The Engine Operation and Maintenance Manual must be used in conjunction with these instructions.

SAFETY PRECAUTIONS

WARNING: WHEN THIS SYMBOL IS DISPLAYED, BECOME ALERT, YOUR SAFETY MAY BE INVOLVED.

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of the roller as well as the individual doing the work.

This manual provides general direction for accomplishing service and repair work with approved and effective techniques. Following them will assure reliability.

As you read through the procedures, you will come across, NOTES, CAUTIONS and WARNINGS. Each one has a specific purpose, NOTES give you added information that will help in completing a particular procedure, CAUTIONS are given to prevent you from making an error that could damage the machine. WARNINGS remind you to be especially careful in those areas where carelessness can cause personal injury.

To ensure against injury to personnel and/or damage to equipment, whenever servicing or preventive maintenance is to be carried out:

1. PARK ON LEVEL GROUND, DRUMS STRAIGHT AHEAD.
2. CONNECT THE STEERING LOCK.
3. TURN ENGINE OFF.
4. BLOCK DRUMS FRONT AND REAR.
5. DISCONNECT BATTERY WHEN MAKING REPAIRS TO ELECTRICAL SYSTEM OR WELDING.

M-SE50II OM
July 1987

3-1
GENERAL INFORMATION

A. While simplified maintenance is given high priority in the design of the roller, the need for adherence to a preventive maintenance schedule MUST be emphasized if maximum benefits are to be realized.

B. A large percentage of service problems can be identified with improper maintenance or use of the wrong lubricant. Use lubricants as specified in this manual. Substitute only products that are certified as equivalent by a reputable lubricants manufacturer.

SERVICING PRACTICES

A. Check component oil levels after the machine has been stopped to permit oil in the various components to drain to the bottom. Dipsticks, sight gauges and other check plugs are marked for use when the machine is parked on a level surface. Improper oil levels will result if levels are checked on a grade. Excessive or insufficient grease or oil will cause parts to run hot, inducing rapid wear.

B. Drain fluids after the machine has run for some time so components and fluids are at operating temperature. Any sediment or impurities in reservoirs will be in suspension and drain more readily. Clean the magnetic drain plugs.

C. Conditions are seldom ideal for performing maintenance tasks. Take care to prevent dirt and foreign material from entering the engine, hydraulic or electrical components.

D. Before removing any component, wipe the surrounding area free of loose dirt and clean with a suitable non-flammable solvent.

E. Cleanliness is No. 1 when servicing hydraulic systems. KEEP DIRT AND CONTAMINANTS OUT OF THE SYSTEM! Small particles can score valves, seize pumps, clog orifices and cause expensive repair jobs.

Keep the oil clean.
Keep the system clean.
Keep the work area clean.
LUBRICANTS

The following definitions will be of assistance in purchasing of recommended lubricants.

A  Grease (MPG)

Use multi-purpose type grease conforming to MIL-L-7866. NLGI No. 2 grade is suitable for most temperatures. NLGI No. 1 or No. 0 are suitable for extremely low temperatures.

B  Engine Oil

Cummins Engine

Use multi-viscosity oil, preferably 15W-40 that meets API Classification CC/CD (equivalent to MIL-L-45199B).

Lighter, 10W-30 oils can be used to aid in starting when ambient temperatures remain below 23°F (-5°C). Continuous use of low viscosity oils can increase engine wear.

Refer to Engine Manual for additional information.

C  Hydraulic Oil

Oil in the hydraulic system serves as the power transmission medium. It is also the system's lubricant and coolant.

Use industrial-type hydraulic oils which are certified by the supplier as having anti-wear, anti-foam, anti-rust and anti-oxidation additive properties for heavy duty use. Mobilfluid 300 or an equivalent is recommended.

D  Gear Lubricant

Use SAE 80W-90 extreme pressure lubricant in the drum planetary hubs, drum reservoirs, and the pump drive gearbox.

