operation in ambient temperatures between -10°C and +40°C (14–104°F). The following recommendations apply for operation in higher ambient temperatures, up to a maximum of +50°C (122°F):

Higher ambient temperature above +50°C (122°F)

The diesel engine can be run at this temperature using the normal oil, but the following oils and fluids must be used for other components.
Hydraulic system: Shell Tellus TX100 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

Never aim a water jet directly at the cap of the fuel tank or hydraulic reservoir. This is especially important when using a high-pressure jet.

Put a plastic bag over the filler cap and secure with an elastic band. This will prevent water under pressure from entering the venting hole in the filler cap, which could cause operational disturbance, such as a clogged filter. Do not spray water directly on 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.

Protective structure (ROPS)

If the roller is equipped with a Roll Over Protective Structure (ROPS), it must on no account be subjected to welding and holes must never be drilled in the structure. Never attempt to repair a damaged structure; it must be replaced with a new one.

Starting aid

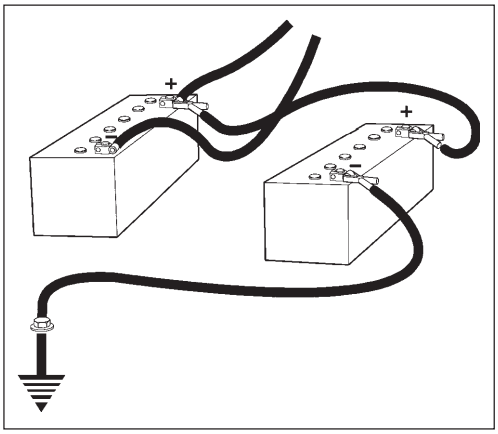


Fig. 45 Starting aid

WARNING

Do not connect the negative cable to the negative pole of a discharged battery, because in the event of a spark, the oxyhydrogen gas that is emitted around the battery could explode.

CAUTION

Always ensure that voltage of the start-assistance battery is the same as that of the discharged battery.

Switch off the ignition and all power-consuming items. Switch off the engine in the assisting machine. Connect first the positive pole of the start-assistance battery to the positive pole of the discharged battery, then connect the negative pole of the start-assistance battery to a bolt or the engine-lifting lug in the machine to the discharged battery. Start the engine of the assisting machine and let it run for a while. Attempt to start the other machine. Disconnect the cables in the reverse order.

Fuses

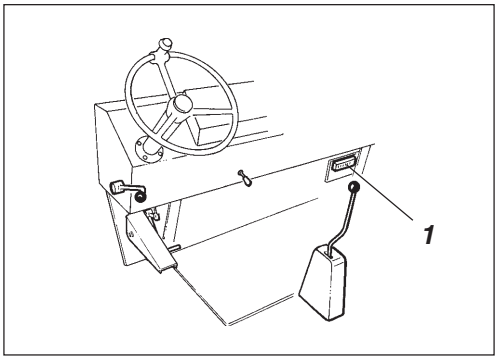


Fig. 46 Instrument panel
1. Fuse box

The electrical regulating and control system is protected by 9 fuses.

The fuse box (1) is located on the right side under the instrument panel.

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

WARNING

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

Fuses on the machine

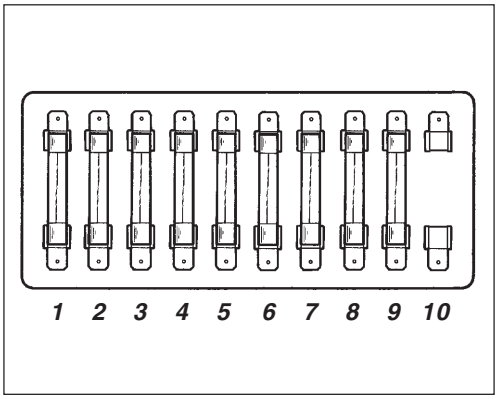


Fig. 47 Fuse box

10 A	*1. Starter switch*
10 A	*2. Instruments*
10 A	*3. Horn/reversing alarm*
10 A	*4. Operating current, working lights, front/ instrument lighting/hazard beacon □ / driving lights □*
10 A	*5. Operating current, working lights, rear*
20 A	*6. Working lights, front/rear*
10 A	*7. Water pump*
10 A	*8. Driving lights, rear*
10 A	*9. Driving lights, front*
	10. Vacant

□ = Optional equipment

The figure shows the ampere rating and function of the different fuses.

Master switch

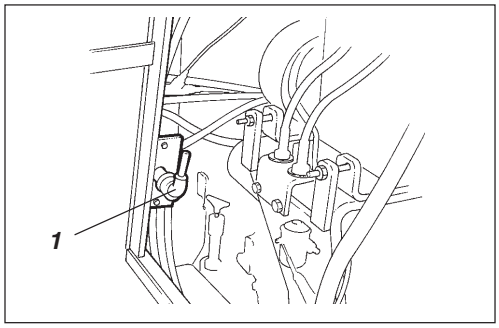


Fig. 48 Engine compartment, right side
1. Master switch

Turn off the master switch (1) and remove the handle before leaving the roller.

CAUTION

The master switch handle should be removed when the operator leaves the roller. This will prevent the battery from discharging and will also make it difficult for any unauthorized person to start and drive the machine. Also lock the hood of the engine compartment.