• DESCRIPTION
• OPERATING
• MAINTENANCE

OPERATORS MANUAL
CC 41
VIBRATORY ROLLERS

OM-10016-2 Eng
The DYNAPAC CC 41 vibrating roller is primarily designed for compacting asphalt, but is also suitable for the compaction of base courses and other types of fill. Wide drums and a high working speed give the roller an exceptional compaction capacity, so that it is particularly suitable for work on large areas, such as streets, road construction works, car parks and industrial sites.
The CC 41 is a vibrating roller with articulated steering and drive on both the front and rear drums. The drive, vibration and steering are hydraulic.

Frame

The frame consists of a front section and a rear section joined by a central pivot. A water tank is mounted on each frame section. The rear frame section also contains fuel and hydraulic oil tanks.

The drive machinery of the roller is also located in the rear frame, but with the centre of gravity displaced to a point above the central pivot, so that the total weight of the roller is equally distributed on the drums.

Drums

The front and rear drums are identical. They are made of heavy steel plate and are mounted in the frame with rubber elements.

Steering

The steering is hydraulic, by means of two cylinders connected between the rear frame and the central pivot.

Brakes

The CC 41 is equipped with three separate braking systems:

- the regular brake consists of the hydrostatic drive device
- the parking brake is a multi-disc brake which acts on the rear drum gear (the drum)
- the emergency brake is also a multi-disc brake and it acts on both the front and rear drum gears (the drums).

The parking and emergency brakes are applied at the same time and are connected to the diesel engine cut-out. The brakes are applied automatically when the engine is stopped.

Drive

The diesel engine drives a variable delivery swash-plate pump which provides the hydraulic oil pressure and flow to the roller drive motors. Each motor is connected to a drum gear which, in turn, drives the drum.

Vibration is achieved by an eccentric shaft mounted in the drum. The eccentric shaft is driven by a hydraulic motor connected directly to the shaft.

The hydraulic motor is supplied with oil from a pump section which is integral with the steering pump. Amplitude settings and the engagement and disengagement of the vibrating action are achieved by means of an electro-hydraulically operated valve. The valve is operated from the driver's seat.
Sprinkler device/scrapers

An arrangement consisting of a ribbed rubber mat with built-in sprinkler pipes is located under each water tank. The ribbed rubber mat is spring-loaded against the rolling surface of the drum. The load exerted by the mat against the drum is adjustable.

The supply of water is controlled by an electrically operated valve fitted in the pipe between the tank and the ribbed rubber mat. Two scrapers are also fitted to each drum. The scrapers are made of rubber and the pressure exerted by each against the drum can be adjusted.

Lighting equipment

The CC 41 is equipped as standard with road lighting in front and red rear lights as well as two spotlamps at the rear, which act as working lamps. A rotating beacon, direction indicators lamps and warning flashers are available as extra equipment.

TECHNICAL PARTICULARS

Dimensions

![Diagram of dimensions](image)

Fig 2

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
</tr>
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<tbody>
<tr>
<td>5000</td>
<td>1885</td>
<td>3290</td>
<td>2390</td>
<td>3195</td>
<td>1220</td>
<td>1670</td>
<td>115</td>
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<table>
<thead>
<tr>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
<th>M</th>
</tr>
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<tbody>
<tr>
<td>100</td>
<td>3440</td>
<td>360</td>
<td>360</td>
<td>±38°</td>
</tr>
</tbody>
</table>

Thickness of the drum running surface: 22 mm
### Weights

<table>
<thead>
<tr>
<th>Description</th>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Net weight</td>
<td>kg</td>
<td>9700</td>
</tr>
<tr>
<td>Operating weight (incl. driver + 50% of water + 50% of fuel)</td>
<td>kg</td>
<td>10300</td>
</tr>
<tr>
<td>Weight of cab (additional)</td>
<td>kg</td>
<td>400</td>
</tr>
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</table>

### Engine specification

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caterpillar</td>
<td>D 3208</td>
</tr>
<tr>
<td>Fuel</td>
<td>Diesel</td>
</tr>
<tr>
<td>Number of cylinders</td>
<td>8</td>
</tr>
<tr>
<td>Output at 2400 r/min.</td>
<td>kW/hp (DIN)</td>
</tr>
<tr>
<td>Fuel consumption</td>
<td>l/h</td>
</tr>
<tr>
<td>Lubr. oil consumption</td>
<td>l/h</td>
</tr>
<tr>
<td>Engine weight</td>
<td>kg</td>
</tr>
</tbody>
</table>

### Drive system

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable delivery pump</td>
<td>SPV 23</td>
</tr>
<tr>
<td>Flow</td>
<td>l/min. 214</td>
</tr>
<tr>
<td>Hydraulic motors (two)</td>
<td>OMF 21</td>
</tr>
<tr>
<td>Speed in both directions</td>
<td>m/min. 0-165</td>
</tr>
<tr>
<td>Infinitely variable</td>
<td>km/h 0-10</td>
</tr>
<tr>
<td>Drum gear</td>
<td>Prometheus or Renondin</td>
</tr>
<tr>
<td>Hydraulic oil filter</td>
<td>10 μm (suct. filter) Gresen</td>
</tr>
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</table>

### Steering system

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Pump (Triplex pump)</td>
<td>Commercial P30B</td>
</tr>
<tr>
<td>Flow</td>
<td>l/min. 29</td>
</tr>
<tr>
<td>Control valve</td>
<td>Danfoss OSP B500</td>
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<tr>
<td>Vertical tilting</td>
<td>±12</td>
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### Vibration system

<table>
<thead>
<tr>
<th>Description</th>
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</tr>
</thead>
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<tr>
<td>Pump (Triplex pump)</td>
<td>Commercial P30B</td>
</tr>
<tr>
<td>Flow</td>
<td>l/min. 110</td>
</tr>
<tr>
<td>Vibration valve</td>
<td>Commercial D20</td>
</tr>
<tr>
<td>Vibration motor</td>
<td>Commercial N30</td>
</tr>
<tr>
<td>Frequency</td>
<td>vibr./min. (Hz) 2500 (42)</td>
</tr>
<tr>
<td>Centrifugal force</td>
<td></td>
</tr>
<tr>
<td>high amplitude</td>
<td>kN 98</td>
</tr>
<tr>
<td>low amplitude</td>
<td>kN 49</td>
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<tr>
<td>Nominal amplitude</td>
<td></td>
</tr>
<tr>
<td>high</td>
<td>mm 0.8</td>
</tr>
<tr>
<td>low</td>
<td>mm 0.4</td>
</tr>
<tr>
<td>Static linear load</td>
<td></td>
</tr>
<tr>
<td>front drum</td>
<td>kg/cm 30.5</td>
</tr>
<tr>
<td>rear drum</td>
<td>kg/cm 31.0</td>
</tr>
<tr>
<td>Hydraulic oil cooler</td>
<td>Blackstone</td>
</tr>
<tr>
<td>Suction strainer (on certain rollers)</td>
<td>Vickers 125μm</td>
</tr>
</tbody>
</table>
### Electrical system
- **Battery**
  - Voltage: \( V \) 12
  - Capacity: \( \text{Ah} \) 170
- **Alternator**
  - Motorola 14V (AC) 55A
- **Starter motor**
  - \( \text{kW} \) 2

