

MAINTENANCE

CA 15

VIBRATORY ROLLER

SUMMER 2

Diesel engine: Deutz F4L 912
From ser. no 598 001

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READ THROUGH THESE INSTRUCTIONS CAREFULLY BEFORE STARTING ANY SERVICE WORK

Correct maintenance is essential to ensure that the machine will give many years of satisfactory service, so these instructions should therefore be carefully followed.

Keep the engine instruction manual available as well.

LUBRICANTS

A B C and D refer to the maintenance schedule.

Always use specified lubricants in the stated amounts. Excessive or insufficient grease or oil will cause parts to run hot, thus inducing rapid wear.

(A) GREASE

Lithium base with EP additive (lead oleate), NLGI No. 2, Shell Alvania EP Grease 2.

(B) ENGINE OIL

API service CD/SE, SAE 10W/30

The instructions for the diesel engine (oil change intervals, etc) described in the manufacturer's instruction manual should be followed, in addition to those listed here.

Air temperature	Viscosity
-20°C - +20°C	SAE 10W/30
-10°C - +40°C	SAE 15W/40

(C) HYDRAULIC OIL

with anti-wear additive - Shell Tellus oil T 68

(D) LUBRICATING OIL

SAE 80/90 HD API, GL-5

Note

If the roller is to be used under exceptionally hot or cold conditions, get in touch with DYNAPAC for supplementary lubrication recommendations.

DYNAPAC

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We reserve the right to change specifications without notice

M1-10216-1 ENG



MAINTENANCE SCHEDULE

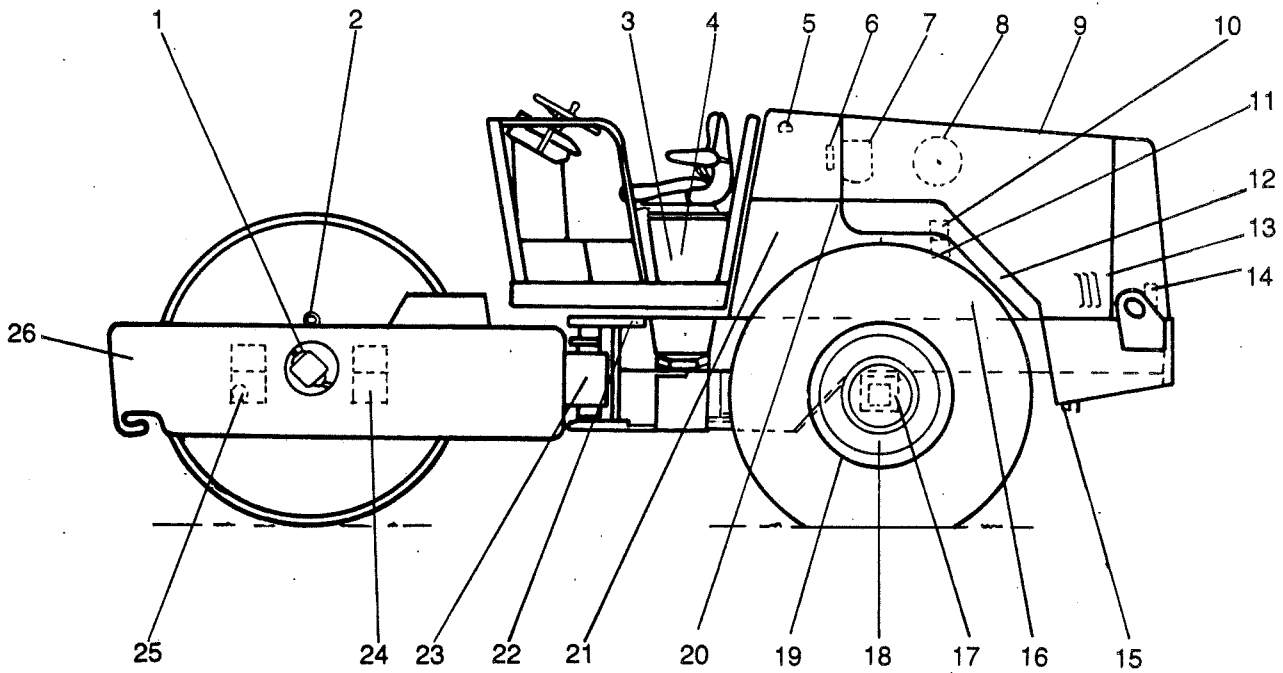


Fig 1 Maintenance schedule

- | | |
|--|--|
| 1 Torque hub (only on D and PD machines) | 14 Fuel tank - filler pipe |
| 2 Drum oil - filling | 15 Fuel tank - drain plug |
| 3 Battery | 16 Diesel engine - oil level |
| 4 Hydraulic oil filling | 17 Rear axle - lubricating oil levels |
| 5 Breather filter, hydr. oil tank | 18 Wheel nuts |
| 6 Hydr. oil level - sight glass | 19 Tyre pressures |
| 7 Hydraulic oil filter | 20 Hydr. oil tank - draining |
| 8 Air cleaner | 21 Hydraulic oil cooler |
| 9 Diesel engine cover - hinges | 22 Steering cylinder |
| 10 Fuel filter - diesel engine | 23 Articulated joint |
| 11 Diesel engine - engine oil filter | 24 Shock absorbers and mounting screws |
| 12 Fuel feed pump - diesel oil | 25 Drum oil - sight glass |
| 13 V-belts/V-belt monitor | 26 Scraper |

RUNNING-IN INSTRUCTIONS

During the running-in period, i.e. during the first 50 hours, the machine must be operated with care. The purpose of this is to allow the bearing surfaces to become hard and smooth. This increases the service life considerably. These running-in instructions and intervals apply when running in.

**REAR AXLE AND TORQUE HUB
(ONLY D AND PD)**

The oil in the differential/planetary gears and torque hub shall be changed after the first 50 hours of operation. Oil changes are then carried out every 2000 hours of operation.

ENGINE

The oil and the filter must be changed after the first 50 hours. The oil and oil filter are then changed every 500 hours. This interval applies only if diesel with a maximum sulphur content of 0.5% by weight is used and for temperatures above -10°C. Refer also to the engine manufacturer's instructions.

Item in Fig 1	Operation	Page	Lubricants see Page 1
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EVERY DAY (every 10 hours of operation)

26 ...	Scraper setting - adjust	6	
- ...	Brakes - check	6	
16 ...	Engine oil level - check	6	..... B
6 ...	Oil level in hydraulic oil tank - check	7	..... C
14 ...	Fuel tank - replenish	8	
- ...	Air cleaner indicator lamp - check	8	

EVERY WEEK (every 50 hours of operation)

8 ...	Air cleaner filter element - clean		
	oil hoses and connections - inspect for leakage	9	
24 ...	Shock absorbers and securing bolts - inspect	10	
22,23	Articulated joint/steering cylinder - lubricate	11	..... A
19 ...	Tyre pressures - check	11	

MAINTENANCE SCHEDULE

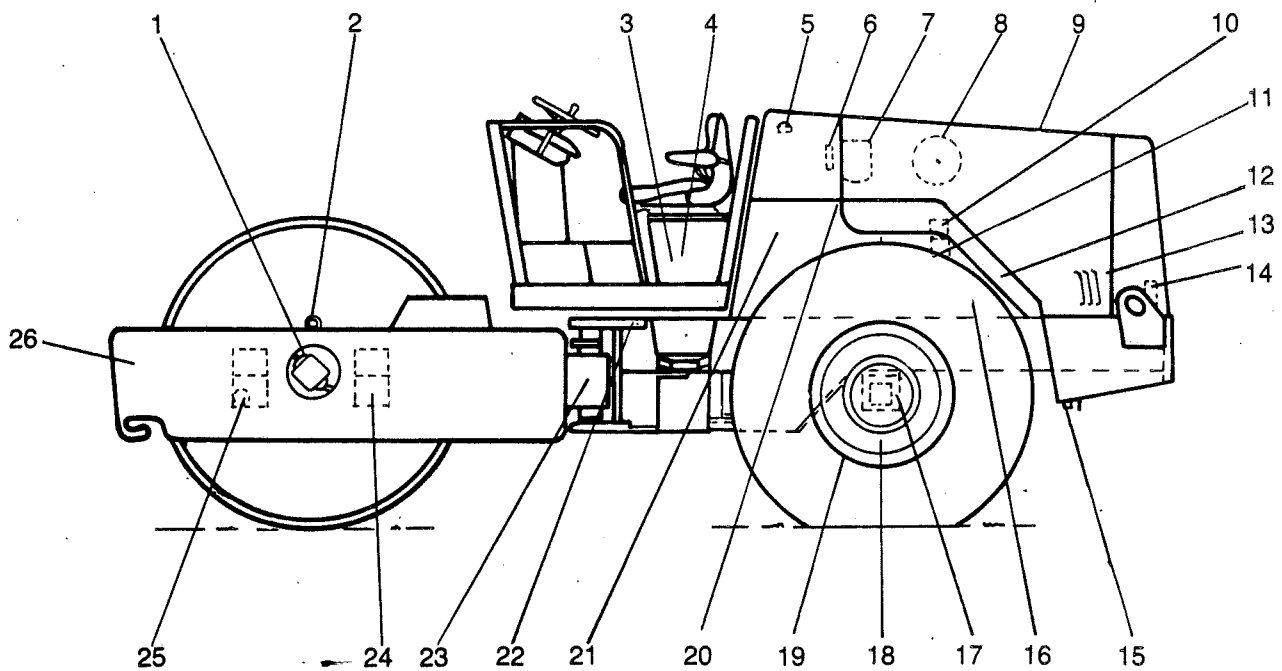


Fig 1 Maintenance schedule

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| 6 Hydr. oil level - sight glass | 19 Tyre pressures |
| 7 Hydraulic oil filter | 20 Hydr. oil tank - draining |
| 8 Air cleaner | 21 Hydraulic oil cooler |
| 9 Diesel engine cover - hinges | 22 Steering cylinder |
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| 13 V-belts/V-belt monitor | 26 Scraper |

Item in Fig 1	Operation	Page	Lubricants see Page 1
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EVERY 14 DAYS (every 100 hours of operation)

- ...	Engine cooling fins - clean *	12	
21 ...	Hydraulic oil cooler - clean externally	12	
3 ...	Battery - check	13	

EVERY MONTH (every 250 hours of operation)

13 ...	V-belt monitor - check	14	
13 ...	Fan belt and alternator V-belt tension - check	15	

EVERY THREE MONTHS (every 500 hours of operation)

7 ...	Hydraulic oil filter - replace	16	
11 ...	Engine oil - change and engine oil filter - replace	17	..... B
11 ...	Diesel engine controls - lubricate	*	
9 ...	Engine cover hinges - lubricate	18	

EVERY SIX MONTHS (every 1000 hours of operation)

5 ...	Hydraulic oil tank breather filter - replace	19	
- ...	Engine valve clearances - check	*	
10 ...	Fuel filter element - replace	19	
12 ...	Fuel system - bleed	20	
12 ...	Fuel feed pump strainer - clean	20	
1 ...	Torque hub oil - change (only on D and PD machines)	21	..... D

EVERY YEAR (every 2000 hours of operation)

2,25	Drum oil - change	22	..... D
6 ...	Hydraulic oil tank oil - change	23	..... C
17 ...	Rear axle planetary gear oil - change	25	..... D
17 ...	Rear axle differential oil - change	25	..... D
15 ...	Fuel tank - drain	26	

* See the engine instruction manual

EVERY DAY (every 10 hours of operation)

Scrapers — adjusting

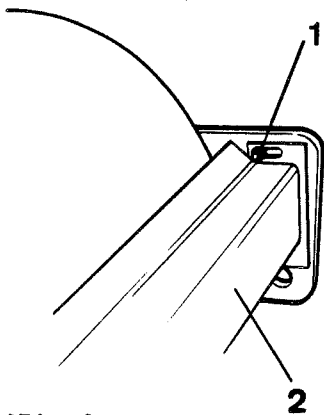


Fig 2

- 1 Mounting screws
- 2 Scraper

Adjust the scraper position as follows:

- 1 Loosen all four mounting screws.
- 2 Set the scraper approx. 10 mm (0.4 in) away from the drum.
- 3 Retighten the mounting screws.

Brakes — checking

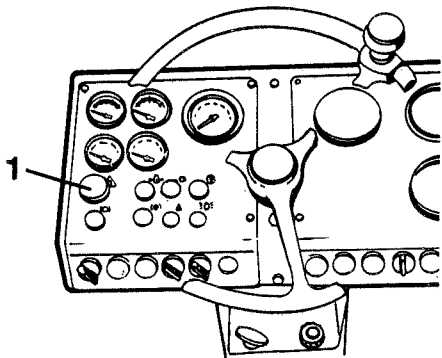


Fig 3 Instrument panel

- 1 Emergency stop

- 1 Drive the machine forwards slowly.
- 2 Depress the emergency stop, the machine should then stop.
- 3 After checking the brakes, move the forward/-reverse lever to the neutral position before resetting the emergency stop.

Engine — checking the oil level

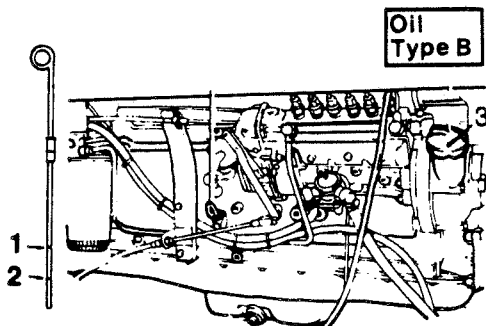


Fig 4 Checking oil level

- 1 Upper mark
- 2 Lower mark
- 3 Filler cap

- 1 Drive the machine onto a level surface and switch off the engine.
- 2 Remove the dipstick (1) and check the oil level.
- 3 If the oil is close to or below the lower mark, replenish with grade B as recommended on page 1 under "Lubricants".

