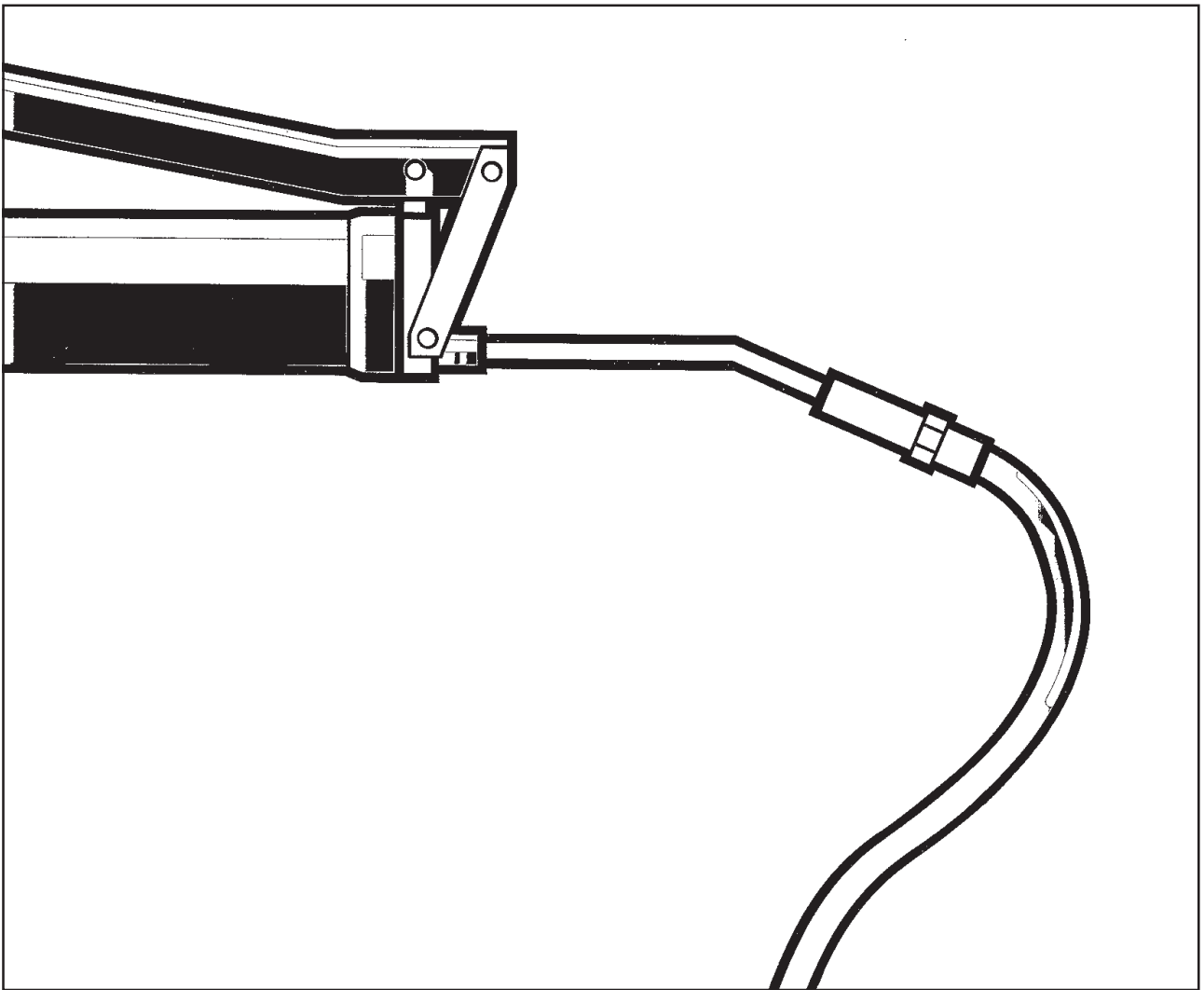


DYNAPAC

CS 141

MAINTENANCE

M141EN4



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DYNAPAC

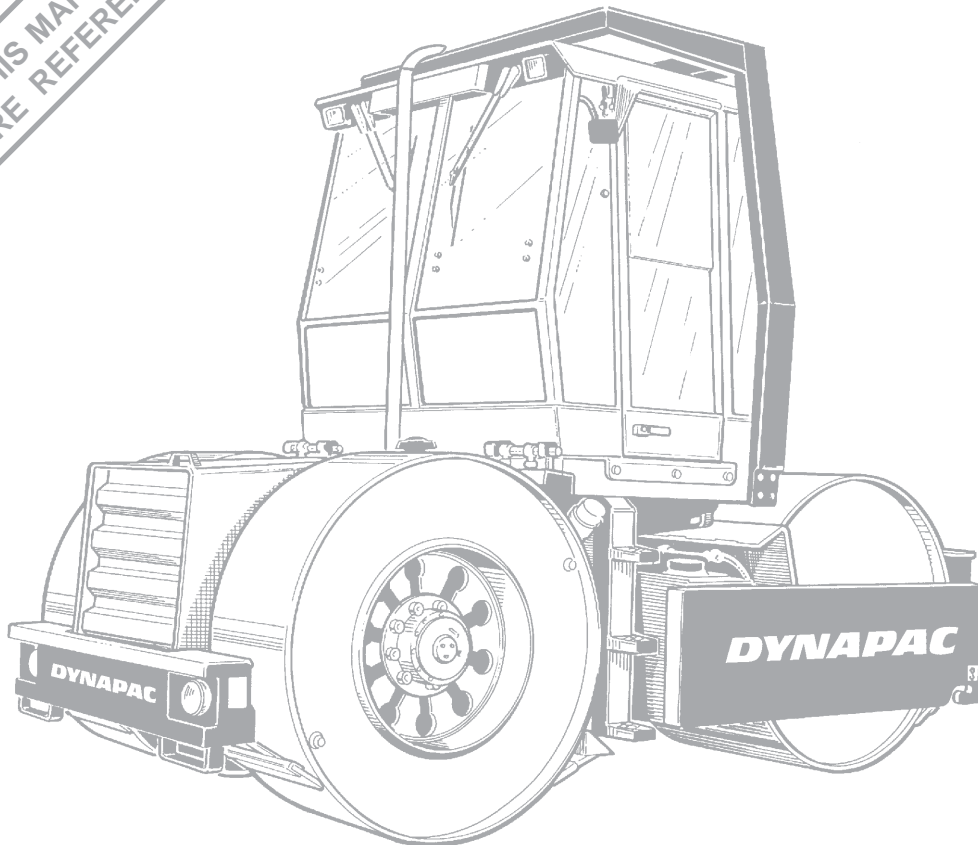
Static Three-drum Roller CS 141

Maintenance M141EN4, April 2002

**Diesel engine:
Cummins 4BT-3.9**

These instructions apply from:
CS 141 PIN (S/N) *21720192*
CS 141 PIN (S/N) *21720211* (New instrument panel)

**KEEP THIS MANUAL FOR
FUTURE REFERENCE**



Dynapac CS 141 is a static 10–13 tonne articulated 3-drum roller. The drums have the same diameter and the line load is equal over the entire width. Propulsion and brakes on all three drums.

Good working environment for the operator. The ergonomically designed cab, with its amply sized windows facilitates a complete all-round view. The cab is an optional feature, but is described in this manual.

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WARNING SYMBOLS

WARNING



Safety instructions—Personal safety.

CAUTION



Special caution—Machine or component damage.

GENERAL

WARNING



Read the entire manual before starting any service work.

WARNING



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

WARNING



If the gas springs of the engine hood are disconnected and the hood is put in the upper position—latch the hood to prevent it from closing inadvertently.

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

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



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

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

CAUTION



The manufacturer's instructions in the engine manual also apply. This is placed under a separate flap in the product folder for the roller.