Gear lubricant should meet spec. MIL-L-2105C or API classification GL-5.
Figure 1
Maintenance Locations

1 Engine Oil
2 Radiator
3 Hydraulic Tank
4 FuelTank
5 Air Cleaner
6 Drum Wiper
7 Drum Shock Mounts
8 Brakes
9 Fuel Filters
10 Water System
11 Drum Oil Fill Plug, Sight Glass
12 Steering Hitch, Steering Cylinders
13 Hydraulic Filters
14 Pump Drive
15 Drum Planetary Transmission
16 Console Swivel Bearing

* Refers to far side of the machine.
### LUBRICATION AND MAINTENANCE SCHEDULE

<table>
<thead>
<tr>
<th>Item</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Check Engine Oil Level*</td>
</tr>
<tr>
<td>2</td>
<td>Check Engine Coolant Level*</td>
</tr>
<tr>
<td>3</td>
<td>Check Hydraulic Oil Level</td>
</tr>
<tr>
<td>4</td>
<td>Check Fuel Tank Level</td>
</tr>
<tr>
<td>5</td>
<td>Check Air Cleaner Indicator Light on Instr. Panel</td>
</tr>
<tr>
<td>6</td>
<td>Check Adjustment of Drum Wipers(CC50A)</td>
</tr>
<tr>
<td></td>
<td>Check Drum Scraper Adjustment(CC50S &amp; PD)</td>
</tr>
<tr>
<td>7</td>
<td>Check Condition of Drum Shock Mounts and Mounting Bolt Tightness</td>
</tr>
<tr>
<td>8</td>
<td>Check Brake Operation</td>
</tr>
<tr>
<td>9</td>
<td>Drain the Fuel/Water Separator (Cummins)*</td>
</tr>
<tr>
<td>10</td>
<td>Check Water Spray System(CC50A) Clean Water Strainers, Spray Nozzles</td>
</tr>
</tbody>
</table>

### EVERY 50 HOURS OR WEEKLY

<table>
<thead>
<tr>
<th>Item</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>9</td>
<td>Drain Fuel Pre-filter Sediment Bowl*</td>
</tr>
<tr>
<td>11</td>
<td>Check Drum Oil Level</td>
</tr>
<tr>
<td>12</td>
<td>Lubricate the Steering Hitch and Steering Cylinder Bushings</td>
</tr>
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</table>

### EVERY 200 HOURS OR MONTHLY

<table>
<thead>
<tr>
<th>Item</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drain and Refill Engine Oil, Replace Oil Filter*</td>
</tr>
<tr>
<td>13</td>
<td>Replace the Hydraulic Filters</td>
</tr>
<tr>
<td>14</td>
<td>Check Oil Level in the Pump Drive</td>
</tr>
<tr>
<td>15</td>
<td>Check Oil Level in Drum Planetary Gear (2)</td>
</tr>
<tr>
<td>16</td>
<td>Lubricate Console Swivel Bearing</td>
</tr>
</tbody>
</table>

### EVERY 10000 HOURS OR YEARLY

<table>
<thead>
<tr>
<th>Item</th>
<th>Operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Drain Engine Coolant and Flush System*</td>
</tr>
<tr>
<td>3</td>
<td>Drain and Refill Hydraulic Tank</td>
</tr>
<tr>
<td>9</td>
<td>Replace the Fuel Filters*</td>
</tr>
<tr>
<td>11</td>
<td>Drain and Refill Drum Oil, Both Sides of Drums</td>
</tr>
<tr>
<td>14</td>
<td>Drain and Refill Pump Drive</td>
</tr>
<tr>
<td>15</td>
<td>Drain and Refill Drum Planetary Gear (2)</td>
</tr>
</tbody>
</table>

* Consult Cummins Engine Operation and Maintenance Manual for regular Maintenance Schedule
EVERY 10 HOURS OR DAILY

Checking Engine Oil Level

1 Check that roller is on a level surface and the engine has been stopped to allow oil to drain down.

2 Remove the dipstick (1) and check the oil level. The film of oil on the dipstick should extend to the upper mark.

3 If level is low, add type B oil specified on page 3-3.

1 Dipstick
2 Filler cap

Checking Engine Coolant Level

1 Check level when the engine is stopped and cool.

WARNING: AT OPERATING TEMPERATURES THE COOLANT IS HOT AND UNDER PRESSURE. STEAM CAN CAUSE PERSONAL INJURY. REMOVE FILL CAP SLOWLY TO RELIEVE PRESSURE.

2 Coolant level should be 1-½ inches (25 mm) below filler neck. Add as required a 50/50 mixture of water/antifreeze to maintain freeze protection.

3 Clean the radiator fins when foreign deposits hinder the flow of air. When operating in hot, dusty conditions, periodic cleaning will prevent a decrease in cooling efficiency. An air hose with a suitable nozzle is sufficient to remove loose dirt. If oil is present steam cleaning will be necessary.

