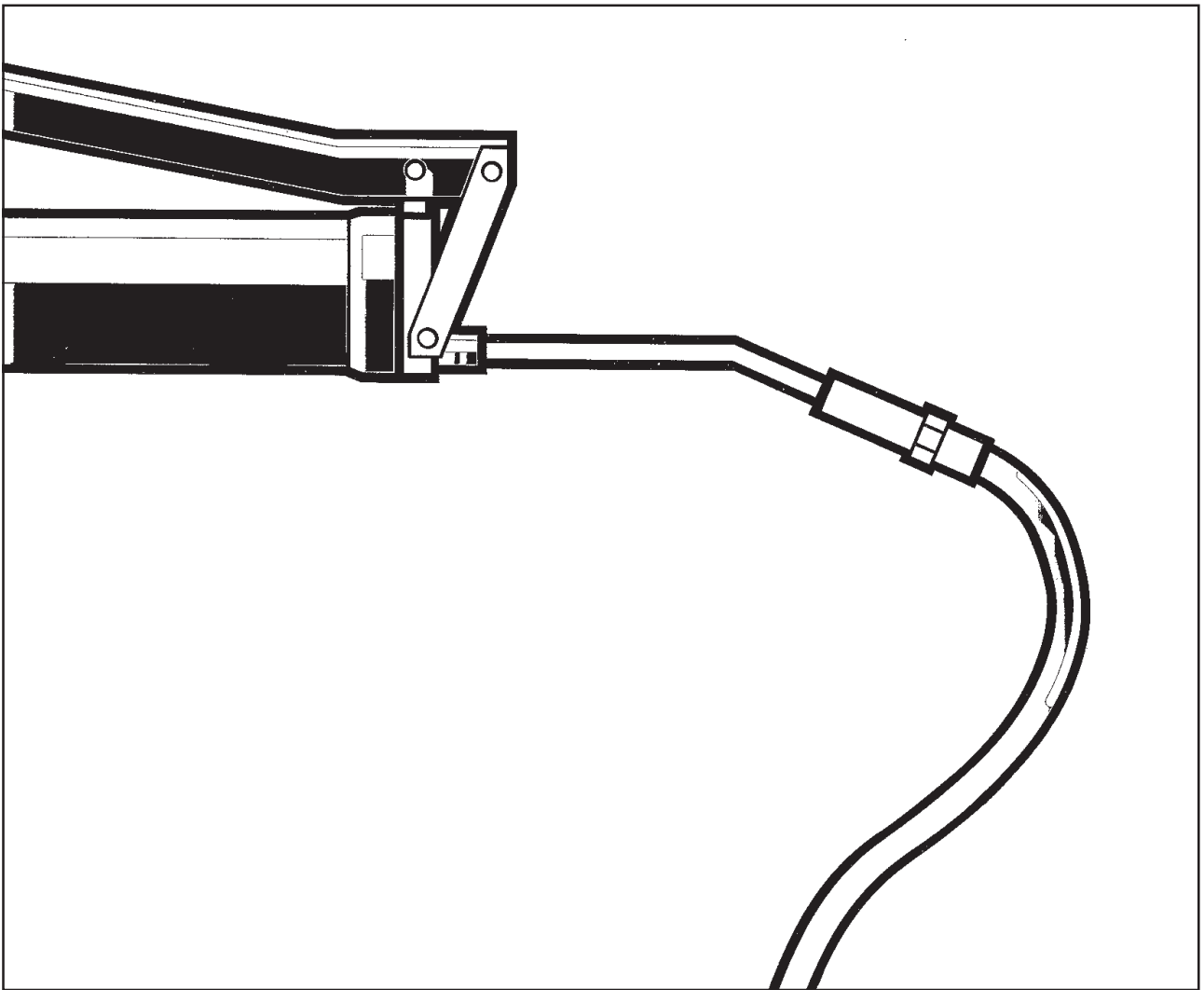


DYNAPAC CA150 MAINTENANCE

M150EN3



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DYNAPAC

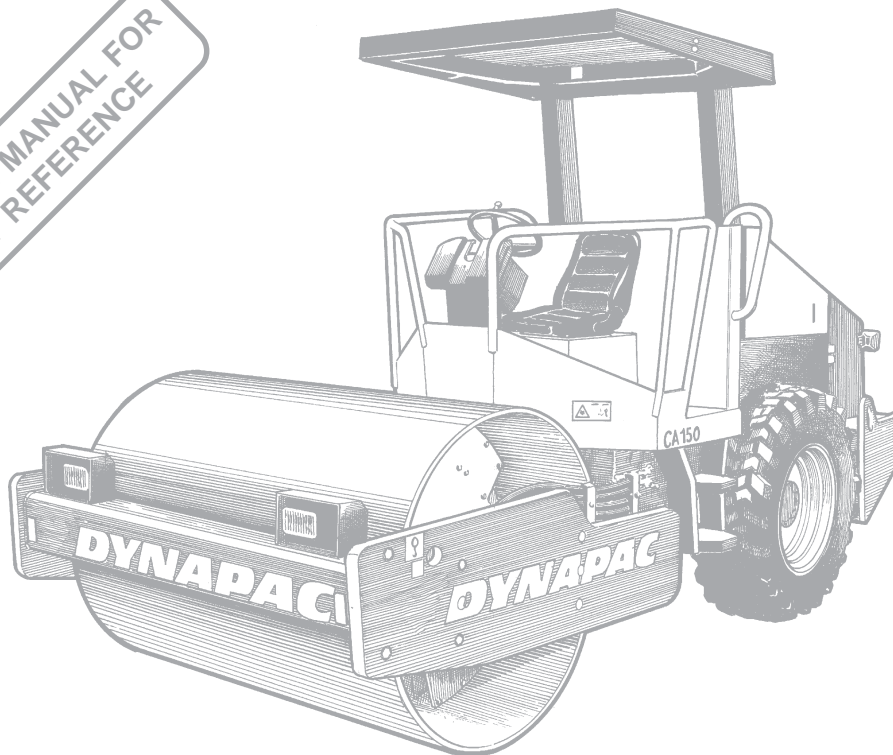
Vibratory Roller CA150

Maintenance M150EN3, February 2004

**Diesel engine:
CA 150: Cummins 4BT 3.3**

**These instructions apply from:
CA150 PIN (S/N) *73X20400***

**KEEP THIS MANUAL FOR
FUTURE REFERENCE**



CA150 is Dynapac's light vibratory soil compactor. Available in STD, D (smooth drum) and P, PD (padfoot) versions. The P, PD version has its widest range of application on cohesive material and rockfill materials.

All types of supporting and reinforcement courses can be compacted, and the interchangeable drums, ie, D to PD and vice versa, give enhanced versatility in the choice of application.

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

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WARNING SYMBOLS

WARNING



Safety instruction – Personal Safety

CAUTION



Special caution – Machine or component damage

GENERAL

WARNING



Read through the entire manual before starting any maintenance operations.

WARNING



Ensure good ventilation (air extraction) if the diesel engine is run indoors.

It is important that the roller is maintained correctly to ensure proper function. It should be kept clean so that any leakage, loose bolts and loose connections can be discovered in time.

Make a habit of walking round the roller to check it every day before starting the first shift – including under the machine. This is often the easiest way of discovering any leakage.



SPARE A THOUGHT FOR THE ENVIRONMENT! Do not let oil, fuel and other environmentally hazardous substances contaminate the environment.

This manual contains instructions for periodic attention which should normally be carried out by the roller operator.

CAUTION



There are additional instructions relating to the diesel engine, for which the manufacturer's instructions are detailed in the engine manual. This is found under a separate flap in the roller's product binder.

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
















Always use high-quality lubricants, in the quantities specified. Excess grease or oil can promote overheating, resulting in premature wear.

	ENGINE OIL ambient air temperature -10°C – +50°C (14°F - 122°F)	Shell Rimula SAE 15W/40 or equivalent API Service CH-4 (CG-4)
	HYDRAULIC FLUID ambient air temperature -10°C – +40°C (14°F - 104°F) ambient air temperature above +40°C (above 104°F)	Shell Tellus Oil TX68 or equivalent Shell Tellus Oil T100 or equivalent
	BIODEGRADABLE HYDRAULIC FLUID	Shell Naturelle HF-E46 When it leaves the factory, the machine may be filled with biologically degradable fluid. The same type of fluid must be used when changing or topping off.
	TRANSMISSION OIL ambient air temperature -15°C – +40°C (5°F - 104°F) ambient air temperature above +40°C (above 104°F)	Shell Spirax SAE 80W/90, HD API, GL-5 Shell Spirax HD85W/140 or equivalent
	DRUM OIL ambient air temperature -15°C – +40°C (5°F - 104°F) ambient air temperature above +40°C (above 104°F)	Shell Spirax SAE 80W/90, HD API, GL-5 Shell Spirax HD85W/140 or equivalent
	GREASE	SKF LGHB2 (NLGI Class 2) or equivalent for articulated joint. Shell Retinax LX2 or equivalent for other lubrication points.
	FUEL	See the engine manual
	COOLANT mixed 50/50 with water	GlycoShell or equivalent Anti-freeze protection down to about -41°C (-42°F).