CALIFORNIA

Proposition 65 Warning







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

LUBRICANTS AND SYMBOLS

CAUTION
















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

	ENGINE OIL, ambient temperature -10°C - +50°C (14°F – 122°F)	Shell Rimula TX SAE 15W/40 or equivalent API CF-4/SG, (CD/CE)
	HYDRAULIC FLUID, ambient temperature -10°C - +40°C (14°F – 104°F) temperature. over +40°C	Shell Tellus TX68 or equivalent Shell Tellus TX100 or equivalent
	BIOLOGICAL HYDRAULIC FLUID	Shell Naturelle HF-E46 When the machine leaves the factory, it may be filled with biologically degradable fluid. The same type of fluid must always be used when changing or topping off.
	GREASE	SKF LGHB2 (NLGI-Klass 2) or equivalent for the articulation. Shell Retinax LX2 or equivalent for other grease points
	FUEL	See engine manual
	COOLANT 50/50 mixture with water	Shell Anti Freeze 402 or equivalent Anti-freeze down to about -35°C (-31°F)

CAUTION



Other fuel and lubricants are required for operation in extremely high or extremely low ambient temperature. See chapter “Special instructions”, or consult Dynapac.

	Engine, oil level		Battery
	Engine, oil filter		Sprinkler
	Hydraulic reservoir, level		Sprinkler water
	Hydraulic fluid, filter		Fuel gauge
	Lubricating oil		Fuel filter
	Coolant, level		Recyclable
	Air cleaner		

TECHNICAL SPECIFICATIONS

Weight and sizes

Shipping weight not incl. ROPS/cab and ballast kg	9,600	(21,164 lbs)
Operating mass with ROPS/cab and ballast, EN500 kg	12,800	(28,219 lbs)
Operating mass without ROPS/cab (with ballast) kg	12,000	(26,455 lbs)
Max. weight, kg	13200	(29,100 lbs)
Length, standard equipped roller, mm	4800	(190 in)
Width, standard equipped roller, mm	2100	(83 in)
Height, without ROPS/cab mm	2600	(Shipping height) (8.5 feet)
Height, with ROPS/exhaust pipe	3280 / 3460	(10.75 / 11.35 feet)

Fluid volumes, litres (qts or gal)

Hydraulic reservoir	66 (17.4 gal)
Fuel tank	110 (29 gal)
Water tank	550 (145.2)
Diesel engine, oil volume	9.5 l (10 qts)
Cooling system	17 (4.5 gal) (Without cab), 20 (5.3 gal) (With cab)
Ballast in the drums	2x470 (2x124 gal) (Front), 1130 (298.3) (Rear)

Electrical system

Battery	12 V, 160 Ah
Alternator	14 V, 95A
Fuses	See under "Electrical system"

Propulsion

Speed range, km/h (miles/h)	0-15 (0-9.3)
Climbing capacity - theoretical (%)	45

TECHNICAL SPECIFICATIONS

Tightening torque

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

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

ROPS

CAUTION



ROPS -bolts are **always** to be torque tightened dry.

Bolt size :	M22 (P/N 19 50 96 - 19 50 97)
Strength class:	10.9
Tightening torque:	520 Nm (Dacromet treated)

Hydraulic system

Opening pressure (MPa)	
Drive system	42,0
Supply system	2,2
Steering system	14,0
Brake disengagement	1,5

Noise levels – Operator’s station (ISO 6394)

Measured on hard surface, standard roller	
Operator’s station, (without Cab):	LpA: 82 dB(A)
7 metres from machine:	LpA 82 dB (A)

Vibration – Operator’s station (ISO 2631)

Measured on foam rubber mat, standard roller
Vibration in the operator’s seat is 0,04 m/s ² (without cab)*
Vibration in the operator’s seat is 0,1 m/s ² (with cab)*
Limit value 0,5 m/s ² .
* Total acceleration in the driver’s seat.

MAINTENANCE SCHEDULE

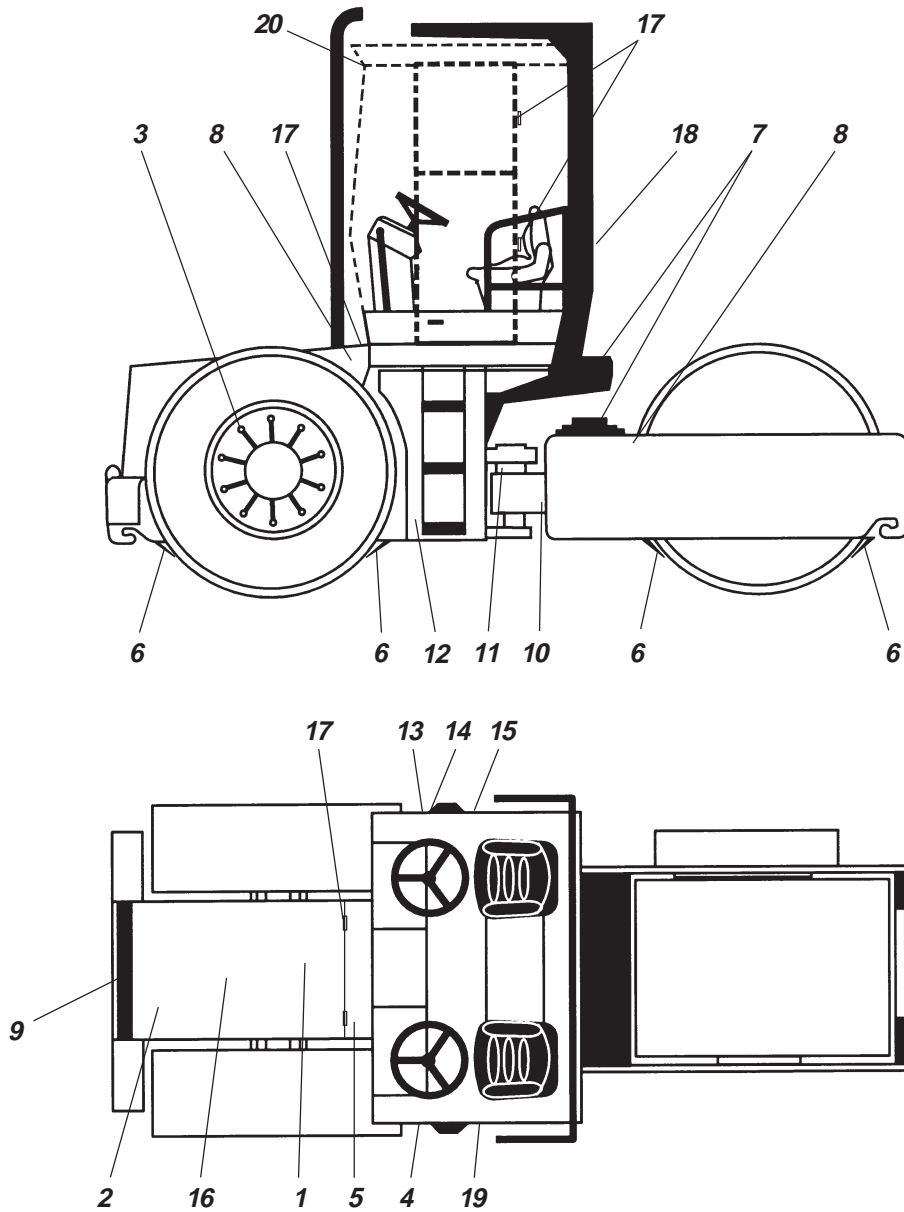


Fig. 1 Service and maintenance points

- | | |
|-------------------------|------------------------------|
| 1. Engine oil | 11. Steering cylinder |
| 2. Radiator | 12. Hydraulic filter |
| 3. Drum nuts | 13. Hydraulic fluid level |
| 4. Refueling | 14. Hydraulic fluid, filling |
| 5. Air cleaner | 15. Hydraulic reservoir |
| 6. Scrapers | 16. Diesel engine |
| 7. Water tanks, filling | 17. Hinges |
| 8. Sprinkler system | 18. ROPS |
| 9. Battery | 19. Fuel tank |
| 10. Articulation joint | 20. Fresh air filter |

MAINTENANCE MEASURES

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

CAUTION



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

CAUTION



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


Every 10 hours of operation (Daily)

Items in fig. 1	Action	See page	Comments
	Before starting each day		
2	Check coolant level	9	
1	Check level of engine oil	9	See engine manual
13	Check level in hydraulic reservoir	10	
4	Refuel	10	
7	Fill the water tank	10	
8	Check sprinkler system	11	
	Test the brakes	11	
6	Check setting of scrapers	12	
	Inspect spring-action scrapers	12	Optional

Every 50 hours of operation (Weekly)

Items in fig. 1	Action	See page	Comments
	Check/clean the filter element in the air cleaner	13	
10	Lubricate the articulation	14	
11	Lubricate the steering cylinder mounts	14	
15	Check tightening of drum nuts	15	

CAUTION



After the **first** 50 hours of operation, change all oil and hydraulic fluid filters and the lubricating oil, but not the hydraulic fluid.