### Braking system
- **Regular brakes**
- **Emergency brake \( \ast \)**
- **Parking brake \( \ast \)**
  - Automatic multi-disc brakes

\( \ast \) Systems with common components

### Sprinkler system
- **System, type**
- **Gravity feed**
- **Solenoid valve**
- **ASCO**
- **Ribbed rubber mats**

### Operating limits
- **Turning circle, inner/outer**
  - \( \text{m} \) 4.1/5.8
- **Climbing capacity**
  - \( \% \, (\degree) \) 36 (20\( \degree \))
- **Permissible side slope \( \ast \ast \)**
  - \( \% \, (\degree) \) 36 (20\( \degree \))

\( \ast \ast \) Applies to a stationary roller pointing straight ahead

### Oil-fluid capacities
- **Engine oil, crankcase**
  - \( \text{litres} \) 14.5
- **Radiator**
  - \( \text{litres} \) 40
- **Fuel tank**
  - \( \text{litres} \) 175
- **Hydraulic oil tank**
  - \( \text{litres} \) 220
- **Drum gear**
  - \( \text{litres} \) 2 x 13
- **Pump drive**
  - \( \text{litres} \) 3
- **Drum oil chamber**
  - \( \text{litres} \) 2 x 20
- **Water tank**
  - \( \text{litres} \) 2 x 450

### Hydraulic pressures
- **Feed pressure**
  - \( \text{MPa} (\text{kgf/cm}^2) \) 1.2-1.5 (12-15)
- **By-pass pressure, drive**
  - \( \text{MPa} (\text{kgf/cm}^2) \) 35 (350)
- **Vibration**
  - \( \text{MPa} (\text{kgf/cm}^2) \) 14.5 (145)
- **Steering**
  - \( \text{MPa} (\text{kgf/cm}^2) \) 15 (150)
- **Brake system pressure, min. for disengagement**
  - \( \text{MPa} (\text{kgf/cm}^2) \) 0.8 (8)
Fig. 3 Hydraulic diagram

1. Drum gear, with multi-disc brake
2. Hydraulic motor - drive system
3. Brake valve
4. Pressure switch - brake warning lamp
5. Measurement tapping - drive system
6. Pressure relief valve - drive system
7. Pressure relief valve - sprinkler system
8. Shuttle valve
9. Measurement tapping - feed system
10. Servo valve, front & rear
11. Feed pump
12. Pressure relief valve - feed system in the drive system
13. Steering valve (Orbitrol)
14. Steering cylinders
15. Shock pressure valve - steering system
16. Pressure relief valve - steering system
17. Hydraulic motor - vibration system
18. Hydraulic pump - drive system
19. Measurement tapping - steering system
20. Triplex pump - vibration/steering
21. Measurement tapping - vibration system
22. Control valves - vibration system
23. Hydraulic oil tank
24. Suction strainer (only on certain rollers)
25. Hydraulic oil cooler
26. Pump housing pressure safety valve
27. Engine
28. Suction filter, drive system (with blocked by-pass)
The electrical system is a 12 V system.

The battery is charged by an alternator and provides current to all power consumers. Charging may be checked using the ammeter on the instrument panel.

The roller equipment includes a horn and a neutral-gear start interlocking device. Headlamps are fitted front and rear as standard. Other electrical components are shown in the wiring diagram and in the associated list.
Fig. 4 Wiring diagram

1 Battery
2 Solenoid valve - water sprinkling
3 Brake valve
4 Pressure switch - brake
5 Water temperature transmitter - engine
6 Temperature transmitter - hydraulic oil
7 Fuel level transmitter
8 Oil pressure transmitter - engine
9 Fuel solenoid - engine
10 Starter motor
11 Alternator
12 Voltage regulator
13 Control valves - vibration
14 Horn relay
15 Horn
16 Headlamps - front and rear
17 Rear lights (red)
18 Water temperature gauge - engine
19 Oil temperature gauge - hydraulic oil
20 Fuel gauge
21 Ammeter
22 Brake warning lamp
23 Amplitude selector - rear drum
24 Amplitude selector - front drum
25 Vibration switch - rear drum
26 Vibration switch - front drum
27 AVC microswitch
28 NEUTRAL-GEAR START microswitch
29 Starter knob
30 Horn button
31 Oil pressure warning lamp - engine
32 Lighting switch - front, full beam/dipped
33 Lighting switch - rear, full beam/dipped
34 Sprinkler switch, TIMER/MANUAL
   (only on machines with serial Nos. 4951063 - 4951184)
35 Sprinkler switch - front, MANUAL/OFF/CONTINUOUS
36 Sprinkler switch - rear, MANUAL/OFF/CONTINUOUS
37 Timer for sprinkling (one for the front and one for the rear drum - only on machines with serial Nos. 4951063 - 4951184)
38 Fuse box in the cab (accessory)
39 Direction indicator warning lamp
40 Flasher relay
41 Direction indicator lamps
42 Direction indicator switch
DYNAPAC

DRIVING INSTRUCTIONS
VIBRATING ROLLER CC 41

Caterpillar D 3208 diesel engine

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Fig.1.