DO NOT USE HIGH AIR OR WATER PRESSURE

4 Observe instructions on Coolant Filter replacement, refer to Cummins Operation and Maintenance Manual.
EVERY 10 HOURS OR DAILY (continued)

Checking Hydraulic Oil Level

1 With the roller on a level surface check the level of the oil in the sight glass (1).

2 If oil level is more than 2 cm (0.75 in) below the top of the sight glass, add type C oil, specified on page 3-3.

3 Check that fill cap breather holes are not clogged.

1 Sight glass
2 Filler cap

Checking Fuel Tank Level

Fill tank to the lower edge of the fill pipe at the end of each day's operation to reduce condensation forming in the tank.

Use the proper grade fuel. Use clean fuel handled in clean containers.

WARNING: WHEN HINGED COVER IS RAISED, ALWAYS USE THE SAFETY SUPPORT (2).

1 Filler cap
2 Safety Support

Checking the Air Cleaner Indicator

The air cleaner includes a pressure-drop sensor connected to a warning lamp on the instrument panel.

If the air cleaner warning lamp (1) on the instrument panel lights up when the engine is running at full RPM, clean or replace the element.

1 Warning Lamp
EVERY 10 HOURS OR DAILY (continued)

Cleaning the Air Cleaner Element

1. When warning light on instrument panel indicates that element servicing is required, unscrew the wing nut (5) and remove the outer cover (4).

2. Unscrew the wing nut in the center of the filter and remove the main element (3). DO NOT REMOVE THE SAFETY ELEMENT.

3. Inspect the main element for dust streaks on the inside. If there are any dust streaks, the element is damaged. THROW IT AWAY.

   Use a clean cloth to clean the filter housing and the outer cover, also check that evacuator valve (7) is in place and free of obstruction.

4. Inspect main element gasket, if it is not smooth and flat or that it might allow dust to get by, do not reuse.

5. Check all connections between the air cleaner and engine to be certain they are tight and do not leak.

6. Clean the primary element (6) using compressed air or by washing. DO NOT CLEAN THE SAFETY ELEMENT. Replace the safety element every third primary element change or cleaning.

Cleaning with Compressed Air

Direct air through the element from the inside (opposite normal air flow) at a maximum air pressure of 100 psi (0.7 MPa).

Keep the nozzle at least one inch (25 mm) from the pleated paper, moving the nozzle up and down while rotating the element.

Inspection

Place a bright light inside the element and rotate the element slowly. If any rupture, holes or damaged gaskets are discovered, replace the element. Replace the primary element after 6 cleanings or annually whichever occurs first.
EVERY 10 HOURS OR DAILY (continued)

Checking Drum Wiper Adjustment (CC50A)

Adjust rubber wiper assemblies so that they bear against the drum evenly with sufficient pressure to cause a deflection of the rubber wiper.

1 To adjust the wiper, loosen bolts at the wiper brackets and slide the wiper down until contact with the drum is made, then retighten the bolts.

2 When rubber wiper is worn to the point that adjustment is not sufficient, the wiper can be adjusted by loosening the bolts in the clamp bar and moving the rubber wiper toward the drum.

Scraper Adjustment (CC50S & CC50PD)

CC50PD and CC50S Scrapers should be adjusted for ¼ - 3/4 inch (12-19 mm) drum clearance.

If necessary:

1 Loosen scraper bar mounting screws and adjust for uniform clearance across the drum. Check top and bottom of each scraper.

2 Retighten the mounting screws.

Note: PD scrapers must be adjusted periodically to compensate for tooth wear.
EVERY 10 HOURS OR DAILY (continued)

Checking Condition of Drum Shock Mounts and Mounting Bolts

1 Check all shock mount bolts for tightness.

2 Check condition of all rubber mounts on both sides of the drums. Replacement of the shock mounts is recommended when cracks develop in the rubber that have a maximum depth of 3/8 in. (10 mm) and a total length of 2 1/2 in. (60 mm).

When such cracks develop, the shock will deteriorate very quickly effecting spring rate and load carrying capacity.

REPLACE RUBBER MOUNTS IN COMPLETE SETS.

Checking Brake Operation

1 Drive the roller slowly forward and use the Emergency Stop to apply the brakes.

Machine should stop abruptly.

2 Pull out the Emergency Stop and restart the engine.

3 If braking distance is excessive, the cause must be determined and corrected.

WARNING: DO NOT OPERATE MACHINE WITH REDUCED BRAKING EFFECT.

Draining the Water Separator

Open drain valve to drain the water, close the valve when fuel runs clear.