MAINTENANCE MEASURES

Every 250 hours of operation (Monthly)

Items in fig. 1	Action	See page	Comments
9	Check electrolyte level in battery	16	
16	Drain the fuel filters	16	
2	Clean the radiator elements	17	Or when required
1	Change the engine oil and oil filter	17	See engine manual

Every 500 hours of operation (Every three months)

Items in fig. 1	Action	See page	Comments
19	Replace engine fuel filter		See engine manual
16	Replace engine fuel pre-filter	18	
	Lubricate hinges and controls	18	
14	Check breather filter on the hydraulic reservoir	18	

Every 1000 hours of operation (Every six months)

Items in fig. 1	Action	See page	Comments
	Check the engine V belt tension		See engine manual
16	Check engine valve clearance		See engine manual
12	Change the hydraulic filter	19	
5	Change main filter in the air cleaner	19	
20	Change air cleaner filter in cab	19	
19	Drain the fuel tank	20	
15	Drain condensation from the hydraulic reservoir	20	

Every 2000 hours of operation (Yearly)

Items in fig. 1	Action	See page	Comments
15	Change the hydraulic fluid	21	
19	Empty and clean the fuel tank	21	
7	Empty and clean the water tanks	21	
10	Check the condition of the articulation	22	

EVERY 10 HOURS OF OPERATION (Daily)

Engine hood support

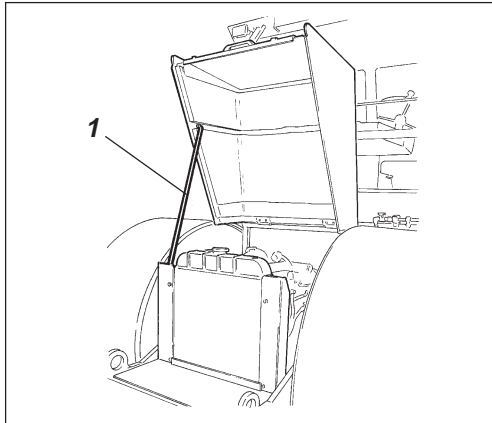


Fig. 2 Engine compartment
1. Engine hood support

WARNING



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

WARNING



Ensure that the engine hood support is securely in position for all work in the engine compartment.

Coolant level – Check

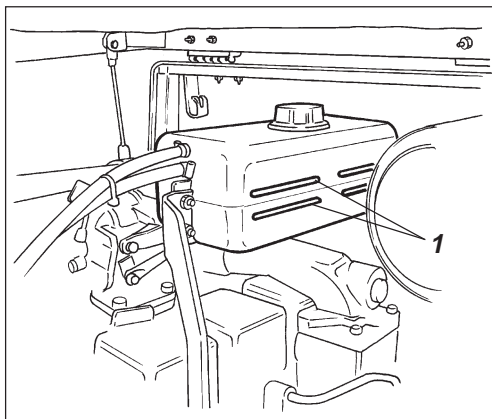


Fig. 3 Radiator filler hole
1. Level mark in expansion vessel (max./min.)

Check the level with the engine stopped and cold.

Coolant should reach the top level mark (1) in the radiator expansion vessel.

WARNING



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

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

Diesel engine – Checking the oil level

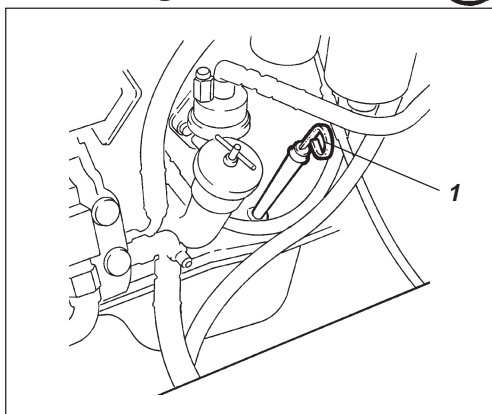


Fig. 4 Engine compartment
1. Dipstick

WARNING



Beware of hot parts of the engine and hot radiator when taking out the oil dipstick. Risk for burns.

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

See the engine manual for further details.

EVERY 10 HOURS OF OPERATION (Daily)

Hydraulic reservoir – Level check/Filling

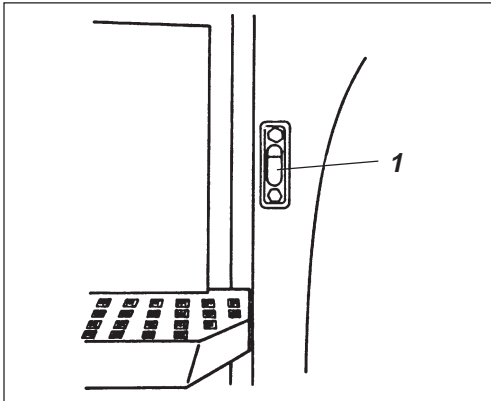


Fig. 5 Right step up
1. Sight glass

Check that the fluid level is between the min. and max. marks. Top off with hydraulic fluid according to the lubricant specification if the level is too low.

Fuel tank – Refueling

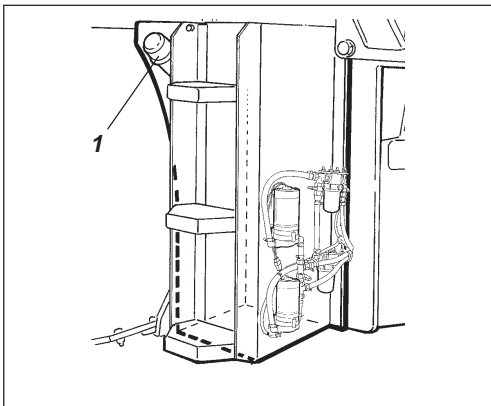


Fig. 6 Fuel tank
1. Filler pipe

Refuel every day before starting operation. Screw off the lockable tank cap (1) and fill diesel fuel to the lower edge of the filler pipe.

WARNING



Never refuel while the engine is running, do not smoke, and avoid spilling fuel.

See the engine handbook for the grade of diesel fuel.

The tank holds 110 l (29 gallons) of fuel.

Water tanks – Filling

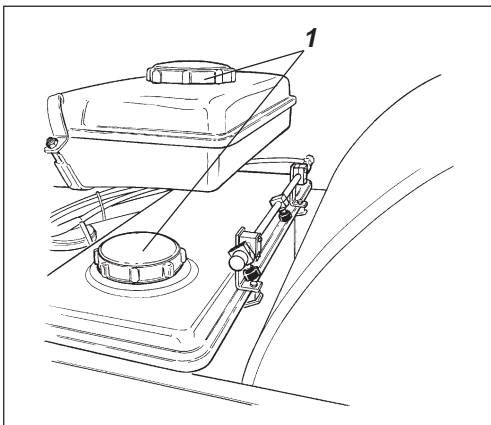


Fig. 7 Water tanks
1. Strainers

CAUTION



Screw off the tank cap and fill with pure water, do not remove the strainer (1).

Fill both water tanks; they hold a total of 550 liters (145 gallons).



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

EVERY 10 HOURS OF OPERATION (Daily)

Sprinkler system – Checking / Cleaning

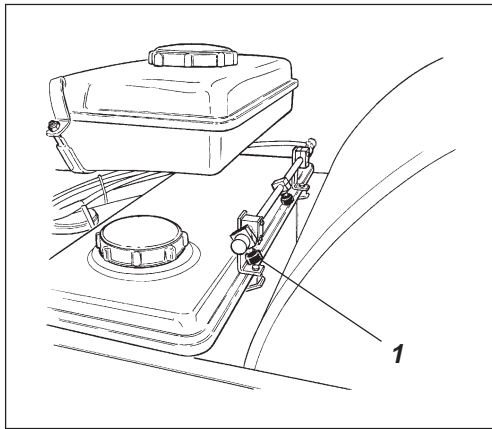


Fig. 8 Sprinkler ramp
1. Water nozzles

Start the sprinkler system and make sure that no nozzle (1) is clogged. If necessary, clean clogged nozzles and the coarse filter located adjacent to the water pump (2), see figures below.