Hydraulic tank — checking the oil level

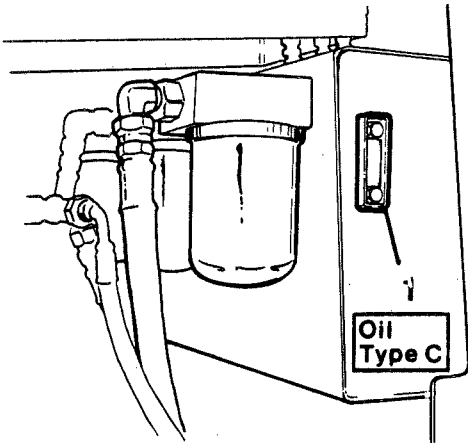


Fig 5 Hydraulic oil tank

1 Sight glass

- 1 Drive the machine onto a level surface and check the level of the oil in the sight glass (1).
- 2 If the oil level is more than 2 cm (0.75 in) below the top of the sight glass, replenish with grade C oil, as recommended on page 1 under "Lubricants".

Hydraulic tank — replenishing with oil

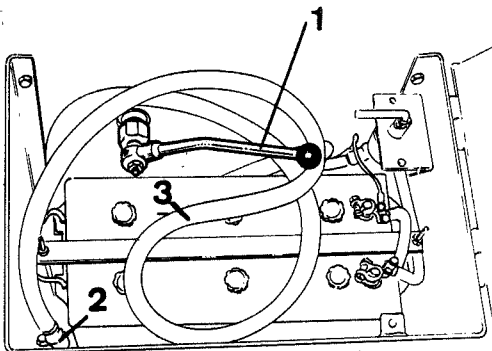


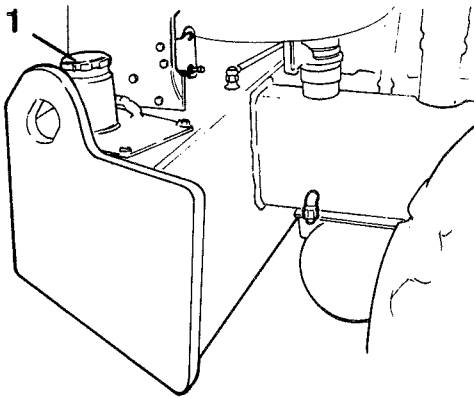
Fig 6 Battery box

1 Pump lever
2 Protective plug
3 Suction hose.

- 3 Take the suction hose (3) from the battery box.
- 4 Unscrew the protective plug (2) from the hose.
- 5 Insert the end of the hose into a drum of new hydraulic oil of grade C as recommended on page 1 under "Lubricants".
- 6 Operate the pump lever (1) to pump hydraulic oil into the tank, up to the mark on the sight glass.

Pump the hydraulic oil through a filter into the tank. Always use this procedure when replenishing the oil.

Fuel tank — replenishing



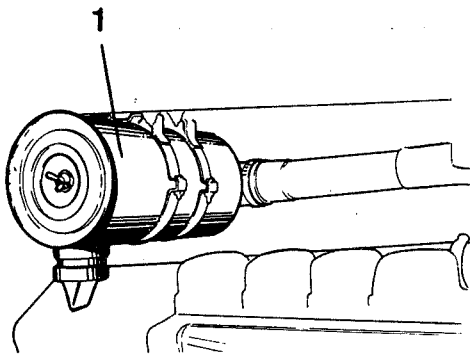
Replenish the fuel tank daily to the lower edge of the filler neck. Use diesel fuel.

Refer to the appropriate manufacturer's instructions for the grade of diesel fuel.

Fig 7 Fuel tank

1 Filler cap

Air cleaner — checking the dust indicator



The air cleaner is fitted with a pressure-drop indicator, which is connected to a warning lamp on the instrument panel.

If the air cleaner warning lamp lights up when the engine is running at full speed, clean the filter (see under the heading "WEEKLY". Air cleaner-cleaning the filter element).

Fig 8 Engine - air cleaner

1 Air cleaner

EVERY WEEK

(every 50 hours of operation)

Air cleaner — cleaning the main filter element

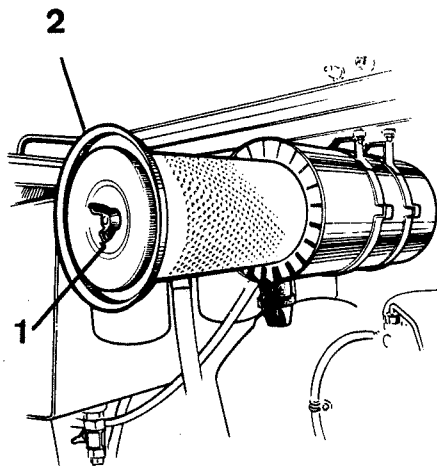


Fig 9

- 1 Wing nut
- 2 Main filter

- 1 Unscrew the wing nut in the centre of the filter and remove the filter.
- 2 Make sure that dust has not penetrated the filter during operation. Check that dust has not entered the engine induction pipe. If it has, this means that the connections, hoses or element have a leak and must therefore be replaced.
- 3 Wipe clean the inside of the filter housing and the induction pipes clean, using a clean cloth.
- 4 Check all connections between the air cleaner and engine to be certain they are tight and do not leak.

Note Replace the back-up filter after it has been cleaned three times or at every third change of the main filter. The back-up filter cannot be cleaned.

Main filter — cleaning with compressed air

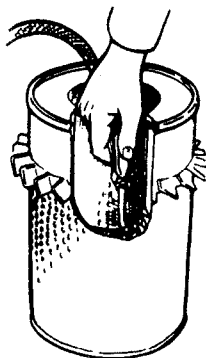


Fig 10 Main filter

Use compressed air at a maximum pressure of 0.7 MPa (7 kgf/cm²) (100 psi).

Play the compressed air up and down along the folds of the paper at 45° to the inside of the filter element. Hold the nozzle at least 1 cm (0.4 in) away from the element to avoid damaging the paper.

Note Do not replace a filter element that has been washed in detergent until it is completely dry.

Main filter — cleaning by washing

If the filter element is sooty or oily, it should be washed in a solution of water and non-foaming detergent, such as "Donaldson D-1400".

The element should be washed in a detergent solution and soaked for at least 15 minutes. Raise and lower the element in the solution from time to time to improve the cleaning effect.

Make sure that the filter element is intact before refitting it. If it has any holes or if the seals are defective, fit a new element. Shine a lamp through the filter when inspecting it, to ensure that it is clean and that there are no holes in the paper element.

Shock absorbers and mounting screws — checking

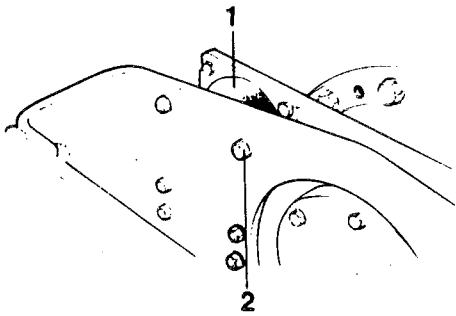


Fig 11 Drum

- 1 Shock absorbers
- 2 Mounting screws

Ensure that the shock absorbers are undamaged and that the mounting screws are correctly tightened. Replace shock absorbers when 20-25 mm (0.75-1 in) deep cracks are detected in them.

Use the blade of a knife or other pointed object when carrying out the inspection.

Steering cylinder and articulated joint – greasing

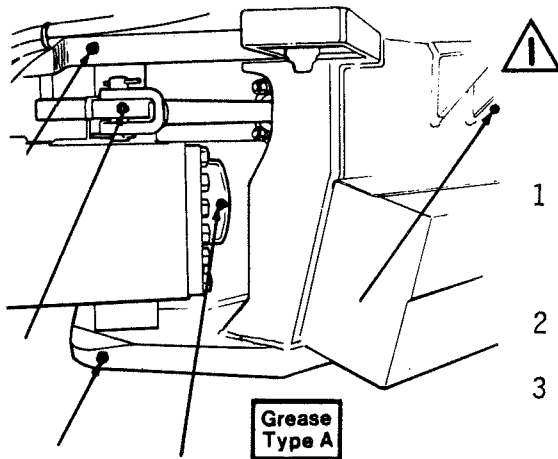


Fig 12 Grease nipples

⚠ ENSURE THE VICINITY OF THE ARTICULATED JOINT IS CLEAR OF PERSONAL WHEN THE ENGINE IS RUNNING. INJURIES COULD OCCUR IF THE STEERING IS OPERATED.

- 1 Turn the drum section to the left so that all the grease nipples on the right-hand side of the articulated joint are accessible.
- 2 Clean any dirt and grease off the five nipples.
- 3 Lubricate each nipple with five strokes of the grease gun. Ensure that grease enters the bearings.

Use grade A grease as recommended on page 1 under "Lubricants". Leave a little grease on the nipples after lubricating to prevent dirt from entering them.

Tyre pressures

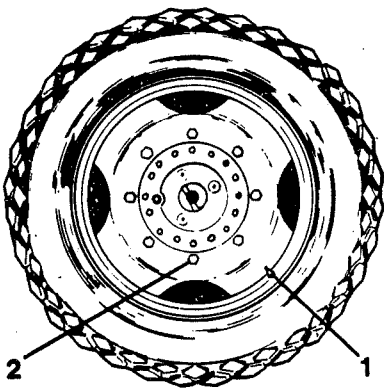


Fig 13 Wheel

- 1 Air valve
- 2 Wheel nut

Check the tyre pressures using a tyre pressure gauge.

The minimum tyre pressure is 0.11 MPa (1.1 kgf/cm²) (15.65 psi) and the maximum tyre pressure is 0.15 MPa (1.5 kgf/cm²) (21.3 psi).

Check both tyres.

EVERY 14 DAYS

(every 100 hours of operation)

Engine cooling fins — cleaning

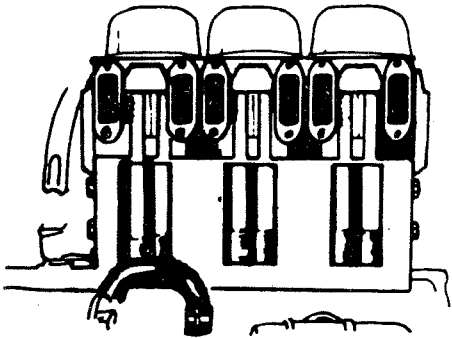


Fig 14 Engine - cooling fins

- 1 Release the catches and remove the air ducting from the engine.
- 2 Clean the cooling fins carefully, preferably using compressed air.

(Refer to the manufacturer's instruction manual for more detailed instructions.)

Hydraulic oil cooler — cleaning the exterior

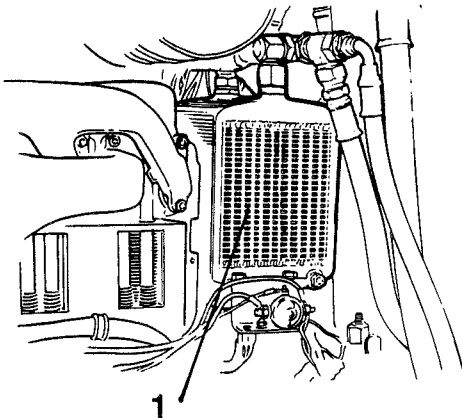
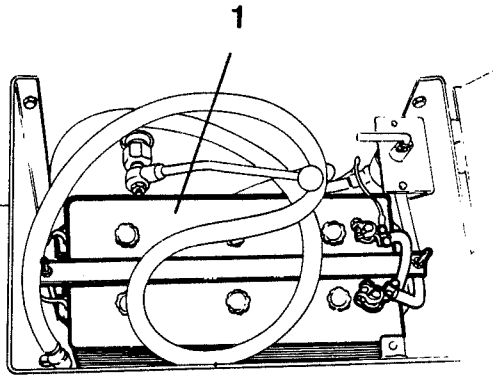


Fig 15

1 Hydraulic oil cooler

Ensure that air can flow freely through the cooler. If the cooler is dirty, clean by flushing with water or by blowing through with compressed air. After cleaning, ensure that seals and sound-absorbers are not damaged.

Battery — checking the electrolyte level



⚠ NEVER USE A NAKED FLAME AND KEEP SPARKS AWAY WHEN CHECKING THE FLUID LEVEL, SINCE EXPLOSIVE GAS IS FORMED IN THE BATTERY WHEN IT IS BEING CHARGED.

- 1 Tilt the seat forward.
- 2 Wipe the top of the battery clean.

Fig 16

1 Battery

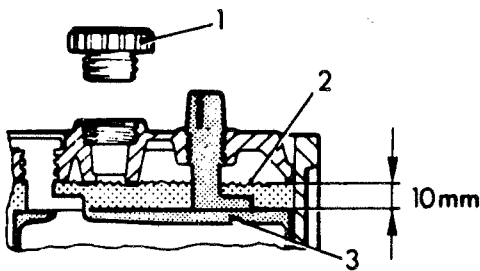


Fig 17 Battery liquid level

- 1 Cell plug
- 2 Liquid level
- 3 Plate

- 3 Remove the cell filler plugs and ensure that the level of the liquid is approx. 10 mm (0.4 in) above the plates.

Check all the cells. If the level is lower, top up to the correct level with distilled water.

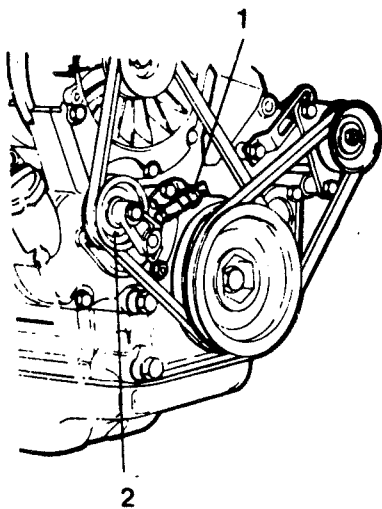
If the air temperature is below freezing, run the engine for a while after adding the distilled water, since the water may otherwise freeze.

- 4 Ensure that the breather holes in the cell filler plugs are not blocked. Then replace the plugs.
- 5 The cable terminals should be clean and securely tightened. If corroded, clean them and coat them with acid-free petroleum jelly.