When driving in extremely high or low ambient temperatures, other lubricants are needed. Refer to the chapter entitled "Special Instructions" or contact Svedala Dynapac.

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

TECHNICAL SPECIFICATIONS

Weight and sizes	CA150	CA150D	CA150PD	CA150P
Operating mass with ROPS, EN500, kg (lbs)	6930 (15,300)	7130 (15,700)	7430 (16,400)	7230 (16,000)
Operating mass without ROPS, kg (lbs)	6600 (14,600)	6800 (15,000)	7100 (15,700)	6900 (15,200)
Operating mass with cab, kg (lbs)	7150 (15,800)	7350 (16,200)	7650 (16,900)	7450 (16,400)
Length, standard-equipped roller, mm (in)	4776 (188)	4776 (188)	4871 (192)	4871 (192)
Width, standard-equipped roller, mm (in)	1852 (73)	1852 (73)	1852 (73)	1852 (73)
Height, with ROPS, mm (in)	2784 (110)	2784 (110)	2825 (111)	2825 (111)
Height, with silencer, mm (in)	2525 (99)	2525 (99)	2540 (100)	2540 (100)
Height, with cab, mm (in)	2815 (111)	2815 (111)	2857 (112)	2857 (112)

Fluid volumes (Liters)	(gal or qts)
Rear axle:	
- Differential	7,0 (7.4 qts)
- Planetary gearing	0,8/side (0.8 qts) /each side
Drum oil	10,5 (11.1 qts)
Hydraulic reservoir	52 (13.7 gal)
Fluid in hydraulic system (D, PD)	18,0 (4.8 gal)
Lubricating oil, Diesel engine	8,0 (8.5 qts)
Coolant, Diesel engine	12,5 (13.2 qts)
Fuel tank	225 (59.4 gal)

Electrical system

Battery	12 V, 170 Ah
Alternator	12 V, 60A
Fuses	See under main heading: Electrical system

Tires

Tire size	420/70 B24 (Std type) 14,9-24T461 8 ply (Tractor type)
Air pressure	110 kPa (1,1 kp/cm ²) (16 psi)



As extra equipment, the tires can be filled with liquid (extra weight up to 350 kg/tire) (770 lbs/tire). Remember this extra weight when you perform service.

Compaction data	CA150	CA150D	CA150PD/P
Static linear load	21,2 (118.7)	21,7 (121.5)	–
Amplitude (High)	1,7 (0.067)	1,7 (0.067)	1,7 (0.067)
Amplitude (Low)	0,8 (0.031)	0,8 (0.031)	0,8 (0.031)
Frequency (High amplitude)	29 (1740)	29 (1740)	29 (1740)
Frequency (Low amplitude)	40 (2400)	40 (2400)	40 (2400)
Centrifugal force (High amplitude)	100 (22,500)	100 (22,500)	125 (28,100)
Centrifugal force (Low amplitude)	94 (21,150)	94 (21,150)	118 (26,550)

TECHNICAL SPECIFICATIONS

Tightening torque

Tightening torque in Nm (lbf.ft) for oiled, bright galvanized bolts tightened with a torque wrench.

M thread	STRENGTH CLASS		
	8.8	10.9	12.9
M6	8,4 (6.2)	12 (8.9)	14,6 (10.8)
M8	21 (15.5)	28 (20.7)	34 (21.1)
M10	40 (15.5)	56 (41.3)	68 (25.1)
M12	70 (51.6)	98 (72.3)	117 (86.3)
M16	169 (124.7)	240 (177)	290 (213.9)
M20	330 (243.4)	470 (346.7)	560 (413.1)
M24	570 (420.4)	800 (590.1)	960 (708.1)
M30	1130 (833.5)	1580 (1165.4)	1900 (1401.4)
M36	1960 (1445.7)	2800 (2065.3)	–

ROPS

CAUTION



ROPS bolts must **always** be tightened dry.

Bolt dimension:	M20 (P/N 50 02 26)
Strength category:	8.8
Tightening torque:	330 Nm (243 lbf.ft) (for Dacromet treated)

Hydraulic system

Opening pressure, MPa (psi)

Drive system	38,0	(5,500)
Charge system	2,0	(290)
Vibration system	33,0	(4,800)
Steering system	17,5	(2,540)
Brake disengagement	1,4	(200)

TECHNICAL SPECIFICATIONS

Vibrations - Drivers seat (ISO 2631)

The vibration values are measured in conformance with the driving mode described in EU directive 2000/14/EC on EU equipped machines, on soft polymer material with vibration switched ON and the operator's seat in transport mode.

Whole-body vibration is measured at less than the action value of 0.5 m/s² specified in EU directive 2002/44/EC. (The limit value is 1.15 m/s².)

Hand/arm vibration is measured at less than the action value of 2.5 m/s² specified in the same directive. (The limit value is 5 m/s².)

CAUTION



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

Acoustic values

The acoustic values are measured in conformance with EU directive 2000/14/EC on EU-equipped machines, on soft polymer material with vibration switched ON and the operator's seat in transport mode.

Model	Guaranteed acoustic power level dB(A) Lw(A)	Acoustic pressure level, operator's ear (platform) dB(A) Lp(A)	Acoustic pressure level, operator's ear (cab) dB(A) Lp(A)
CA150	107	89	90