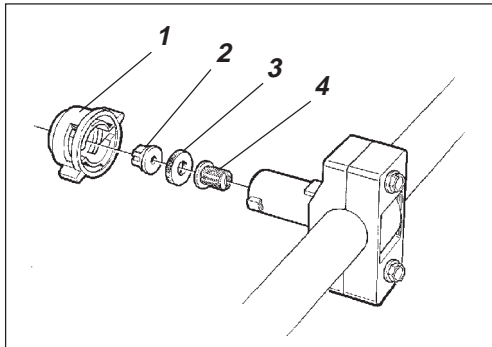


Fig. 9 Nozzle
1. Sleeve
2. Nozzle
3. Compaction
4. Strainer

Dismantle the clogged nozzle by hand. Blow the nozzle (2) and fine filter (4) clean with compressed air, or install replacement parts, and clean the clogged parts at a later opportunity.

WARNING



Wear protective goggles when working with compressed air.

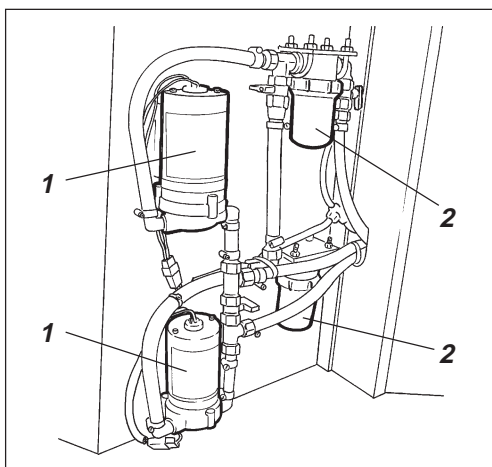


Fig. 10 Water system (basic setting)
1. Water pump
2. Water strainer housing

Inspect the intake water filters of the pumps every day. The water filter housing (2) can be removed.

Flush the housing and the filter clean with water and then put them back into place.

CAUTION



Use only clean water in the water tank.

CAUTION



The water system must completely drained if the roller is to be left unused for a longer period or if temperatures below zero can be expected. Remove the bottom plug to drain the tank.

There are two strainers located behind the fuel tank.

EVERY 10 HOURS OF OPERATION (Daily)

Brakes – Check

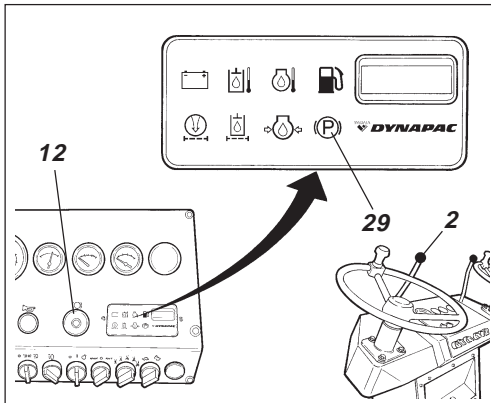


Fig. 11 Instrument panel

- 2. Forward/reverse lever
- 12. Reserve/Parking brake knob
- 29. Control lamp, brakes

WARNING



Check operation of the brakes as follows:

Drive the roller **slowly** forward.

Press down the reserve brake knob (12). The brake warning lamp (29) should light and the roller should stop.

After checking the brakes, put the forward/reverse lever (2) in neutral before resetting the reserve brake knob.

Pull out the reserve brake knob.

Scrapers, fixed – Checking / Setting

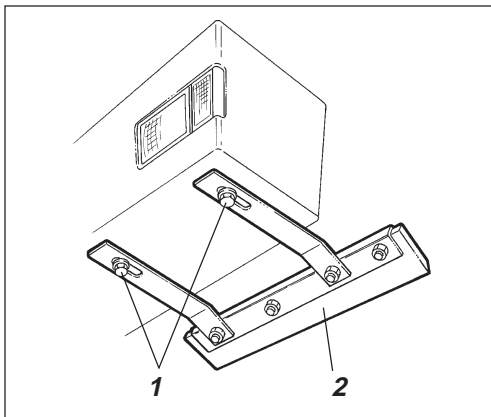


Fig. 12 Drum scrapers

- 1. Locking screws
- 2. Scraper

Make sure that the scrapers are undamaged. Adjust the scrapers so that they lie 1–2 mm from the drum. For special asphalt compounds it may be better if the scraper blades (2) lie lightly against the drums.

The remains of asphalt can accumulate on the scraper and thus influence the contact force.

Loosen the screws (1) to adjust contact pressure of the scraper blade against the drum.

Remember to tighten all the screws after any adjustment.

Scrapers, spring-action (Optional) – Check

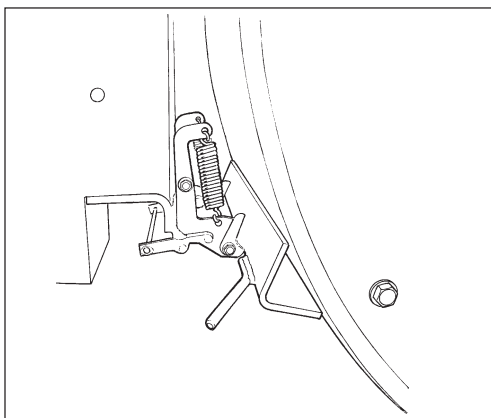


Fig. 13 Spring-action scrapers

Make sure that the scrapers are undamaged. The spring-action scrapers require no adjustment because the spring force provides the correct contact force. Asphalt remnants can accumulate on the scraper and influence the contact force. Clean as necessary.

CAUTION



Make sure the scrapers are retracted from the drum during transport driving.

EVERY 50 HOURS OF OPERATION (Weekly)

Air cleaner – Check/Cleaning

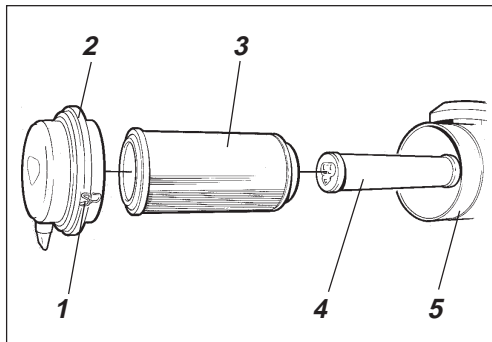


Fig. 14 Air cleaner

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

WARNING



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

CAUTION



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

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

Do not remove the backup filter (4).

Main filter – Cleaning with compressed air

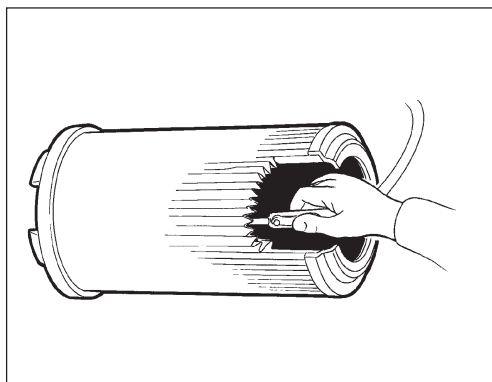


Fig. 15 Main filter

Use compressed air at a maximum pressure of 5 bar (72 psi) to clean the main filter by blowing up and down along the inside of the pleated paper filter.

Hold the air nozzle at least 2 to 3 cm (0.8-1.2 in) from the paper pleats so as not to tear the paper.

WARNING



Use protective goggles when working with compressed air.

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

CAUTION



Ensure that the hose clips between the filter housing and the intake hose are tightened and that the hoses are intact. Inspect the entire hose system all the way to the engine.

CAUTION



Change the main filter after cleaning it five times.