EVERY MONTH

(every 250 hours of operation)

V-belt monitor — checking



⚠ NEVER CONTROL THE V-BELT MONITOR WITH THE ENGINE RUNNING.

The belt is tensioned by a spring-loaded belt tensioner (2). If the belt should break, the belt tensioner will be moved outwards by the spring and will actuate the pressure switch on the belt monitor (1), causing the horn to sound.

Fig 18 Checking the V-belt and V-belt monitor

- 1 V-belt monitor
- 2 Belt tensioner

Depress the switch (1). The machine horn should sound. If the alarm device is defective, it should be repaired immediately.

- 1 Park the machine in a safe place.
- 2 Stop the engine.
- 3 Move the battery master switch to the "OFF" position, so that the horn is disconnected.
- 4 Fit a new V-belt (see the engine manufacturer's instruction manual).
- 5 Restore the battery master switch to the "ON" position.

V-belt — checking

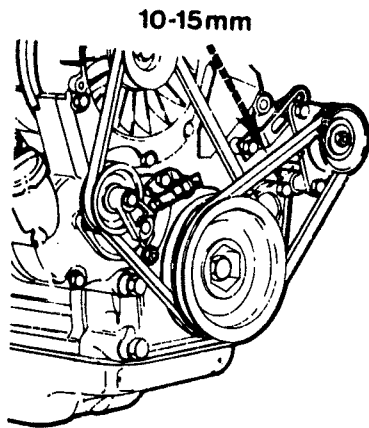


Fig 19 Checking the V-belt tension

1 V-belt monitor switch

Check the belt tension by pressing the belt midway between the alternator pulley and the crankshaft pulley. It should not be possible to depress the belt by more than 10-15 mm (0.4-0.6 in). If the deflection is greater, the belt must be tensioned.

At the same time, ensure that the V-belt monitor for the fan belt operates satisfactorily. The horn should sound when the belt monitor switch (1) is depressed.

V-belt — adjusting

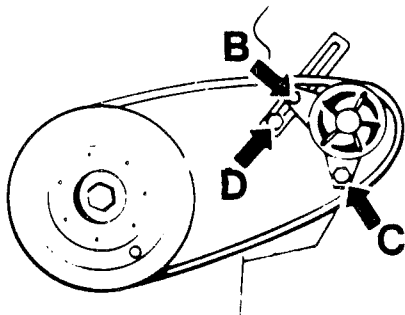


Fig 20 Tensioning the alternator V-belt

- 1 Loosen the alternator mounting screws (B) and (C) and nut (D).
- 2 Press the alternator outwards until the belt is again correctly tensioned (see above).
- 3 Retighten screws (B), (C) and the nut (D).

EVERY THREE MONTHS

(every 500 hours of operation)

Hydraulic oil filters

— replacing

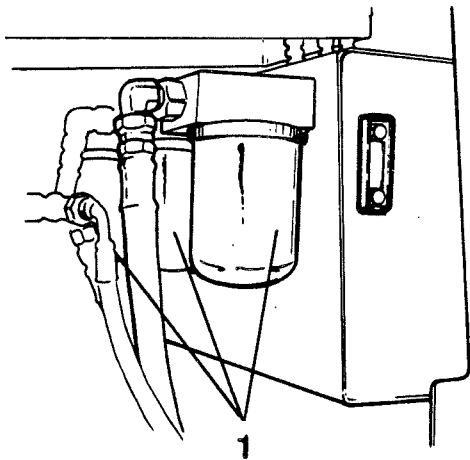


Fig 21

1 Hydraulic oil filters

1 Unscrew the hydraulic oil tank breather filter, to release any pressure in the tank.

2 Remove the hydraulic oil filters (1).

Discard the filters.

Note Ensure that the old seal is not left on the filter head, since leakage would then occur between the new and old seals.

3 Clean the sealing surface of the filter heads carefully.

4 Apply a thin film of clean hydraulic oil to the new filter seals.

5 Tighten the filter by hand.

First screw the filter until the seal seats against the filter head. Then tighten it an additional half-turn.

Note Do not tighten the filter too much, since this may damage the seal.

6 Start the engine and check that there is no leakage around the filters.

General about diesel engine lubrication

Engine — deviations from the normal oil change interval

Note Irrespective of the number of hours of operation, the engine oil and engine oil filter must be changed every six months. The oil filter must always be replaced when the engine oil is changed.

Oil change intervals are dependent on the grade of the lubricating oil and the sulphur content of the fuel.

Changing the oil every three months or every 500 hours of operation is conditional on the use of engine oil of grade "For API Service CD, SAE" and on the use of diesel fuel of good quality, with a sulphur content below 0.5%. The air temperature should also be over -10°C .

If oil of grade "For API Service CC/SC, SAE" is used or if the sulphur content of the diesel fuel is above 0.5%, the oil should be changed earlier and more frequently (see the engine manufacturer's instructions).

Warm up the engine thoroughly before draining the oil. Impurities in the lubricating system will then be well mixed with the oil and will be removed with it. Furthermore, the oil flows more readily when it is hot.

Engine — changing the oil

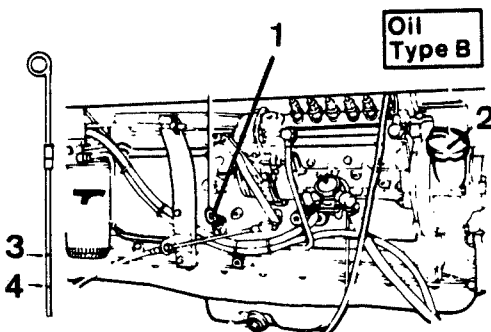


Fig 22 Engine

- 1 Dipstick
- 2 Oil filler cap
- 3 Lower level mark
- 4 Upper level mark

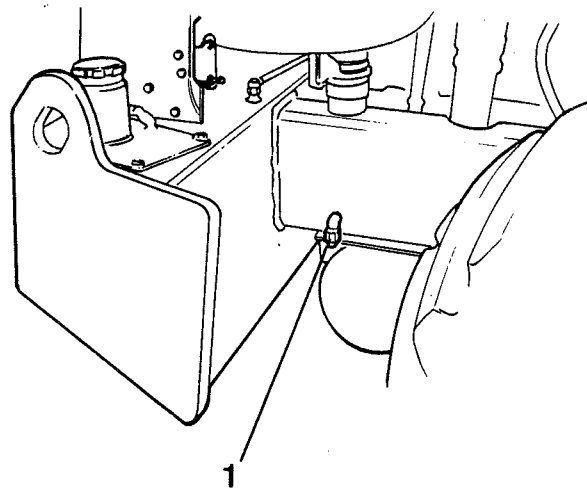


Fig 23

- 1 Drain plug
- 1 Remove the filler cap (2).
 - 2 Remove the drain plug (3) and allow the oil to drain out into a suitable receptacle to hold at least 12 litres (3.5 US gallons), while changing the oil filter.
 - 3 Clean the drain plug (3) and refit it.

Engine — replacing the oil filter

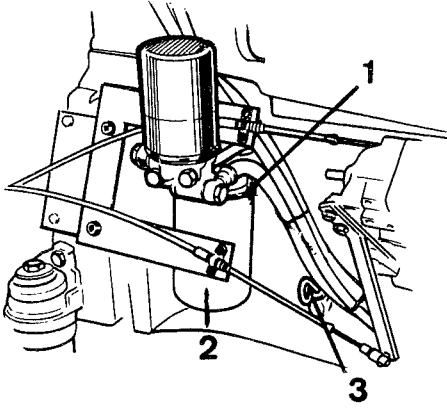


Fig 24 Engine

- 1 Rubber seal
- 2 Oil filter

- 1 Remove the oil filter (1) and discard it. It is of the disposable type and cannot be cleaned.

Note Ensure that the old rubber seals are not left on the filter head since leakage would then occur between the new and old seals.

- 2 Clean the sealing surfaces of the filter holder.
- 3 Lightly oil the rubber seal (1) on the new filter.
- 4 Screw the filter into place by hand until the rubber seal seats correctly and then turn the filter an additional half-turn.

Note Do not tighten the filter too much, since this may damage the seal.

Engine — changing the oil

- 1 Replenish with new grade B oil as recommended on page 1 under "Lubricants".

Oil capacity: approx. 11 litres (2.9 US gallons).

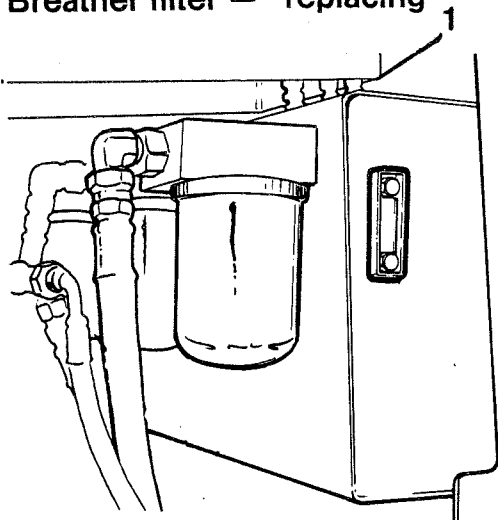
- 2 Check the oil level using the dipstick (3). The level should be at the upper mark. If necessary, replenish with more oil.
- 3 Refit the filler cap.
- 4 Start and warm up the engine. Ensure that there are no oil leaks.

Controls, hinges and joints — greasing

Lubricate all engine cover hinges with grade B oil as recommended on page 1 under "Lubricants".

EVERY SIX MONTHS
(every 1000 hours of operation)

Breather filter — replacing



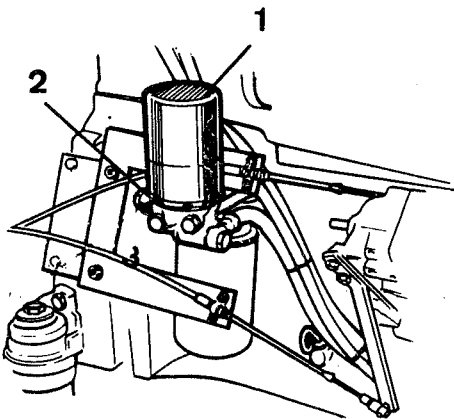
- 1 Remove the old filter (1) over the hydraulic oil tank and replace with a new one.

Under dusty conditions, replace the filter every 500 hours of operation.

Fig 25

1 Breather filter

Fuel filter — replacing



- 1 Unscrew the fuel filter.
- 2 Clean the sealing surface (2).
- 3 Apply clean diesel fuel to the rubber gasket on the new filter.
- 4 Screw the new filter into place by hand, until the rubber gasket seats correctly, then tighten it an additional half-turn.

Fig 26 Fuel filter

Start the engine and ensure that the filter does not leak.

Fuel system — bleeding

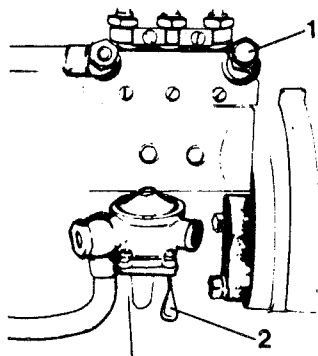


Fig 27 Bleeding the fuel system

- 1 Screw
- 2 Pump lever

- 1 Loosen the screw (1).
- 2 Manually operate the pump lever (2) on the feed pump until the fuel flowing out at the screw (1) is free from air bubbles.
- 3 Retighten the screw (1).

Note If no fuel flows out past the screw when the hand pump is operated, turn the engine over using a 36 mm (1 7/16) non-adjustable spanner fitted to the crankshaft nut.

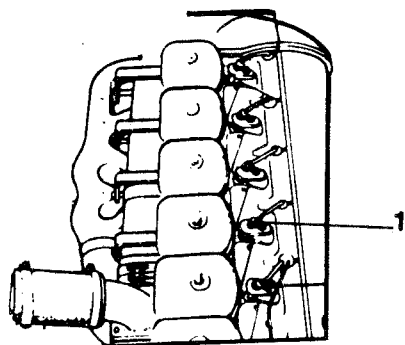


Fig 28 Bleeding the pressure lines

- 1 Coupling nut

- 4 If the pressure lines have been disconnected, they must also be bled.
- 5 Loosen the pressure line coupling (1) a couple of turns and run the starter motor until bubble-free fuel flows out past the nut.

The throttle should be in the fully open position.

- 6 Tighten the pressure line connection.
- 7 Bleed the other pressure lines in a similar manner, if necessary.

Fuel strainer — cleaning

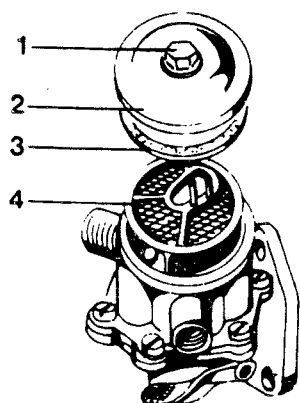


Fig 28 Fuel feed pump

- 1 Retaining screw
- 2 Cover
- 3 Gasket
- 4 Strainer

- 1 Loosen the retaining screw (1).
- 2 Remove the cover (2).
- 3 Remove the strainer (4) and wash in diesel fuel.
- 4 Lubricate the gasket (3) with clean diesel fuel.
- 5 Assemble in the reverse order.
- 6 Bleed the fuel system (see the section "Bleeding").

Note Start the engine and check that there is no leakage.

Torque hub — changing the oil

Only on D and PD machines.

Note that the torque hub has two oil spaces:

- one in a planetary gear section
- one in an angular gear section

Before the oil is drained, the torque hub should be warmed up.

