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MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

CATERPILLAR®

CATERPILLAR®

KEBU7519-08
July 2009

Operation and Maintenance Manual

CP-533E and CS-533E Vibratory Soil Compactors

BZE1-Up (Machine)
TBE1-Up (Machine)
BZG1-Up (Machine)
TLH1-Up (Machine)
DAK1-Up (Machine)
ASL1-Up (Machine)
TJL1-Up (Machine)
ASM1-Up (Machine)
DAM1-Up (Machine)

i03646685

Maintenance Interval Schedule

SMCS Code: 1000; 7000

Ensure that all safety information, warnings and instructions are read and understood before any operation or any maintenance procedures are performed.

The user is responsible for the performance of maintenance, including all adjustments, the use of proper lubricants, fluids, filters, and the replacement of components due to normal wear and aging. Failure to adhere to proper maintenance intervals and procedures may result in diminished performance of the product and/or accelerated wear of components.

Use mileage, fuel consumption, service hours, or calendar time, WHICH EVER OCCURS FIRST, in order to determine the maintenance intervals. Products that operate in severe operating conditions may require more frequent maintenance.

Note: Before each consecutive interval is performed, all maintenance from the previous interval must be performed.

When Required

Every 10 Service Hours or Daily

Every 50 Service Hours or Weekly

Every 50 Service Hours or Monthly

Initial 250 Service Hours

Every 250 Service Hours or Monthly

Every 250 Service Hours or 3 Months

Every 500 Service Hours or 3 Months

Every 500 Service Hours or 6 Months

Every 1000 Service Hours or 1 Year

Every 2000 Service Hours or 2 Years

Every Year

Every 3000 Service Hours or 2 Years

Every 3 Years After Date of Installation or Every 5 Years After Date of Manufacture

Every 3000 Service Hours or 3 Years

Every 6000 Service Hours or 3 Years

Every 12 000 Service Hours or 6 Years

i02829504

Axle Oil (Rear) - Change

SMCS Code: 3260-044

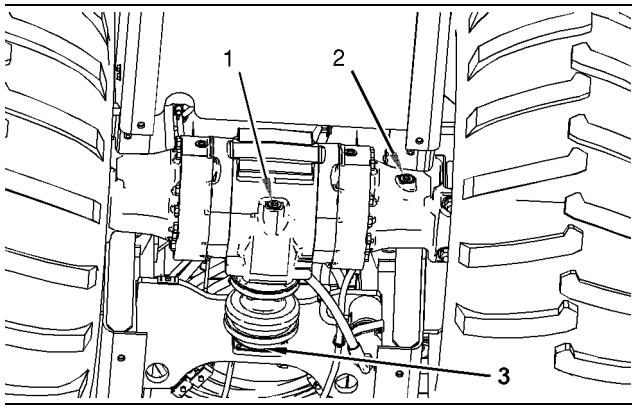

Illustration 71 g01037231

1. Run the machine and operate the machine for five minutes before you change the oil. This will suspend any foreign particles that are present in the oil. Running the machine will also provide a more accurate S·O·S analysis.

2. Remove differential drain plug (1). The differential drain plug (1) is located on the back side of the differential case near the bottom. Remove the drain plug for the axle gear reducer (3).

Note: Drain the oil into a suitable container. Dispose of the used oil in an appropriate manner.

3. Remove differential level/fill plug (2). The differential level/fill plug (2) is located on the back right side of the differential case.

4. Clean differential drain plug (1) and install differential drain plug (1). Clean the drain plug for the axle gear reducer (3) and install the drain plug for the axle gear reducer (3). Add the proper oil to the differential. Maintain the level of the oil to the bottom of the hole for the differential level/fill plug (2). Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Capacities (Refill)” section for more information.

5. Clean differential level/fill plug (2) and install differential level/fill plug (2).

i01913989

Axle Oil Level (Rear) - Check

SMCS Code: 3260-535-FLV

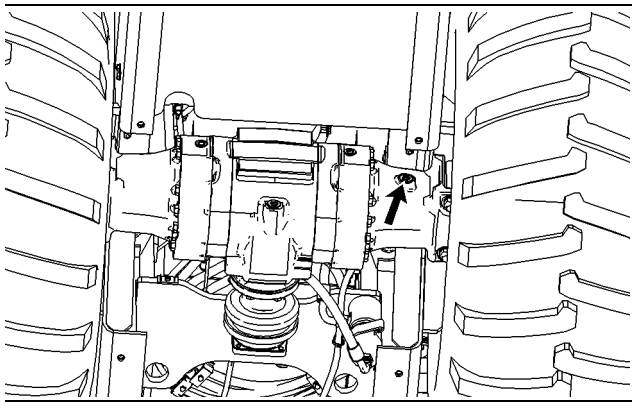

Illustration 72 g00996841

Note: Always check the oil level when the machine is parked on a level surface.

Note: The differential level/fill plug is located on the back side of the rear axle.

1. Remove the level/fill plug. Maintain the oil level to the bottom of the level/fill plug opening. If necessary, add oil.

Note: When you add oil, allow the oil to settle in order to verify the oil level.

2. Clean the level/fill plug. Install the plug.

i01913993

Axle Oil Sample - Obtain

SMCS Code: 3260-008

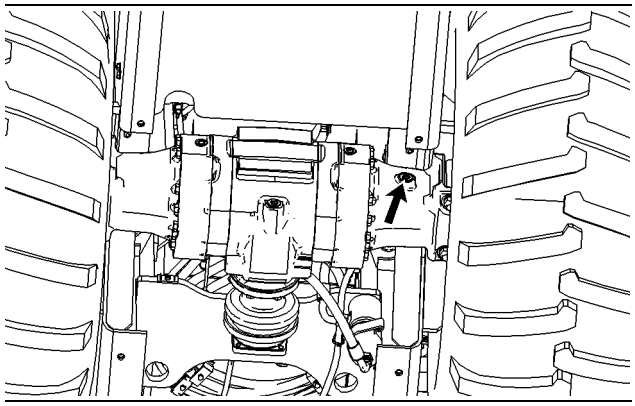

Illustration 73 g00996841

Obtain an oil sample of the differential oil through the oil level/fill plug. The oil level/fill plug is located on the back side of the rear axle.

Refer to the Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for more information.

i02855591

Backup Alarm - Test

SMCS Code: 7406-081

The backup alarm is located at the rear of the machine.

Turn the engine start switch to the ON position in order to perform the test.

Move the propel control lever to the REVERSE position.

The backup alarm should start to sound immediately. The backup alarm will continue to sound until the transmission control lever is moved to the STOP position or to the FORWARD position.

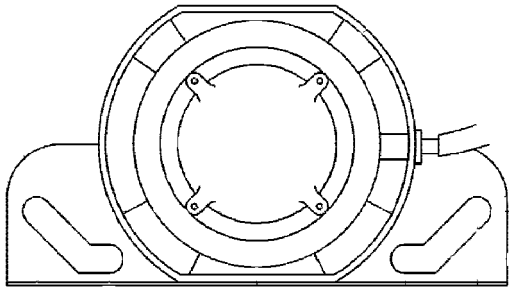

Illustration 74 g00930005

If the backup alarm does not sound, make the necessary repairs immediately. Do not operate a machine without a backup alarm.

i01985706

Battery - Clean/Check

SMCS Code: 1401-535

Illustration 75 g01028949

Note: The batteries that are supplied with the machines are maintenance free batteries. You do not need to check the level of the electrolyte in the maintenance free batteries.

Check the following items:

- Clean the top of the batteries with a clean cloth.
- Clean the battery terminals. Coat the battery terminals with petroleum jelly.
- Tighten the battery retainers on both of the batteries.

i00993589

Battery - Recycle

SMCS Code: 1401-561

Always recycle a battery. Never discard a battery.

Always return used batteries to one of the following locations:

- A battery supplier
- An authorized battery collection facility
- Recycling facility

i01985707

Battery or Battery Cable - Inspect/Replace

SMCS Code: 1401-040; 1401-510; 1402-040; 1402-510

1. Turn the engine start switch to the OFF position. Turn all switches to the OFF position.
2. Turn the battery disconnect switch to the OFF position. Remove the battery disconnect switch key.

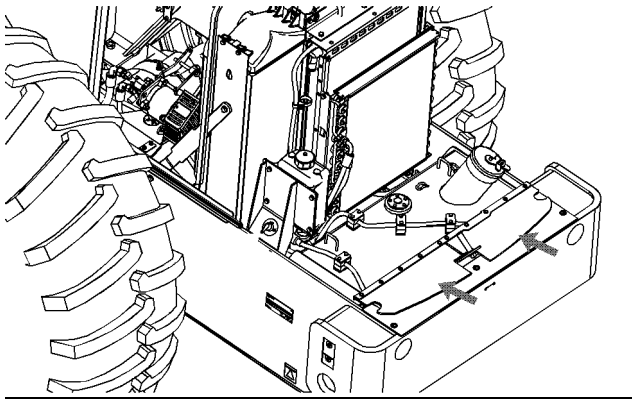

Illustration 76 g01028957

3. The battery compartment is located at the rear of the machine in the engine compartment.
4. Remove the covers for the batteries.
5. At the battery disconnect switch, disconnect the negative battery cable that is connected to the frame.

Note: Do not allow the disconnected battery cables to contact the disconnect switch. Do not allow the disconnected battery cables to contact the other cables. Do not allow the disconnected battery cables to contact the opposite terminal of either battery.

6. Disconnect the negative battery cable at the battery.
7. Disconnect the positive battery cable from the battery.
8. Remove the positive cable from the starter motor.
9. Remove the cable that connects the two batteries together.
10. Perform the necessary repairs. Replace the cables or the batteries, as needed.
11. Reverse the above steps in order to reconnect the batteries.
12. Connect the battery cable at the battery disconnect switch.
13. Install the battery disconnect switch key.
14. Install the battery compartment covers.
15. Turn the battery disconnect switch to the ON position.

i01909555

Belts - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510

Your engine is equipped with a fan drive belt and with accessory drive belts. Your engine is also equipped with an alternator belt. For maximum engine performance and maximum utilization of your engine, inspect the belts for wear and for cracking. Check the belt tension. Adjust the belt tension in order to minimize belt slippage. Belt slippage will decrease the belt life. Belt slippage will also cause poor performance of the alternator and of any driven equipment.