1 Forward-reverse lever
2 Coolant temperature gauge
3 Hydraulic oil temperature gauge
4 Fuel gauge
5 Ammeter
6 Brake warning lamp (red)
7 Tachometer
8 Vibration switch, rear, AUTO-O-MANUAL
9 Vibration switch, front, AUTO-O-MANUAL
10 Throttle
11 Starter switch
12 Timer, front*)
13 Timer, rear*)
14 Oil pressure warning lamp
15 Working lights, front, MAIN BEAM/DIPPED
16 Working lights, rear, MAIN BEAM/DIPPED
17 Timer, MANUAL (AUTOMATIC)*
18 Sprinkler (front drum)
19 Sprinkler (rear drum)
20 Horn button
21 Amplitude selector (rear drum)
22 Amplitude selector (front drum)

*) Discontinued after Serial No. 4951185

DYNAPAC

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Tel. 08-98 80 00 - Cables DYNAPAC, STOCKHOLM - Telex 19531 DYNAPAC

We reserve the right to change specifications without notice.

0-10016-3 Eng
Replaces 0-10016-2 Eng
BEFORE STARTING

1. Check that the daily maintenance has been carried out (see the MAINTENANCE INSTRUCTIONS). When rolling asphalt, place the rubber mats against the roller. Check that the mats are being moistened. The mats should be suspended clear of the rollers when compacting soil.

STARTING THE ENGINE

1. Move the forward-reverse lever (1) to the NEUTRAL position. The engine cannot be started when the lever is in any other position.

2. Move the vibration switches (8 and 9) to the NEUTRAL positions.

3. Press in the button on the throttle (10) and set the throttle to about 1/4 full throttle. Turn the starter switch (11) to the ON position.

Check that the coolant temperature gauge (2), the hydraulic oil temperature gauge (3) and fuel gauge (4) indicate readings and that the oil pressure warning lamp (14) and brake warning lamp (5) light up.

4. Grip the forward-reverse lever (1), depress and turn the starter switch (11) to the START position and hold it there until the engine fires. Do not keep the starter motor engaged for more than about 10 s at a time. Adjust the setting of the forward-reverse lever so that the roller remains stationary.

When starting the engine at temperatures below -12°C (10°F), a small amount of starter gas may be sprayed into the air cleaner before attempting to start the engine.

5. Run the engine at 800 - 1000 r/min (7) for 2 - 10 min, depending on the air temperature, to warm it up.

6. While warming up the engine, check that the ammeter (5) points to + and that the warning lamps (14 and 6) have gone out.

Before driving:

Familiarize yourself with the capacity of the brakes. Carry out the check as described in the MAINTENANCE INSTRUCTIONS.

This check should be carried out as often as is required to be completely sure that the brakes always act satisfactorily.

If the engine does not start, wait briefly before attempting to start it again.
1 Open the throttle (10) until the engine is running at a speed of 2400 r/min.
Adjust the speed accurately by turning the control. Anticlockwise to increase speed.
Clockwise to reduce speed.

2 Check that the steering system is in working order by turning the steering wheel once to the right and once to the left while the roller is stationary.

3 When driving on asphalt, switch on the sprinkler system using the toggle switches (18 and 19). These may be set to two positions:
Upwards = Manual sprinkling each time the spring-loaded switch is pressed.
Downwards = Sprinkler valve fully open.

On rollers with Serial Nos. 4951063 - 4951184:
Upwards = Manual sprinkling each time the spring-loaded switch is pressed
Downwards = Automatic sprinkling

When driving on asphalt, switch on both sprinkler systems (front and rear) using the switches (18 and 19). The quantity of water supplied to the drums may be controlled individually using the two knobs on the control boxes. The drum which is ahead (depending on the direction of travel) automatically leaves a small water surplus that can be utilized by the other drum. The correct balance is achieved using the knobs (12 and 13) (Timer). The front or rear drums may also be sprinkled manually by pushing up the appropriate spring-loaded switch (18 or 19).

4 Move the forward-reverse lever (1, in Fig. 5) carefully to the forward or reverse position, depending on the desired direction of travel.

N.B. Always control the speed of the roller with the forward-reverse lever and not by changing the engine speed.

5 While driving, check that the gauges show normal readings and that the warning lamps do not light up.
- The maximum coolant temperature (2) should not exceed about 100°C (approx. 210°F).
- The maximum hydraulic oil temperature (3) should not exceed about 85°C (approx. 185°F).
BRAKING

Braking is normally carried out by means of the forward-reverse lever (1). The hydrostatic transmission will slow down the roller when the lever is moved to the neutral position.

In addition, a multi-disc brake in each drum gear is applied when the engine is switched off.

Emergency braking

In case of emergency, turn the starter switch (11) to STOP.

STOPPING

1. Switch off the vibrations.

2. Stop the roller by moving the forward-reverse lever to the NEUTRAL position.

3. Press in the throttle until the engine is running at idling speed (600 - 700 r/min) and let it run for a few minutes.

4. Turn the starter switch (11) to STOP.

VIBRATING/DRIVING

Adjusting - High/Low amplitude

Fig.7.
21 Rear drum amplitude selector
22 Front drum amplitude selector

Manual vibration

Fig.8.
Automatic vibration switch

Never permit vibration when the roller is stationary.

Drum vibrations may be adjusted individually, using the switches (21 and 22) so that the front and rear drums are vibrating at different amplitudes, i.e. high at the front - low at the rear or vice versa.

Refer to the sticker concerning high and low amplitudes and the settings for the front and rear drums.

N.B. Never move the amplitude selector between high and low amplitude when the vibration switch is at ON - wait a few seconds before changing the setting.

Engaging and disengaging front and rear drum vibrations is carried out using the appropriate switches (8 and 9) - see the sticker.
Automatic vibration

The roller also incorporates automatic vibration control, which switches off the vibrations while the direction of travel is being changed (when the forward-reverse lever passes through the neutral position).

The setting for engagement of vibrations at different travelling speeds can be adjusted, after the cover (1) has been removed.

Fig.9 shows the adjustment mechanism. The dimension 4 mm gives an engagement speed of about 2 km/h.

Fig.9.
1 Cover
2 Adjusting cam
3 Microswitch

PARKING

Never leave the roller with the engine running - see the SAFETY RECOMMENDATIONS.

The roller is fitted with a parking brake which is applied automatically when the engine is switched off.

When parking on an incline, use a stone or such-like to chock the drum.

Fig.10.
A brake block (1) for each drum
Roller fitted with a Prometheus drum gear (earlier model).

The following preparatory measures must be carried out to permit towing:

- Chock the drums with brake blocks as shown in Fig. 10.
- Remove the screw (2) from the shuttel valve (1) and swing the arm (3) forwards.
- Remove the plugs (4) from the brake end and release the brake by screwing two M8 screws into the plug holes. The screws are in the tool box.
- Repeat the operations on the front drum (drum gear).
- Connect a towbar or similar.
- Remove the brake blocks.