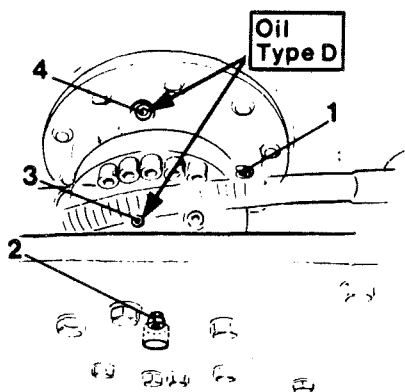


Fig 30 Torque hub

- 1 Level plug
- 2 Level plug
- 3 Filler plug
- 4 Filler plug

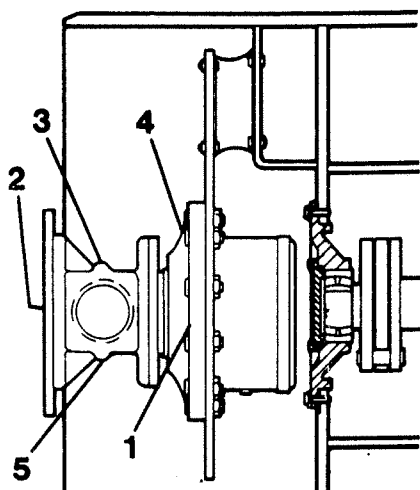


Fig 31 Torque hub viewed from the side

- 1 Level plug
- 2 Level plug
- 3 Filler plug
- 4 Filler plug
- 5 Drain plug

1 Drive the roller on to a flat surface so that the drain plug (1) is right at the bottom.

2 Wipe the plugs clean.

3 Place a vessel under the plugs (1) and (5) and remove them. Drain the oil. The vessel should hold 5 litres (5.3 US qt). Refit the plug (5).

4 Reverse the roller so that the filler plug (4) is at the top.

5 Remove the level plug (2) and filler plugs (3) and (4).

6 First pour in oil through the plug (4) until it escapes through the level plug (1). Then pour through the plug (3) until the oil escapes from the level plug (2). Refit the plugs.

Oil quantity approx 3 litres (3.2 US qt). Use oil D according to "Lubricants", page 1.

EVERY YEAR

(every 2000 hours of operation)

Drum — changing the oil

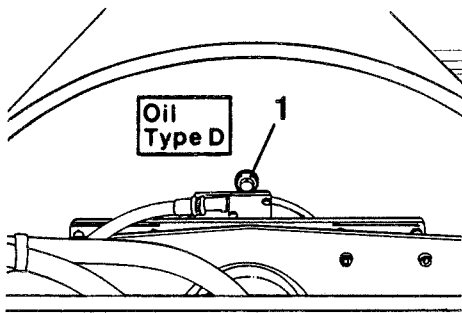


Fig 32 Roller

1 Drain/filler plug

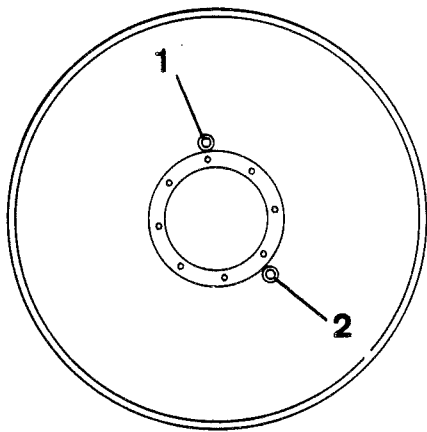


Fig 33 Roller position when filling

1 Filler plug
2 Sight glass

1 Drive the machine so that the drain plug (1) is in the lowest position.

2 Remove the plug and drain the oil.

Collect the oil in a suitable receptacle.

3 Drive the machine so that the drain plug (1) is in the highest position.

4 Replenish with oil type D according to the lubricant chart, see page 1, to half way up the sight glass. See figure 33.

5 Replace the plug.

6 Check for tightness.

Hydraulic tank — changing the oil

Note To ensure trouble-free operation of the machine, the strictest cleanliness is essential when servicing the hydraulic system.

The hydraulic oil should be changed when the system is hot, i.e. at the end of a shift. Oil flows more freely when it is hot and any impurities will then be well mixed with the oil and will flow out when the oil is drained.

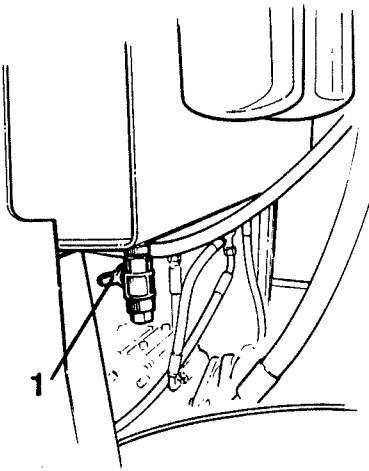


Fig 34 Draining the hydraulic oil tank

- 1 Clean the area around the tank drain plug thoroughly.
- 2 Obtain a receptacle to hold at least 100 litres (26.4 US gallons) to collect the oil. An empty oil drum or the like is suitable.

Place the receptacle beside the machine and allow the oil to flow via a hose from the drain plug to the oil drum.

1 Drain cock

- 3 Remove the cover plate (1) located on the top of the hydraulic oil tank.

Note Take care to prevent impurities from entering the tank.

- 4 Cleaning the tank. This is most easily achieved by drawing up the sediment from the bottom of the tank by means of a filter unit. If cloths or brushes are used, they must be completely clean and free from dust and loose ends.

Note If the tank is rinsed out with hydraulic oil, all connections in the bottom of the tank must be plugged to prevent impurities from entering the hydraulic lines.

Do not forget to remove the plugs after cleaning.

- 5 Refit the cover plate. Fit a new gasket and use Loctite sealing compound or its equivalent to ensure a good seal.

Note Ensure that no sealing compound enters the tank.

Hydraulic tank — replenishing with oil

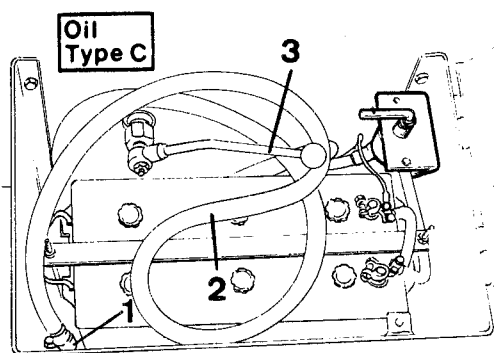


Fig 35 Battery box

- 1 Protective plug
- 2 Suction hose
- 3 Pump lever

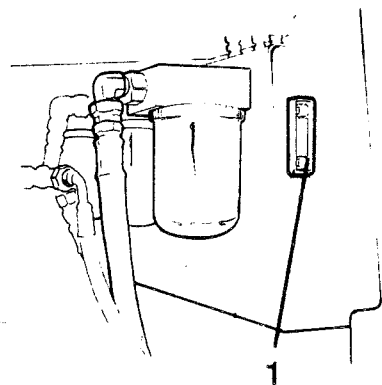


Fig 36 Hydraulic oil tank

- 1 Sight glass

- 1 Take the suction hose (2) from the battery box. Unscrew the protective plugs (1) from the hose.

Insert the hose into a drum of new hydraulic oil. Use grade C oil as recommended on page 1 under "Lubricants".

- 2 Operate the pump lever (3) and fill the tank to the FULL mark on the sight glass. The tank holds approx. 75 litres (19.7 US gallons).

Pump the hydraulic oil through a filter into the tank. Always use this procedure when replenishing with new oil.

- 3 Start the engine and operate the various hydraulic systems.
- 4 Check the oil level and, if necessary, replenish.

**Rear axle planetary gear
— changing the oil**

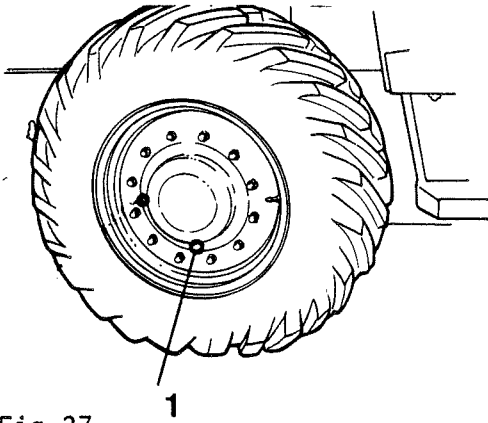


Fig 37
1 Drain position

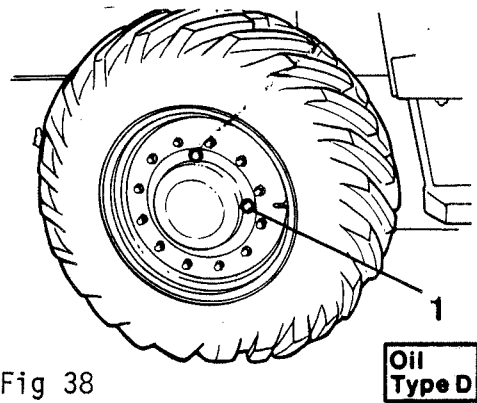


Fig 38
1 Filling position

- 1 Drive the roller onto a level surface so that the drain plug is at its lowest point.
- 2 Remove the level and drain plugs.
- 3 Place a receptacle to hold about 3 litres (0.8 US gallon) under the drain plugs.

Drain the oil.
- 4 Drive the roller so that the level plug is positioned according to the figure 37.
- 5 Fill up with oil through the plug hole until the oil reaches up to the lower edge of the hole. Each planetary gear holds about 2.5 litres (0.7 US gallon). Use oil type D as recommended on page 1 under "Lubricants".
- 6 Refit the plugs.
- 7 Change the oil in the other rear axle planetary gear in the same manner.

**Rear axle differential
— changing the oil**

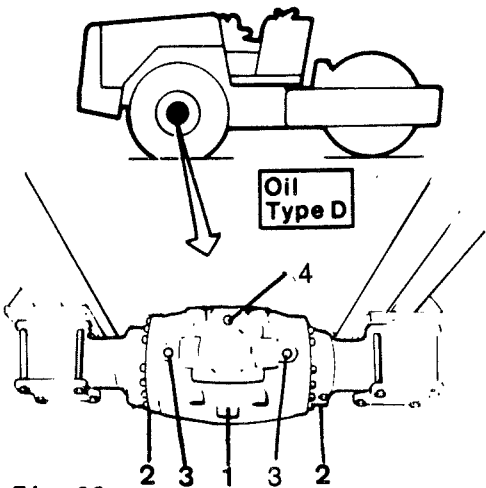


Fig 39
1 Drain plug
2 Drain plugs
3 Level plug
4 Filler plug

⚠ NEVER WORK UNDER THE ROLLER WHEN THE ENGINE IS RUNNING. PARK THE MACHINE ON A LEVEL SURFACE. BLOCK DRUM AND WHEELS.

- 1 Drive the roller onto a level surface and stop the engine.
- 2 Clean the area around the plugs (1), (2), (3) and (4).
- 3 Place a receptacle to hold about 12 litres (3.2 US gallon) under the drain plug (1).
- 4 Remove the plugs and collect the oil in the receptacle.
- 5 Clean the drain plugs (1), refit them when all oil has drained and tighten them.
- 6 Fill up with oil through plug (4) until the oil reaches up to the lower edge of the hole (3). The differential holds about 11 litres (2.9 US gallon). Use grade D oil as recommended on page 1 under "Lubricants".
- 7 Refit the filler plug (4) and tighten it.

Fuel tank — draining

Water and sediment in the fuel tank can be drained through the plugs (1) in the bottom of the fuel tank.

Note Do not drain all the fuel, since air may then enter the fuel system.

Draining should be carried out when the machine has been stationary some time - such as overnight.

The machine should preferably be left with one side slightly higher than the other, so that the water and sediment will collect at the lower drain plug.

Drain as follows:

- 1 Clean the area around the lower drain plug.
- 2 Loosen the plug and drain the water and sediment until only clean diesel fuel flows from the drain plug hole. Then retighten the plug.

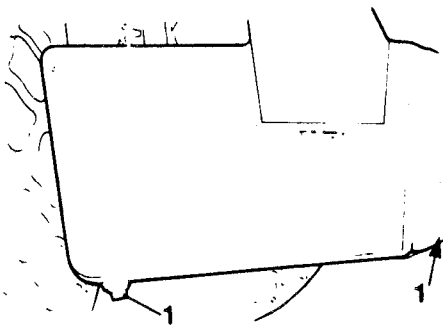


Fig 40 Fuel tank

1 Drain plugs

SPECIAL INSTRUCTIONS

When it is delivered from the factory, the machine is filled with the standard oils specified in the table below. Brand names are used as examples in specifying lubricants, in all cases equivalent lubricants may be used.

STANDARD OILS SUPPLIED AND OTHER RECOMMENDED OILS

If the machine is to be used in areas where the ambient temperature may be above the "upper temperature, °C", "special oil" as specified in the table below must be used.

Before using the machine at extremely low ambient temperatures, read the explanatory notes below.

Explanatory notes

The tabulated temperature limits apply to the individual "systems" or to the individual components and refer to the limits for the lubricating properties of each oil.

The "MAXIMUM OPERATING TEMPERATURE" of the machine may be different from the ambient temperature. Contact DYNAPAC for additional recommendations before operating the machine under extremely hot or cold conditions.

The temperature limits tabulated below apply to standard models.

It may be necessary to check temperature gauges continually if the machine is working in the upper temperature ranges when fitted with accessories, such as noise-damping equipment.

Temperatures in °C (°F)

	"Standard oil"	"Special oil"	"Standard oil" (Min. API GL5)	"Special oil"
	SHELL TELLUS Oil T 68	SHELL TELLUS Oil T 100	SHELL SPIRAX SAE 90 HD	SHELL SPIRAX SAE 140 HD
Hydraulic tank	-10 +40 (14) (104)	0 +50 (32) (122)		
Drum			-15 +40 (5) (104)	+5 +50 (41) (122)
Torque hub			-15 +40 (5) (104)	+5 +50 (41) (122)

INSTRUCTIONS FOR LONGTERM PARKING

Applicable to rubber-coated drums.

If the machine is parked for a long time, i.e. longer than a month, there is some risk of damaging the rubber coating on the drum by deforming it.

To prevent such damage, support the drum frame up so that the drum is clear of the ground. The frame may be lifted using a jack or similar aid but the frame must be rested on robust supports.