Backup filter – Replacement

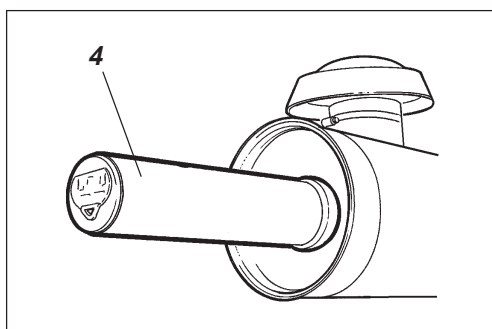


Fig. 16 Air filter

4. Backup filter

Replace the backup filter with a new one after cleaning or changing the main filter five times. The backup filter cannot be cleaned and reused.

To change the backup filter (4), pull out the used filter from its holder, insert a new filter and reassemble the air cleaner in the reverse order.

EVERY 50 HOURS OF OPERATION (Weekly)

Articulation steering and steering cylinder bushings – Lubrication

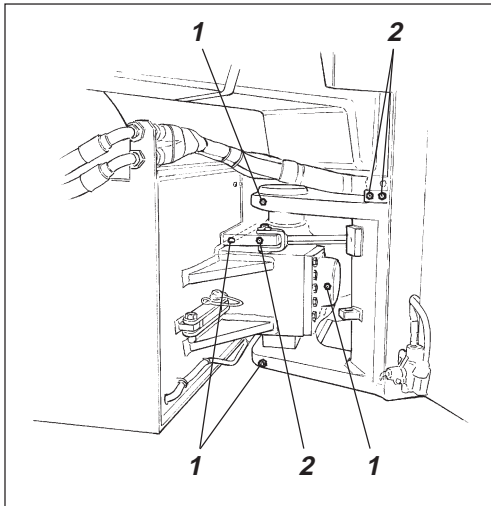


Fig. 17 Lubricant nipples

1. Lubricant nipples, articulation
2. Lubricant nipples, steering cylinders

WARNING



Nobody must be allowed 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 left to gain access to all seven grease nipples (1 and 2) from the right side of the machine.

Wipe the grease nipples. Lubricate the articulation nipples (1) with five strokes of the hand grease gun, and the steering cylinder bearings (2) with three strokes in each bearing. Make sure that grease penetrates the bearings. If grease does not penetrate the bearings, it may be necessary to relieve the articulation joint with a jack while repeating the greasing process.

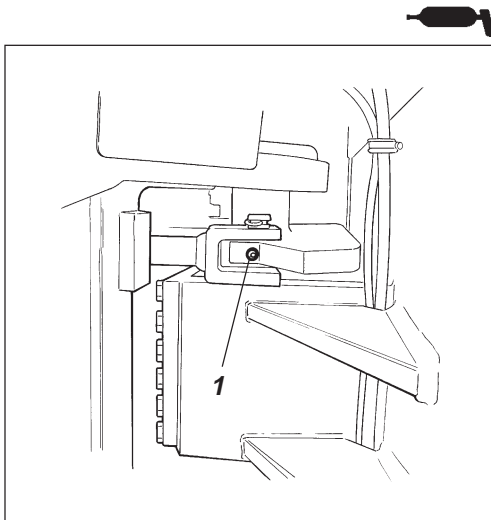


Fig. 18 Lubricant nipple

1. Lubricant nipple, steering cylinder

Turn the machine back for driving straight ahead. This makes the rear bearing (1) of the left steering cylinder accessible from the left side of the machine.

Wipe the nipple and grease with three strokes of the hand grease gun.

EVERY 50 HOURS OF OPERATION (Weekly)

Tightening the drum nuts – Check

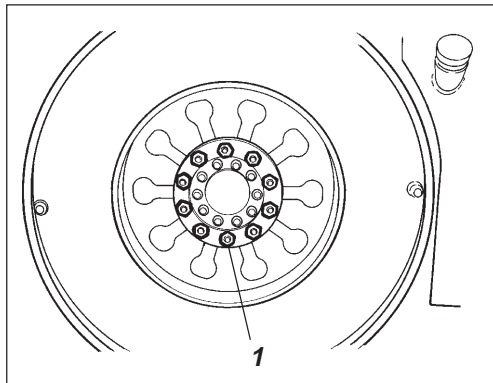


Fig. 19 *Drum*
1. *Drum nut*

Ensure that all nuts are properly tightened. Tightening torque is 500 Nm (369 lbf.ft).

Check all the nuts on all three drums.
(Applies only on new machine or newly fitted wheels.)

EVERY 250 HOURS OF OPERATION (Monthly)

Electrolyte level in battery – Check

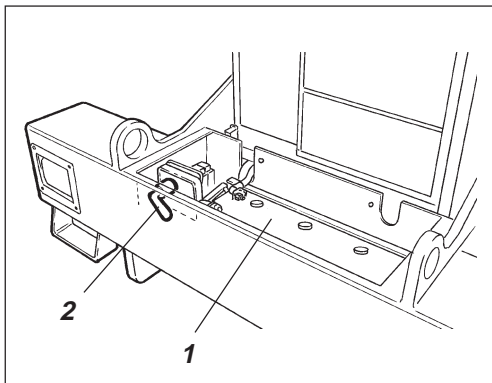


Fig. 20 Location of battery
1. Battery
2. Battery disconnecter

WARNING



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

WARNING



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

The battery is located in the front beam, underneath the cover.

WARNING



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

Battery cell

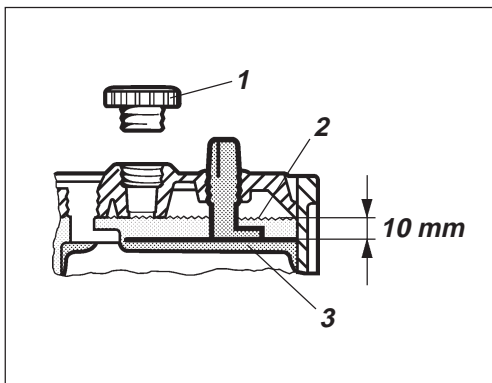


Fig. 21 Electrolyte level in battery
1. Cell cap
2. Electrolyte level
3. Plates

Take off the cell caps and make sure that electrolyte is about 10 mm above the plates. Check the level of all cells. Top off with distilled water to the right level if the level is low. If the ambient temperature is below freezing, run the engine for a while before topping off with distilled water. Otherwise the electrolyte might freeze.

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

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

CAUTION



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



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

WARNING



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

Unscrew the drain plug at the bottom of the filter.

Make certain, with the aid of the secondary hand-operated pump, that all sediment comes out. See Cummins service manual.

Tighten the drain plug as soon as uncontaminated fuel runs out.

Fuel filter – Draining

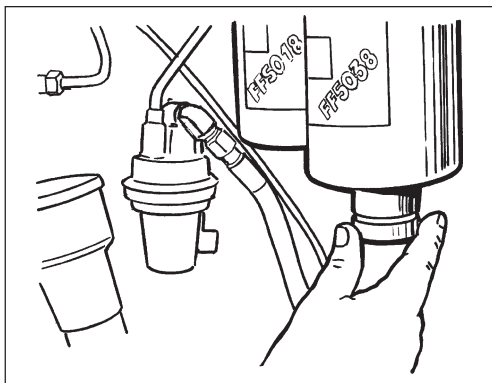


Fig. 22 Fuel filter

EVERY 250 HOURS OF OPERATION (Monthly)

Radiator – Check/Cleaning

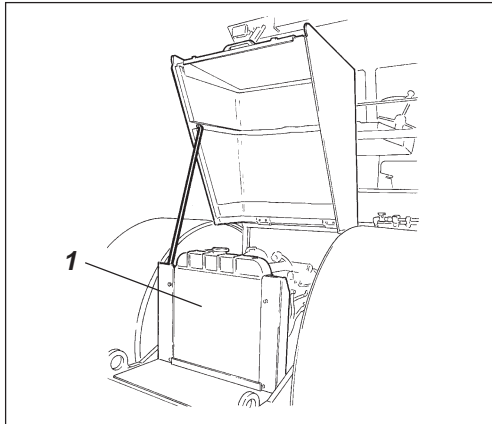


Fig. 23 Engine compartment
1. Radiator

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

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

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

CAUTION



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

WARNING



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

Engine – Oil change

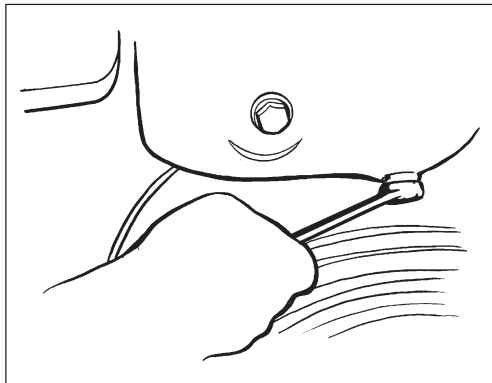


Fig. 24 Drain plug

Run the engine warm before draining the oil.