Fig.11. By-pass valve
1 Shuttel valve
2 Locking screw
3 Arm for by-passing
4 Plugs

If a chain or ropes are used, a counter-force must be provided as shown in the figure.

Fig.12. Counter-force
Roller fitted with a Renondin drum gear (newer model).

- Chock the drums with brake blocks as shown in Fig. 10.
- Remove the three screws (1).
- Remove the cover (2).
- Turn the cover (2) so that the clearance hole (3) is opposite the internally threaded shaft (4).
- Use two of the screws (1) to secure the cover.
- Use the third screw as an extractor. Screw it fully into the open hole until the shaft has been extracted.
- Repeat the operations on the front drum (drum gear).
- Connect a towbar or similar.
- Remove the brake blocks.

**Fig. 13. Disengaging a Renondin drum gear (rear drum)**

1. Screw
2. Cover
3. Open hole
4. Shaft

- If a chain or ropes are used, a counter-force must be provided as shown in the figure.

**Fig. 14. Counter-force**
The roller may be towed up to 300 m after the following measures have been taken:

- Let the engine run at idling speed.
- Remove the screw (2) from the shuttle valve (1) and swing the arm (3) forwards.

N.B. All towing should be carried out using a rigid towbar, since the roller brakes are disengaged. Alternatively, a counter-force may be provided as shown in Fig.14.

Fig.15. By-pass valve
1 Shuttle valve
2 Screw
3 Arm

**LIFTING INSTRUCTIONS**

The steering pivot must be locked before the roller is lifted, to prevent any movement about this point.

Lock the front and rear parts of the frame with chains from the tool box.

Connect the lifting chains in the lifting slots and ensure that none of the components of the roller is crushed by the slings.

N.B. Lifting slings must be designed to conform to the regulations currently in force.

Never walk under a suspended load!

Weight 10 000 kg

![Diagram](image-url)
Do not forget to move the locking device (Fig. 16) to its original position before starting the engine.

SAFETY RECOMMENDATIONS

- Never leave the roller with the engine running.
- Always chock the drum when the roller is parked on an incline. The engine must be switched off.
- Never carry passengers on the roller.
- Always ensure that the brakes are in good working order (see the MAINTENANCE INSTRUCTIONS).
- Never carry out repairs or adjustments to the roller when the engine is running.
- Ensure that nobody comes between the tractor part and the drum part of the roller when the engine is running, since they would run the risk of being crushed.
- Ensure that guards are always fitted over V-belts and rotating shafts.
- Be observant on site and ensure that nobody comes in the path of the roller.
- Use the horn to attract attention.
- Drivers must be familiar with the roller driving and maintenance instructions before starting or driving the roller.
MAINTENANCE INSTRUCTIONS
VIBRATING ROLLER CC41
Caterpillar D3208 diesel engine

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<td>Every month (200 h. of operation)</td>
</tr>
<tr>
<td>Maintenance schedule</td>
<td>2</td>
<td>Every 3 months (500 h. of operation)</td>
</tr>
<tr>
<td>Daily (10 h. of operation)</td>
<td>3</td>
<td>Every 6 months (1000 h. of operation)</td>
</tr>
<tr>
<td>Every week (50 h. of operation)</td>
<td>7</td>
<td>Every year (2000 h. of operation)</td>
</tr>
<tr>
<td>Every 14 days (100 h. of operation)</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Read through the instruction manual before commencing any service work.

Proper maintenance is essential to ensure that the roller will give many years of satisfactory service and the instructions given here should therefore be carefully followed.

Also keep the Caterpillar engine instruction manual near at hand.

LUBRICANTS

Always use good-quality lubricants in the stated amounts. Excessive grease or oil will cause parts to run hot, thus causing rapid wear.

A B C D E refer to the maintenance schedule

A GREASE Lithium based with EP additive (lead oleate), NLGI number 2
Shell Alvania EP Grease 2

B ENGINE OIL API Service CD/SE SAE 10W/30

<table>
<thead>
<tr>
<th>Air temperature</th>
<th>Viscosity</th>
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<tbody>
<tr>
<td>-32°C and above</td>
<td>SAE 10W/30</td>
</tr>
<tr>
<td>-12°C - 0°C</td>
<td>SAE 10W</td>
</tr>
<tr>
<td>-7°C - +32°C</td>
<td>SAE 20</td>
</tr>
<tr>
<td>above +32°C</td>
<td>SAE 30</td>
</tr>
</tbody>
</table>

C HYDRAULIC OIL with anti-wear additive
Shell Tellus T Oil 68

D GEARBOX OIL SAE 90 HD API, GL-5

E BRAKE OIL Shell Donax™

If the roller is to be used under exceptionally hot or cold conditions, get in touch with DYNAPAC for additional lubricating recommendations.
MAINTENANCE SCHEDULE

Fig. 1  Service points

1  Oil level - drum gears and brakes
2  Rubber mats
3  Water tanks
4  Fuel filler cap
5  Engine - oil filter
6  Engine - dipstick
7  Radiator - filler cap
8  Air cleaner
9  Engine - V-belts
10 Engine - valves
11 Engine - fuel filter
12 Tachometer cable
13 Drum - filler plug
14 Scrapers
15 Rubber elements - fastening bolts
16 Drum oil level plugs
17 Pump drive
18 Steering pivot
19 Hydraulic oil filter
20 Steering cylinder mountings
21 Fuel system water trap
22 Hydraulic oil filler cap/
    Sight glass and suction strainer
23 Battery

<table>
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<tbody>
<tr>
<td>Fig 1</td>
<td></td>
<td></td>
<td>See page 1</td>
</tr>
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</table>

DAILY (every 10 hours of operation)

2, 14 Adjust the scrapers and rubber mats  
4 Fill the fuel tank
6 Check the engine oil level
7 Check the coolant level
21 Drain the water trap (on rollers with serial no.  
   4951099 and above)
22 Check the oil level in the hydraulic oil tank and  
   check the breather holes in the tank cap
- Test the brakes

NOTE  After each emergency application of the brakes, drain and flush the brake  
housings with paraffin or its equivalent. In addition, use new oil to fill  
rollers fitted with Renondin drum gears (see the section entitled "Lubricants"  
on page 1).
**WEEKLY (every 50 hours of operation)**