Alternatively, the machine may be moved at regular intervals and parked so that the line of contact between the drum and the ground is changed from time to time.

The small deformations in the rubber coating resulting from parking for a short period are rolled out when the machine is used.

MAINTENANCE

CA 15

VIBRATORY ROLLER

SURE-1-53 2

Diesel engine: Cummins 4BT 3.9
From ser. no 598 001

CONTENTS	Page	Page	
Lubricants	1	Every month	13
Maintenance schedule	2	Every three months	15
Daily	6	Every six months	16
Weekly	9	Every year	18
Every 14 days	12	Special instructions	23

READ THROUGH THESE INSTRUCTIONS CAREFULLY BEFORE STARTING ANY SERVICE WORK

Correct maintenance is essential to ensure that the machine will give many years of satisfactory service, so these instructions should therefore be carefully followed.

Keep the engine instruction manual available as well.

LUBRICANTS

A B C and D refer to the maintenance schedule.

Always use specified lubricants in the stated amounts. Excessive or insufficient grease or oil will cause parts to run hot, thus inducing rapid wear.

(A) GREASE

Lithium base with EP additive (lead oleate), NLGI No. 2, Shell Alvania EP Grease 2.

(B) ENGINE OIL

API service CD/SE, SAE 10W/30

The instructions for the diesel engine (oil change intervals, etc) described in the manufacturer's instruction manual should be followed, in addition to those listed here.

Air temperature	Viscosity
-20°C - +20°C	SAE 10W/30
-10°C - +40°C	SAE 15W/40

(C) HYDRAULIC OIL

with anti-wear additive - Shell Tellus oil T 68

(D) LUBRICATING OIL

SAE 80/90 HD, API, GL-5

Note

If the roller is to be used under exceptionally hot or cold conditions, get in touch with DYNAPAC for supplementary lubrication recommendations.

DYNAPAC

Heavy Equipment AB

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We reserve the right to change specifications without notice

M2-10216-1 ENG



MAINTENANCE SCHEDULE

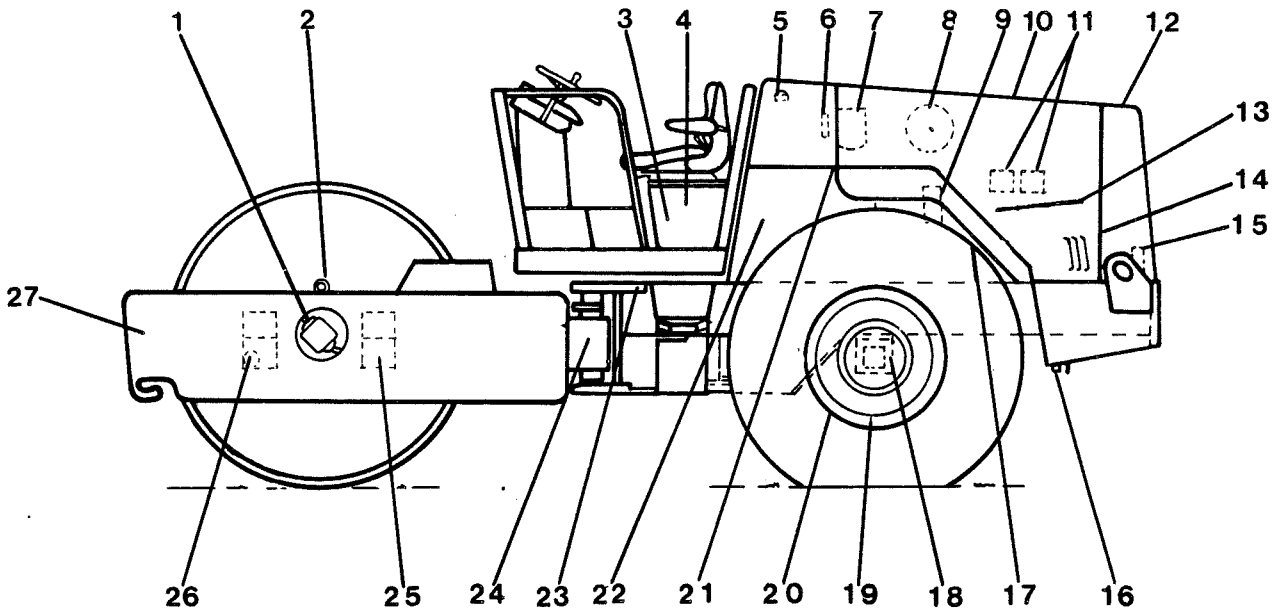


Fig 1 Maintenance schedule

- | | |
|--|--|
| 1 Torque hub (only on D and PD machines) | 15 Fuel tank - filler pipe |
| 2 Drum oil - filling | 16 Fuel tank - drain plug |
| 3 Battery | 17 Diesel engine - oil level |
| 4 Hydraulic oil filling | 18 Rear axle - lubricating oil levels |
| 5 Breather filter, hydr. oil tank | 19 Wheel nuts |
| 6 Hydr. oil level - sight glass | 20 Tyre pressures |
| 7 Hydraulic oil filter | 21 Hydr. oil tank - draining |
| 8 Air cleaner | 22 Hydraulic oil cooler |
| 9 Lub.- oil filter - diesel engine | 23 Steering cylinder |
| 10 Hinges - engine hood | 24 Articulated joint |
| 11 Fuel filter/water separator - diesel engine | 25 Shock absorbers and mounting screws |
| 12 Coolant | 26 Drum oil - sight glass |
| 13 Fuel feed pump - diesel oil | 27 Scraper |
| 14 V-belt | |

RUNNING-IN INSTRUCTIONS

During the running-in period, i.e. during the first 50 hours, the machine must be operated with care. The purpose of this is to allow the bearing surfaces to become hard and smooth. This increases the service life considerably. These running-in instructions and intervals apply when running in.

**REAR AXLE AND TORQUE HUB
(ONLY D AND PD)**

The oil in the differential/planetary gears and torque hub shall be changed after the first 50 hours of operation. Oil changes are then carried out every 2000 hours of operation.

ENGINE

The oil and the filter must be changed after the first 50 hours. The oil and oil filter are then changed every 250 hours. This interval applies only if diesel with a maximum sulphur content of 0.5% by weight is used and for temperatures above -10°C. Refer also to the engine manufacturer's instructions.

Item in Fig 1	Operation	Page	Lubricants see Page 1
---------------	-----------	------	-----------------------

EVERY DAY (every 10 hours of operation)

27	... Scraper setting - adjust	6	
-	... Brakes - check	6	
17	... Engine oil level - check	6	..... B
6	... Oil level in hydraulic oil tank - check	7	..... C
12	... Coolant level - check	7	
15	... Fuel tank - replenish	8	
-	... Air cleaner indicator lamp - check	8	
11	... Water separator - drain	8	

EVERY WEEK (every 50 hours of operation)

8	... Air cleaner filter element - clean		
	... oil hoses and connections - inspect for leakage	9	
25	... Shock absorbers and securing bolts - inspect	10	
23,24	... Articulated joint/steering cylinder - lubricate	11	..... A
20	... Tyre pressures - check	11	

MAINTENANCE SCHEDULE

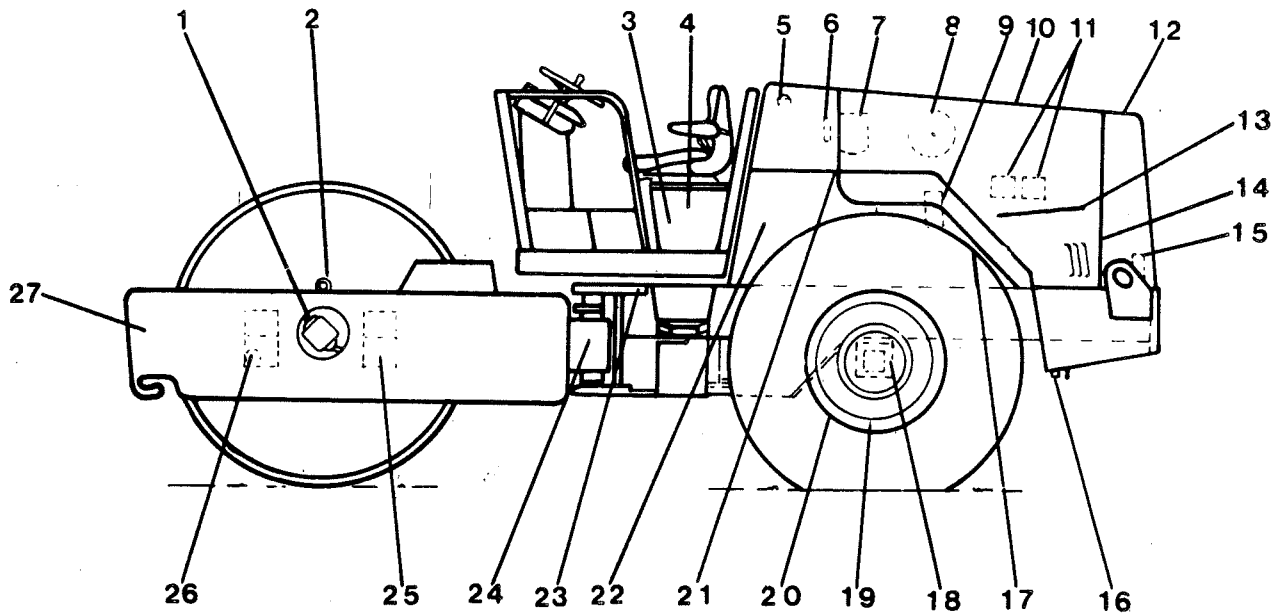


Fig 1 Maintenance schedule

- | | | | |
|----|---|----|-------------------------------------|
| 1 | Torque hub (only on D and PD machines) | 15 | Fuel tank - filler pipe |
| 2 | Drum oil - filling | 16 | Fuel tank - drain plug |
| 3 | Battery | 17 | Diesel engine - oil level |
| 4 | Hydraulic oil filling | 18 | Rear axle - lubricating oil levels |
| 5 | Breather filter, hydr. oil tank | 19 | Wheel nuts |
| 6 | Hydr. oil level - sight glass | 20 | Tyre pressures |
| 7 | Hydraulic oil filter | 21 | Hydr. oil tank - draining |
| 8 | Air cleaner | 22 | Hydraulic oil cooler |
| 9 | Lub.- oil filter - diesel engine | 23 | Steering cylinder |
| 10 | Hinges - engine hood | 24 | Articulated joint |
| 11 | Fuel filter/water separator - diesel engine | 25 | Shock absorbers and mounting screws |
| 12 | Coolant | 26 | Drum oil - sight glass |
| 13 | Fuel feed pump - diesel oil | 27 | Scraper |
| 14 | V-belt | | |

Item in Fig 1	Operation	Page	Lubricants see Page 1
---------------	-----------	------	-----------------------

EVERY 14 DAYS (every 100 hours of operation)

- ...	Engine cooling fins - clean *	12	
22 ...	Hydraulic oil cooler - clean externally	12	
3 ...	Battery - check	13	

EVERY MONTH (every 250 hours of operation)

9,17	Engine oil - change and engine oil filter - replace	13	
10 ...	Controls and hinge points - lubricate	14	A and B

EVERY THREE MONTHS (every 500 hours of operation)

- ...	Antifreeze in radiator - check		
7 ...	Hydraulic oil filter - replace	15	
11 ...	Fuel filter element - replace	15	
- ...	Fuel system - bleed	*	

EVERY SIX MONTHS (every 1000 hours of operation)

5 ...	Hydraulic oil tank breather filter - replace	16	
14 ...	Fan belt and alternator V-belt tension - check	16	
- ...	Engine valve clearances - check	*	
1 ...	Torque hub oil - change (only on D and PD machines)	17	D

EVERY YEAR (every 2000 hours of operation)

2,26	Drum oil - change	18	D
6 ...	Hydraulic oil tank oil - change	19	C
18 ...	Rear axle planetary gear oil - change	21	D
18 ...	Rear axle differential oil - change	21	D
16 ...	Fuel tank - drain	22	
- ...	Special instructions	23	
12 ...	Engine cooling system - flush	25	

* See the engine instruction manual

EVERY DAY (every 10 hours of operation)

Scrapers — adjusting

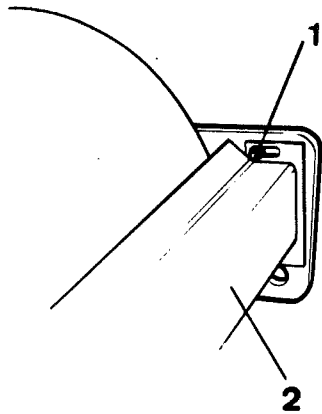


Fig 2

- 1 Mounting screws
- 2 Scraper

Adjust the scraper position as follows:

- 1 Loosen all four mounting screws.
- 2 Set the scraper approx. 10 mm (0.4 in) away from the drum.
- 3 Retighten the mounting screws.

Brakes — checking

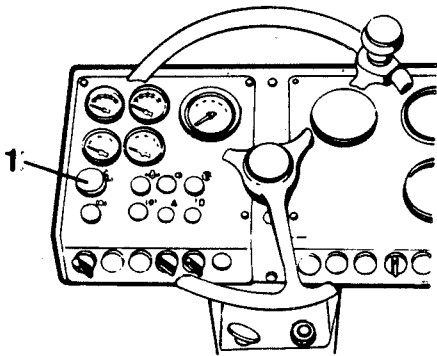


Fig 3 Instrument panel

- 1 Emergency stop

- 1 Drive the machine forwards slowly.
- 2 Depress the emergency stop, the machine should then stop.
- 3 After checking the brakes, move the forward/-reverse lever to the neutral position before resetting the emergency stop.