If new belts are installed, recheck the belt adjustment after 30 minutes of operation. If two belts or more are required for an application, replace the belts in belt sets. If only one belt of a matched set is replaced, the new belt will carry more load. This is due to the fact that the older belts are stretched. The additional load on the new belt could cause the new belt to break.

Open the engine compartment.

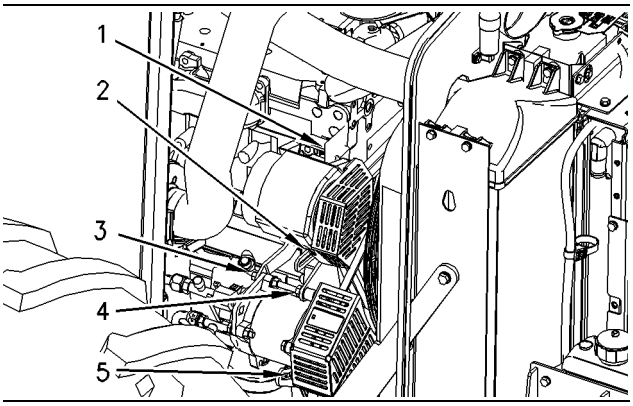

Illustration 77 g00995076

(1) Alternator mounting bolt
(2) Alternator bracket bolt
(3) Compressor mounting bolt
(4) Compressor mounting bolt
(5) Compressor bracket mounting bolt

Alternator Belt

1. To check the belt tension, apply 110 N (25 lb) of force midway between the pulleys. Correctly adjusted belts will deflect 14 to 20 mm (1/2 to 3/4 inch).

2. In order to adjust the alternator belt, loosen bracket bolt (2) and mounting bolt (1) on the alternator bracket.

3. To achieve the correct adjustment, move the alternator inward or move the alternator outward, as required.

4. Tighten mounting bolt (1) and bracket bolt (2).

Air Conditioner Belt (If Equipped)

1. Stop the engine in order to inspect the air conditioner belt.

2. Inspect the condition of the air conditioner belt and the adjustment of the air conditioner belt. The air conditioner belt should deflect 14 to 20 mm (0.55 to 0.79 inch) under 110 N (25 lb) of force.

3. Loosen compressor mounting bolts (3) and (4). Loosen compressor bracket mounting bolt (5).

4. Move the compressor until the correct belt tension is reached.

5. Tighten compressor bracket mounting bolt (5). Tighten compressor mounting bolts (3) and (4).

6. Recheck the belt deflection. If the amount of deflection is incorrect, repeat Step 3 to Step 5.

7. Start the engine. If poor cooling is still experienced, turn off the air conditioner. Stop the engine. Notify your Caterpillar dealer for air conditioner system service.

i01986269

Cab Air Filter - Clean/Replace (If Equipped)

SMCS Code: 7342-070; 7342-510

The cab air filter is located to the left of the seat.

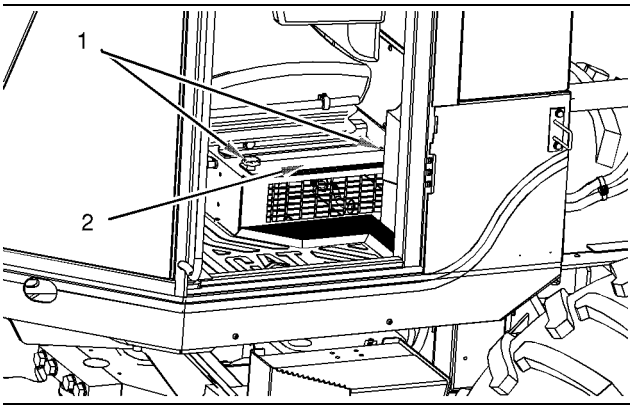

Illustration 78 g01039169

1. Remove two hand knobs (1).

2. Remove cover (2).

3. To remove the air filter, pull upward on the filter.

4. Clean the air filter with a maximum of 200 kPa (30 psi).

5. After you clean the air filter, inspect the air filter. If the air filter is damaged or badly contaminated, use a new air filter.

6. Install the filter in the reverse order of the previous steps.

Purge Valves for the Air Conditioning (If Equipped)

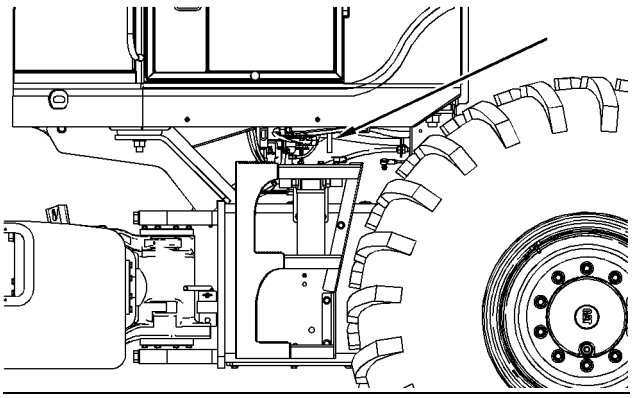

Illustration 79 g01029837

The purge valves are located in rubber hoses under the cab. There is a valve on the left side of the machine and there is a valve on the right side of the machine. Squeeze the rubber hose in order to remove any dirt or debris. The purge valve may need to be removed from the hose in order to completely remove all of the dirt or debris.

Note: If your machine is equipped with side panels, the side panels will need to be removed in order to gain access to the purge valves.

i01909803

Circuit Breakers - Reset

SMCS Code: 1420-529

The circuit breaker panel is located in the engine compartment.

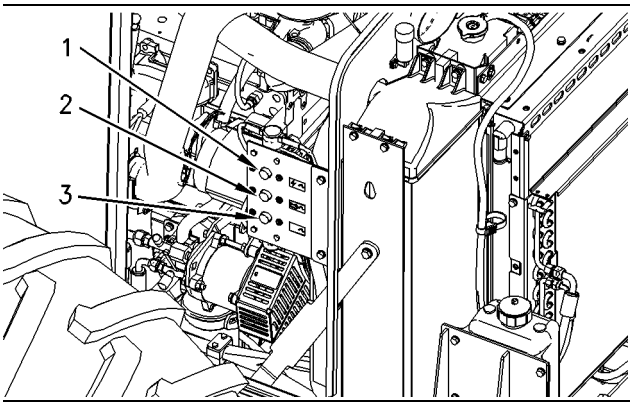

Illustration 80 g00997034

Circuit Breaker/Reset – Push in the button in order to reset the circuit breaker. If the electrical system is functioning properly, the button will remain depressed. If the button does not remain depressed, check the appropriate electrical circuit. Repair the electrical circuit, if necessary.

Main Breaker (1)

Breaker for the Alternator (2)

Breaker for the Glow Plugs (3)

i02005168

Cooling System Coolant (ELC) - Change

SMCS Code: 1395-044-NL

Drain the coolant whenever the coolant is dirty. Drain the coolant when foam is observed.

1. Stop the engine. Allow the cooling system to cool completely.

2. Open the hood for the engine. Refer to the Operation and Maintenance Manual, “Acces Doors and Covers” for further information.

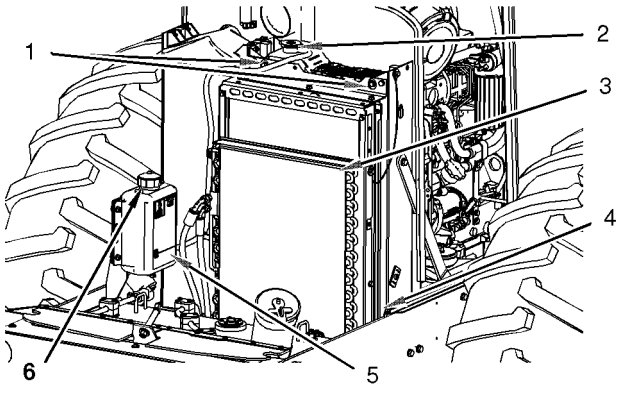

Illustration 81 g01040615

(1) Bolts
(2) Radiator cap
(3) Cooler
(4) Drain valve
(5) Expansion tank
(6) Cap for the expansion tank

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove cooling system pressure cap slowly to relieve pressure only when engine is stopped and cooling system pressure cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Coolant Additive contains alkali. Avoid contact with skin and eyes.

3. Slowly loosen radiator cap (2) and remove radiator cap (2).

4. Remove the cap for expansion tank (6).

NOTICE
Care must be taken to ensure that fluids are contained during performance of inspection, maintenance, testing, adjusting and repair of the product. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembling any component containing fluids.

Refer to Special Publication, NENG2500, “Caterpillar Tools and Shop Products Guide” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

5. Drain valve (4) is located on the bottom corner of the radiator. Remove bolts (1) in order to allow cooler (3) to swing forward. This will allow easier access to drain valve (4). Open drain valve (4). Allow the coolant to drain into a suitable container.

6. Close drain valve (4). Move cooler (3) into position and install bolts (1). Fill the radiator with a solution which consists of clean water and of cooling system cleaner. Once the radiator is filled, fill the cooling system expansion tank to the full line. The concentration of the cooling system cleaner in the solution should be between 6 percent and 10 percent.

7. Install radiator cap (2) and the cap for the expansion tank (6).

8. Close the hood for the engine.

9. Start the engine. Run the engine for 90 minutes. Stop the engine. Allow the cooling system to cool completely.

10. Slowly loosen radiator cap (2) and remove radiator cap (2).

11. Remove the cap for expansion tank (6).

12. Remove bolts (1) in order to allow cooler (3) to swing forward. Drain the cleaning solution into a suitable container.

13. While the engine is stopped, flush the system with water. Flush the system until the draining water is transparent.

14. Move cooler (3) into position and install bolts (1). Close drain valve (4).

NOTICE
Mixing Extended Life Coolant (ELC) with other products reduces the effectiveness of the coolant and shortens coolant life. Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specifications for premixed or concentrate coolants. Use only Caterpillar Extender with Caterpillar ELC. Failure to follow these recommendations could result in the damage to cooling systems components.