<table>
<thead>
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<th>Operation</th>
<th>Page</th>
<th>Lubricant</th>
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<tbody>
<tr>
<td>1</td>
<td>Lubricate the driven gear shaft*** (Renondin)</td>
<td>7</td>
<td>A</td>
</tr>
<tr>
<td>1</td>
<td>Check the oil level in the drum gears</td>
<td>7</td>
<td>D</td>
</tr>
<tr>
<td>1</td>
<td>Change the oil in the drum gears*</td>
<td>16</td>
<td>D</td>
</tr>
<tr>
<td>5</td>
<td>Change the engine oil filter**</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Change the engine oil**</td>
<td>13</td>
<td>B</td>
</tr>
<tr>
<td>8</td>
<td>Clean the air cleaner filter element. Check that hoses and connections do not leak</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Check the tension of the fan and alternator V-belts</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Check the oil level in the drums</td>
<td>10</td>
<td>D</td>
</tr>
<tr>
<td>15</td>
<td>Check the rubber elements and the fastening bolts</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>18</td>
<td>Lubricate the steering pivot</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>20</td>
<td>Lubricate the steering cylinder mountings</td>
<td>10</td>
<td>A</td>
</tr>
<tr>
<td>23</td>
<td>Check the battery</td>
<td>11</td>
<td></td>
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**EVERY 14 DAYS (every 100 hours of operation)**

<table>
<thead>
<tr>
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<th>Lubricant</th>
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<tbody>
<tr>
<td>7</td>
<td>Clean the outside of the radiator</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Check the valve clearances</td>
<td></td>
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**EVERY THREE WEEKS (every 150 hours of operation)**

<table>
<thead>
<tr>
<th>Item in Fig</th>
<th>Operation</th>
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<th>Lubricant</th>
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<tbody>
<tr>
<td>5</td>
<td>Change the engine oil filter</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Change the engine oil</td>
<td>13</td>
<td>B</td>
</tr>
</tbody>
</table>

**EVERY MONTH (every 200 hours of operation)**

<table>
<thead>
<tr>
<th>Item in Fig</th>
<th>Operation</th>
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<th>Lubricant</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Change the oil in the drum gears*</td>
<td>16</td>
<td>D</td>
</tr>
<tr>
<td>1</td>
<td>Change the oil in the brake housings (Renondin)***</td>
<td>14</td>
<td>E</td>
</tr>
<tr>
<td>1</td>
<td>Drain the Prometheus brake housings****</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Clean the air cleaner dust collector</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Lubricate the tachometer cable</td>
<td>15</td>
<td>A</td>
</tr>
<tr>
<td>17</td>
<td>Check the oil level in the pump drive</td>
<td>15</td>
<td>D</td>
</tr>
<tr>
<td>19</td>
<td>Change the hydraulic oil filter (one)</td>
<td>15</td>
<td></td>
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</tbody>
</table>

**EVERY THREE MONTHS (every 500 hours of operation)**

<table>
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<tbody>
<tr>
<td>1</td>
<td>Change the oil in the drum gears</td>
<td>16</td>
<td>D</td>
</tr>
<tr>
<td>7</td>
<td>Top up the corrosion inhibitor in the coolant (See the engine instr. manual)</td>
<td>16</td>
<td>D</td>
</tr>
<tr>
<td>10</td>
<td>Adjust the engine valve clearances            (See the engine instr. manual)</td>
<td>17</td>
<td></td>
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</tbody>
</table>

**EVERY SIX MONTHS (every 1000 hours of operation)**

<table>
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<tbody>
<tr>
<td>4</td>
<td>Drain the fuel tank</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Change the fuel filter/Bleed the fuel system</td>
<td>17</td>
<td></td>
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</tbody>
</table>

**EVERY YEAR (every 2000 hours of operation)**

<table>
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<tr>
<td>7</td>
<td>Flush the engine cooling system</td>
<td>19</td>
<td></td>
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<tr>
<td>13</td>
<td>Change the oil in the drums</td>
<td>20</td>
<td>D</td>
</tr>
<tr>
<td>17</td>
<td>Change the oil in the pump drive</td>
<td>20</td>
<td>D</td>
</tr>
<tr>
<td>22</td>
<td>Change the oil in the hydraulic oil tank. Clean the suction strainer</td>
<td>21</td>
<td>C</td>
</tr>
<tr>
<td>22</td>
<td>Check the crankcase ventilation diaphragm (See the engine instr. manual)</td>
<td>21</td>
<td></td>
</tr>
</tbody>
</table>

* Only on new or reconditioned drum gears
*** Only on new or reconditioned engines
***** Only on Renondin drum drives
**** Only on Prometheus drum drives (earlier models)
DAILY
(every 10 hours of operation)

Rubber mats—rubber scrapers
Adjusting, checking

1. Ensure that the rubber scrapers rest against the drums.
2. Lower the rubber mats when compacting asphalt.

Check that the grooves in the mats are not blocked. Adjust the pressure of the mats against the drum by changing the positions of the rubber elements.

Fuel tank—filling up

1. Fill up the fuel tank to the lower edge of the filler pipe with diesel fuel each day.

![Fig. 2 Fuel tank](CC 41-13083-1)

1. Filler cap

Engine—checking the oil level

- Drive the roller onto a level surface and switch off the engine.
- Remove the dipstick (1) and check the oil level.
- If the oil is close to the lower mark (2), top up with type $\triangledown$ oil.

![Fig. 3](12251-1)

1. Dipstick
2. Filler cap
Radiator—checking the coolant level

CAUTION!
The coolant is pressurised. If the cap is removed quickly, coolant will be released in the form of steam and may cause serious burns. Use gloves and protective goggles.

The cooling system should be at operating temperature and the engine should be stationary during these operations.

1. Place a piece of cloth or the like over the filler cap and turn the cap to the first stop. When the pressure has fallen, press down the cap, turn it further and remove it. The coolant level should reach the level tab in the radiator.

2. When necessary, top up with water and corrosion inhibitor (CAT 3P2044 or equivalent). In winter add anti-freeze.

Water trap—draining

![Diagram of Water Trap](image)

Fig. 4 Water trap (Left-hand side)
1. Glass container

(This only applies to rollers with high serial numbers, which have been fitted with water traps.)
Open the drain cock (1) and let the water run out. The glass container must never be more than half full of water.

Hydraulic oil tank—checking the oil level

![Diagram of Hydraulic Oil Tank](image)

Fig. 5
1. Oil filler cap
2. Sight glass

Check that the breather holes in the tank filler cap are not blocked.