Engine — checking the oil level

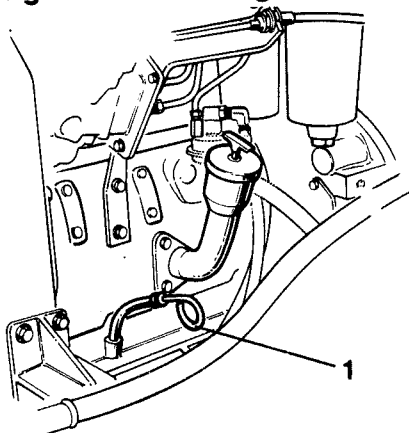


Fig 4 Checking oil level

- 1 Oil dipstick

- 1 Drive the machine onto a level surface and switch off the engine.
- 2 Remove the dipstick (1) and check the oil level.
- 3 If the oil is close to or below the lower mark, replenish with grade B as recommended on page 1 under "Lubricants".

Hydraulic tank — checking the oil level

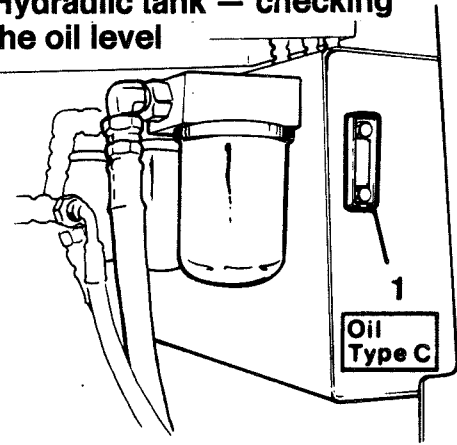


Fig 5 Hydraulic oil tank

- 1 Sight glass

- 1 Drive the machine onto a level surface and check the level of the oil in the sight glass (1).
- 2 If the oil level is more than 2 cm (0.75 in) below the top of the sight glass, replenish with grade C oil, as recommended on page 1 under "Lubricants".

Hydraulic tank — replenishing with oil

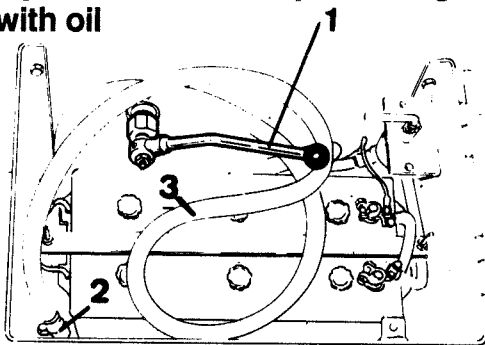


Fig 6 Battery box

- 1 Pump lever
2 Protective plug
3 Suction hose

- 3 Take the suction hose (3) from the battery box.
- 4 Unscrew the protective plug (2) from the hose.
- 5 Insert the end of the hose into a drum of new hydraulic oil of grade C as recommended on page 1 under "Lubricants".
- 6 Operate the pump lever (1) to pump hydraulic oil into the tank, up to the mark on the sight glass.

Pump the hydraulic oil through a filter into the tank. Always use this procedure when replenishing the oil.

Radiator — checking the coolant level

Coolant levels should be checked each day before the machine is run. If the coolant level must be checked at operating temperature the engine should be switched off first.



CAUTION: AT OPERATING TEMPERATURES THE COOLANT IS HOT AND PRESSURISED. IF THE CAP IS REMOVED QUICKLY, COOLANT WILL BE RELEASED IN THE FORM OF STEAM AND MAY CAUSE SCALDING. USE GLOVES AND PROTECTIVE GOGGLES.

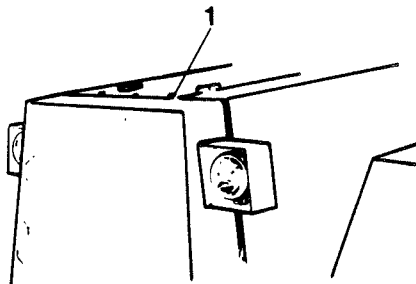
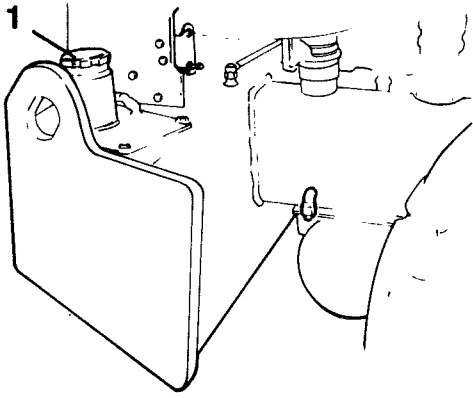


Fig 7 Radiator

- 1 Filler cap

- 1 Place a piece of cloth or the like over the filler cap and turn the cap to the first stop. When the pressure has fallen, press down the cap, turn further and then remove. The coolant level should reach the level tab in the radiator.
- 2 If necessary, replenish with water and corrosion inhibitor (CAT 3P2044 or equivalent. In winter, add anti-freeze as well.

Fuel tank — replenishing



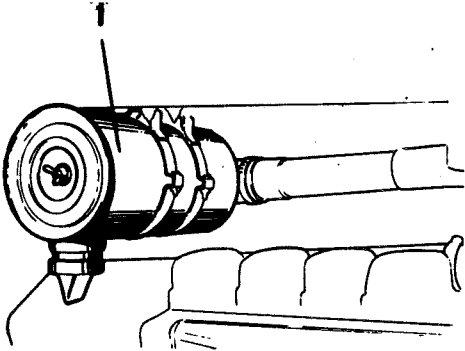
Replenish the fuel tank daily to the lower edge of the filler neck. Use diesel fuel.

Refer to the appropriate manufacturer's instructions for the grade of diesel fuel.

Fig 8 Fuel tank

1 Filler cap

Air cleaner — checking the dust indicator



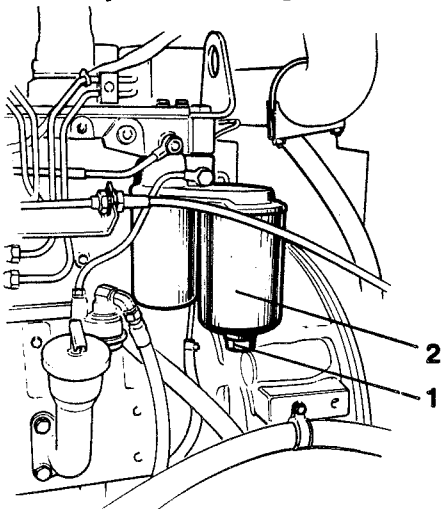
The air cleaner is fitted with a pressure-drop indicator, which is connected to a warning lamp on the instrument panel.

If the air cleaner warning lamp lights up when the engine is running at full speed, clean the filter (see under the heading "WEEKLY". Air cleaner-cleaning the filter element).

Fig 9 Engine - air cleaner

1 Air cleaner

Water trap — draining



Drain the water trap by unscrewing the screw (1).

Fig 10 Diesel engine

1 Screw
2 Water trap

EVERY WEEK

(every 50 hours of operation)

Air cleaner — cleaning the main filter element

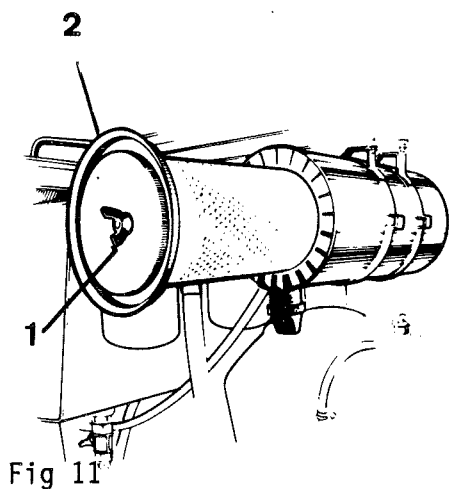


Fig 11

- 1 Wing nut
- 2 Main filter

- 1 Unscrew the wing nut in the centre of the filter and remove the filter.
- 2 Make sure that dust has not penetrated the filter during operation. Check that dust has not entered the engine induction pipe. If it has, this means that the connections, hoses or element have a leak and must therefore be replaced.
- 3 Wipe clean the inside of the filter housing and the induction pipes clean, using a clean cloth.
- 4 Check all connections between the air cleaner and engine to be certain they are tight and do not leak.

Note Replace the back-up filter after it has been cleaned three times or at every third change of the main filter. The back-up filter cannot be cleaned.

Main filter — cleaning with compressed air



Fig 12 Main filter

Use compressed air at a maximum pressure of 0.7 MPa (7 kgf/cm²) (100 psi).

Play the compressed air up and down along the folds of the paper at 45° to the inside of the filter element. Hold the nozzle at least 1 cm (0.4 in) away from the element to avoid damaging the paper.

Note Do not replace a filter element that has been washed in detergent until it is completely dry.

Main filter — cleaning by washing

If the filter element is sooty or oily, it should be washed in a solution of water and non-foaming detergent, such as "Donaldson D-1400".

The element should be washed in a detergent solution and soaked for at least 15 minutes. Raise and lower the element in the solution from time to time to improve the cleaning effect.

Make sure that the filter element is intact before refitting it. If it has any holes or if the seals are defective, fit a new element. Shine a lamp through the filter when inspecting it, to ensure that it is clean and that there are no holes in the paper element.

Shock absorbers and mounting screws — checking

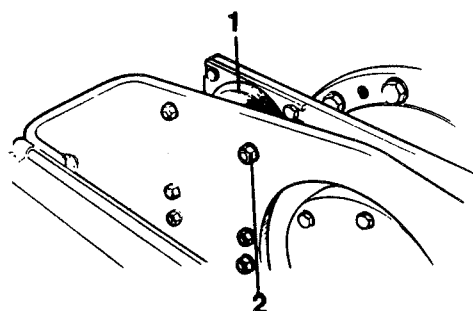


Fig 13 Drum

- 1 Shock absorbers
- 2 Mounting screws

Ensure that the shock absorbers are undamaged and that the mounting screws are correctly tightened. Replace shock absorbers when 20-25 mm (0.75-1 in) deep cracks are detected in them.

Use the blade of a knife or other pointed object when carrying out the inspection.

Steering cylinder and articulated joint – greasing

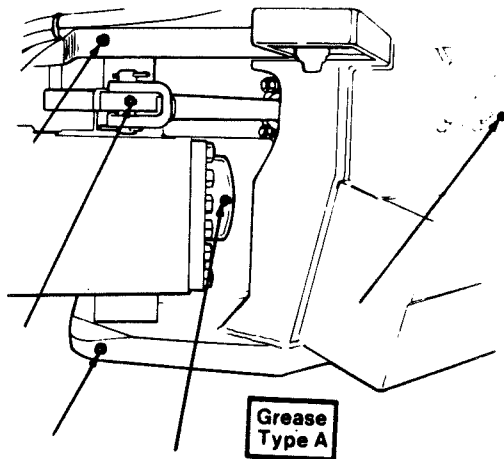


Fig 14 Grease nipples

⚠ ENSURE THE VICINITY OF THE ARTICULATED JOINT IS CLEAR OF PERSONAL WHEN THE ENGINE IS RUNNING. INJURIES COULD OCCUR IF THE STEERING IS OPERATED.

- 1 Turn the drum section to the left so that all the grease nipples on the right-hand side of the articulated joint are accessible.
- 2 Clean any dirt and grease off the five nipples.
- 3 Lubricate each nipple with five strokes of the grease gun. Ensure that grease enters the bearings.

Use grade A grease as recommended on page 1 under "Lubricants". Leave a little grease on the nipples after lubricating to prevent dirt from entering them.

Tyre pressures

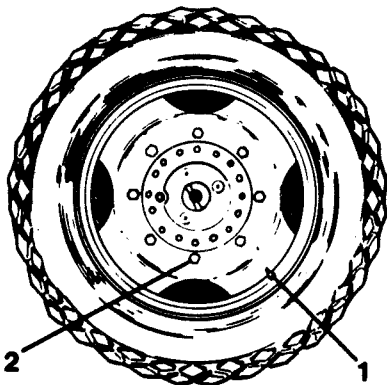


Fig 15 Wheel

- 1 Air valve
- 2 Wheel nut

Check the tyre pressures using a tyre pressure gauge.

The minimum tyre pressure is 0.11 MPa (1.1 kgf/cm²) (15.65 psi) and the maximum tyre pressure is 0.15 MPa (1.5 kgf/cm²) (21.3 psi).

Check both tyres.

Hydraulic oil cooler — cleaning the exterior

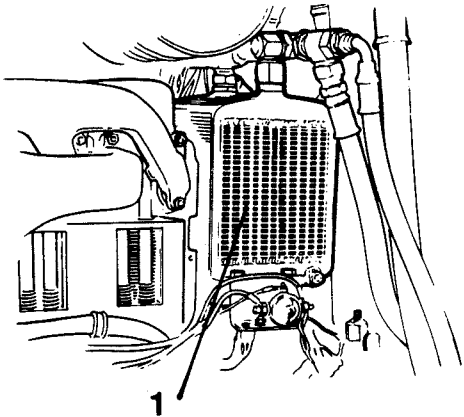
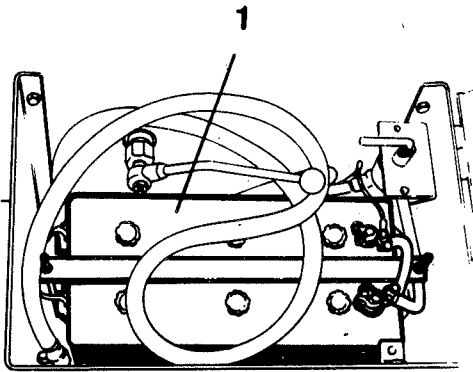


Fig 16

1 Hydraulic oil cooler

Ensure that air can flow freely through the cooler. If the cooler is dirty, clean by flushing with water or by blowing through with compressed air. After cleaning, ensure that seals and sound-absorbers are not damaged.