If ELC cooling system contamination occurs, refer to Operation and Maintenance, “Extended Life Coolant (ELC)” under the topic ELC Cooling System Contamination.

15. Add the coolant solution. See the following topics:

- Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “Cooling System Specifications”
- Operation and Maintenance Manual, “Capacities (Refill)”

Note: If you are using Caterpillar antifreeze, do not add the supplemental coolant additive at this time.

16. Start the engine. Run the engine without the cooling system pressure cap until the thermostat opens and the coolant level stabilizes.

17. Completely fill the radiator.

Note: The radiator must remain completely full in order for the expansion tank to work properly.

18. Replace radiator cap (2) if the gasket is damaged. Install radiator cap (2).

19. Maintain the level of the coolant to the full line on expansion tank (5).

20. Install the cap for expansion tank (6).

21. Stop the engine.

22. Close the hood for the engine.

i01986272

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352-544-NL

⚠ WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

When a Caterpillar Extended Life Coolant (ELC) is used, an Extender must be added to the cooling system.

Use a 8T-5296 Coolant Test Kit to check the concentration of the coolant.

Refer to the Special Publication, SEBU6250, “Caterpillar Machines Fluids Recommendations”, “Cooling System Specifications” for more information about the addition of Extender.

NOTICE

Topping off or mixing Cat ELC with other products that do not meet Caterpillar EC-1 specifications reduces the effectiveness of the coolant and shortens coolant service life.

Use only Caterpillar products or commercial products that have passed the Caterpillar EC-1 specification for pre-mixed or concentrate coolants. Use only Extender with Cat ELC.

Failure to follow these recommendations can result in shortened cooling system component life.

1. Stop the engine. Allow the cooling system to completely cool.

2. Open the engine compartment.

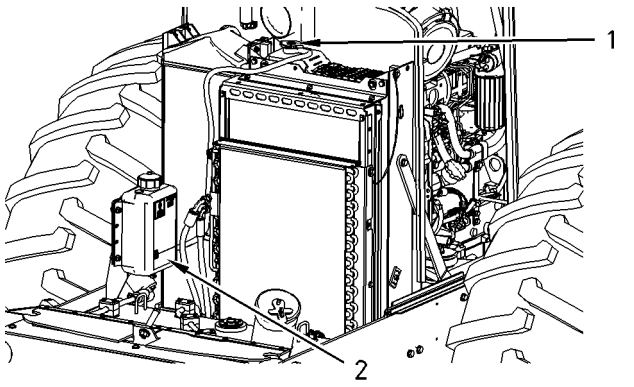

Illustration 82 g00997589

(1) Radiator cap
(2) Expansion tank

3. Remove the cap for expansion tank (2).

4. Add the recommended amount of extender to the coolant system. Refer to the Special Publication, SEBU6250, “Caterpillar Machines Fluids Recommendations”, “Cooling System Specifications” for the proper amount.

5. Maintain the level of the coolant to the full line on cooling system expansion tank (2).

Note: The radiator must remain completely full in order for the expansion tank to work properly.

6. Install the cap for the expansion tank (2).

7. Close the engine compartment.

i02005238

Cooling System Coolant Level - Check

SMCS Code: 1350-535-FLV; 1395-535-FLV

⚠ WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

1. Open the engine compartment.

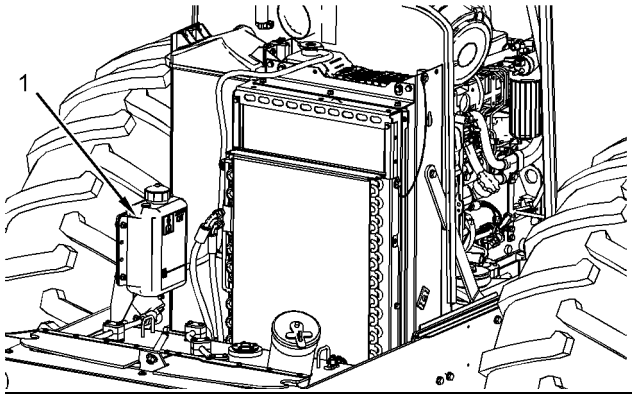

Illustration 83 g01037151

2. Maintain the level of the coolant in expansion tank (1) to the level line.

3. Close the engine compartment.

i01914342

Cooling System Coolant Sample (Level 1) - Obtain

SMCS Code: 1350-008; 1395-008; 7542

NOTICE
Always use a designated pump for oil sampling, and use a separate designated pump for coolant sampling. Using the same pump for both types of samples may contaminate the samples that are being drawn. This contaminate may cause a false analysis and an incorrect interpretation that could lead to concerns by both dealers and customers.

Note: Level 1 results may indicate a need for Level 2 Analysis.

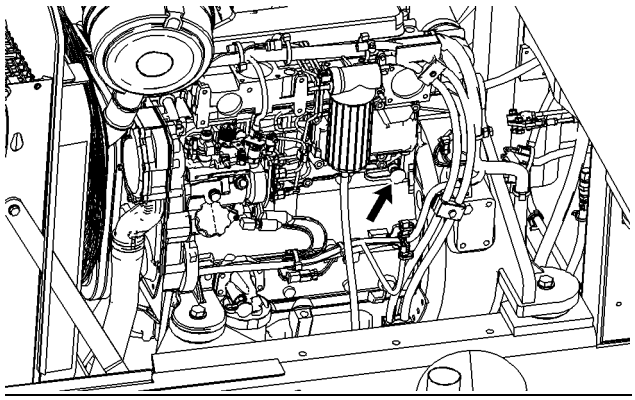

Illustration 84 g00997081

Refer to the Operation and Maintenance Manual, “Access Doors and Covers” for the location of the service points.

Obtain the sample of the coolant as close as possible to the recommended sampling interval. In order to receive the full effect of S·O·S analysis, you must establish a consistent trend of data. In order to establish a pertinent history of data, perform consistent samplings that are evenly spaced. Supplies for collecting samples can be obtained from your Caterpillar dealer.

Use the following guidelines for proper sampling of the coolant:

- Complete the information on the label for the sampling bottle before you begin to take the samples.
- Keep the unused sampling bottles stored in plastic bags.
- Obtain coolant samples directly from the coolant sample port. You should not obtain the samples from any other location.
- Keep the lids on empty sampling bottles until you are ready to collect the sample.
- Place the sample in the mailing tube immediately after obtaining the sample in order to avoid contamination.
- Never collect samples from expansion bottles.
- Never collect samples from the drain for a system.

Submit the sample for Level 1 analysis.

For additional information about coolant analysis, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i01914348

Cooling System Coolant Sample (Level 2) - Obtain

SMCS Code: 1350-008; 1395-008; 7542

NOTICE
Always use a designated pump for oil sampling, and use a separate designated pump for coolant sampling. Using the same pump for both types of samples may contaminate the samples that are being drawn. This contaminate may cause a false analysis and an incorrect interpretation that could lead to concerns by both dealers and customers.

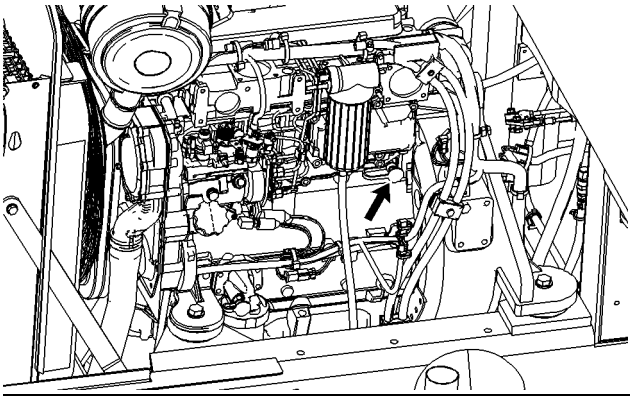

Illustration 85 g00997081

Refer to the Operation and Maintenance Manual, “Access Doors and Covers” for the location of the service points.

Obtain the sample of the coolant as close as possible to the recommended sampling interval. Supplies for collecting samples can be obtained from your Caterpillar dealer.

Refer to Operation and Maintenance Manual, “Cooling System Coolant Sample (Level 1) - Obtain” for the guidelines for proper sampling of the coolant.

Submit the sample for Level 2 analysis.

For additional information about coolant analysis, see Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” or consult your Caterpillar dealer.

i01909533

Cooling System Pressure Cap - Clean/Replace

SMCS Code: 1382-070; 1382-510

1. Open the engine compartment.

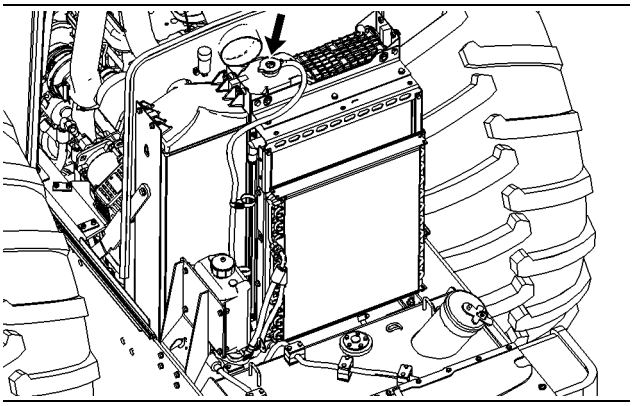

Illustration 86 g00996985

2. The cooling system pressure cap is on the top of the radiator.

⚠ WARNING

Personal injury can result from hot coolant, steam and alkali.

At operating temperature, engine coolant is hot and under pressure. The radiator and all lines to heaters or the engine contain hot coolant or steam. Any contact can cause severe burns.

Remove cooling system pressure cap slowly to relieve pressure only when engine is stopped and cooling system pressure cap is cool enough to touch with your bare hand.

Do not attempt to tighten hose connections when the coolant is hot, the hose can come off causing burns.

Cooling System Coolant Additive contains alkali. Avoid contact with skin and eyes.

3. Remove the cooling system pressure cap slowly in order to relieve pressure.

4. Inspect the cooling system pressure cap for foreign material, for deposits, and for damage. Clean the cooling system pressure cap with a clean cloth. If the cooling system pressure cap is damaged, replace the cooling system pressure cap.