KEEP WATER OUT OF THE FUEL
Checking the Water Spray System

This operation should be done for both front and rear water tanks.

1 Use only clean water in the tanks. Assure that inlet strainer (1) is in place before filling tank.

The strainer should be cleaned when water does not pass through rapidly. Strainer lifts out easily for cleaning.

2 Clean the outlet strainer daily.

With water pump OFF, remove the strainer bowl (2). Clean the strainer screen and bowl with clean water then replace.

3 Spray nozzles (3) are located behind the tank support.

Check that the nozzles are not clogged, water should fan out to cover the entire surface of the drum.

The nozzles include individual strainers at each nozzle tip and can be removed by hand for cleaning. To remove a nozzle, simply turn counterclockwise.

Use compressed air or clean water to clean the nozzle tips and strainers.
Cold Weather

The water system must be drained when machine is exposed to freezing temperatures.

CAUTION: DAMAGE TO WATER SYSTEM COMPONENTS CAN RESULT IF WATER IS NOT DRAINED IN FREEZING WEATHER.

1. Drain the water tank by removing the drain plug (5) on the bottom of the tank.
2. Open solenoid drain valve (4).
3. Remove outlet strainer bowl (3) and spill out the water.
4. Repeat above steps for the other tank.
Draining Fuel Sediment Bowl

1. Loosen knurled nut and pivot clamp outward to drop the glass bowl.
2. Remove the gasket and strainer screen from the top of the housing.
3. Wash the strainer screen and bowl in clean diesel fuel. Check gasket, replace if hard or damaged.
4. Reassemble.

Checking Drum Oil Level

NOTE: EACH DRUM CONTAINS TWO SEPARATE RESERVOIRS FOR LUBRICATING THE ECCENTRIC WEIGHT BEARINGS. OIL LEVEL IS CHECKED SEPARATELY AT EACH SIDE.

1. Drive the roller on a level surface until indicator (1) is aligned with top of frame as shown. Fill plug (2) is then located at the 12 o'clock position.
2. Oil level should show approximately halfway on the sight glass (3).
3. If necessary, add type D oil specified on page 3-3.
4. Repeat this procedure for the other side of the drum. Also check the oil level of the other drum.
Lubricating the Steering Hitch and Steering Cylinders

CC50A Cross Type Hitch

WARNING: NEVER ALLOW ANYONE TO STAND IN THE STEERING HITCH AREA WHEN THE ENGINE IS RUNNING. INJURY COULD OCCUR IF THE STEERING IS OPERATED.

1. Clean any dirt and grease from the 4 hitch fittings.

2. Lubricate the vertical and horizontal pins of the hitch with five shots of type A grease specified on page 3-3.

   Be sure that grease enters the bearings.

3. Lubricate the steering cylinder fittings with two shots of grease at each of the four fittings.

CC50S and CC50PD Standard Hitch

WARNING: NEVER ALLOW ANYONE TO STAND IN THE STEERING HITCH AREA WHEN THE ENGINE IS RUNNING. INJURY COULD OCCUR IF THE STEERING IS OPERATED.

1. Turn the steering to the right so that lubrication fittings are accessible on the left side of the machine, there are 3 fittings on each side.

2. Clean any dirt and grease from the fittings.

3. Grease the vertical pin with 5 shots of grease making sure that grease enters the bearings. Use type A grease specified on page 3-3.

4. Grease the steering cylinder fittings with 2 shots of grease at each fitting.

5. Turn the steering to the left and repeat above procedure for the horizontal pin and the other steering cylinder. Cover plate must be removed for access to the horizontal pin fitting.
EVERY 200 HOURS OR MONTHLY

Changing the Engine Oil

Drain engine oil after engine has run for some time, any sediment or impurities will be in suspension and drain more readily.

Draining:

1. Clean the area around the drain plug (1) and remove. A 20 liter (5 US gallon) drain pan is adequate.

2. Allow the oil to drain.

3. Check the condition of the oil.
   - Thin, black oil indicates fuel dilution.
   - Milky discoloration indicates coolant dilution.

WARNING: USE CAUTION WHEN DRAINING OIL OR CHANGING FILTERS. HOT OIL OR COMPONENTS CAN CAUSE BURNS IF THEY CONTACT SKIN:

Replacing the Oil Filter

1. Using a filter wrench, loosen the filter, then unscrew the filter by hand and discard.

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

3. Fill the new filter with clean engine oil, also apply a light film of oil to the gasket sealing surface before installing the filter.