CAUTION



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

MAINTENANCE SCHEDULE

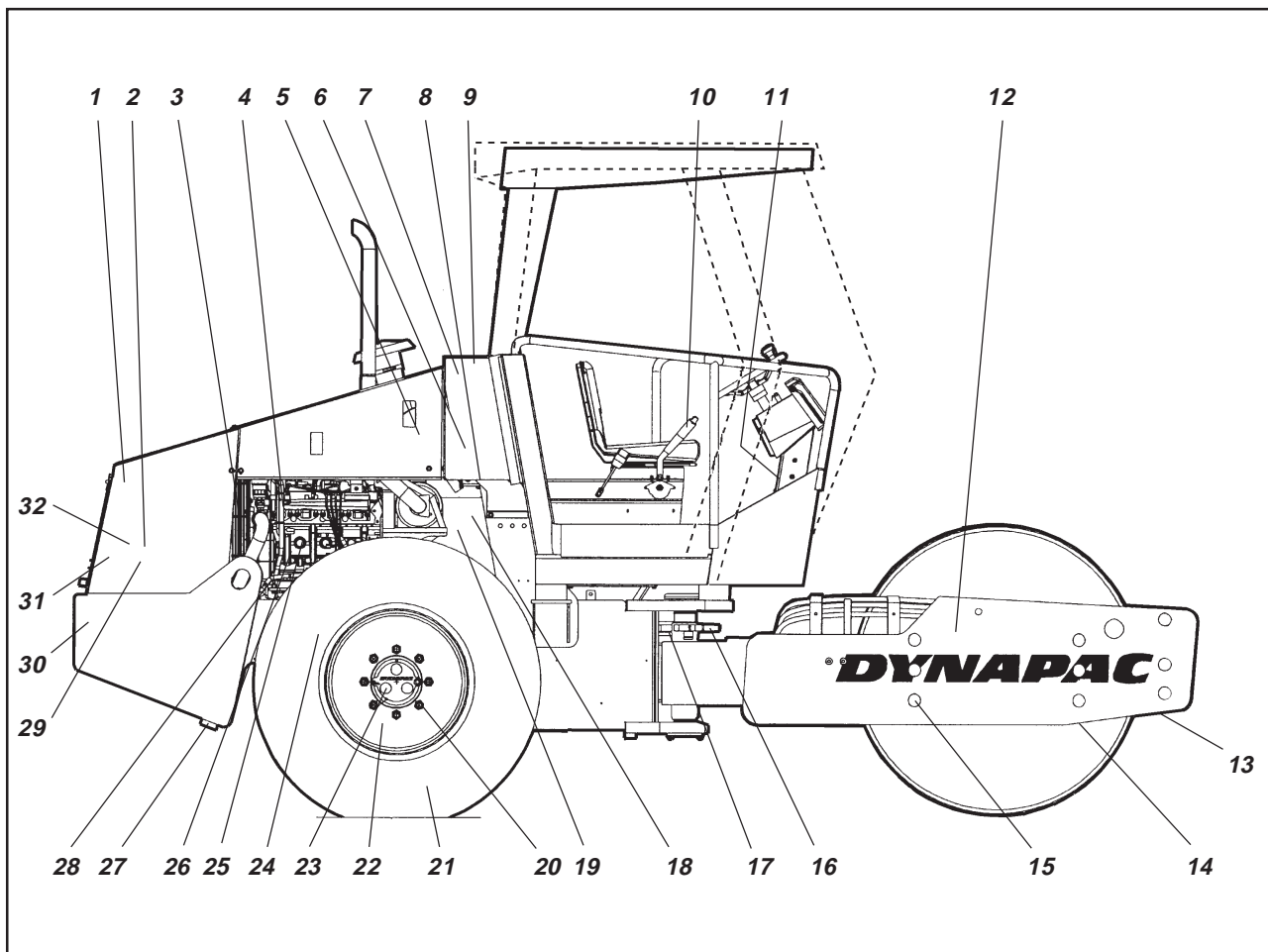


Fig. 1 Service and maintenance points

- | | | |
|-------------------------------------|--|--------------------------------------|
| 1. Radiator grille | 12. Drum oil, filling | 23. Rear axle, planetary gearing, x2 |
| 2. Fuel filter, initial fuel filter | 13. Scrapers | 24. Rear axle suspension, two sides |
| 3. Drive belts, cooling, alternator | 14. Drum oil, level plug, x1 | 25. Feed pump, fuel |
| 4. Oil level, diesel engine | 15. Rubber elements and fastening screws | 26. Oil filter, diesel engine |
| 5. Air filter | 16. Steering joint | 27. Draining, fuel tank |
| 6. Hydraulic reservoir, sight glass | 17. Steering cylinder, x1 | 28. Engine suspension, x4 |
| 7. Breather filter | 18. Hydraulic filter, x1 | 29. Diesel fuel, filling |
| 8. Drain, hydraulic reservoir | 19. Flywheel casing, hydraulic pumps | 30. Battery |
| 9. Hydraulic fluid, filling | 20. Wheel nuts | 31. Radiator |
| 10. Forward/reverse lever | 21. Tire pressure | 32. Hydraulic fluid cooler |
| 11. Fuse box | 22. Rear axle, differential | |

MAINTENANCE MEASURES

Periodic maintenance shall be carried out at the specified intervals, that is to say either every day, every week etc., or after the specified number of operating hours, whichever comes first.

CAUTION



Always first remove all exterior dirt before filling up fluids etc., and before checking oil and fuel levels, and also when lubricating with grease or oil.

CAUTION




The engine manual specifies additional service/maintenance instructions which relate to the diesel engine.

Every 10 operating hours (daily)

Item. in fig. 1	Measure	See page	Comments
	Before the day's first start		
13	Check scraper setting	10	
1	Check for free circulation of cooling air	11	
31	Check coolant level	11	See engine manual
4	Check diesel engine oil level	12	See engine manual
29	Top up fuel tank	12	
6	Check fluid level in hydraulic tank	12	
	Check brakes	13	

Every 50 operating hours (weekly)

Item. in fig. 1	Measure	See page	Comments
	Check that hoses and couplings are not leaking		
7	Clean the filter element of the air cleaner	14	Replace as required
16	Lubricate steering joint	15	
17	Lubricate the steering cylinder brackets	15	
20	Check the wheel-nuts are tightened	16	
21	Check tire pressure	16	
	<p>CAUTION</p>  <p>After the first 50 hours of operation, change only the drum oil and all the oil filters.</p>		

MAINTENANCE MEASURE

Every 250 operating hours (monthly)

Item. in fig. 1	Measure	See page	Comments
23	Check the oil level in rear axle/planetary gearing	17	
14	Check the oil level in drum	17	
32	Clean the radiators	18	
20, 24	Inspect and tighten bolted joints	18	Applies only to new and repaired components
15	Inspect rubber elements and bolted joints	18	
26	Change engine oil and oil filter	19	See engine manual
30	Inspect the battery	19, 20	

Every 500 operating hours (every three months)

Item. in fig. 1	Measure	See page	Comments
2	Replace fuel filter		See engine manual
2	Clean the initial fuel filter	21	
7	Check bleeder filter on hydraulic tank	22	

Every 1000 operating hours (every six months)

Item. in fig. 1	Measure	See page	Comments
18	Change the hydraulic fluid filters	22	
27	Drain condensate from fuel tank	23	
5	Replace air cleaner main filter	23	
8	Drain condensate from hydraulic tank	24	
22	Change oil in rear axle differential	24	
24	Change oil in rear axle planetary gears	24	
	Check diesel engine valve clearance		See engine manual
3	Check belt tension for drive belt system		See engine manual

Every 2000 operating hours (every year)

Item. in fig. 1	Measure	See page	Comments
8, 9	Change fluid in hydraulic tank	25	
12	Change oil in roller	25	
10	Lubricate Forward/Reverse control	26	

EVERY 10 OPERATING HOURS (Daily)

Scrapers – Check/Adjust

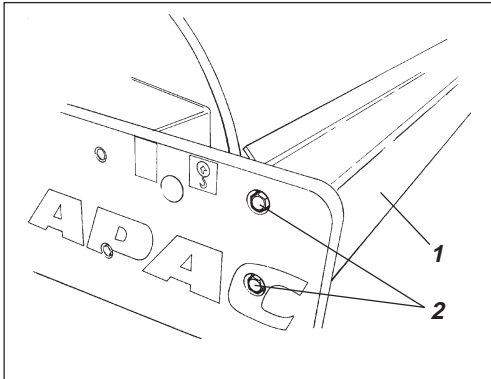


Fig. 2 Scrapers
1. Scraper beam
2. Screws



WARNING

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



CAUTION

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

If necessary, adjust distance to the drum as follows: the scraper is integrated with the beam. Loosen the four screws (2) on the frame side, then adjust the beam to about 20 mm (0.8 in) from the drum. Tighten the screws.

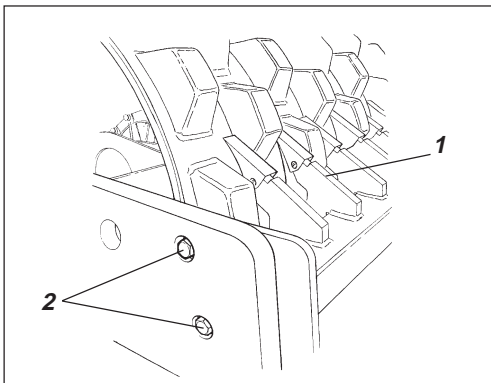


Fig. 3 Scrapers
1. Scraper blade
2. Screws

CA150PD/P

Loosen the four screws (2) on the frame side, then adjust the beam to about 25 mm (1 in) between the teeth and the drum. Tighten the screws.

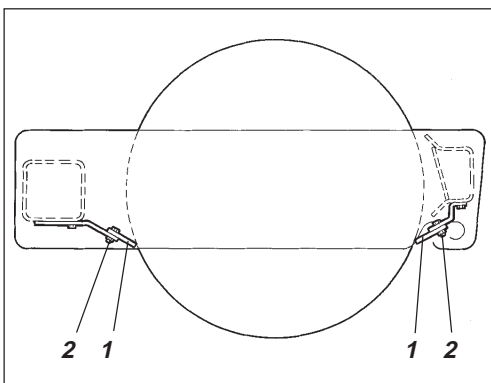


Fig. 4 Scrapers
1. Scraper blade
2. Screws

Soft scrapers (Optional)

Loosen the screws (2) and adjust to light contact against the drum. Tighten the screws.

EVERY 10 OPERATING HOURS (Daily)

Air circulation – Check

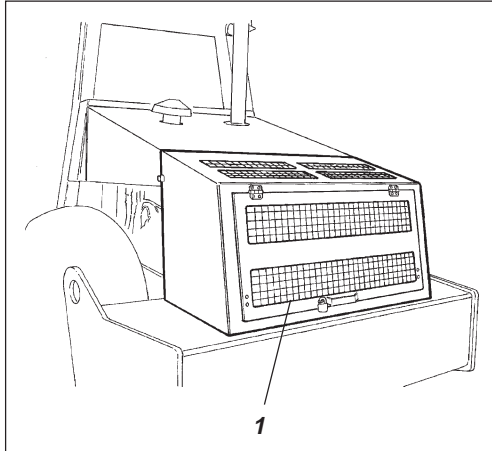


Fig.5 Grille
1. Cover

Check that the diesel engine has free circulation of cooling air through the grille in the engine compartment.

Open the cover (1) fully upward. Make sure that the red safety catch on the right side is latched.

Coolant level – Check

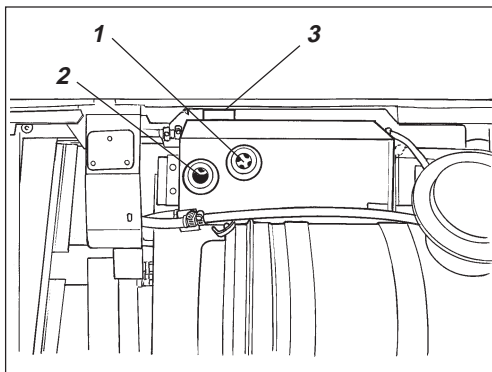


Fig.6 Radiator
1. Max. level
2. Min. level
3. Filler cap

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

WARNING



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

Fill with a mixture of 50% water and 50% anti freeze. See page 3 in these instructions and in the engine manual.

CAUTION



Flush the system every other year and change the coolant. Ensure also that air can flow unrestricted through the radiator.