5. Install the cooling system pressure cap.

6. Close the engine compartment.

i02005284

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510; 1393-010

Replace the water temperature regulator on a regular basis in order to reduce the chance of unscheduled downtime and of problems with the cooling system.

The water temperature regulator should be replaced after the cooling system has been cleaned. Replace the water temperature regulator while the cooling system is completely drained. Replace the water temperature regulator while the cooling system coolant is drained to a level below the water temperature regulator housing.

NOTICE
Failure to replace the engine's water temperature regulator on a regularly scheduled basis could cause severe engine damage.

Note: If you are only replacing the water temperature regulator, drain the cooling system coolant to a level that is below the water temperature regulator housing.

1. Open the engine compartment.

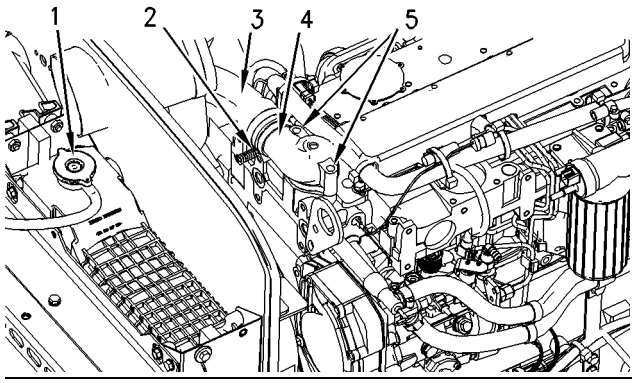

Illustration 87 g00997683

⚠ WARNING

At operating temperature, the engine coolant is hot and under pressure.

Steam can cause personal injury.

Check the coolant level only after the engine has been stopped and the fill cap is cool enough to touch with your bare hand.

Remove the fill cap slowly to relieve pressure.

Cooling system conditioner contains alkali. Avoid contact with the skin and eyes to prevent personal injury.

2. Remove radiator cap (1) in order to relieve the pressure in the cooling system.

3. Loosen hose clamp (2) and remove hose (3) from water temperature regulator housing (4).

4. Remove bolts (5) from water temperature regulator housing (4) and remove water temperature regulator housing (4).

5. Remove the gasket and remove the water temperature regulator from the water temperature regulator housing. Make a note of the orientation of the old regulator.

NOTICE
The water temperature regulators may be reused if the water temperature regulators are within test specifications, are not damaged, and do not have excessive buildup of deposits.

NOTICE
Since Caterpillar engines incorporate a shunt design cooling system, it is mandatory to always operate the engine with a water temperature regulator.

Depending on load, failure to operate with a water temperature regulator could result in either an overheating or an overcooling condition.

NOTICE
If the water temperature regulator is installed incorrectly, it will cause the engine to overheat.

6. Install a new water temperature regulator. Orient the regulator in the same manner as the old regulator. Install a new gasket. Install the water temperature regulator housing.

7. Install the water temperature regulator housing and the hose. Tighten the hose clamp.

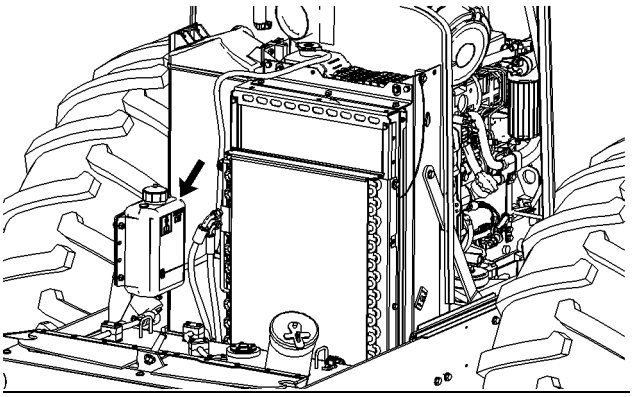

Illustration 88 g00997605

8. Add the cooling system coolant. Maintain the level of the coolant to the full line on the cooling system expansion tank.

Note: The radiator must be completely full in order for the expansion tank to work properly.

9. Inspect cooling system pressure cap and the gasket for damage. Replace the pressure cap if the pressure cap or the gasket are damaged.

10. Install the cooling system pressure cap.

11. Close the engine compartment.

i01900991

Crankshaft Vibration Damper - Inspect

SMCS Code: 1205-040

⚠ WARNING

Accidental machine starting can cause injury or death to personnel working on the machine.

To avoid accidental machine starting, turn the battery disconnect switch to the OFF position and remove the key. If the machine is not equipped with a battery disconnect switch, disconnect the battery cables from the battery and tape the battery clamps.

Place a do not operate tag at the battery disconnect switch location to inform personnel that the machine is being worked on.

The Crankshaft Vibration Damper is located under the hood on the right side of the machine.

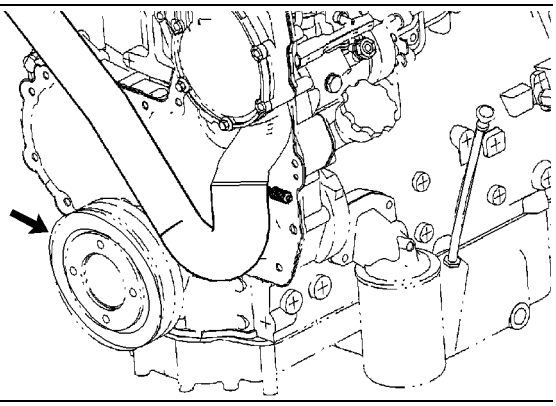

Illustration 89 g00944099

Typical example

The Crankshaft Vibration Damper

Damage to the crankshaft vibration damper or failure of the crankshaft vibration damper can increase torsional vibrations. This can result in damage to the crankshaft and to other engine components. A deteriorating damper can cause excessive gear train noise at variable points in the speed range.

The damper is mounted to the crankshaft on the front of the engine.

Visually inspect the crankshaft vibration damper for damage.

Check the bolts for proper tightness.

Close the hood.

Refer to the Service Manual or consult your Caterpillar dealer for information about damper replacement.

i01763534

Drum Cooling Oil - Change

SMCS Code: 6605-044-OC

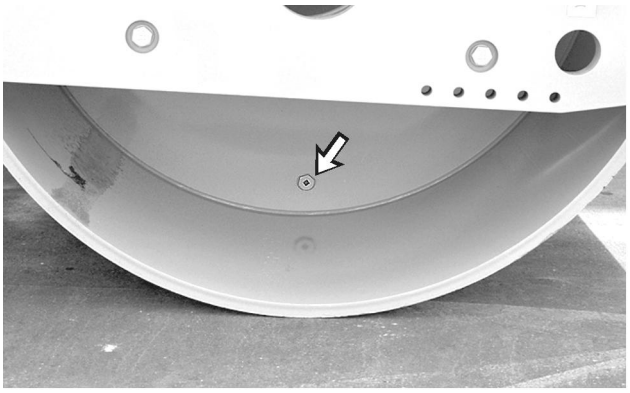

Illustration 90 g00902281

Note: Clean the area around the fill/drain plug before servicing the drum.

The drum cooling oil requires service when the disassembly of the drum or the assembly of the drum is needed.

Rotate the fill/drain plug to the bottom of the drum. Remove the drain plug. Pump the oil out of the drum.

Use the drain plug opening in order to fill the cavity. Install the plug after adding the correct amount of oil. The oil will be near the bottom of the opening.

In order to check the level of the oil, rotate the drum so the plug is at the bottom of the drum. Remove the plug. Maintain the oil to the bottom of the opening.

Refer to the Operation and Maintenance Manual, “Lubricant Viscosities” and the Operation and Maintenance Manual, “Capacities (Refill)”.

i02839701

Drum Scrapers - Inspect/Adjust/Replace

SMCS Code: 6607-025; 6607-040; 6607-510

Smooth Drum Scrapers (If Equipped)

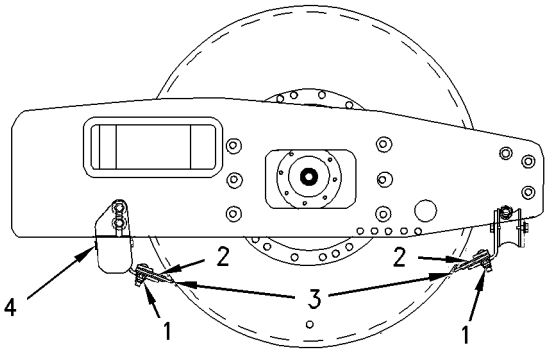

Illustration 91 g00930431

Steel Scrapers

There is one scraper that is located on the front bumper. There is an optional steel scraper for the rear of the drum.

Adjust

Loosen bolts (1).

Adjust the steel scraper to 20 mm (0.75 inch) to 25 mm (1 inch) from the drum surface.

Flexible Scrapers

There is a scraper on the front of the drum and there is a scraper on the rear of the drum.

Adjust

1. Inspect flexible scraper (2). Clean the flexible scraper of dirt and debris.
2. Loosen bolts (1) that are holding the rear flexible scraper blade and the backing plate to the bracket.
3. Loosen bolts (1) that hold the front flexible scraper blade and the backing plate to the bracket.

Note: When you adjust flexible scraper (3), steel backing plate (2) must not come into contact with the surface of the drum.

4. Adjust flexible scraper blades (3) in order to slightly come into contact with the surface of the drum. Adjust the flexible scraper blades (3) and backing plate (2) together.
5. Tighten bolts (1).

Replace the Flexible Scrapers

1. Replace the flexible scrapers if excessive wear or damage is evident.
2. Loosen the bolts (1) that are holding flexible scraper blades (3).
3. Remove flexible scraper blades (3). Install the new flexible scraper blades.

Note: When you adjust flexible scraper blade (3), the steel backing plate (2) must not come into contact with the surface of the drum.

4. Adjust flexible scraper blades (3) in order to slightly come into contact with the surface of the drum. Adjust the flexible scraper blades (3) and backing plate (2) together.
5. Tighten the bolts and tighten the nuts.