WARNING



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

WARNING



Switch off the engine and apply the parking brake.



Place a receptacle that holds at least 15 liters (4 gallons) under the drain plug. Save the oil and dispose of it properly.

WARNING



Risk for burns when draining hot oil. Protect your hands.

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

Change the engine oil filter at the same time. See engine instruction manual.

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

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

EVERY 500 HOURS OF OPERATION (Every three months)

Fuel pre-filter – Replacement

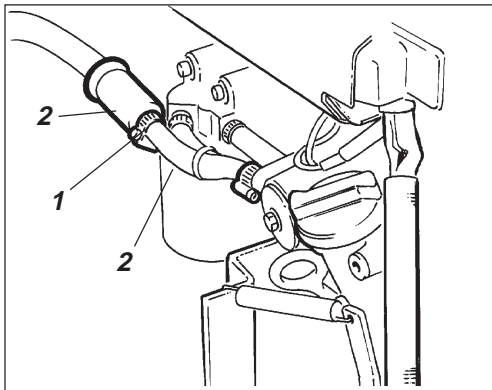


Fig. 25 Diesel engine
1. Fuel pre-filter
2. Hose clamps

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.

Loosen the hose clips (2) and remove the filter (1). Fit the new fuel filter and make certain the direction of flow is correct. The arrow should point from the tank.



Discard the pre-filter (1) in a safe manner, it is of the expendable type and cannot be cleaned.

Fit a new pre-filter and tighten the hose clamps again.

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

WARNING



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

Hinges, controls – Lubrication

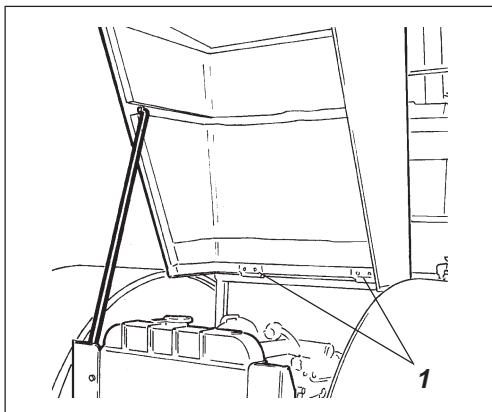


Fig. 26 Enginehood
1. Hinge

Lubricate both hinges (1) on the engine compartment doors until grease penetrates through.

Grease the hinges of the cab door in the same way.

Lubricate the hinges of the front and rear spotlight covers with a few drops of oil.

Lubricate the forward/reverse control wires by the control arm of the hydraulic pump. Apply a few drops of oil to the mouth of the control sleeve.

Hydraulic reservoir cap – Check

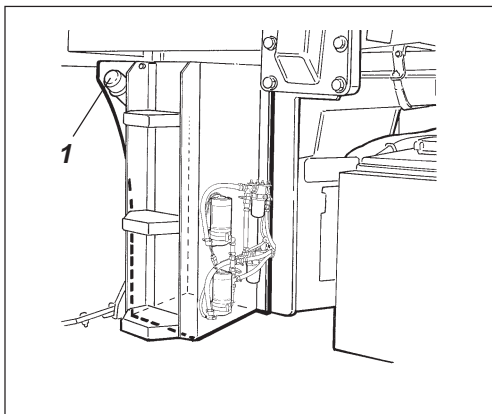


Fig. 27 Fuel tank
1. Tank cap

Unscrew and make sure that the reservoir cap 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



Use protective goggles when working with compressed air.

EVERY 1000 HOURS OF OPERATION (Every six months)

Hydraulic fluid filter – Changing

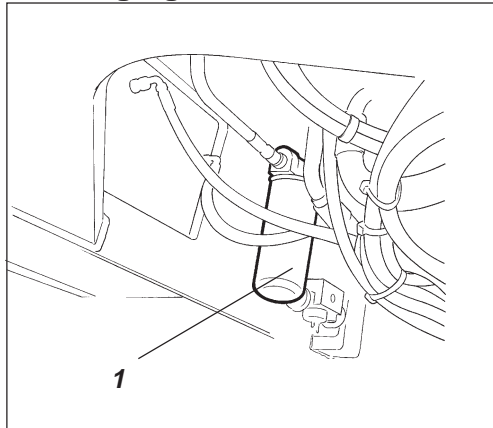


Fig. 28 Underside
1. Return filter

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.

The filter is located to the left inside the frame.

Clean thoroughly around the left inside.



Remove the oil filter (1) and discard it in a safe manner; it is of the expendable type and cannot be cleaned.

CAUTION



Make sure that the old sealing ring is not left on the filter holder. This could cause leakage between the new and old gaskets.

Thoroughly clean the sealing surface of the filter holder.

Apply a thin coat of fresh hydraulic fluid on the rubber gasket of the new filter. Screw on the filter by hand.

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; it could otherwise damage the gasket.

Start the engine and check that the filter does not leak. Check the hydraulic fluid level in the sight glass (3) and top off as required.

Air filter – Replacement

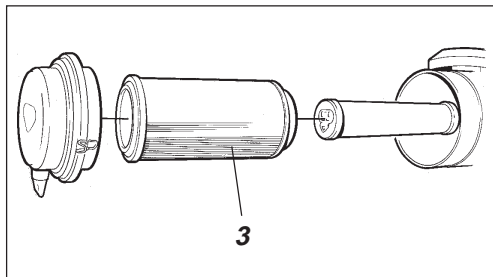


Fig. 29 Air cleaner
3. Main filter

WARNING



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

Replace the main filter (3) of the air cleaner even if it has not yet been cleaned five times, see 50 hours with regard to changing the filter.

CAUTION



If a clogged filter is not replaced the exhaust fumes will be black and the engine will lose power. There will also be danger of severe damage to the engine.

Cab fresh air filter – Change

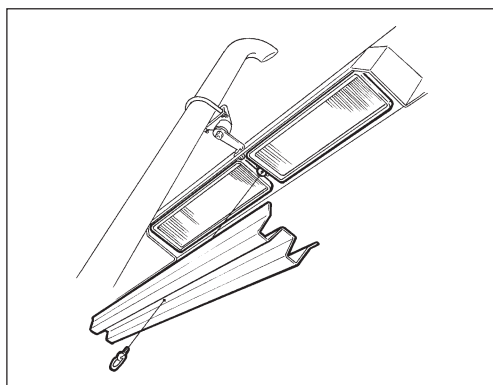


Fig. 30 Air cleaner filter

Unscrew the grille in front of the filter.

Replace the filter element and clean the filter cavity.

Retach the grille.

EVERY 1000 HOURS OF OPERATION (Every six months)

Fuel tank – Draining off water

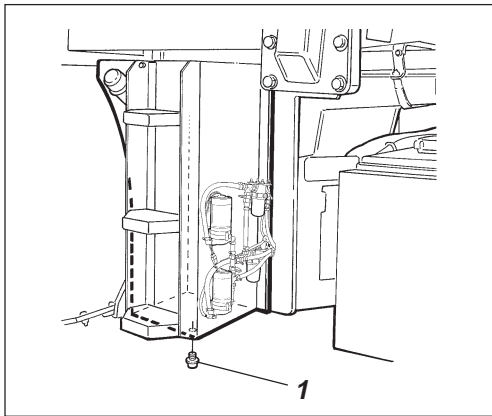


Fig. 31 Fuel tank
1. Drain plug

Water can be drained via the drain plug at the bottom of the tank. Draining should be done when the roller has been standing still for some time, eg, overnight.

Unscrew the drain plug (1) and allow water and sediment to drain off until only pure fuel runs out.

Tighten the drain plug. If the tank is emptied completely then the fuel system must be vented. See Cummins service manual.