Battery — checking the electrolyte level

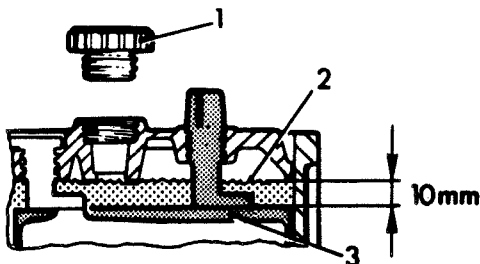


NEVER USE A NAKED FLAME AND KEEP SPARKS AWAY WHEN CHECKING THE FLUID LEVEL, SINCE EXPLOSIVE GAS IS FORMED IN THE BATTERY WHEN IT IS BEING CHARGED.

- 1 Tilt the seat forward.
- 2 Wipe the top of the battery clean.

Fig 17

1 Battery



- 3 Remove the cell filler plugs and ensure that the level of the liquid is approx. 10 mm (0.4 in) above the plates.

Check all the cells. If the level is lower, top up to the correct level with distilled water.

If the air temperature is below freezing, run the engine for a while after adding the distilled water, since the water may otherwise freeze.

Fig 18 Battery liquid level

1 Cell plug
2 Liquid level
3 Plate

- 4 Ensure that the breather holes in the cell filler plugs are not blocked. Then replace the plugs.
- 5 The cable terminals should be clean and securely tightened. If corroded, clean them and coat them with acid-free petroleum jelly.

EVERY MONTH (every 250 hours of operation)

General about diesel engine lubrication

Engine — deviations from the normal oil change interval

Note Irrespective of the number of hours of operation, the engine oil and engine oil filter must be changed every six months. The oil filter must always be replaced when the engine oil is changed.

Oil change intervals are dependent on the grade of the lubricating oil and the sulphur content of the fuel.

Changing the oil every three months or every 250 hours of operation is conditional on the use of engine oil of grade "For API Service CD, SAE" and on the use of diesel fuel of good quality, with a sulphur content below 0.5%. The air temperature should also be over -10°C .

If oil of grade "For API Service CC/SC, SAE" is used or if the sulphur content of the diesel fuel is above 0.5%, the oil should be changed earlier and more frequently (see the engine manufacturer's instructions).

Warm up the engine thoroughly before draining the oil. Impurities in the lubricating system will then be well mixed with the oil and will be removed with it. Furthermore, the oil flows more readily when it is hot.

Engine — changing the oil

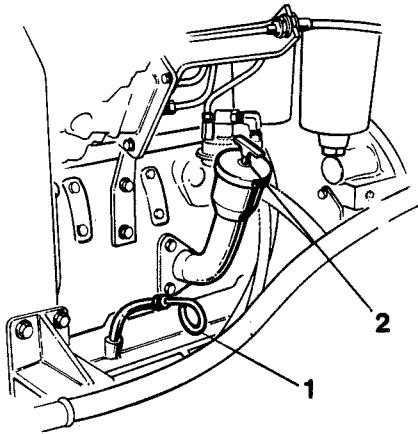


Fig 19 Engine

- 1 Dipstick
- 2 Oil filler cap

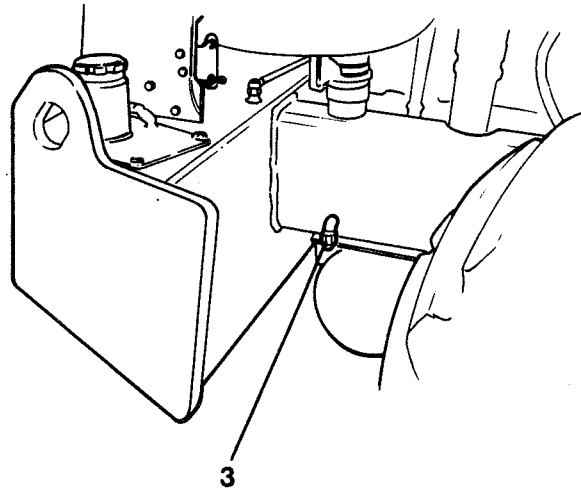


Fig 20

- 3 Drain plug

- 1 Remove the filler cap (2).
- 2 Remove the drain plug (3) and allow the oil to drain out into a suitable receptacle to hold at least 12 litres (3.5 US gallons), while changing the oil filter.
- 3 Clean the drain plug (3) and refit it.

Engine — replacing the oil filter

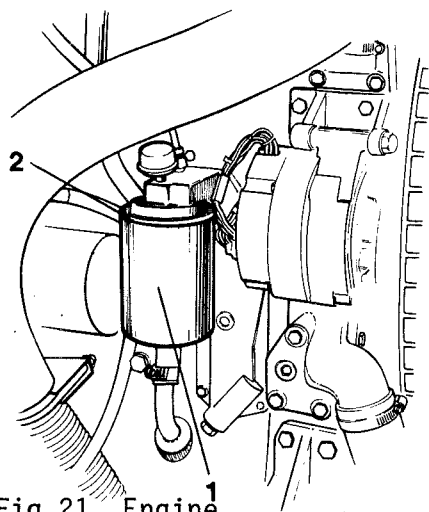


Fig 21 Engine

- 1 Oil filter
- 2 Rubber seal

- 1 Remove the oil filter (1) and discard it. It is of the disposable type and cannot be cleaned.

Note Ensure that the old rubber seals are not left on the filter head since leakage would then occur between the new and old seals.

- 2 Clean the sealing surfaces of the filter holder.
- 3 Lightly oil the rubber seal (2) on the new filter.
- 4 Screw the filter into place by hand until the rubber seal seats correctly and then turn the filter an additional half-turn.

Note Do not tighten the filter too much, since this may damage the seal.

Engine — changing the oil

- 1 Replenish with new grade B oil as recommended on page 1 under "Lubricants".

Oil capacity: approx. 9.5 litres (10 US quarts).

- 2 Check the oil level using the dipstick. The level should be at the upper mark. If necessary, replenish with more oil.
- 3 Refit the filler cap.
- 4 Start and warm up the engine. Ensure that there are no oil leaks.

Controls, hinges and joints — greasing

Lubricate all engine cover hinges with grade B oil as recommended on page 1 under "Lubricants".

EVERY THREE MONTHS (every 500 hours of operation)

Hydraulic oil filters — replacing

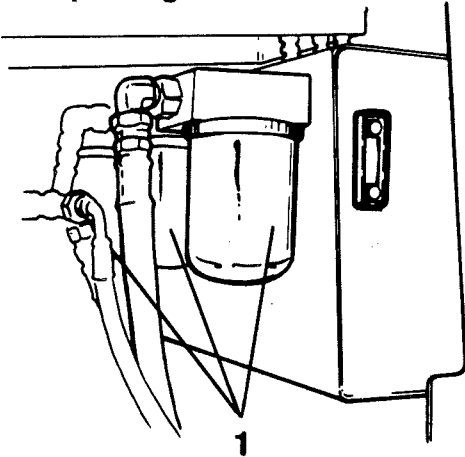


Fig 22

Hydraulic oil filters

- 1 Unscrew the hydraulic oil tank breather filter, to release any pressure in the tank.
- 2 Remove the hydraulic oil filters (1).

Discard the filters.

Note Ensure that the old seal is not left on the filter head, since leakage would then occur between the new and old seals.

- 3 Clean the sealing surface of the filter heads carefully.
- 4 Apply a thin film of clean hydraulic oil to the new filter seals.
- 5 Tighten the filter by hand.

First screw the filter until the seal seats against the filter head. Then tighten it an additional half-turn.

Note Do not tighten the filter too much, since this may damage the seal.

- 6 Start the engine and check that there is no leakage around the filters.

Fuel filter — replacing

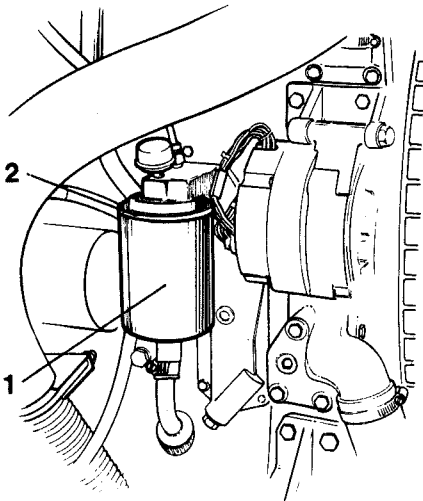


Fig 23 Diesel engine

- 1 Fuel filter
- 2 Sealing surface

- 1 Unscrew the fuel filter.
- 2 Clean the sealing surface (2).
- 3 Apply clean diesel fuel to the rubber gasket on the new filter.
- 4 Screw the new filter into place by hand, until the rubber gasket seats correctly, then tighten it an additional half-turn.

Start the engine and ensure that the filter does not leak.

See the engine instruction book for bleeding of the fuel system.

EVERY SIX MONTHS
(every 1000 hours of operation)

Breather filter — replacing 1

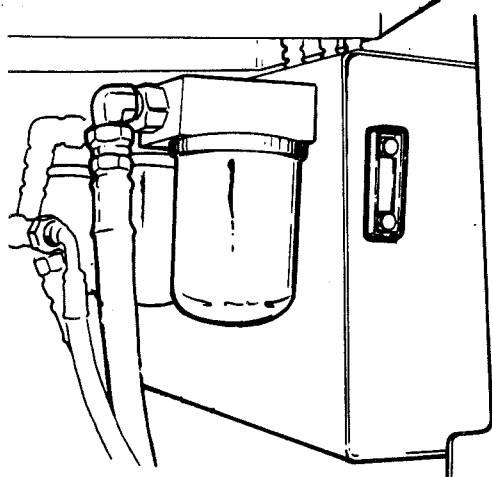


Fig 24

1 Breather filter

- 1 Remove the old filter (1) over the hydraulic oil tank and replace with a new one.

Under dusty conditions, replace the filter every 500 hours of operation.

V-belt — checking

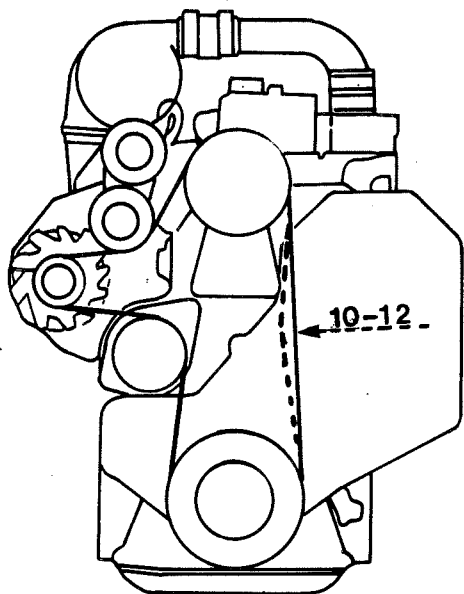


Fig 25 Checking the V-belt tension

Check the belt tension by pressing the belt midway between the alternator pulley and the crankshaft pulley. It should not be possible to depress the belt by more than 10-12 mm (0.4-0.6 in). If the deflection is greater, the belt must be tensioned.

See also the engine instruction book for maintenance of V-belts.

Torque hub — changing the oil

Only on D and PD machines.

Note that the torque hub has two oil spaces:

- one in a planetary gear section
- one in an angular gear section

Before the oil is drained, the torque hub should be warmed up.

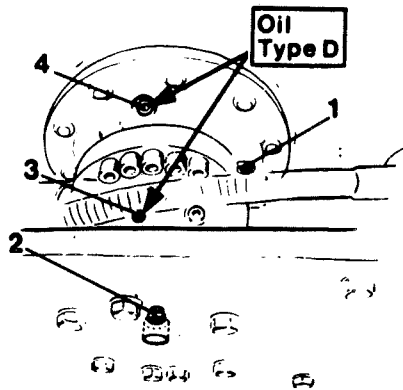


Fig 26 Torque hub

- 1 Level plug
- 2 Level plug
- 3 Filler plug
- 4 Filler plug

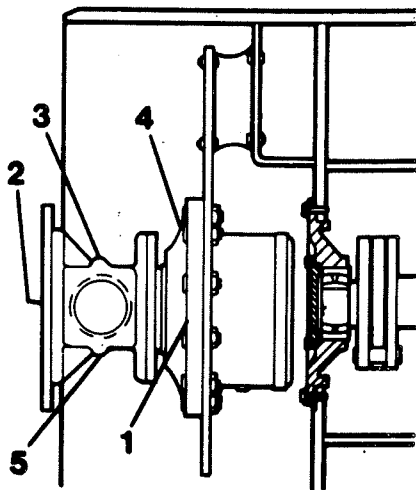


Fig 27 Torque hub viewed from the side

- 1 Level plug
- 2 Level plug
- 3 Filler plug
- 4 Filler plug
- 5 Drain plug

1 Drive the roller on to a flat surface so that the drain plug (1) is right at the bottom.

2 Wipe the plugs clean.

3 Place a vessel under the plugs (1) and (5) and remove them. Drain the oil. The vessel should hold 5 litres (5.3 US qt). Refit the plug (5).

4 Reverse the roller so that the filler plug (4) is at the top.

5 Remove the level plug (2) and filler plugs (3) and (4).

6 First pour in oil through the plug (4) until it escapes through the level plug (1). Then pour through the plug (3) until the oil escapes from the level plug (2). Refit the plugs.

Oil quantity approx 3 litres (3.2 US qt). Use oil D according to "Lubricants", page 1.

EVERY YEAR
(every 2000 hours of operation)

Drum – changing the oil

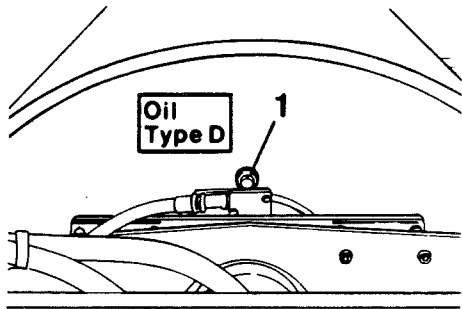


Fig 28 Roller

1 Drain/filler plug

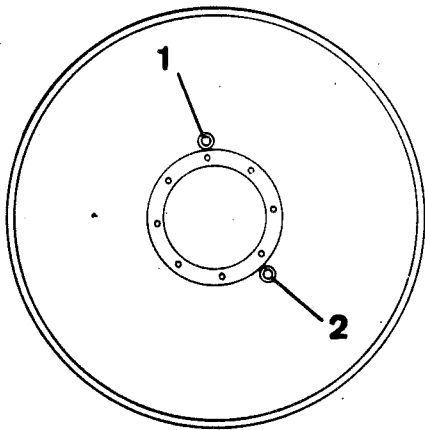


Fig 29 Roller position when filling

1 Filler plug
2 Sight glass

- 1 Drive the machine so that the drain plug (1) is in the lowest position.
- 2 Remove the plug and drain the oil.
Collect the oil in a suitable receptacle.
- 3 Drive the machine so that the drain plug (1) is in the highest position.
- 4 Replenish with oil type D according to the lubricant chart, see page 1, to half way up the sight glass. See figure 29.
- 5 Replace the plug.
- 6 Check for tightness.