Padded Drum Scraper Assembly (If Equipped)

Adjust

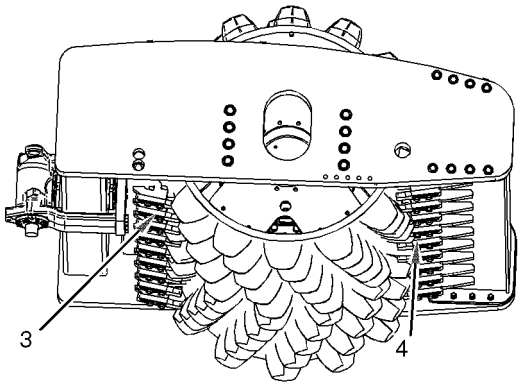

Illustration 92 g01011466

There is one scraper that is located in front of the drum. There is a scraper that is located at the rear of the drum.

1. Inspect the scraper. Clean the dirt and the debris from the scraper.
2. There are two bolts (4) for each scraper (3). Each scraper is individually adjustable.

3. Slide the scraper (3) toward the drum. Adjust the tips so the tips are 25 mm (1 inch) from the surface of the drum. Center the scraper between the pads.

4. Tighten the bolts.

   Bolts (4) ..... 542 N·m (400 lb ft)

i02011923

Eccentric Weight Housing Oil - Change

SMCS Code: 6606-044-OC

Change the Oil

1. Take an oil sample from each eccentric weight housing. There is one eccentric weight housing on each side of the drum. No flushing is necessary, if the oil sample cleanliness rating is equal or lower than ISO 23/21. The flushing procedure should be performed if an oil sample cleanliness rating is higher than ISO 23/21.

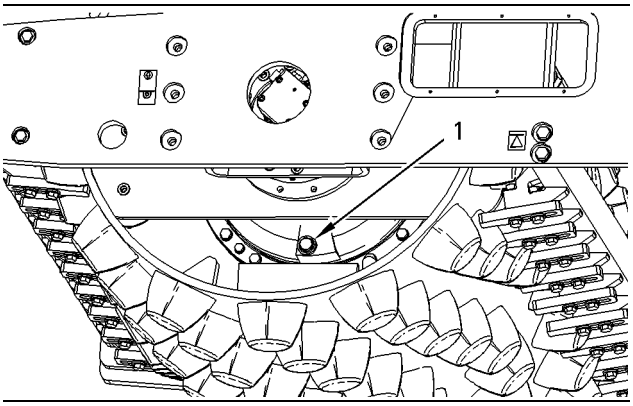

Illustration 93 g00999032

2. Rotate the drum until drain plug (1) is at the bottom of the drum.

3. Place a suitable container under the drain plug. Remove the drain plug. Drain the housing completely. Repeat this step for both housings.

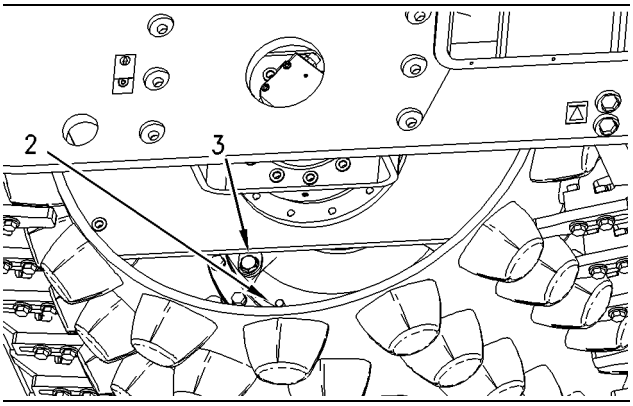

Illustration 94 g00999034

4. Rotate the drum until indicator bar (2) is at the bottom of the drum.

5. Remove level check plug (3). Fill the housing with oil. Refer to the Operation and Maintenance Manual, “Lubrication Viscosities” and Operation and Maintenance Manual, “Capacities (Refill)”. Maintain the level of the oil to the bottom of the level check opening.

6. Clean the plugs. Install the plugs.

7. Repeat this procedure for the other eccentric weight housing.

Flush the Housing

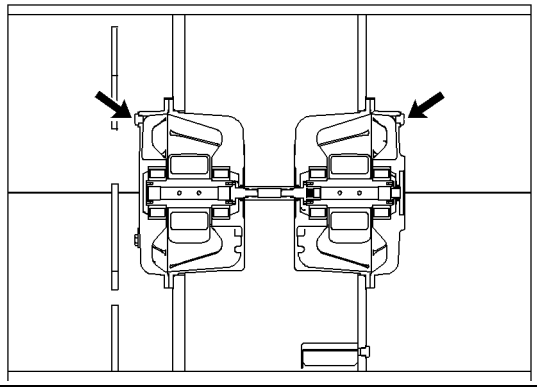

Illustration 95 g00661129

1. There are two eccentric weight housings. The housings are on each side of the drum. Perform the following procedure on each housing.

2. Drain the oil from the eccentric weight housings.

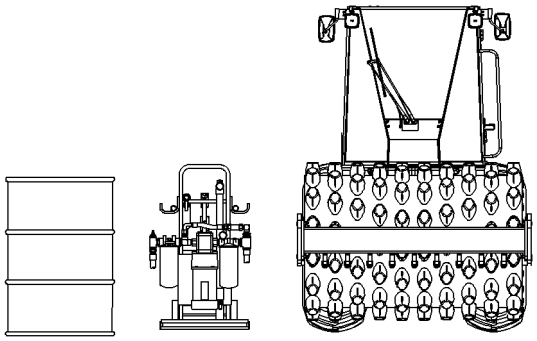

Illustration 96 g00999061

3. Pump 151 L (40 US gal) of a suitable hydraulic oil into a 208 L (55 US gal) drum.

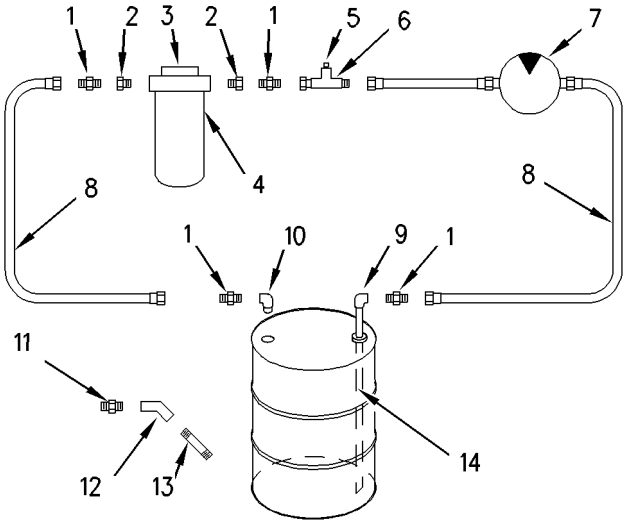

Illustration 97 g00684344

(1) 8C-6875 Connector
(2) 8B-5774 Reducer Bushing
(3) 9U-6989 Head
(4) 9U-6983 Filter Element
(5) 6V-3965 Nipple Assembly
(6) 8T-4834 Swivel Orifice Tee
(7) 127-8781 Filter Cart
(8) 2.4 m (8 ft) of 25 mm (1 inch) hose
(9) 3B-6498 Elbow
(10) 3L-7024 Street Elbow
(11) 127-0593 Connector
(12) 3B-7728 Elbow
(13) 3B-7265 Pipe Nipple
(14) 940 mm (37 inch) of 25 mm (1 inch) pipe

4. Use the 127-8781 Filter Cart in order to flush the oil in the 208 L (55 US gal) drum. Filter the oil for 30 minutes. The particle count of the clean oil must be a maximum of ISO 18/13.

5. Raise the machine. The drum and tires must not be in contact with the ground or the floor. Support the machine on stands. Refer to the Operation and Maintenance Manual, “Additional Messages” for the location on jacking up the machine.

6. Start the engine. Release the parking brake and rotate the drum until the fill/drain plug is at the top of the housing. Apply the parking brake and stop the engine.

7. Remove the plug. Install the valve and fitting assembly that is appropriate for your machine.

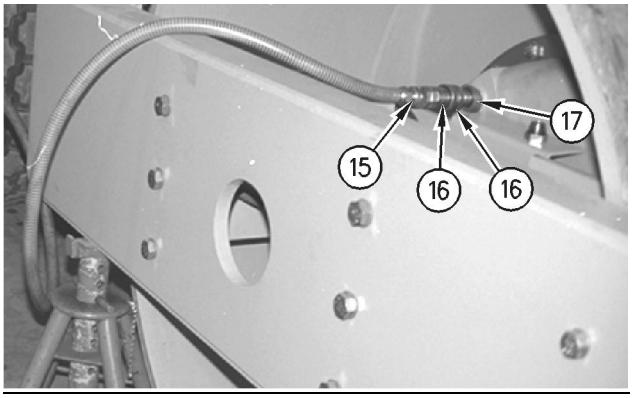

Illustration 98 g00698763

   a. Assemble the 126-7187 Adapter (17) into the male end of the 5R-3796 Quick Coupling Assembly (16). Install the adapter into the hole for the oil fill/drain plug. Assemble the 8T-0198 Seal Connector (15) onto the female end of the quick coupler.

8. Fill the housing with 22 L (6 US gal) gallons of clean oil. Remove the adapter and install the oil fill/drain plug.

9. Run the first flush cycle.

   a. Start the engine. Release the brake.

   b. Set the travel speed control to low speed. In order to rotate the drum, move the propel control.

   c. Set the vibratory amplitude control to the low position.

   d. Turn on the vibratory system. Run the vibratory system for 5 seconds. Turn off the vibratory system. Repeat the cycle for three minutes.

Note: For each cycle, do not run the vibratory system more than 5 seconds.

e. Stop the drum. Position the drum in order to drain the housings.

10. Install the transfer cart. Pump the oil out of the housings. Cycle the oil through the filter for 30 minutes. Cycle the oil until the oil is cleaned to a rating of ISO 18/13 or better.