1. Drive the roller onto a level surface and check the level of the oil in the sight glass.

2. If the oil is close to the EMPTY mark, top up to the FULL mark with type Δ oil.
Brakes—checking

Check the brakes, with the roller on level ground, as follows:

1. Start the engine. Set the engine speed at about 800 r/min. Check that the brake warning lamp (5) has gone out.
2. Remove the switch (2) from the brake valve (1).
3. Check that the brake warning lamp (5) lights up.
4. Sit in the driver's seat and move the forward-reverse lever slowly between the 'forward' and 'reverse' positions (across the '0' position).
   - The roller should not move (forward or backwards)
   - A grating sound will be heard from the by-pass valve in the drive circuit.

The hydraulic oil should be at operating temperature during this check.

The brakes function satisfactorily if the above conditions are satisfied. (The braking torque is then greater or equal to the driving torque.)

Carry out the test only once on any occasion and for not more than about 1 minute.

5. Stop the engine.
6. Replace the switch (2).
7. Grip the forward-reverse lever (6). Start the engine. Check that the brake warning lamp lights up.

**NOTE.** Rollers not having a NEUTRAL START may start moving when the engine is started. Adjust this tendency with the forward-reverse lever.

8. Check that the brake warning lamp (5) has gone out.

Fig. 7b Brake valve under the platform

Fig. 7c Principle of the brake valve

1. Brake valve
2. Switch
3. Pressure switch
4. Wing nut
5. Brake warning lamp
6. Forward-reverse lever
EVERY WEEK
(every 50 hours of operation)

Drum gear, shaft seal (only Renondin) lubricating

Wipe the area clean around the grease nipple (1 in Figs. 8 and 9). Grease each drum gear with 5 strokes of a grease gun containing type A grease.

Drive the roller onto a level surface. Check the level of the oil in both drum gears (see Figs. 8 and 9).
1 Remove the level plug (3).
2 Remove the filler plug (2) and top up with type A oil up to the edge of the level plug (3).
3 Replace the plugs.

Drum gear—Prometheus checking the level

1 Clean the area round the dipstick (2) and check that the oil is up to the level of the mark.
2 If necessary, top up with type A oil.
3 Repeat operations 1 and 2 above on the front drum gear.

Fig. 8 Front drum gear
1 Grease nipple
2 Filler plug
3 Level plug

Fig. 9 Rear drum gear
1 Grease nipple
2 Filler plug
3 Level plug

Fig. 10 Rear drum gear
(shown here)
1 Filler plug
2 Dipstick
Air cleaner—cleaning the filter element

1. Release the overcentre catches (5) and remove the outer cover (1).
2. Remove the wing nut (2); and the seal.
3. Remove the inner cover (3) if it is loose.
   *If the inner cover is difficult to remove from the filter element, it is not necessary to remove it, except when changing the element.*
4. Remove the filter element (4).
5. Check whether any dust has penetrated the cleaner during operation.
   Dust adhering to the inside of the engine induction pipe indicates dust penetration.
   *If dust has penetrated the cleaner, this will be a sign that the connection, hoses or the element leak and must therefore be changed.*
6. Clean the inside of the filter housing (6) and the induction pipe with a clean cloth.
7. Check that the connections and hoses between the filter housing and the engine are undamaged and do not leak.
   *Fit the hose clamps in pairs, pointing in opposite directions, and tighten them securely.*

Cleaning with compressed air

8. Use compressed air at a maximum pressure of 0.7 MPa (7 kgf/cm²).
   Play the compressed air up and down along the folds of the paper on the outside of the filter element. Hold the nozzle at least 2 - 3 cm away from the element to avoid damaging the paper.
Cleaning by washing

Discard the filter element after it has been cleaned 6 times.

Do not fit a filter that has been washed in detergent, until it is completely dry.

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

Immerse the filter in the detergent solution and leave it for at least 15 minutes. Raise and lower the filter in the solution from time to time to improve the cleaning effect.

Check that the filter is intact before refitting it. If it has any holes or if the seals are defective, fit a new filter.

Wipe the inner cover clean, slide the filter into the filter housing and tighten the element and the inner cover thoroughly with the wing nut.

Wipe clean the seals on the outer cover and refit it.

Check the cover seals and replace any that are damaged.

V-belt tension—checking

Check the tension of the cooling fan, water pump and alternator V-belts by pressing them down with the thumb at a point mid-way between the alternator pulley and the water pump pulley. It should not be possible to depress the belts by more than 6-7 mm.

Tensioning the V-belts

Back off the alternator retaining bolts A slightly.

Press the alternator outwards until the V-belts are again correctly tensioned.

Tighten bolts A.

If the fan guards have been removed, they must be replaced before the engine is started and the roller is moved.
Drum—checking the oil level

Drive the roller so that the front filler/drain plug (1) is at the uppermost position, as shown in Fig. 16.

Back off the level plug (2) about 3 turns.

Oil should flow out past the plug if the drum gear contains the correct amount of oil. If this is not the case, remove the filler/drain plug (1) and top up, as necessary, using type △ oil.

Use a funnel when topping up — it is contained in the tool kit.

Repeat this whole procedure on the front drum.

Fig. 16 Rear drum
1 Filler/drain plug
2 Level plugs

Rubber elements and fastening bolts—checking

Check that the rubber elements are undamaged and that the fastening bolts are tight. Change the rubber elements when 20 – 25 mm deep cracks are detected in them.

Steering cylinders and steering pivot—lubricating

Point the roller to the right, wipe any dirt and grease off the nipples (1) and grease each nipple with five strokes of the grease gun, using type △ grease.

Then point the roller to the left and grease the other side in the same manner.

Lubricate the steering cylinder mountings. Note. The 2 grease nipples to the rear are accessible from underneath the roller.

At the same time, check that the steering pivot nuts:
- one horizontally in the steering pivot
- one vertically under the frame
are locked.

Fig. 17
1 Steering pivot grease nipples (two)

Fig. 18 Steering pivot
2 Grease nipples on the steering cylinder mounting (four)
Battery—checking the electrolyte level

Fig. 19 Battery

- Remove the cover.
- Clean the battery terminals, if necessary, and coat them with petroleum jelly.
- Check that the electrolyte is approx. 10 mm above the plates. Top up with distilled water as necessary.

Never use a naked flame when checking the electrolyte level, since explosive gas is formed in the battery when it is being charged.