EVERY 10 OPERATING HOURS (Daily)

Diesel engine – Check oil level

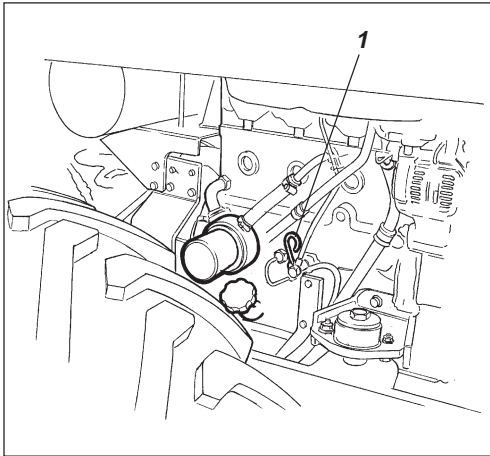


Fig. 7 Engine compartment
1. Oil dipstick

WARNING



Park the machine on a level surface. The engine should be switched off and the parking brake engaged during all inspection and adjustment operations on the machine, unless otherwise stated.

WARNING



Watch out for contact with hot engine parts and the hot radiator when the oil dipstick is being removed. There is a risk of burn injuries.

The dipstick is on the left-hand side of the engine.

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

Fuel tank – Filling

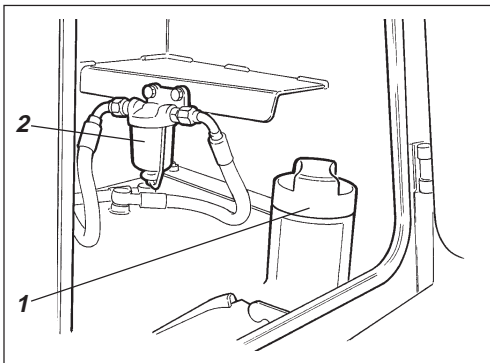


Fig. 8 Fuel tank
1. Filler pipe
2. Initial fuel filter

Refuel every day. Top off to the lower edge of the filler pipe. Use diesel fuel in accordance with the engine manufacturer's specifications.

WARNING



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

The fuel tank holds 225 litres (59,4 gal).

CAUTION



Check that there is no sediment or water in the fuel pre-filter (2). Clean the pre-filter if required, see under "500 hours of operation".

Hydraulic reservoir – Check fluid level

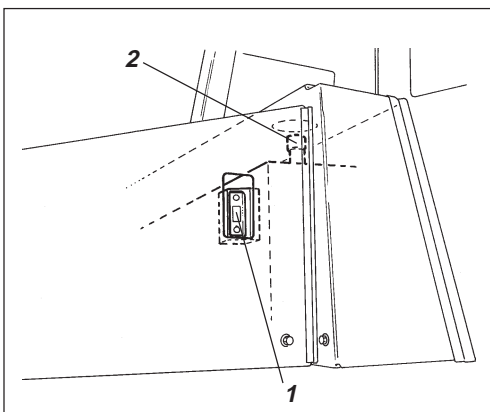


Fig. 9 Hydraulic fluid reservoir
1. Sight glass
2. Filler pipe

Position the roller on a level surface and check that the sight glass reading (1) is between the max. – min. marks. Top off with hydraulic fluid according to the lubricant specification if the level is too low.

EVERY 10 OPERATING HOURS (Daily)

Brake function – Check

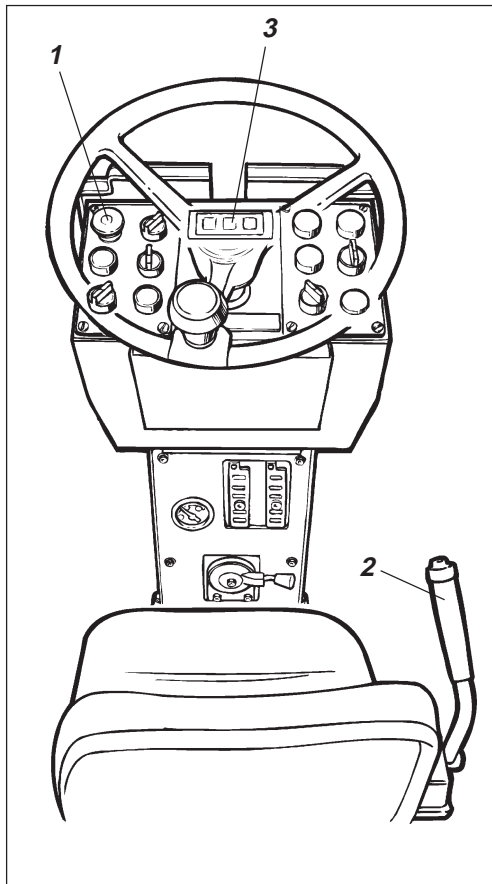


Fig. 10 Control panel

1. Reserve-/parking brake knob
2. Forward/reverse lever
3. Warning lamp



Check operation of the brakes as follows:

Drive the roller **slowly** forward.

Push the reserve/parking brake knob (1); the warning lamp (3) on the instrument panel should light and the roller should stop.

After testing the brakes, set the forward/reverse lever (2) in neutral.

Pull up the reserve-/parking brake knob.

The roller is now ready for operation.

EVERY 50 OPERATING HOURS (Weekly)

Air cleaner – Check/clean

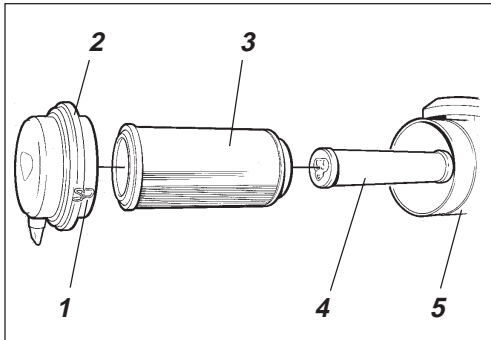


Fig. 11 Air cleaner

1. Locking braces
2. Cover
3. Main filter
4. Safety filter
5. Filter housing



Replace or clean the air cleaner's main filter if the warning lamp on the instrument panel lights up when the diesel engine is operating at full speed.

Undo the three locking braces (1). Then pull off the cover (2) and pull out the main filter (3).

Do not remove the safety filter (4).

Main filter – Cleaning with compressed air

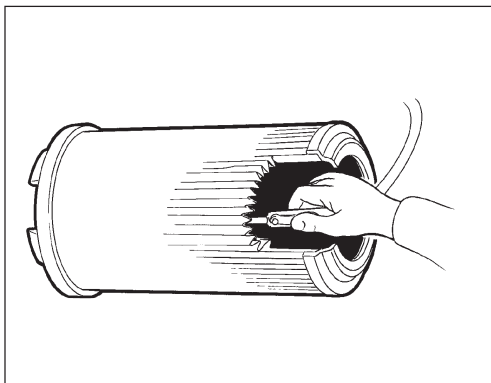


Fig. 12 Main filter

If the main filter is to be cleaned, compressed air at max. 5 bar (72 lbs/sq in) pressure should be used. Blow up and down along the paper creases on the inside of the filter.

Hold the nozzle at least 2–3 cm (0.8-1.2 in) away from the paper creases so that the paper does not tear under the pressure of air.

WARNING



Use protective goggles when working with compressed air.

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

CAUTION



Check that the hose clamps between the filter housing and inlet hose are tightened and that they do not leak. Check the entire length of the hose all the way to the engine.

CAUTION



Once the main filter has been cleaned a maximum of 5 times, it must be replaced.

Safety filter – Replacement

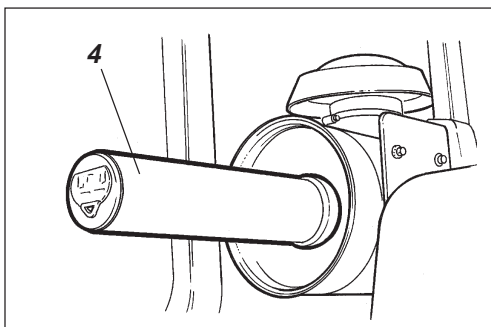


Fig. 13 Air filter

4. Safety filter

Replace the safety filter with a new one at every 5th replacement or cleaning of the main filter. The safety filter cannot be cleaned.

When replacing the safety filter (4), pull out the old filter from its holder, insert a new one and refit the air cleaner in the reverse order to the instructions given in the figure above.