11. Install the transfer cart to the housings. Pump the oil into the housings. Remove the adapter and install the oil fill/drain plug. For the second cycle, repeat steps 9.a through 9.d. After the second cycle, take an oil sample before filtering the oil. No further flushing is necessary, if the oil sample cleanliness rating is equal or lower than ISO 18/13. Another flushing is necessary, if the oil sample cleanliness rating is higher than ISO 18/13.

Note: If no further flushing is necessary, adjust the oil level so that the housing is filled to the correct oil level.

12. When the flushing is complete, rotate the drum to the position in order to drain the housings. Remove the valve and fitting assembly. Drain as much of the oil as possible.

13. Rotate the drum until the fill/drain plug is at the top. Remove the level check plug. Fill the drum to the correct level. Refer to the Operation and Maintenance Manual, “Capacities (Refill) ”. Refer to the Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations”, “Lubricant Information”.

Note: The new oil must have a oil sample cleanliness rating that is equal or lower than ISO 18/13.

i01953476

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070-PY; 1054-510-PY

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result.

Service the air cleaner filter element when the yellow piston on the engine air filter service indicator enters the red zone or the indicator reads 63.5 cm (25 inch) of water. Refer to Operation and Maintenance Manual, “Engine Air Filter Service Indicator - Inspect”.

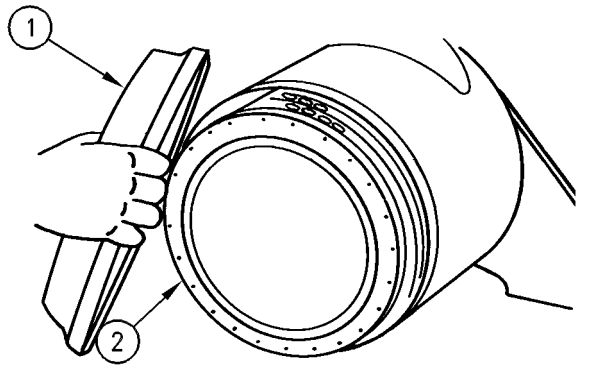

Illustration 99 g00102316

1. Remove cover (1) for the air filter housing.

2. Remove primary filter element (2) from the air filter housing.

3. Clean the inside of the air filter housing.

4. If the machine is equipped with a vacuator valve, clean the vacuator valve on the cover for the air filter housing.

5. Install a clean primary air filter element. Install the cover for the air filter housing.

Note: Refer to “Cleaning Primary Air Filter Elements”.

6. Reset the engine air filter service indicator.

7. Close the access door.

If the yellow piston in the indicator moves into the red zone after starting the engine or the exhaust smoke is still black after installation of a clean primary filter element, install a new primary filter element. If the piston remains in the red zone replace the secondary element.

Cleaning Primary Air Filter Elements

NOTICE
Caterpillar recommends certified air filter cleaning services available at participating Caterpillar dealers. The Caterpillar cleaning process uses proven procedures to assure consistent quality and sufficient filter life.

Observe the following guidelines if you attempt to clean the filter element:

Do not tap or strike the filter element in order to remove dust.

Do not wash the filter element.

Use low pressure compressed air in order to remove the dust from the filter element. Air pressure must not exceed 207 kPa (30 psi). Direct the air flow up the pleats and down the pleats from the inside of the filter element. Take extreme care in order to avoid damage to the pleats.

Do not use air filters with damaged pleats, gaskets, or seals. Dirt entering the engine will cause damage to engine components.

The primary air filter element can be used up to six times if the element is properly cleaned and if the element is properly inspected. When the primary air filter element is cleaned, check for rips or tears in the filter material. The primary air filter element should be replaced at least one time per year. This replacement should be performed regardless of the number of cleanings.

NOTICE
Do not clean the air filter elements by bumping or tapping. This could damage the seals. Do not use elements with damaged pleats, gaskets, or seals. Damaged elements will allow dirt to pass through. Engine damage could result.

Visually inspect the primary air filter elements before cleaning. Inspect the air filter elements for damage to the seal, the gaskets, and the outer cover. Discard any damaged air filter elements.

There are two common methods that are used to clean primary air filter elements:

- Pressurized air
- Vacuum cleaning

Pressurized Air

Pressurized air can be used to clean primary air filter elements that have not been cleaned more than two times. Pressurized air will not remove deposits of carbon and oil. Use filtered, dry air with a maximum pressure of 207 kPa (30 psi).

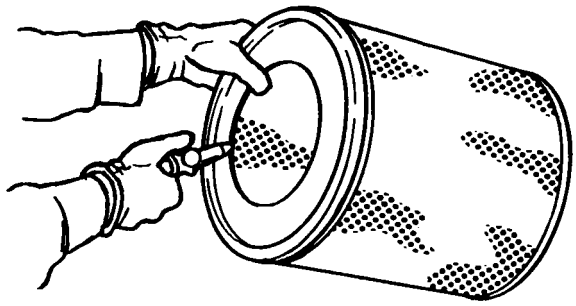

Illustration 100 g00281692

Note: When the primary air filter elements are cleaned, always begin with the clean side (inside) in order to force dirt particles toward the dirty side (outside).

Aim the hose so that the air flows inside the element along the length of the filter in order to help prevent damage to the paper pleats. Do not aim the stream of air directly at the primary air filter element. Dirt could be forced further into the pleats.

Vacuum Cleaning

Vacuum cleaning is another method for cleaning primary air filter elements which require daily cleaning because of a dry, dusty environment. Cleaning with pressurized air is recommended prior to vacuum cleaning. Vacuum cleaning will not remove deposits of carbon and oil.

Inspecting the Primary Air Filter Elements

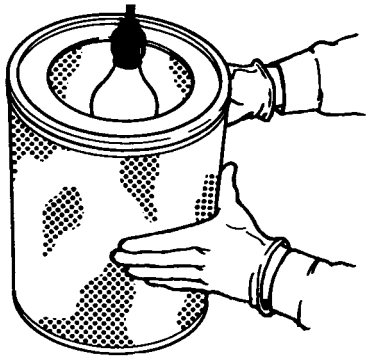

Illustration 101 g00281693

Inspect the clean, dry primary air filter element. Use a 60 watt blue light in a dark room or in a similar facility. Place the blue light in the primary air filter element. Rotate the primary air filter element. Inspect the primary air filter element for tears and/or holes. Inspect the primary air filter element for light that may show through the filter material. If it is necessary in order to confirm the result, compare the primary air filter element to a new primary air filter element that has the same part number.

Do not use a primary air filter element that has any tears and/or holes in the filter material. Do not use a primary air filter element with damaged pleats, gaskets or seals. Discard damaged primary air filter elements.

Storing Primary Air Filter Elements

If a primary air filter element that passes inspection will not be used, the primary air filter element can be stored for future use.

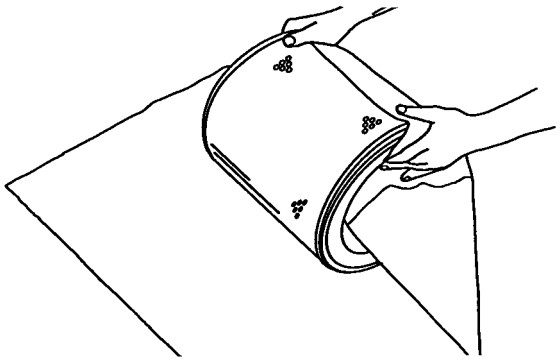

Illustration 102 g00281694

Do not use paint, a waterproof cover, or plastic as a protective covering for storage. An airflow restriction may result. To protect against dirt and damage, wrap the primary air filter elements in Volatile Corrosion Inhibited (VCI) paper.

Place the primary air filter element into a box for storage. For identification, mark the outside of the box and mark the primary air filter element. Include the following information:

- Date of cleaning
- Number of cleanings

Store the box in a dry location.

i01822684

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510-SE

NOTICE
Always replace the secondary filter element. Never attempt to reuse the secondary filter element by cleaning the element.

When the primary filter element is replaced, the secondary filter element should be replaced.

The secondary filter element should also be replaced if the exhaust smoke is still black.

1. Open the access door on the front left side of the machine.
2. See Operation and Maintenance Manual, “Engine Air Filter Primary Element - Clean/Replace”. Remove the air cleaner cover from the air cleaner housing. Remove the primary filter element from the air cleaner housing.

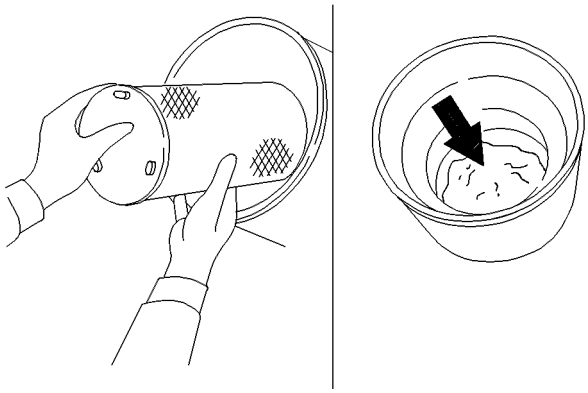

Illustration 103 g00101451

3. Remove the secondary filter element.

4. Cover the air inlet opening. Clean the inside of the air cleaner housing.

5. Remove the cover from the air inlet opening.

6. Install the new secondary filter element.

7. Install the primary filter element.

8. Install the air cleaner cover and close the latches securely.

9. Close the access door.

i02012411

Engine Air Filter Service Indicator - Inspect

SMCS Code: 7452-040

1. Open the engine compartment.

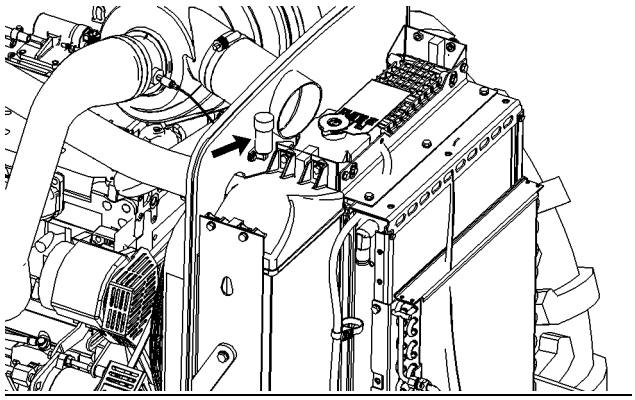

Illustration 104 g00996994

This is the location of the engine air filter service indicator.