   CAUTION: FILL THE FILTER WITH CLEAN ENGINE OIL BEFORE INSTALLING.

4. Screw the filter by hand until the seal seats against the filter head. Then tighten an additional half-turn using a filter wrench if necessary.

   CAUTION: OVERTIGHTENING MAY DISTORT THE THREADS OR DAMAGE THE FILTER ELEMENT SEAL.
Refilling with Oil:

1 Install the oil pan drain plug and fill the engine with type B oil specified on page 3-3.

   Approximate refill capacity:
   Cummins Engine - 20 qts (19 liters) + filter

2 Operate the engine at idle and inspect for leaks at the filter and the drain plug.

3 Stop the engine and check oil level with the dipstick. Allow 5 minutes for oil to drain down before checking. Oil should be at the FULL mark on the dipstick.

   NOTE: For Coolant filter maintenance, refer to the Cummins Engine Operation and Maintenance Manual.

Replacing the Hydraulic System Filters

1 With the hydraulic system warmed-up and running, check the filter indicators, filters must be replaced if gauge is in the RED range.

   Note Cold oil may cause gauges to show RED.

2 Wipe any dirt from the filter housing. Remove and discard the old filters.

3 Fill the new filter with clean hydraulic oil and apply a thin film of clean hydraulic oil to the new filter seals.

4 Tighten each filter by hand, tighten additional half-turn after gasket contact.

   Note Overtightening the filter can distort the threads or damage the seal.

5 Start the engine and check that there is no leakage around the filters.
EVERY 200 HOURS OR MONTHLY (continued)

Checking Pump Drive Oil Level

1 Be sure that roller is standing on a level surface.
2 Remove the level plug (2) on the right side of the pump drive housing. Oil level should be up to the bottom of the plug hole.
3 If level is low, add oil through the filler plug hole (1) until oil runs out through the level plug (2) hole.
   Use type D oil as specified on page 3-3.
4 Clean and replace the plugs.

Checking Oil Level in the Drum Planetary Gear

1 Fill plug (1) is located at the 12 o'clock position, oil level is checked at the plugs located at 3 o'clock or 9 o'clock position on the planetary gear.
2 Clean the area around one of the level plugs.
3 Remove one level plug (2) and check that oil level is up to the plug hole.
4 If necessary, add type D oil specified on page 3-3 to maintain level at half-full.
5 Clean and replace the plugs.
6 Repeat the above procedure for the other drum.
Lubricate Console Swivel Bearing
CC50A

Lubricate the steering column with 2 shots of type A grease specified on page 3-3.

Lubrication Fitting
EVERY 1000 HOURS OR YEARLY

Draining the Engine Coolant, Flushing the Cooling System

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

WARNING: AT OPERATING TEMPERATURE THE COOLANT IS HOT AND UNDER PRESSURE. STEAM CAN CAUSE PERSONAL INJURY. REMOVE FILL CAP WHEN COOLANT TEMPERATURE IS BELOW 120°F (50°C).

1 With the engine cool and the roller on a level surface, remove the radiator cap (1) and open the drain cock (2) at the bottom of the radiator and also at the engine oil cooler.

A drain pan with a capacity of about 11 gallons (40 liters) will be adequate.

2 Check for damaged hoses and loose or damaged hose clamps. Check the radiator for leaks, damage and buildup of dirt. Clean and repair as required.

3 To clean the system, flush with clean water. If the system shows mineral build-up, scale, rust or oil, use a heavy duty radiator cleaner and follow the manufacturer's instructions.

4 Refill the system slowly with a mixture of 50% water and 50% ethylene-glycol type antifreeze.

During filling, air must be vented from the engine coolant passages. Open the engine venting petcock and the petcock on the aftercooler on CC50 S and PD machines.

See CUMMINS Engine Operation and Maintenance Manual for complete information on cleaning and refilling of the cooling system.

New coolant must be correctly charged with supplemental additives using liquid DCA4 concentrate or DCA4 coolant filter. See the Cummins Manual.
Changing Oil in the Hydraulic Tank

Strict cleanliness is essential when servicing the hydraulic system to ensure trouble-free operation of the roller.

Drain the oil after the machine has run for some time so the components and fluid are at operating temperature. Any sediment or impurities in the reservoir will be in suspension and drain more readily.

Draining the hydraulic tank:

1. Clean the area around the tank drain plug and remove the plug. Allow the oil to drain into a suitable container that can hold at least 225 liters (60 US gallons).