EVERY 50 OPERATING HOURS (Weekly)

Steering joint and steering cylinder – Lubrication

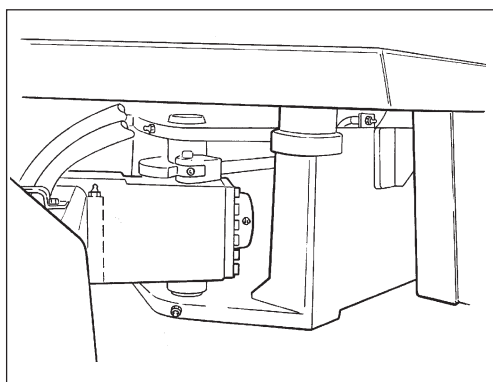


Fig. 14 Steering joint, left side

Steering joint – Lubrication

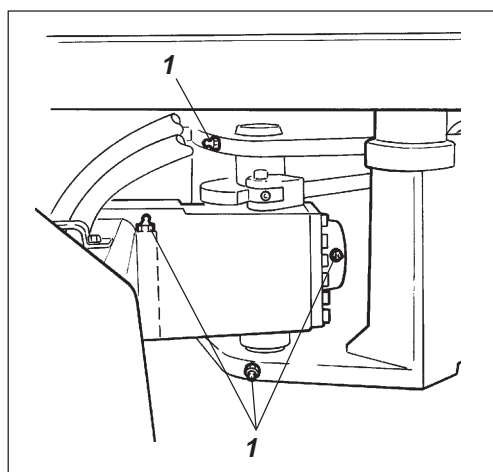


Fig. 15 Steering joint, left side

1. Lubricating nipples, steering joint (x4)

Steering cylinder – Lubrication

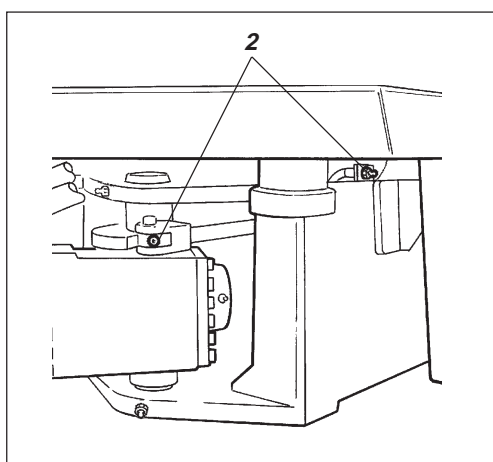


Fig. 16 Steering cylinder, left side

2. Lubricating nipples, cylinder brackets (x2)



WARNING

Place the roller on a level surface. Switch the engine off and push in the reserve/parking brake knob for all checking and adjustments on the roller, unless otherwise specified.



WARNING

Allow no one to get near the steering joint when the engine is running. Danger of being crushed when steering is operated. Push the reserve/parking brake knob before lubricating.

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



CAUTION

Use grease recommended in Lubricant Specification.

Wipe all the nipples clean from dirt and grease.

Lubricate each nipple (1) with five strokes of the grease gun. Make sure that grease penetrates the bearings.

If grease does not penetrate through the bearings, it may be necessary to relieve the load on the articulated joint with a hydraulic jack and then repeat the greasing process.

Wipe nipples clean from dirt and grease.

Lubricate each nipple (2) with three strokes of the grease gun.

Allow a little grease to remain on the nipples after greasing. This will prevent contaminants from entering the nipples.

EVERY 50 OPERATING HOURS (Weekly)

Tires – tire pressure
Wheel nuts – tightening

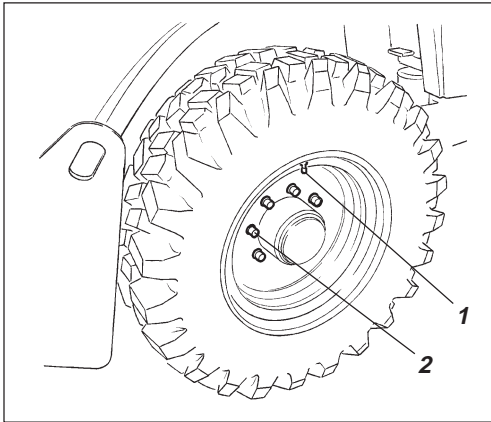


Fig. 17 Wheels

1. Air valve
2. Wheel nut

Check the tire pressures using a pressure gauge.

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

The relevant tire pressures are given under the heading “Specifications”.

Check both tires.

CAUTION



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

Check the tightening torque of the wheel nuts (2) at 470 Nm (350 lbf.ft). Check both wheels and all the nuts. (Applies only to new machine or recently fitted wheels.)

WARNING



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

EVERY 250 OPERATING HOURS (Monthly)

Rear axle differential – Check oil level

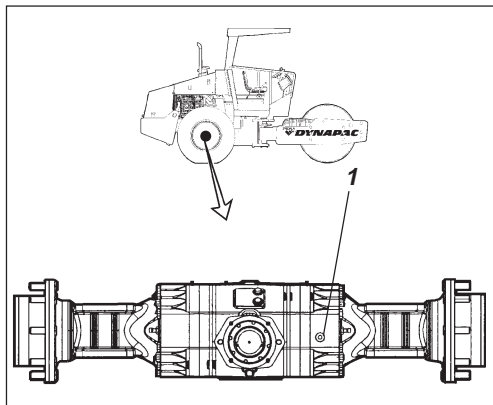


Fig. 18 Oil level check – differential housing
1. Oil level/Filler plug



WARNING
Place the roller on a level base. The engine must be switched off and the parking brake applied for all checking and adjustments on the roller unless stated otherwise.



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

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

Rear axle planetary gears – Check oil level

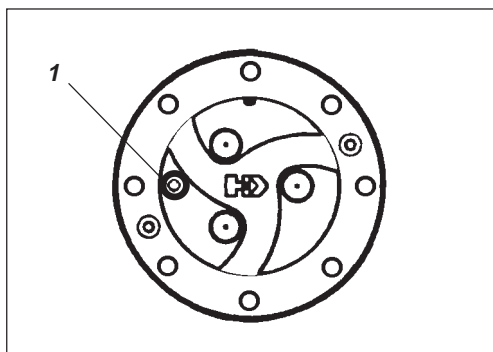


Fig. 19 Oil level check – planetary gear
1. Oil level/Filler plug

Position the roller with the level plug (1) in the planetary gears at 9 o'clock.

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

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

Drum – Checking the oil level

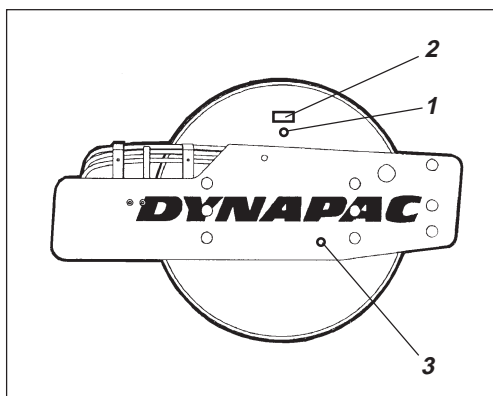


Fig. 20 Right side of drum
1. Filling plug
2. Number plate
3. Sight glass

Position the roller on a flat surface so that the filler plug (1) and number plate (2) on the right side of the drum are straight up.

Oil level should reach up to the sight glass (3).

Top off as required through the filler plug (1) halfway on the sight glass.

Clean the magnetic filler plug (1) from any metal particles before refitting it.

See lubricant specification for the right grade of oil.



CAUTION
Do not overfill with oil, risk of overheating.

EVERY 250 OPERATING HOURS (Monthly)

Coolers – Checking/cleaning

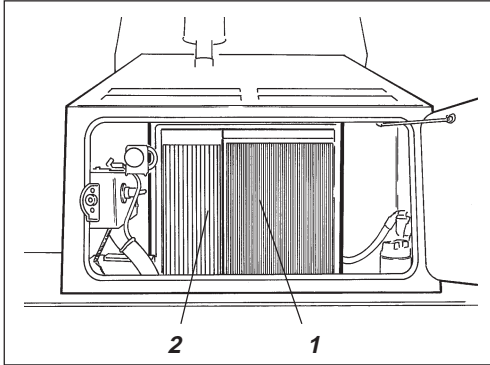


Fig. 21 Hydraulic cooler

1. Water cooler
2. Hydraulic fluid cooler

Open the engine cover to gain access to the water and hydraulic coolers.

Ensure that the flow of air through the coolers (1) and (2) is unobstructed.

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 cooler. The cooler may otherwise be damaged.

WARNING



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

Bolted joints

– Checking tightening torque

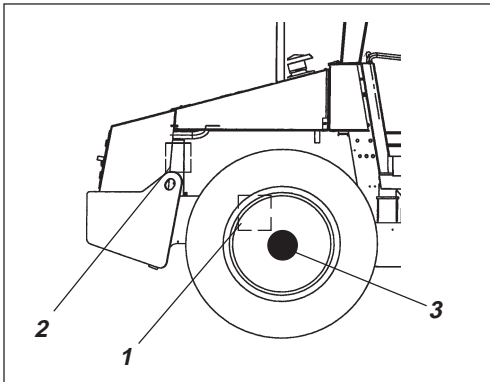


Fig. 22 Right side of machine

1. Rear axle
2. Engine suspension
3. Wheel nuts

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

Engine suspension (3). Check that all M12 bolts (x20) are tightened, 78 Nm (57 lbf.ft).

Wheel nuts (4). Check that all nuts are tightened, 470 Nm (347 lbf.ft), oiled.