Hydraulic reservoir – Draining

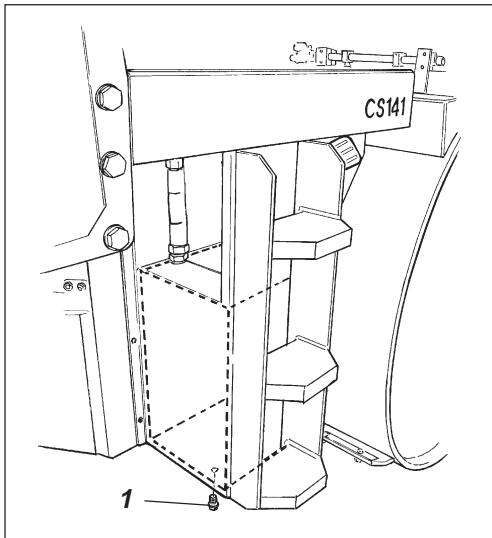


Fig. 32 Hydraulic reservoir
1. Oil drain plug

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

Drain after the roller has stood still for a longer period, eg, overnight. Drain as follows:

Hold a can underneath the drain plug (1).

Loosen the plug and allow any water to run out.

Tighten the plug.

EVERY 2000 HOURS OF OPERATION (Yearly)

Hydraulic reservoir – Changing the fluid

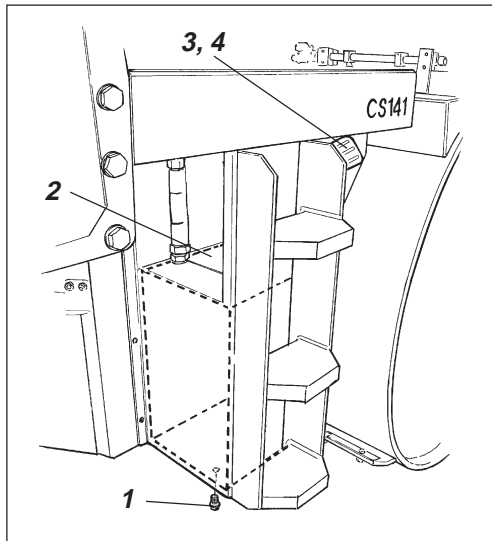


Fig. 33 Hydraulic reservoir

1. Drain valve
2. Cover plate
3. Filler cap
4. Strainer

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.



Place a receptacle that will hold at least 50 liters under the plug. Save the oil and dispose of it in an approved manner.

Remove the drain plug (1) and allow all the oil to run out, wipe and refit the drain plug.

Wash the filler cap (3) and the strainer (4) using a cleaning agent and blow them dry.

CAUTION



Fill with fresh hydraulic fluid of the grade indicated in the Lubricant specification.

Replace the hydraulic filter as described under the heading "Every 1000 hours of operation."

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

Fuel tank – Cleaning

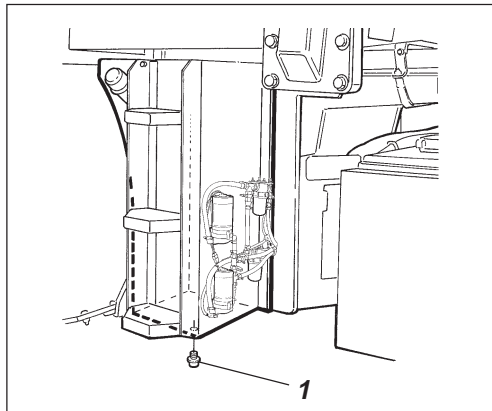


Fig. 34 Fuel tank

1. Oil emptying pump

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



Place a receptacle that will hold at least 50 liters (13 gallons) under the plug. Save the fuel and dispose of it properly.

Remove the drain plug (1) and let all the fuel run out, wipe and refit the drain plug.

WARNING



Remember the danger of fire when handling fuel.

Water tank – Cleaning

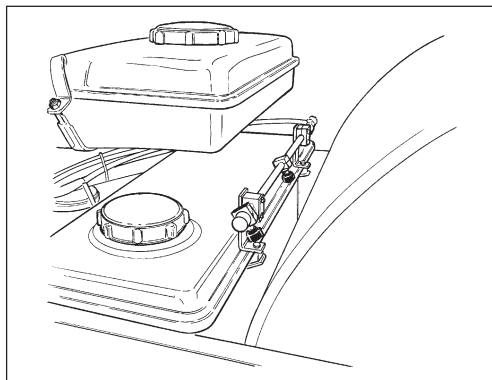


Fig. 35 Water tank

Clean the tanks with water and a suitable detergent for plastic surfaces.

Refit the filter housing (1) or the drain plug (2), fill with water and check for tightness.



The water tanks are made of recyclable plastic (polyethylene).

EVERY 2000 HOURS OF OPERATION (Yearly)

Steering joint – Check

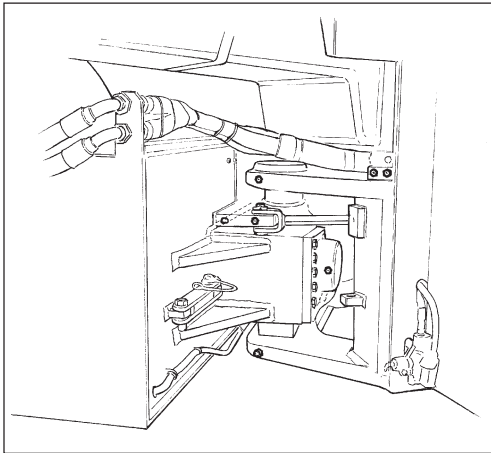


Fig. 36 Steering joint

Inspect the steering joint to detect any damage or cracks.

Check and correct any loose bolts.

Check also for any stiffness and play.

LONG-TERM PARKING

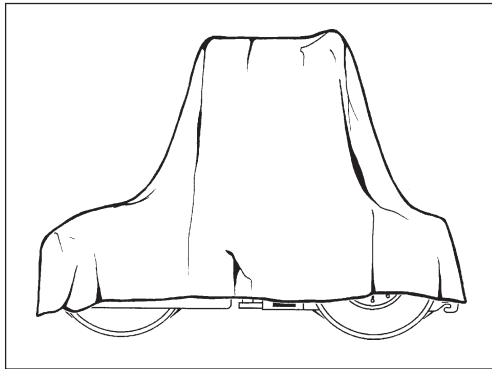


Fig. 37 Roller protected against the weather

CAUTION



The following instructions should be followed for storage longer than one month:

The measures apply for a period of up to 6 months.

The items marked * must be restored before using the roller.

Diesel engine

- * See manufacturer's instructions in the engine manual that accompanies the roller.

Battery

- * Remove the battery from the roller, clean it, check that the electrolyte level is correct (see under the heading "Every 250 hours of operation") and tricklecharge the battery once a month.

Air cleaner, exhaust pipe

- * Cover the air cleaner (see under the heading "Every 50 hours of operation") or its opening with plastic or tape. Cover the exhaust opening. This is necessary to prevent moisture from entering the engine.

Fuel tank

Fill the fuel tank completely to prevent condensation.

Hydraulic reservoir

Fill the hydraulic reservoir to the uppermost level mark, see under the heading "Every 10 hours of operation."

Sprinkler system

- * Empty the water tank completely (see under the heading "Every 2000 hours of operation"), also hoses, filter housing and water pump. Remove all the sprinkler nozzles (see under the heading "Every 10 hours of operation").

Steering cylinder, hinges, etc.

Lubricate bearings of the steering joint and both bearings of the steering cylinder with grease (see under the heading "Every 50 hours of operation"). Grease the piston rod of the steering cylinder with inhibitor grease. Grease the hinges on doors to the engine compartment and the cab, and also grease both ends of the forward/reverse control (bright parts) (see under the heading "Every 500 hours of operation").

Hoods, tarpaulin

- * Lower the instrument shield plate on the steering column. Cover the entire roller with a tarpaulin. The tarpaulin must be free from the ground. Store the roller indoors if possible, preferably on premises with an even temperature.

SPECIAL INSTRUCTIONS

Standard oils and other recommended fluids

On leaving the factory, the various systems and components are filled with oil or fluid as indicated in the Lubrication specification and are thus suitable for operation in ambient temperatures between -10°C and $+40^{\circ}\text{C}$ (14°F - 104°F)

CAUTION



A maximum temperature of $+35^{\circ}\text{C}$ (95°F) applies for biological hydraulic fluid.