2. Start the engine. Run the engine at high idle. If the yellow piston in the engine air filter service indicator enters the red zone, service the air cleaner.

3. Press the end of the indicator in order to reset the indicator after the air cleaner has been serviced.

Note: See the Operation and Maintenance Manual, “Engine Air Filter Primary Element - Clean/Replace”. See the Operation and Maintenance Manual, “Engine Air Filter Secondary Element - Replace”.

4. Close the engine compartment.

i01404793

Engine Compartment - Clean

SMCS Code: 1000-070

NOTICE
Before spraying the engine compartment with high pressure water turn off the engine and allow the engine to cool. Do not spray water directly on a hot fuel injection pump or damage may occur.

Use a commercially available engine degreaser in order to clean the engine compartment. Use caution and minimize the water around bearings and electrical connections.

i02213902

Engine Mounts - Inspect

SMCS Code: 1152-040

Engine vibration can be caused by improper mounting of the engine. Engine vibration can be caused by loose engine mounts or deteriorated engine mounts.

1. Open the engine compartment.

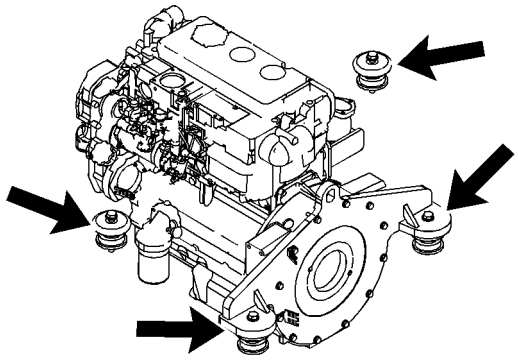

Illustration 105 g01117287

2. Inspect the engine mounts for deterioration.

3. Replace any engine mount that is deteriorated.

4. Inspect the engine mounts for correct bolt torque.

5. Tighten the mounts if the mounts are loose.

6. Close the engine compartment.

i02012412

Engine Oil Level - Check

SMCS Code: 1348-535-FLV

NOTICE
Do not under fill or overfill engine crankcase with oil. Either condition can cause engine damage.

Stop the engine in order to check the oil level. DO NOT check the oil level when the engine is running.

Park the machine on a level surface.

1. Open the engine compartment.

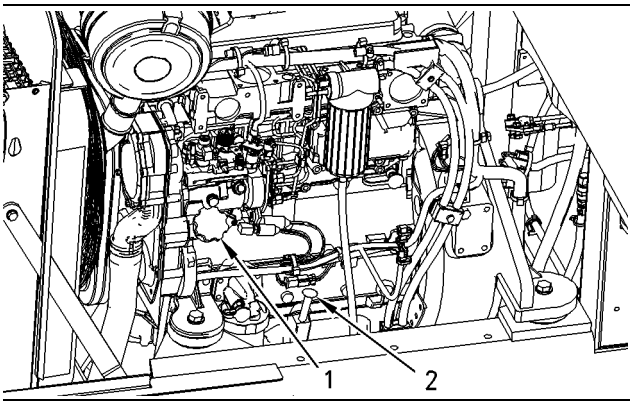

Illustration 106 g00997702

2. Remove dipstick (2). Wipe the dipstick with a clean cloth. Insert the dipstick. Remove the dipstick and note the oil level. Insert the dipstick.

Note: Refer to the Operation and Maintenance Manual, “Lubricant Viscosities” for more information on the correct grade of engine oil to use. Refer to Operation and Maintenance Manual, “Capacities (Refill)” for the correct amount of oil that is used when the oil is changed. The correct amount of oil determines the correct level of the oil in the FULL range on the dipstick.

NOTICE
Do not overfill the crankcase. The oil level must not reach the top of the **FULL** range mark or above the **FULL** range mark.

3. Maintain the oil level on the dipstick between the FULL RANGE mark and the ADD OIL mark . Add oil if the oil level is too low.

Note: Operating your engine with the oil level above the FULL mark in the FULL Range could cause the crankshaft to dip into the oil. This could result in excessively high operating temperatures. The high operating temperatures could result in reduced lubricating characteristics of the oil. This could cause damage to the bearings and loss of engine power.

4. If the oil level is correct, close the engine compartment.

Add The Engine Oil

1. Remove oil filler cap (1).

2. Add the oil so that the oil is at the correct level.

3. Clean the oil filler cap. Install the oil filler cap.

4. Close the engine compartment.

i01914327

Engine Oil Sample - Obtain

SMCS Code: 1348-008

⚠ WARNING

Hot oil and hot components can cause personal injury. Do not allow hot oil or hot components to contact the skin.

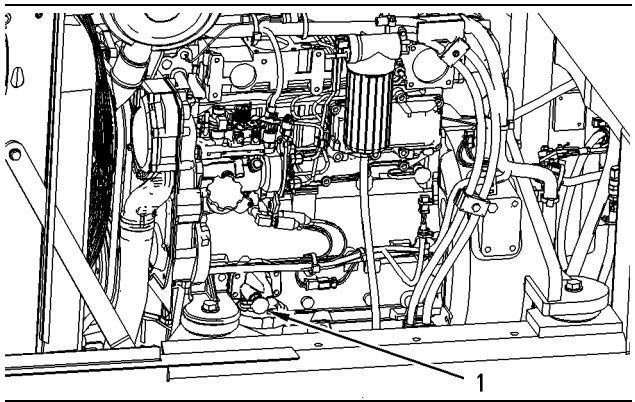

Illustration 107 g00997051

Obtain a sample of the engine oil from engine oil sampling valve (1) that is located on the engine oil filter housing. Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the engine oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of the engine oil.

i02013243

Engine Oil and Filter - Change

SMCS Code: 1318-510

Run the engine in order to warm up the oil. Stop the engine before you drain the oil. When the oil is warm the waste particles are suspended in the oil. The waste particles will be removed when the oil is drained.

As the oil cools, the waste particles settle to the bottom of the oil pan. The waste particles will not be removed if the oil is too cool.

The waste particles can recirculate through the engine lubrication system if the recommended procedure is not followed.

1. Open the engine compartment.

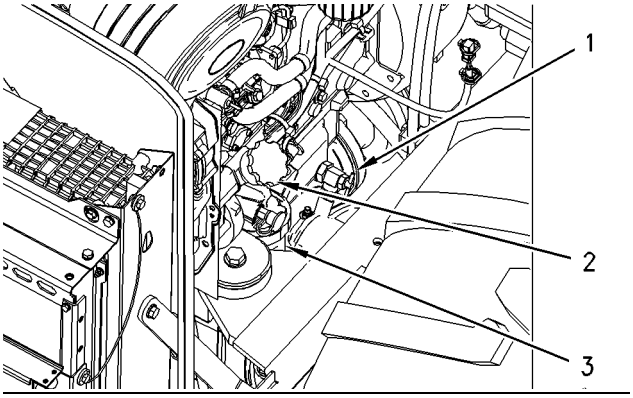

Illustration 108 g00997115

Access panels have been removed in order to clearly show the components.

(1) Drain valve
(2) Oil filler cap
(3) Filter element

2. Place a suitable container under the drain valve. Open drain valve (1). Refer to the Operation and Maintenance Manual, “General Hazard Information” for information that pertains to containing fluid spillage.

3. Allow the oil to completely drain.

4. Close drain valve (1).

5. Remove filter element (3).

Note: Dispose of the used filter element according to local regulations.

6. Clean the filter housing base. All of the old filter seal must be removed from the filter housing base.

7. Apply a thin coat of engine oil to the seal of the new filter element.

8. Install the new filter by hand. When the seal contacts the base, tighten the filter element for an additional 3/4 turn. This will tighten the filter sufficiently.

   Every new oil filter has rotation index marks that are spaced at 90 degree increments. Use the rotation index marks as a guide for tightening the oil filter.

9. Remove oil filler cap (2). Fill the crankcase with new oil. See Operation and Maintenance Manual, “Capacities (Refill)”. See Operation and Maintenance Manual, “Lubricant Viscosities”. Clean the oil filler cap and install the oil filler cap.

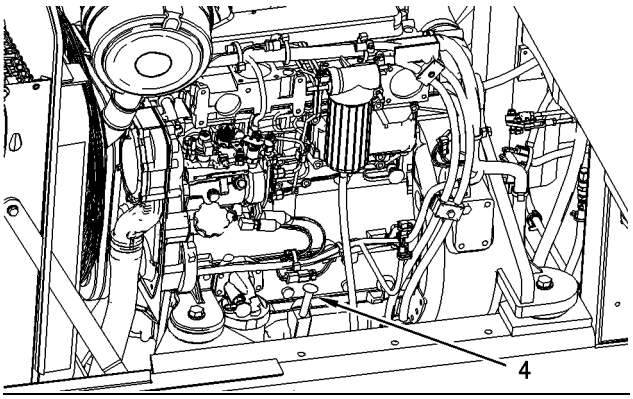

Illustration 109 g00997353

(4) Dipstick

10. Before you start the engine, check the oil level on dipstick (4). The oil level must be within the FULL RANGE on the dipstick.

11. Start the engine. Run the engine for two minutes. Inspect the machine for leaks. Stop the machine.

12. Wait for ten minutes in order to allow the oil to drain back into the crankcase. Check the oil level. Maintain the oil level within the FULL RANGE on the dipstick.

13. Close the engine compartment.

i01897328

Engine Valve Lash - Check

SMCS Code: 1105-535

Note: A qualified service person should perform the valve lash check and/or the valve lash adjustment. Special tools and training are required.

Refer to your machine's Service Manual for complete instructions.

i01919752

Engine Water Pump - Inspect

SMCS Code: 1361-040

A water pump that has failed might cause severe engine overheating. Severe engine overheating could result in the following problems:

- Cracks in the cylinder head
- Piston seizure
- Other potential engine damage

Open the engine compartment.