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

Rubber elements and screw fasteners – Check

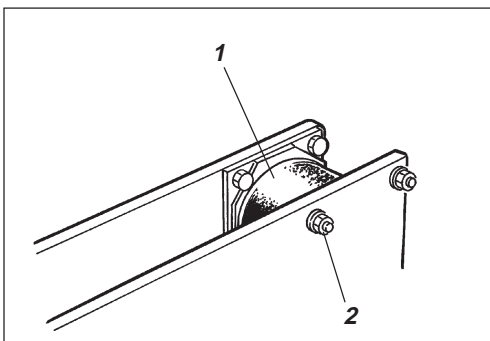


Fig. 23 Roller, vibration side

1. Rubber element
2. Screw fasteners

Check all the rubber elements (1), and replace them all if more than 25% of the elements on the same side of the roller have cracks deeper than 10–15 mm (0.4-0.6 in).

Use a knife blade or other pointed tool when carrying out this check.

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

EVERY 250 OPERATING HOURS (Monthly)

Diesel engine

– Changing the filter and oil

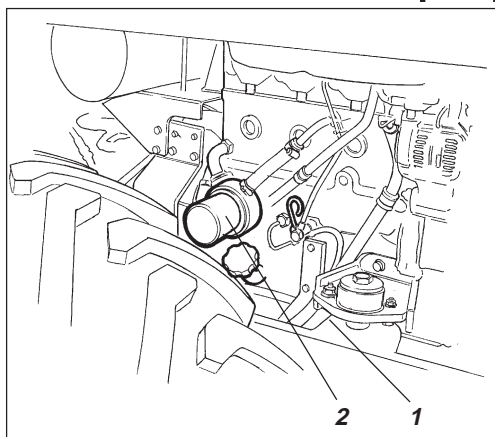


Fig. 24 Left side of engine

1. Drain plug
2. Oil filter

WARNING



Position the roller on a level surface. Stop the engine and apply the parking brake/ reserve brake.

The oil drain plug (1) located in a mount on the rear axle is most easily accessible from underneath the engine. Drain the oil while the engine is warm. Place a receptacle for at least 15 litres under the drain plug.

WARNING



Danger of being scalded when draining off hot oil. Protect your hands.

Change the engine oil filter (2) at the same opportunity. See also the engine manual.



Dispose of the drained oil and filter in an approved manner.

Battery

– Check electrolyte level

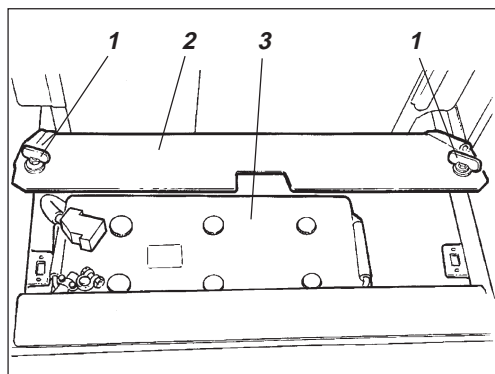


Fig. 25 Battery box

1. Quick-release screws
2. Battery cover
3. Battery

WARNING



Make sure there are no naked flames in the vicinity when checking the electrolyte level. An explosive gas is formed in the battery during the charging process.

Lift up the engine compartment cover and undo the quick-release screws (1).

Raise the battery cover (2).

Dry the upper face of the battery.

WARNING



Use protective goggles. The battery contains corrosive acid. In the event of contact, rinse with water.

EVERY 250 OPERATING HOURS (Monthly)

Battery cell

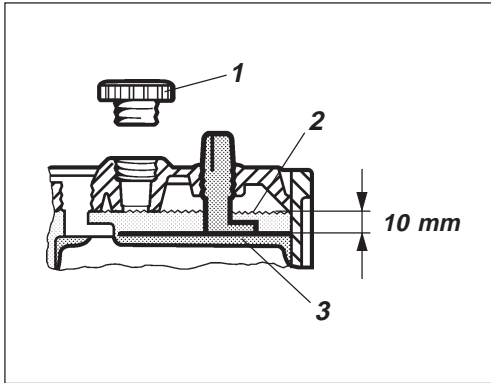


Fig. 26 Electrolyte level in battery

1. Cell cover
2. Electrolyte level
3. Plate

Remove the cell covers and check that the fluid level is about 10 mm (0.4 in) above the plates. Check the level in all the cells. If the level is lower, top up to the correct level with distilled water. If the ambient air temperature is below freezing point, the engine should be run for a while after the distilled water is added, otherwise there is a risk that the water might freeze.

Check that the ventilation holes in the cell covers are not blocked, then refit the covers.

The cable terminals must be properly tightened and clean. Corroded cable connections should be cleaned and greased with alkaline Vaseline.

CAUTION



When removing the battery, always undo the negative cable first.

When fitting the battery, always connect the positive cable first.



Dispose of the old battery in the approved environmentally suitable manner – batteries contain toxic lead.

WARNING



When carrying out electrical welding on the machine, disconnect the battery's negative cable and then all the electrical connections leading to the alternator.

EVERY 500 OPERATING HOURS (Every three months)

Fuel pre-filter – Cleaning

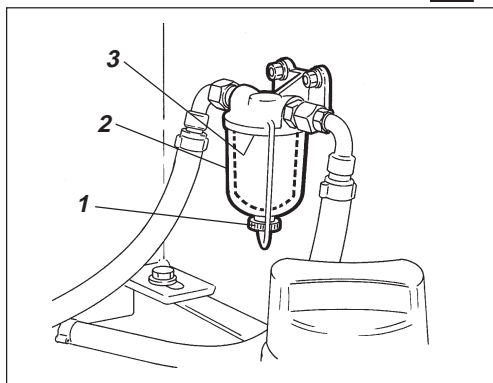


Fig. 27 Engine
1. Screw
2. Glass bowl
3. Filter



Place the roller on a level base. The engine must be switched off and the parking brake applied for all checking and adjustments on the roller unless stated otherwise.

Loosen the screw (1) and remove the bowl (2).

Take out the strainer (3) and clean using a non-flammable fluid. Reinstall the strainer and the bowl.

Start the engine and check that the pre-filter does not leak.



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

EVERY 1000 OPERATING HOURS (Every six months)

Hydraulic filter – Replacement

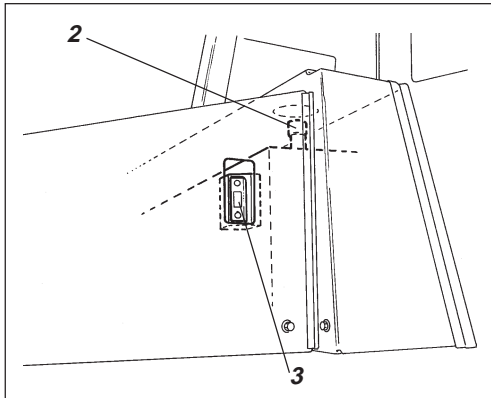


Fig. 28 Hydraulic reservoir
2. Filler cap/Breather filter
3. Sight glass

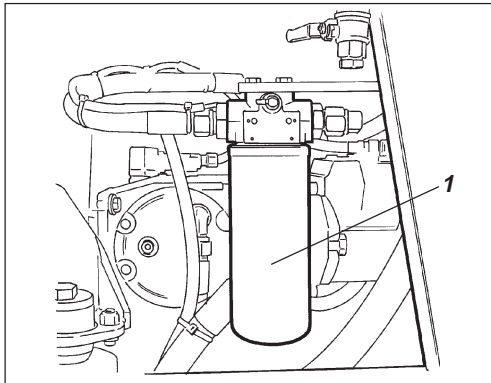


Fig. 29 Engine compartment
1. Hydraulic filter (x1)

WARNING



Place the roller on a level base. The engine must be switched off and the parking brake applied for all checking and adjustments on the roller unless stated otherwise.

Loosen the cap/breather filter (2) on top of the reservoir to relieve any excess pressure inside.

Ensure that the breather filter (2) is not clogged, air must have unobstructed passage through the cap in both directions.

If clogged in either direction, clean with a little diesel oil and blow with compressed air until free passage is assured, or replace the cap with a new one.

WARNING



Wear protective goggles when working with compressed air.

Clean thoroughly round the hydraulic filter. Remove the hydraulic filter (1) and scrap it. They are of the **expendable type** and cannot be cleaned.

CAUTION



Ensure that the old sealing ring is not left on the filter holder. Leakage may otherwise occur between the new and the old seals.

Thoroughly clean the sealing surface of the filter holder.

Apply a thin coat of fresh hydraulic fluid on the new filter seal.

CAUTION



First, screw on until the filter seal lies against the filter holder. Then screw a further half turn. Do not tighten the filter too hard, which could damage the gasket.

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

WARNING



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

EVERY 1000 OPERATING HOURS (Every six months)

Hydraulic tank – Drainage

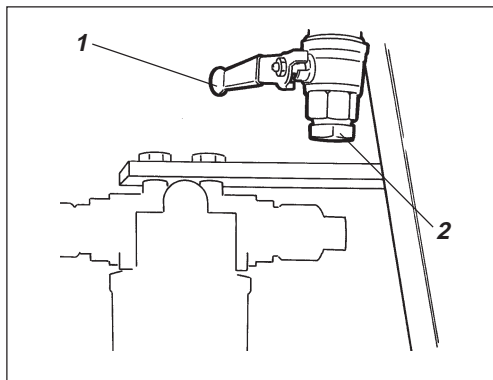


Fig. 30 Hydraulic tank, underside

1. Drainage tap
2. Plug

Condensate in the hydraulic reservoir is removed via the drainage tap (1).