Fig. 20 Battery electrolyte

1 Cell plug
2 Electrolyte level
3 Plate
EVERY 14 DAYS
(every 100 hours of operation)

Radiator—cleaning the outside

Check that air can flow freely through the radiator. If the radiator is dirty, clean it by flushing with water or blowing with compressed air. After cleaning, check that any seals and sound-absorbers are not damaged.

EVERY THREE WEEKS
(every 150 hours of operation)

Engine—changing the oil filter

Fig. 21 Engine
1 Oil filter

Do not tighten the filters too hard, since this may damage the seals.

1 Remove both oil filters (1) and discard them. They are of disposable type and cannot be cleaned.

Ensure that the old seals are not left on the filter head, since leakage will then occur between the new and the old seals.

2 Clean the sealing surfaces of the filter head with a clean, lint-free cloth.

3 Apply a thin layer of clean engine oil to the new filter seals.

4 Tighten the filters by hand until the seal seats against the filter head. Then tighten an additional half-turn.

Oil-change intervals are dependent on the quality of the lubricating oil and the sulphur content of the fuel. Oil changes every third week or every 150 hours of operation are conditional on the use of oil of grade "For API Service CD, SAE" and on the use of diesel fuel of good grade and with a sulphur content below 0.4%.

If oil of grade "For API Service CC/SC, SAE" is used, or if the sulphur content of the fuel is 0.4% or above, the oil must be changed at shorter intervals (see the engine manufacturer’s instructions).
1 Warm up the engine thoroughly before draining the oil.

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

2 Clean the area around the oil filler cap (1) and then remove the cap.

Fig. 22 Engine
1 Dipstick
2 Oil filler cap

Fig. 23 Oil drain plug (at the steering pivot)

3 Clean the area around the drain plug (1) and place an approx. 15 litre receptacle under the plug.

4 Remove the drain plug and allow the oil to drain into the receptacle. Allow the oil to drain out while changing the oil filter.

5 Wipe the drain plug clean. Fit it back into place and tighten it securely.

On new models, the oil is drained at the steering pivot, as shown in Fig. 23.

The arrangement shown in Fig. 24 applies to all other rollers.

6 Fill up with fresh type ▲ oil as recommended in the section entitled "Lubricants" on page 1.

Oil capacity: 12.5 litres, when changing the filters
11.4 litres, when the filters are not changed.

The oil capacities of engines with serial Nos. above 90N44128 or with recalibrated dipsticks are:

- 14.5 litres, when changing the filters
- 13.5 litres, when the filters are not changed.

7 Check the engine oil level with the dipstick (1).

The level should be up to the FULL mark. Do not overfill, since this may cause damage to the crankshaft packing boxes.

8 Refit the oil filler cap (2). Tighten it firmly, ensuring that it seals satisfactorily.

9 Start the engine and warm it up. Check that there are no oil leaks.

Fig. 24
1 Oil drain plug

Engine—filling up with oil

Fig. 25 Engine
1 Dipstick
2 Oil filler cap
EVERY MONTH  
(every 200 hours of operation)

Brake−Renondin changing the oil

Change the oil in both of the drum gear brake housings.

- Back off the drain plug (3) and drain the oil.
- Refit the plug.
- Remove the level plug (2).
- Remove the filler plug (1) and fill up with type △ oil to the level plug (see the section entitled "Lubricants" on page 1).

NOTE. The oil in brake housing must be changed after each emergency application of the brakes.

Brakes (only Prometheus drum gear) −draining

Back off the drain plug under the brake housing.
Allow any oil to drain and collect it in a container.
Drain both drum gear brake housings as described above.

Air cleaner−cleaning the dust collector

Under extremely dusty conditions, the dust collector should be cleaned every week.

1. Release the catch (1) and remove the dust collector (2).
2. Empty the dust collector and wipe it clean.
3. Clean the "Donaclone" tubes (3), using a bottle−cleaning brush or equivalent.
   If the tubes cannot be cleaned, remove the "Donaclone" tube housing (4). The tubes can then be blown clean with compressed air or washed in water at a maximum temperature of 65°C.
4. Assemble in the reverse order.
   Check the seals and replace any that are damaged.
   Check that the hoses and connections do not leak.

The dust collector is fitted with a self−discharging valve (5). This valve discharges dust and water continuously.
Release the cable at the tachometer and pour type A oil in between the sheath and the cable.

Note that the filler plug (1) is accessible after the floor cover in the platform has been removed. Ensure that the roller is standing on a level surface.

1 Clean the area around the level plug (2) and back off the plug a few turns. Oil should run out if the oil level is correct.
If necessary, top up with oil through the filler plug (1) hole until the oil runs out at the level plug (2).
Clean the area around the filler plug and before removing the plug.
Fill up with type A oil as recommended in the section entitled "Lubricants" on page 1.
A level plug is located on each side of the pump drive. The oil level need only be checked on one side.
2 Refit the level and filler plugs and then put back the floor cover.

1 Remove the oil filter (1).
Discard the filter, since it is of disposable type and cannot be cleaned.
Ensure that the old seal is not left in position. Leakage will otherwise occur between the new and the old seal.
2 Clean the sealing surface of the filter head thoroughly.
3 Apply a thin layer of hydraulic oil to the seal of the new filter.
4 Screw the filter into place by hand.
First screw the filter in until its seal seats against the filter head. Then tighten it an additional half-turn.
5 Start the engine and check that no hydraulic oil leaks out around the filter.
EVERY THREE MONTHS
(every 500 hours of operation)

Drum gears—changing the oil

Stand the roller on a level surface.
When the oil is at operating temperature:

1. Remove the level plug (1).
2. Place a suitable container under the drum gear, remove the drain plug (2) and let the oil drain.
3. Refit the drain plug (2).
4. Remove the filler plug (3) and fill with type △ oil up to the level plug (1).
5. Refit the level plug and the filler plug.

Repeat operations 1 – 5 on the rear drum gear.

Renondin drum gear

Fig. 31 Front drum gear
1. Level plug
2. Drain plug
3. Filler plug

Fig. 32 Rear drum gear
1. Level plug
2. Drain plug
3. Filler plug

Prometheus drum gear

Fig. 33 Rear drum gear
1. Filler plug
2. Dipstick
3. Drain plug

1. Clean the areas round the plugs (1) and (3) and around the dipstick (2).
2. When the oil is at operating temperature, remove the drain plug (3) and drain the oil into a suitable container.
3. Refit the drain plug (3).
4. Fill up with type △ oil and then use the dipstick to check the level.
5. Put back the dipstick (2) and the filler plug (1).