The following recommendations apply for operation in higher ambient temperatures, up to a maximum of $+50^{\circ}\text{C}$ (122°F):

Higher ambient temperature above $+40^{\circ}\text{C}$ (104°F)

The diesel engine can be run at this temperature using the normal oil, but for other components the following fluids must be used: Hydraulic system using mineral fluid Shell Tellus TX100 or equivalent. Other components using transmission oil: Shell Spirax HD 85W/140, or equivalent.

Temperature

The temperature limits apply to standard versions of the roller. Rollers that are fitted with additional equipment, such as noise suppression, etc, may require extra observation in the higher temperature ranges.

High-pressure washing

CAUTION



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

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 an elastic band. This will prevent water from entering the venting hole in the filler cap. This could otherwise cause operational disturbance, such as a clogged filter.

Fire fighting

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

Protective structure (ROPS)

If the roller is equipped with a protective structure (ROPS, Roll Over Protective Structure), or protective cab, the structure or cab must on no account be subjected to welding or the drilling of holes. Never attempt to repair a damaged structure or cab; they must be replaced with new ones.

Starting aid

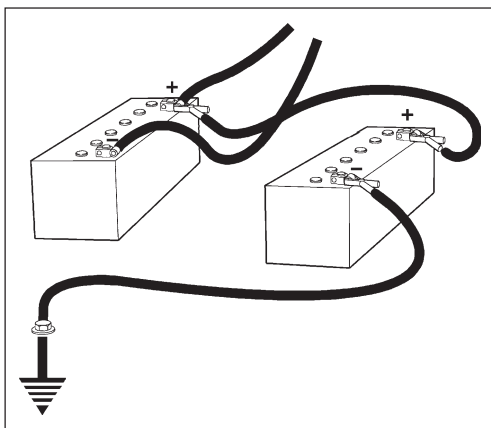


Fig. 38 Starting aid

WARNING



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

CAUTION



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

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

ELECTRICAL SYSTEM, FUSES

Fuses

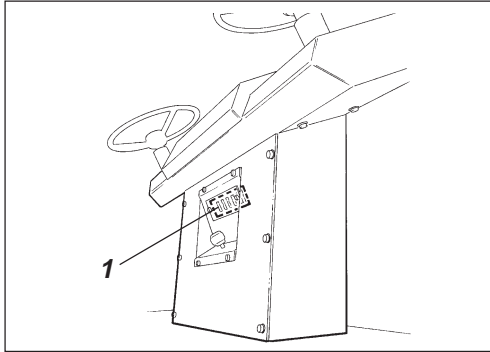


Fig. 39 Instrumentpanel
1. Fuse box

Flat pin fuses protect the electrical regulating and control system.

The fuse box (1) is located underneath the instrument panel.

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

WARNING



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

Fuses on the machine

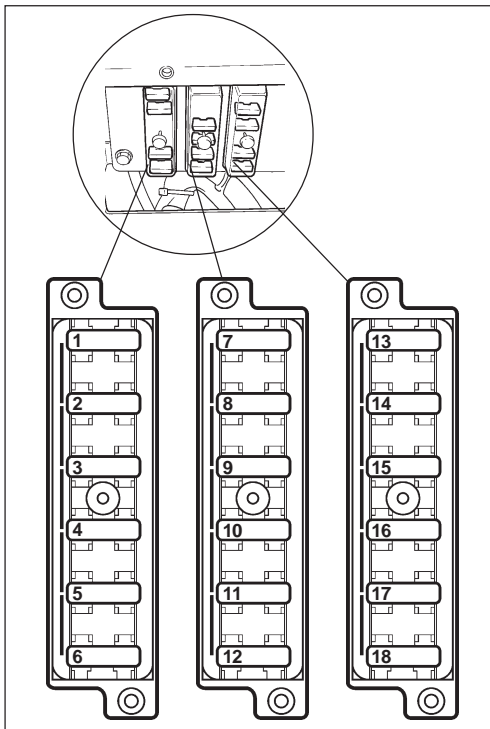


Fig. 40 Fuse boxes

- | | |
|-------|---|
| 7,5 A | 1. Starting |
| 3 A | 2. Warning panel |
| 3 A | 3. Instruments |
| 15 A | 4. Sprinkler |
| 7,5 A | 5. Sprinkler pump 1 |
| 7,5 A | 6. Sprinkler pump 2 |
| 7,5 A | 7. Horn / Reversing alarm |
| - | 8. Reserve |
| 7,5 A | 9. Hazard beacon |
| 20 A | 10. Working lights (left front/rear) |
| 20 A | 11. Working lights (right front/rear) |
| 7,5 A | 12. Driving lights main/dipped beam (front right) |
| 7,5 A | 13. Driving lights main/dipped beam (front left) |
| 7,5 A | 14. Position lights (right front/rear) |
| 7,5 A | 15. Position lights (left front/rear) |
| 10 A | 16. Direction indicator relay |
| 5 A | 17. Direction indicator (right front/rear) |
| 5 A | 18. Direction indicator (left front/rear) |

Relays

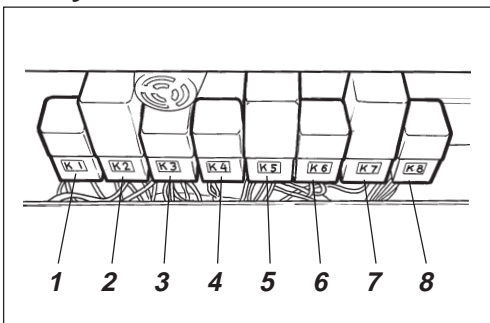


Fig. 41 Relays

1. Main relay
2. Neutral start
3. Neutral
4. High/Low speed
5. Sprinkler
6. Lights
7. Direction indicators
8. Brake lamp

ELECTRICAL SYSTEM, FUSES

Fuses in cab

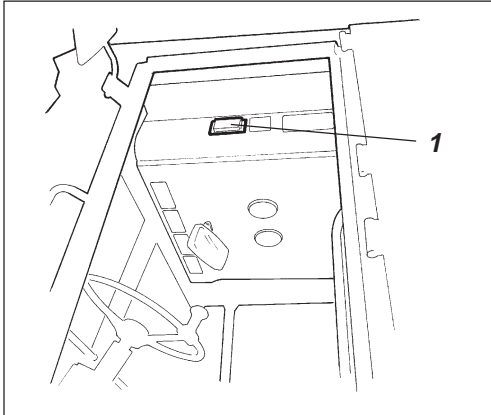


Fig. 42 Cab, left side
1. Fuse boxes

Flat pin fuses protect the electrical regulating and control system in the cab.

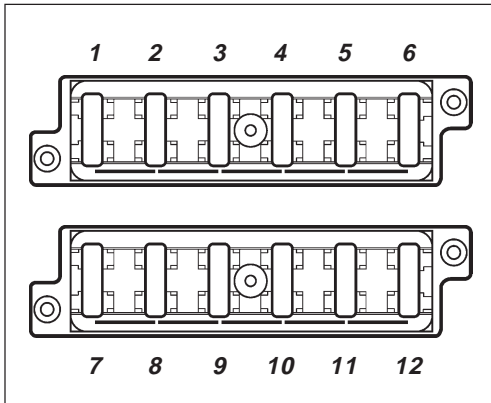
The fuse boxes (1) are located on the left side of the cab roof.

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

WARNING



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



The figures show the ampere rating and function of the different fuses.

Fig. 43 Fuse boxes

- | | |
|------|--|
| | 1. Reserv |
| 10 A | 2. Front working lights |
| 10 A | 3. Rear working lights |
| 15 A | 4. Air fan |
| 10 A | 5. Windscreen wiper, left, rear |
| | 6. Reserv |
| 10 A | 7. Windscreen wiper, right, rear |
| 10 A | 8. Windscreen wiper, right, front |
| 10 A | 9. Windscreen wiper, left, rear |
| 5 A | 10. Washer, rear and front,
Interior lighting cab |
| 5 A | 11. Radio |
| | 12. Reserv |