Drainage should be performed when the roller has been standing for a long period of time, for example overnight. Drain as follows:

Remove the plug (2).

Place a container under the tap.

Open the tap (1) and let any trapped condensate run out.

Shut the drainage tap.

Refit the plug.

Fuel tank – Drainage

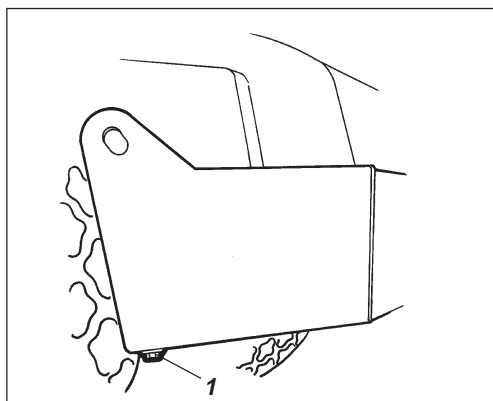


Fig. 31 Fuel tank

1. Drainage plug

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



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

Drainage should be performed when the roller has been standing for a long period of time, for example overnight. The fuel level should be as low as possible.

The roller should preferably have been standing with this side somewhat lower, so that water and sediment will gather near the drainage plug (1). Drain as follows:

Place a container under the plug (1).

Undo the plug and drain off the water and sediment until only clean diesel fuel appears through the plug opening. Refit the plug.

Replace the main filter (3) of the air cleaner even if it has not yet been cleaned five times, see under 50 hours for filter replacement.

Air filter – Replacement

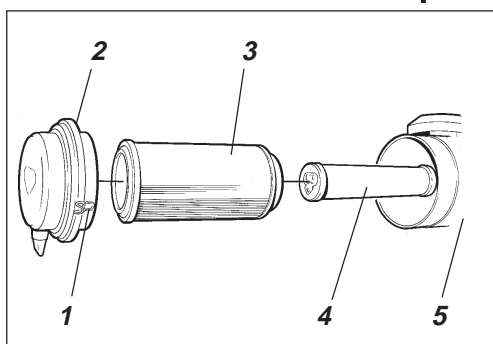


Fig. 32 Air cleaner

1. Locking braces
2. Cover
3. Main filter
4. Backup filter
5. Filter housing

EVERY 1000 OPERATING HOURS (Every six months)

Rear axle differential – Oil change

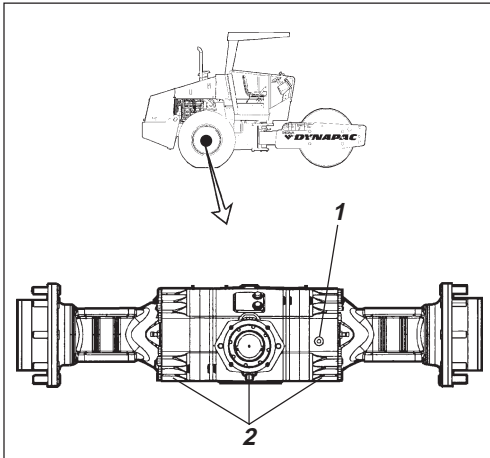


Fig. 33 Rear axle
1. Oil level/Filler plug
2. Drainage plugs



WARNING Never work under the roller with the engine running. Park on a level surface and block the wheels securely.

Wipe clean and remove the level/filler plug (1) and all three drain plugs (2), and drain the oil into a suitable receptacle. The volume is about 7 quarts.



Save the oil and deposit it in an approved manner.

Refit the drainage plugs and top up with fresh oil until the correct level is reached.

Note: It takes a while for the oil to flow into the axle. Do not fill the entire volume all at once.

Refit the oil-level/filler plug. Use transmission oil, see the lubrication specification.

Rear axle planetary gears – Oil change

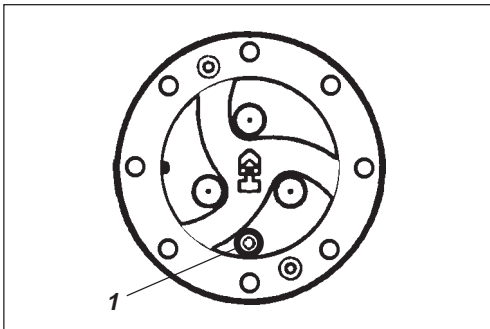


Fig. 34 Planetary gear/drainage position
1. Plug

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

Wipe clean, unscrew the plug (1) and drain the oil into a suitable receptacle. The volume is about 1 litre (1.1 qts).



Save the oil and deposit it in an approved manner.

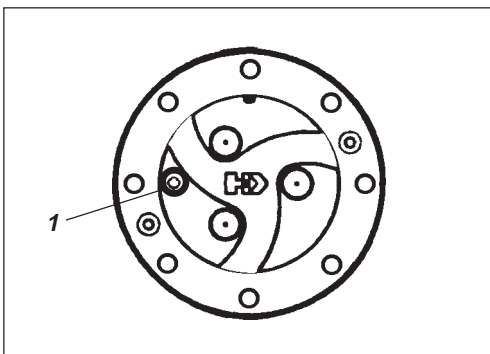


Fig. 35 Planetary gear/filling position
1. Plug

Position the roller with the plug at 9 o'clock.

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

Clean and screw in the plug. Use transmission oil. See lubricant specification.

Change oil in the same way in the other planetary gears of the rear axle.

EVERY 2000 OPERATING HOURS (Every year)

Hydraulic tank – Fluid change

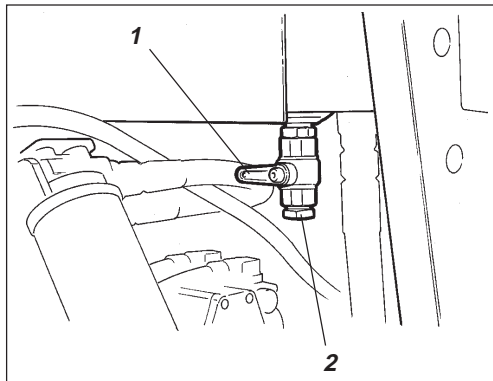


Fig. 36 Hydraulic tank, underside
1. Drainage tap
2. Plug



WARNING
Place the roller on a level surface. Switch the engine off and push in the reserve/parking brake knob for all checking and adjustments on the roller, unless otherwise specified.



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

Obtain a container for collecting the used fluid. The container should have a volume of at least 60 litres (16 gal).

A suitable container may be an empty oil drum or similar item which is placed beside the roller. The fluid then runs in a hose from the drainage plug (1) to the oil drum, after the plug (2) has been removed and the tap opened.



Save the oil and deposit it in an approved manner.

Fill with fresh hydraulic fluid according to instructions under the heading "Hydraulic reservoir—checking the level". Change the hydraulic filter at the same time

Start the diesel engine and operate the various hydraulic functions.



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

Check the fluid level and top up if necessary.

Drum – Changing the Oil

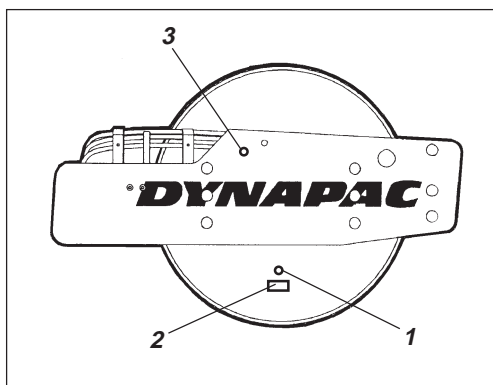


Fig. 37 Drum, right side
1. Drain/Filler plug
2. Number plate
3. Sight glass



Save the oil and deposit it in an approved manner.

Clean and unscrew the plug (1). Allow all of the oil to drain off. Fill with oil according to "Drum—checking the oil level".



WARNING
There is danger of being scalded when draining hot oil. Protect your hands.

EVERY 2000 OPERATING HOURS (Every year)

Steering joint – Check

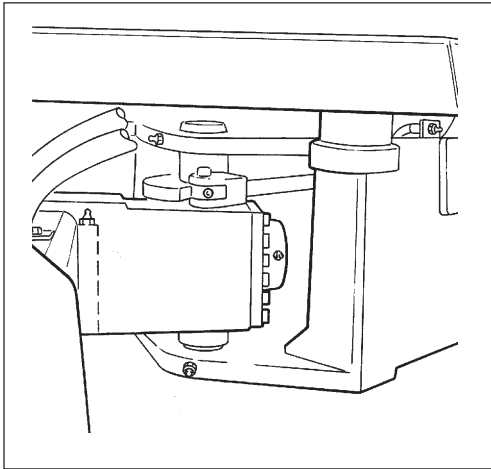


Fig. 38 *Steering joint*

Inspect the steering joint to detect any damage or cracks.

Check and correct any loose bolts.

Check also for any stiffness and play.