Repeat operations 1 – 5 on the front drum gear.
EVERY SIX MONTHS
(every 1000 hours of operation)

Fuel tank–draining

Back off the drain plug (1) at the bottom of the tank a few turns. Drain any water. Tighten the plug again.

Fig. 34 Fuel tank
1 Drain plug

Fuel filter–changing

Refer also to the engine manufacturer’s instruction manual.

1 Remove the fuel filter (1). Discard it, since it is of disposable type and cannot be cleaned.
2 Clean the sealing surface of the filter head.

Ensure that the old seal is not left in position. Leakage will otherwise occur between the new and the old seal.

3 Apply a thin layer of diesel oil to the seal of the new filter.
4 Screw the filter into place by hand.

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

5 Bleed the fuel system (see below).

Fig. 35 Fuel filter
1 Filter

Fuel system–bleeding

When air has entered the fuel system, the engine will not start or it will misfire. The fuel system must then be bled.

1 Stop the engine
2 Open the bleed cock (1) on the top of the fuel pump.

Fig. 36 Bleeding the fuel system
1 Bleed cock
3 Operate the hand pump (1) manually until the fuel flows out evenly at the cock and is free from air bubbles. Do not pump out more fuel than necessary.

Only use the hand pump when the bleed cock is open.

The pump handle is locked in the depressed position. To release it, turn it anti-clockwise until it is released. When the system has been bled, lock the handle, by depressing it and turning it clockwise until resistance is met.

4 Tighten the bleed cock.

5 Start the engine.

If the engine misfires or does not run smoothly, bleed the lines to the injection nozzles.

- Back off the nut (1) at the injection nozzle and let the fuel flow out until the flow is even and free from air bubbles. Then tighten the nut again.

- Bleed all the lines, one line at a time.

- Bleed the fuel lines while the engine is running.
EVERY YEAR
(every 2000 hours of operation)

Engine—flushing the cooling system

Fig. 39 Draining the cooling system
1 Filler cap
2 Drain cock - radiator
3 Drain plugs

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

The coolant must also be changed once a year, as the corrosion inhibitor loses its effectiveness.

The cooling system should be cleaned when the engine is cold.

1. Drive the roller onto a level surface.
2. Remove the radiator filler cap (1).
3. Open the drain cock (2) at the bottom of the radiator.
4. Remove the drain plugs (3) in the cylinder block and on the engine oil cooler:
   • One at the bottom connection to the radiator
   • Two on the cylinder block - one on each side, near the flywheel casing
   • One on the engine oil cooler (underneath)
5. Flush the cooling system with clean water.
   Insert a hose into the radiator filler neck and flush the system with water until the water flowing out at the drain plug holes is completely free from flakes of rust and sediment.

If there are hard deposits of lime or rust in the cooling system, the system should be cleaned using a special radiator cleansing agent. Use a good cleansing agent from a reputable manufacturer and follow the manufacturer's instructions. See also CAT instructions GEG 051 00-01.

6. Refit the drain plugs and shut off the radiator drain cock.
7. Check the coolant hoses.
   Replace hoses that are cracked or show any other signs of defect.
8. Fill up with coolant to the level tab located under the radiator filler cap.
   The lime content of the water should be as low as possible.
   Always fill the cooling system with one of the following two coolants:
   • Clean water and corrosion inhibitor (CAT 3P2044 or its equivalent).
   • 50% clean water and 50% anti-freeze (containing a corrosion inhibitor).
9. Start the engine and run it for 10 minutes.
10. Check the level of the coolant and, if necessary, top it up to the correct level.
11. Check that the cooling system does not leak.
    Ensure that any leaks are sealed.
12. Refit the filler cap (1).
The drum should be at operating temperature before the oil is drained.

DRAINING

1. Drive the roller onto a slightly sloping surface so that the plug (1) is at the lowest position.
2. Remove the plug and drain the oil into a receptacle. The receptacle should hold about 30 litres.

Repeat these operations on the front drum.

FILLING

1. Drive the roller until the drain/filler plug is uppermost, as shown in Fig. 36 (the surface should not be sloping as for the draining operation described above).
2. Back off the level plugs about 5 turns and fill up with type Δ oil as recommended in the section entitled "Lubricants" on page 1, until the oil flows out at the level plug.
3. Tighten the level plugs. Refit the filler plug. Check the tightness of the plugs.

Repeat operations 1 - 3 on the other drum.

1. The filler plug (1) is accessible after the floor cover in the platform has been removed.
2. Drive the roller onto a level surface and stop the engine.
3. Clean the area around the filler plug (1), level plug (2) and drain plug (3).
4. Place a receptacle with a capacity of about 5 litres under the drain plug.
5. Remove the filler plug (1) and drain plug (3). Allow the oil to drain into the receptacle.
6. Clean the drain plug and refit it.
7. The drain plug is magnetic and attracts any iron particles in the oil.
8. Back off the level plug a few turns.
9. There is a level plug on each side of the pump drive. It is only necessary to back off one of them.
10. Fill up with oil until it flows out at the level plug hole.

Use type Δ oil as recommended in the section entitled "Lubricants" on page 1.
11. Tighten the level plug and refit the filler plug.
- Clean the cover and the area around it.
- Disconnect the suction lines (1).
- Remove the fastening screws that retain the cover.
- Drain the oil, through the drain plug hole (2), into a container with a capacity of about 250 litres.
- Lift up the cover. Strainers are fitted in certain rollers.
- If there is a strainer, clean it in diesel oil and blow it clean.
- Clean the inside of the tank.
- Assemble in the reverse order.
- Change the hydraulic oil filter (see page 15).
- Before using the system, refer to the special filtering instructions.

Fig. 43
1 Suction line
2 Drain plug
3 Strainer
CALLING FOR A SERVICE MECHANIC

Call any of our service depots if the services of a mechanic are needed. Provide as detailed information as possible to the contact man at the depot. If the mechanic has a clear idea of the work entailed before leaving the service depot, he will be better prepared for the job and will also have the correct spare parts when he arrives at the work site.

ORDERING SPARE PARTS

Spare parts can be ordered by using the enclosed spare parts catalogue. Be sure to follow the instructions provided in the catalogue for ordering spare parts. Correct details will ensure prompt delivery.