Hydraulic tank — changing the oil

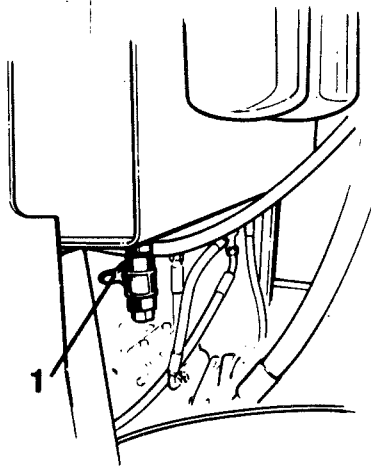


Fig 30 Draining the hydraulic oil tank

1 Drain cock

Note To ensure trouble-free operation of the machine, the strictest cleanliness is essential when servicing the hydraulic system.

The hydraulic oil should be changed when the system is hot, i.e. at the end of a shift. Oil flows more freely when it is hot and any impurities will then be well mixed with the oil and will flow out when the oil is drained.

- 1 Clean the area around the tank drain plug thoroughly.
- 2 Obtain a receptacle to hold at least 100 litres (26.4 US gallons) to collect the oil. An empty oil drum or the like is suitable.

Place the receptacle beside the machine and allow the oil to flow via a hose from the drain plug to the oil drum.

- 3 Remove the cover plate located on the top of the hydraulic oil tank.

Note Take care to prevent impurities from entering the tank.

- 4 Cleaning the tank. This is most easily achieved by drawing up the sediment from the bottom of the tank by means of a filter unit. If cloths or brushes are used, they must be completely clean and free from dust and loose ends.

Note If the tank is rinsed out with hydraulic oil, all connections in the bottom of the tank must be plugged to prevent impurities from entering the hydraulic lines.

Do not forget to remove the plugs after cleaning.

- 5 Refit the cover plate. Fit a new gasket and use Loctite sealing compound or its equivalent to ensure a good seal.

Note Ensure that no sealing compound enters the tank.

Hydraulic tank — replenishing with oil

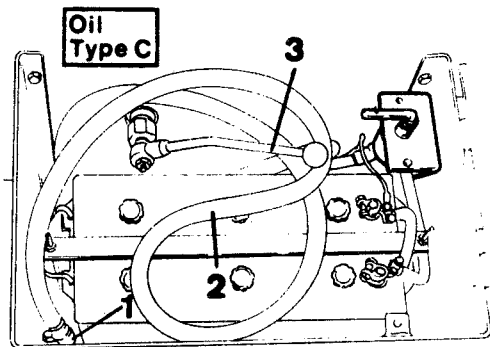


Fig 31 Battery box

- 1 Protective plug
- 2 Suction hose
- 3 Pump lever

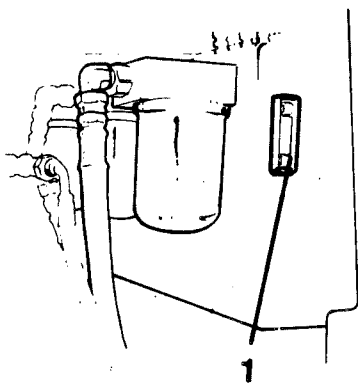


Fig 32 Hydraulic oil tank

- 1 Sight glass

- 1 Take the suction hose (2) from the battery box. Unscrew the protective plugs (1) from the hose.

Insert the hose into a drum of new hydraulic oil. Use grade C oil as recommended on page 1 under "Lubricants".

- 2 Operate the pump lever (3) and fill the tank to the FULL mark on the sight glass. The tank holds approx. 75 litres (19.7 US gallons).

Pump the hydraulic oil through a filter into the tank. Always use this procedure when replenishing with new oil.

- 3 Start the engine and operate the various hydraulic systems.

- 4 Check the oil level and, if necessary, replenish.

Rear axle planetary gears — changing the oil

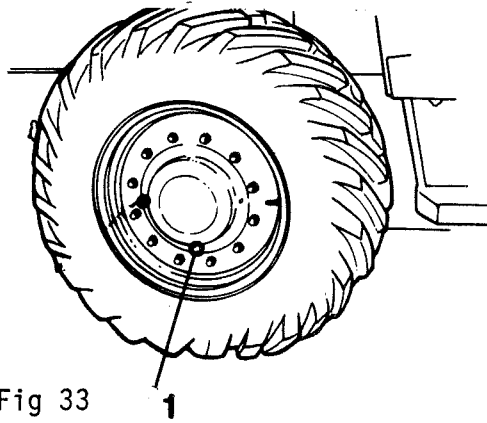


Fig 33

1 Drain position

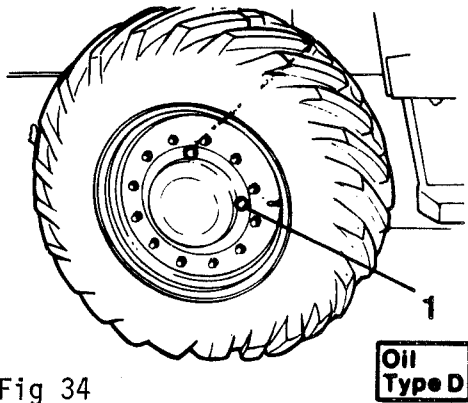


Fig 34

1 Filling position

- 1 Drive the roller onto a level surface so that the drain plug is at its lowest point.
- 2 Remove the level and drain plugs.
- 3 Place a receptacle to hold about 3 litres (0.8 US gallon) under the drain plugs.
Drain the oil.
- 4 Drive the roller so that the level plug is positioned according to the figure 34.
- 5 Fill up with oil through the plug hole until the oil reaches up to the lower edge of the hole. Each planetary gear holds about 2.5 litres (0.7 US gallon). Use oil type D as recommended on page 1 under "Lubricants".
- 6 Refit the plugs.
- 7 Change the oil in the other rear axle planetary gear in the same manner.

Rear axle differential — changing the oil



NEVER WORK UNDER THE ROLLER WHEN THE ENGINE IS RUNNING. PARK THE MACHINE ON A LEVEL SURFACE. BLOCK DRUM AND WHEELS.

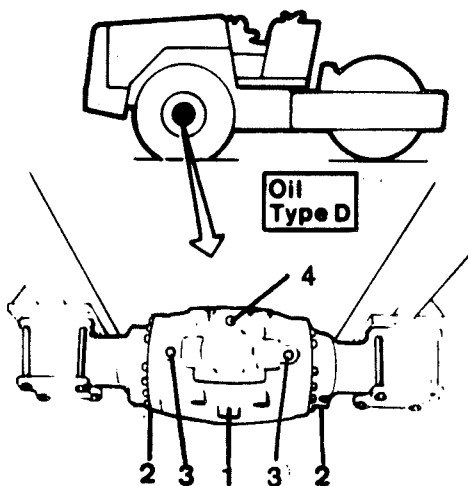


Fig 35

- 1 Drain plug
- 2 Drain plugs
- 3 Level plug
- 4 Filler plug

- 1 Drive the roller onto a level surface and stop the engine.
- 2 Clean the area around the plugs (1), (2), (3) and (4).
- 3 Place a receptacle to hold about 12 litres (3.2 US gallon) under the drain plug (1).
- 4 Remove the plugs and collect the oil in the receptacle.
- 5 Clean the drain plugs (1), refit them when all oil has drained and tighten them.
- 6 Fill up with oil through plug (4) until the oil reaches up to the lower edge of the hole (3). The differential holds about 11 litres (2.9 US gallon). Use grade D oil as recommended on page 1 under "Lubricants".
- 7 Refit the filler plug (4) and tighten it.

Fuel tank – draining

Water and sediment in the fuel tank can be drained through the plugs (1) in the bottom of the fuel tank.

Note Do not drain all the fuel, since air may then enter the fuel system.

Draining should be carried out when the machine has been stationary some time - such as overnight.

The machine should preferably be left with one side slightly higher than the other, so that the water and sediment will collect at the lower drain plug.

Drain as follows:

- 1 Clean the area around the lower drain plug.
- 2 Loosen the plug and drain the water and sediment until only clean diesel fuel flows from the drain plug hole. Then retighten the plug.

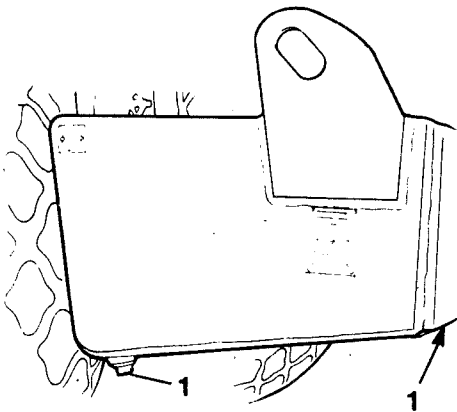


Fig 36 Fuel tank

1 Drain plugs

SPECIAL INSTRUCTIONS

When it is delivered from the factory, the machine is filled with the standard oils specified in the table below. Brand names are used as examples in specifying lubricants, in all cases equivalent lubricants may be used.

STANDARD OILS SUPPLIED AND OTHER RECOMMENDED OILS

If the machine is to be used in areas where the ambient temperature may be above the "upper temperature, °C", "special oil" as specified in the table below must be used.

Before using the machine at extremely low ambient temperatures, read the explanatory notes below.

Explanatory notes

The tabulated temperature limits apply to the individual "systems" or to the individual components and refer to the limits for the lubricating properties of each oil.

The "MAXIMUM OPERATING TEMPERATURE" of the machine may be different from the ambient temperature. Contact DYNAPAC for additional recommendations before operating the machine under extremely hot or cold conditions.

The temperature limits tabulated below apply to standard models.

It may be necessary to check temperature gauges continually if the machine is working in the upper temperature ranges when fitted with accessories, such as noise-damping equipment.

Temperatures in °C (°F)

	"Standard oil"	"Special oil"	"Standard oil" (Min. API GL5)	"Special oil"
	SHELL TELLUS Oil T 68	SHELL TELLUS Oil T 100	SHELL SPIRAX SAE 90 HD	SHELL SPIRAX SAE 140 HD
Hydraulic tank	-10 +40 (14) (104)	0 +50 (32) (122)		
Drum			-15 +40 (5) (104)	+5 +50 (41) (122)
Torque hub			-15 +40 (5) (104)	+5 +50 (41) (122)

INSTRUCTIONS FOR LONGTERM PARKING

Applicable to rubber-coated drums.

If the machine is parked for a long time, i.e. longer than a month, there is some risk of damaging the rubber coating on the drum by deforming it.

To prevent such damage, support the drum frame up so that the drum is clear of the ground. The frame may be lifted using a jack or similar aid but the frame must be rested on robust supports.

Alternatively, the machine may be moved at regular intervals and parked so that the line of contact between the drum and the ground is changed from time to time.

The small deformations in the rubber coating resulting from parking for a short period are rolled out when the machine is used.

Engine — flushing the cooling system



WARNING! AT OPERATING TEMPERATURE THE COOLANT IS HOT AND PRESSURISED.

IF THE RADIATOR CAP IS REMOVED QUICKLY, COOLANT WILL FLOW OUT IN THE FORM OF STEAM AND MAY CAUSE SCALDING. USE GLOVES AND PROTECTIVE GOGGLES.

The cooling system should be cleaned once a year, to flush out rust and sediment.

The coolant must also be changed once a year, as the corrosion inhibitor loses its effectiveness. The cooling system should be cleaned when the engine is cold.

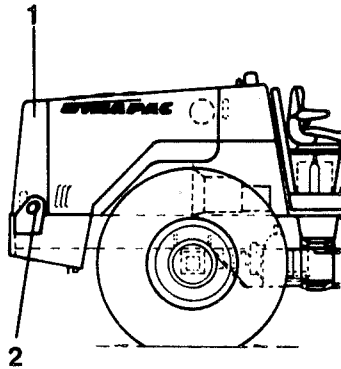


Fig 37 Draining the cooling system

- 1 Filler cap
- 2 Drain cock - radiator

- 1 Drive the roller onto a level surface.
- 2 Remove the radiator filler cap (1).
- 3 Open the drain cock (2) at the bottom of the radiator.
- 4 Flush the cooling system with clean water.

Insert a hose into the radiator filler neck and flush the system with water until the water flowing out at the drain plug holes is completely free from rust and sediment.

Note If there are hard deposits of lime or rust in the cooling system, the system may be cleaned using a special radiator cleansing agent. Use a good cleansing agent from a reputable manufacturer and follow the manufacturer's instructions.

- 5 Refit the drain plugs and close the radiator drain cock.

- 6 Inspect the coolant hoses. Replace hoses that are cracked or show any other signs of defect.
- 7 Fill up with coolant to the level tab in the radiator.

The lime content of the water should be as low as possible.

Always fill the cooling system with one of the following two coolants:

- Clean water and corrosion inhibitor (CAT 3P2044 or its equivalent).
 - 50% clean water and 50% anti-freeze (containing a corrosion inhibitor).
- 8 Start the engine and run for 10 minutes.
 - 9 Check the level of the coolant and, if necessary, replenish to the correct level.
 - 10 Ensure that the cooling system does not leak. Ensure that any leaks are sealed.
 - 11 Refit the filler cap.