Controls and pivoted joints – Lubrication

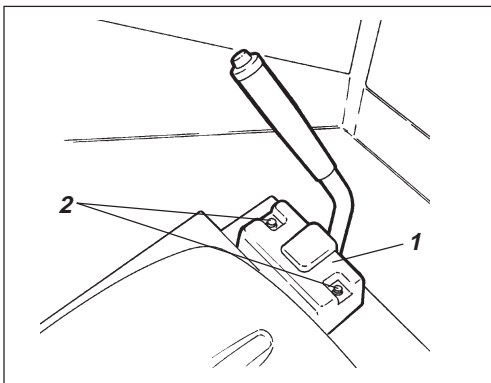


Fig. 39 *Operator's station*

1. *Protective cover*
2. *Screws (x2)*

Lubricate the forward/reverse control mechanism. Unscrew the two screws (2) and take off the protective cover (1). Oil the mechanism.

Refit the protective cover.

LONG-TERM STORAGE

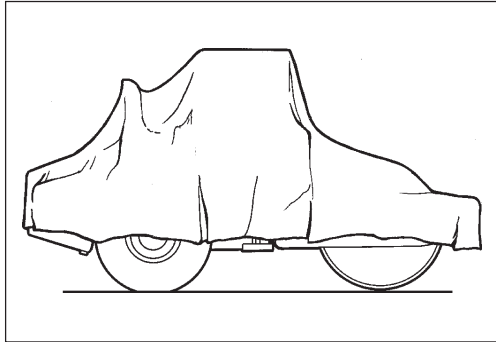


Fig. 40 Protecting the roller from the elements



For long-term storage (longer than one month), the following instructions should be followed.

These instructions apply for storage lasting up to 6 months.

Before re-commissioning the roller, the points marked with an asterisk * must be restored.

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 its 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 completely to prevent condensation.

Hydraulic reservoir

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

Steering cylinder, hinges etc.

Lubricate the steering joint bearings and the steering cylinder's two bearings with grease.

Grease the steering cylinder's piston with conservation grease.

Grease also the engine compartment cover's hinges, the seat slide rails, the engine-speed control and the forward/reverse control mechanism.

Tires (All-weather)

Check that tire pressure is 110 kPa (1,1 kp/cm²), (16 psi).

Covers, tarpaulin

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

SPECIAL INSTRUCTIONS

Standard lubricants and other recommended oils

Upon delivery from the factory, the various systems and components are filled with the oils specified see lubricant specification and they can be used at ambient temperatures from -10°C to +40°C (14°F - 104°F).



A maximum temperature of +35°C (95°F) applies for biological hydraulic fluid.

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

When operating in hotter ambient temperatures, but up to max. +50°C (122°F), the following instructions apply:

The diesel engine can handle this temperature with the standard oil, but the following oils must be used in the other components:
Hydraulic system with mineral fluid: Shell Tellus TX100 or corresponding.
Other components using transmission oil: Shell Spirax HD 85W/140 or corresponding.

Temperatures

The temperature limits apply for a roller with standard features.

Rollers with extra equipment such as noise suppressers etc. may require additional attention at the upper temperatures.

High-pressure washing



When washing the machine, do not direct the jet of water directly at the fuel or hydraulic fluid tank covers. This is particularly important when using a high-pressure washing unit.

Do not spray water directly on electric components or the instrument panel. Put a plastic bag over the filler cap of the fuel tank and secure with a rubber band. This will prevent water from entering the venting hole in the filler cap. This could otherwise cause operational disturbance, for example, a clogged filter.

Extinguishing fires

If there is a fire in or on the machine, it is best to use an ABE-class fire extinguisher. However, a BE-class CO₂ extinguisher is also suitable.

ROPS, protective cab

If the roller is equipped with a protective structure (ROPS, Roll Over Protective Structure), or protective cab, never subject the structure or cab to welding or drilling. Never attempt to repair a damaged structure or cab; they must be replaced with new ones.

Starting assistance

When an auxiliary starter battery is used, always connect the positive terminal on the auxiliary battery to the positive terminal on the roller's battery, and negative to negative.

ELECTRICAL SYSTEM, FUSES

Fuses and relays

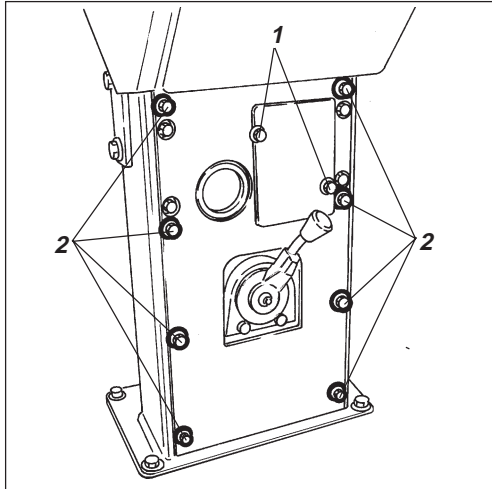


Fig. 41 Instrument panel

1. Screws (x2)
2. Screws (x8)

The electrical regulating and control system is protected by fuses and relays. The number depends on how much additional equipment the machine is prepared for.

The two fuse boxes (3, 4) and the relays (5, 6, 7, 8) are located behind the lower instrument plate, which is removed by unscrewing the screws (1 and 2).

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



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

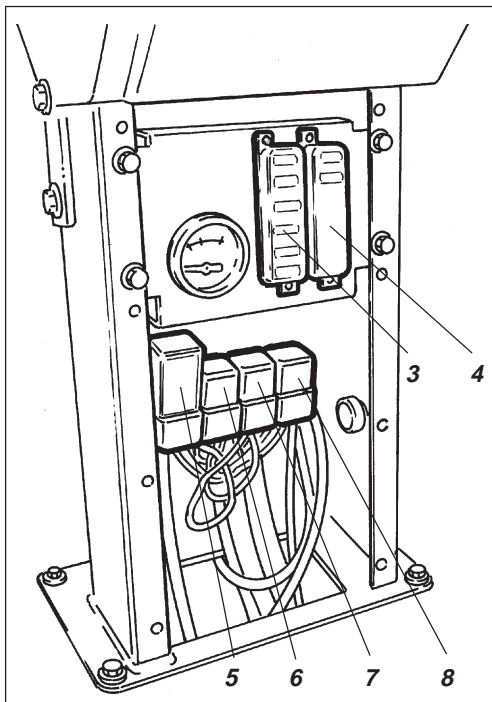


Fig. 42 Instrument panel

- 3,4. Fuse box
5. VBS relay
6. Main relay
7. Hourmeter relay
8. Lights relay □

□ = Optional

ELECTRICAL SYSTEM, FUSES

Fuse boxes in steering column

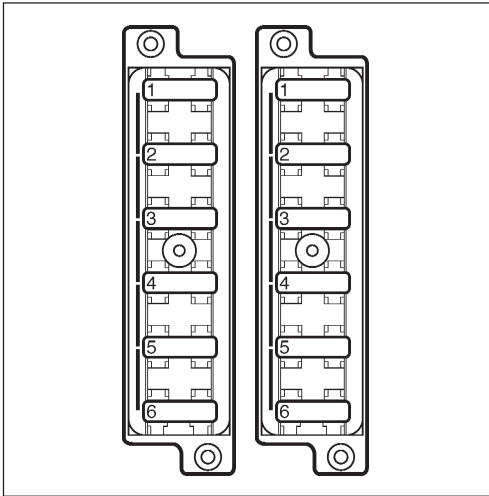


Fig. 43 Fuse box, left side

- 7.5A 1. Hourmeter
- 7.5A 2. VBS relay
- 7.5A 3. Warning lamp
- 7.5A 4. Horn, Fuel gauge
- 7.5A 5. Fuel gauge
- 10A 6. Front wiper, cab

Fig. shows the rating and function of the different fuses. All fuses are flat pin fuses.

Fuse box, right side

- 7.5A 1. High/Low gear
- 3A 2. Compaction meter
- 7.5A 3. Hazard beacon
- 3A 4. Reversing alarm
- 20A 5. Working lights
- 20A 6. Working lights

= Optional

Main fuses/Relays

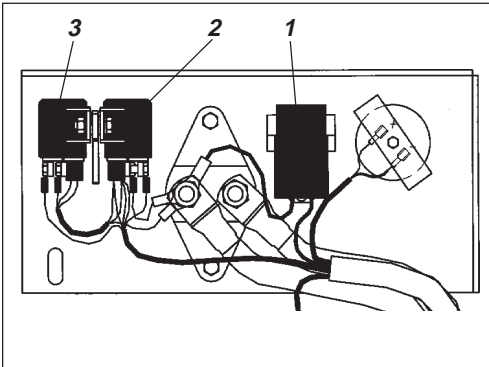


Fig. 44 Engine compartment

- 1. Main fuse
- 2. Fuel solenoid relay
- 3. Start relay

The main fuse (1) is located behind the battery disconnecter. The fuse a flat pin fuse. The fuel solenoid relay (2) and the start relay (3) are also fitted here.

Main fuse 30 A (Green)