2. Clean and remove the cover plate located on the top of the hydraulic tank. Clean out any sediment.

3. Replace the cover plate using new gasket and Loctite sealing compound or its equivalent to ensure a good seal.

   **Note** Ensure that sealing compound does not enter the tank.

4. Replace the hydraulic system filters at the same time. Also check that breather holes in the hydraulic tank cap are not clogged, clean the cap with diesel fuel if necessary.

Filling the hydraulic tank:

1. Refill the tank with type C oil specified on page 3-3.

3. Start the engine and operate the drive, steering and vibration systems. Check for leaks at the filters, drain plug and tank cover.

4. Check oil level and add if necessary.
EVERY 1000 HOURS OR YEARLY (continued)

Replacing the Fuel Filters

1. Using a filter wrench, remove and discard both the fuel filter (1) and the water separator (2).
2. Clean the gasket seating surfaces of the filter heads.
3. Fill new filters with clean fuel and lubricate seals with clean oil.
4. Install the new filters and tighten until gasket contacts base, then tighten 1/2 to 3/4 turn more.
5. Also clean the strainer screen in the sediment bowl.

Small amounts of air introduced by changing the filters will be vented automatically, if filters are filled with fuel prior to installation. If air venting is necessary refer to the engine manual for instructions.

Changing Drum Reservoir Oil

Drain the oil after machine has been operated for some time so oil is warm.

NOTE: EACH DRUM CONTAINS TWO SEPARATE RESERVOIRS. OIL IS DRAINED SEPARATELY FROM EACH SIDE.

1. Drive the roller on a level surface so that fill/drain plugs (1) are at the 6 o'clock position.
2. Remove plugs (1) from each side and allow the oil to drain into suitable containers that can hold at least 7 gal. (26.5 l).
3. After all oil has drained, move the roller so that the drain holes are at 12 o'clock position. Indicator (2) on the drum should line up with the top of the frame.
4. Fill the drum with type D oil specified on page 3-3 until oil shows half-way on the sight glass (3), DO NOT OVERFILL.
5. Clean and replace plugs (1). Repeat this procedure for the other drum.
Changing Oil in the Pump Drive

The Pump Drive should be at operating temperature before the oil is drained.

1. Be sure the roller is on a level surface. Remove the fill plug (1) and the drain plug (2). Allow all the oil to drain. Use a container that can hold at least 5 qts. (5 l).

2. Clean the drain plug and replace.

3. Loosen the level plug a few turns, see pg 3-17.

4. Fill the case with type D oil specified on page 3-3 until it flows from the level plug hole. Allow level to stabilize.

5. Tighten the level plug and replace the fill plug (1).

Changing Oil in the Drum

Planetary Gear

The Planetary Gear should be at operating temperature before the oil is drained.

1. Remove the drain plug (3) at 6 o'clock and the fill plug (2) at 12 o'clock on the hub.

2. Allow oil to drain into a suitable container, then clean and replace drain plug (3).

3. Remove the level plug (1) and fill with type D oil specified on page 3-3, through the fill plug hole until oil level reaches to the bottom of the level plug hole.

   Allow time for the oil level to stabilize, add more oil if necessary. Maintain the level at half-full.

4. Clean and replace the fill and level plugs.

5. Repeat the above procedure for the other drum.
**APPROXIMATE REFILL CAPACITIES**

<table>
<thead>
<tr>
<th>Component</th>
<th>Capacity</th>
<th>Unit(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine Oil</td>
<td>20 qts</td>
<td>(19 l)</td>
</tr>
<tr>
<td>Engine Coolant</td>
<td>41 qts</td>
<td>(39 l)</td>
</tr>
<tr>
<td>Fuel Tank</td>
<td>90 gal</td>
<td>(340 l)</td>
</tr>
<tr>
<td>Hydraulic Tank</td>
<td>90 gal</td>
<td>(340 l)</td>
</tr>
<tr>
<td>Drum Planetary Trans, CC50A</td>
<td>2.6 qts</td>
<td>(2.5 l)</td>
</tr>
<tr>
<td>CC50S, CC50PD</td>
<td>5.8 qts</td>
<td>(5.5 l)</td>
</tr>
<tr>
<td>Drum Reservoir x 2</td>
<td>14 gal</td>
<td>(53 l)</td>
</tr>
<tr>
<td>Pump Drive</td>
<td>4½ qts</td>
<td>(4½ l)</td>
</tr>
<tr>
<td>Water Tank x 2, CC50A</td>
<td>210 gal</td>
<td>(800 l)</td>
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