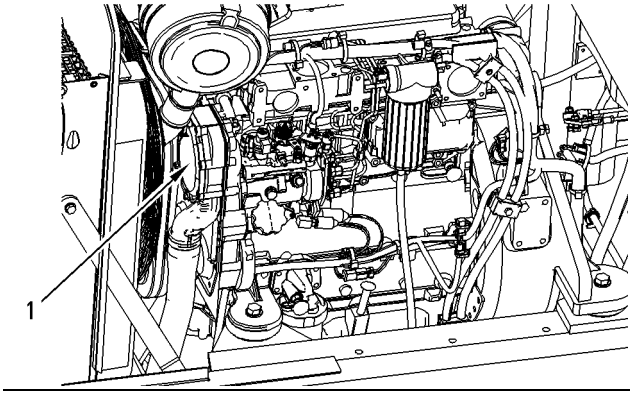

Illustration 110 g00999002

Water pump (1) is located on the engine block at the front of the engine.

Visually inspect the water pump for leaks. If leaks are found, all the seals must be replaced.

i01986436

Final Drive Planetary (Axle) Oil - Change

SMCS Code: 4050-044-OC

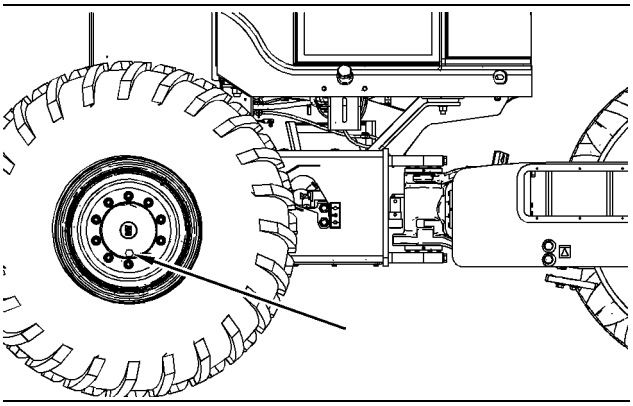

Illustration 111 g01029139

1. Position one final drive so that the oil fill/drain plug is at the bottom.

Note: Refer to Operation and Maintenance Manual, “General Hazard Information” for information on Containing Fluid Spillage.

2. Remove the oil fill/drain plug. Allow the oil to drain into a suitable container.
3. Clean the plug and inspect the O-ring seal. If wear or damage is evident, replace the oil fill/drain plug and/or the O-ring seal.
4. Install the oil fill/drain plug.
5. Rotate the final drive so that the oil fill/drain plug is horizontal.
6. Fill the final drive to the bottom of the opening on the oil fill/drain plug. See Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Capacities (Refill)”.
7. Install the oil fill/drain plug.
8. Perform Step 1 to Step 7 on the other final drive. Use a different container for the oil so that the oil samples from the final drives will be separate.
9. Completely remove the oil that has spilled onto surfaces.
10. Start the engine. Operate the machine in the FORWARD direction and in the REVERSE direction.

11. Apply the parking brake.

12. Stop the engine. Check the oil level.

13. Check the drained oil for metal chips or for particles. If there are any chips or particles, consult your Caterpillar dealer.

14. Properly dispose of the drained material. Obey local regulations for the disposal of the material.

i01986440

Final Drive Planetary (Axle) Oil Level - Check

SMCS Code: 4050-535-FLV

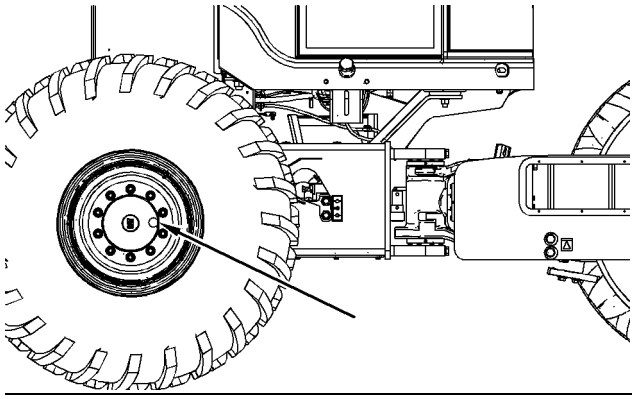

Illustration 112 g01029156

1. Position the machine so that the oil fill/drain plug is horizontal.

Note: Refer to Operation and Maintenance Manual, “General Hazard Information” for information on Containing Fluid Spillage.

2. Remove the oil fill/drain plug.

3. Check the oil level. The oil should be near the bottom of the oil fill/drain plug.

4. Add oil through the oil fill/drain plug, if necessary.

Note: Do not overfill the final drive.

5. Clean the oil fill/drain plug. Inspect the O-ring seal. Replace the O-ring seal if the O-ring seal is worn or damaged.

6. Install the oil fill/drain plug.

7. Repeat the procedure for the other final drive.

i01986445

Final Drive Planetary (Axle) Oil Sample - Obtain

SMCS Code: 4050-008

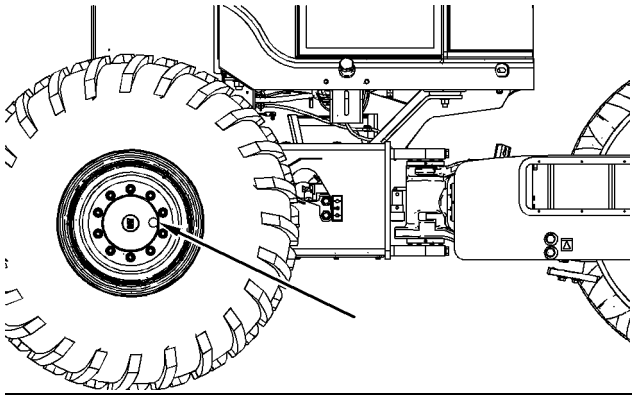

Illustration 113 g01029156

Obtain the oil sample when you change the oil.

Refer to the Operation and Maintenance Manual, “General Hazard Information” for information that pertains to fluid spillage.

Refer to the Special Publication, SEBU6250, “S·O·S Oil Analysis”.

i02828383

Final Drive Planetary (Drum) Oil - Change

SMCS Code: 4050-044-OC; 5655-044-OC

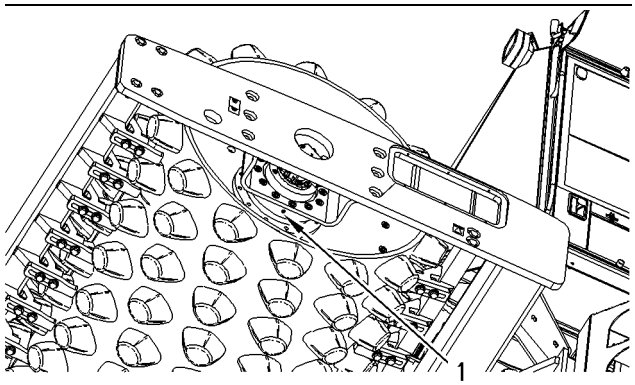

Illustration 114 g00997746

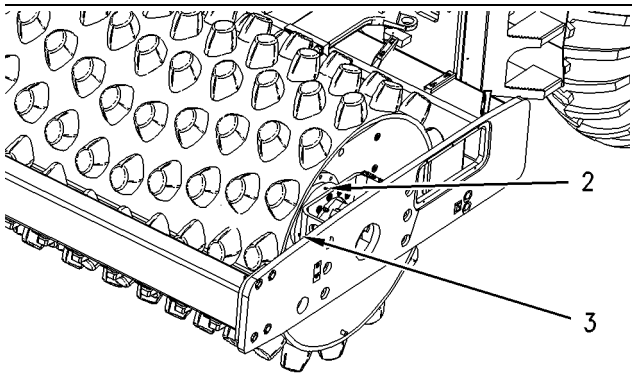

Illustration 115 g00997747

The final drive planetary is located on the left side of the drum.

1. Run the machine and operate the machine for five minutes before you change the oil. This will suspend any foreign particles that are present in the oil. Running the machine will also provide a more accurate S·O·S analysis.

2. Remove drain plug (1). Drain the oil into a suitable container. Dispose of the oil in an acceptable manner. Refer to the Operation and Maintenance Manual, “General Hazard Information” for information that pertains to containing fluid spillage.

3. After the oil is drained, install drain plug (1).

4. Remove level check plug (3) and filler plug (2).

5. Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Capacities (Refill)”.

6. Fill the planetary until the oil is at the bottom of level check plug (3).

Note: After you fill the final drive with oil, wait for five minutes. Check the oil level. If the oil level has lowered, add more oil until the oil is at the bottom of level check plug (3).

7. Clean plugs (2) and (3). Install plugs (2) and (3).

i02827177

Final Drive Planetary (Drum) Oil - Check

SMCS Code: 4050-535-FLV; 5655-535-FLV

The final drive planetary is located on the left side of the drum.

Note: When you add oil to the planetary gearbox, wait for a minute before you check the oil level. The oil in the planetary gearbox must settle in order to obtain an accurate measurement.

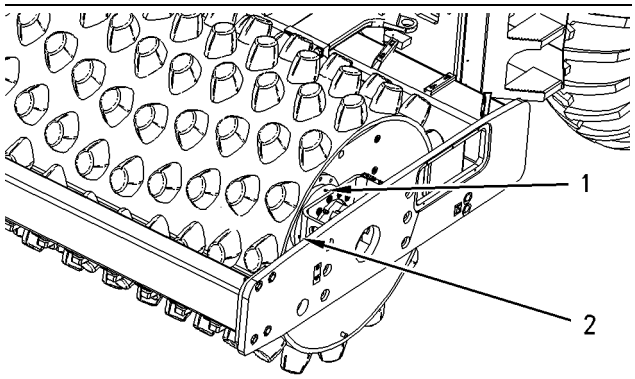

Illustration 116 g00998441

1. Remove level check plug (2). Check the level of the oil in the planetary. Maintain the level of the oil at the bottom of the opening for level check plug (2).

2. If the oil level is low, remove filler plug (1).

3. Add oil in order to maintain the oil level.

4. Clean plugs (1) and (2). Install plugs (1) and (2).

i01915674

Final Drive Planetary (Drum) Oil Sample - Obtain

SMCS Code: 4050-008; 5655-008

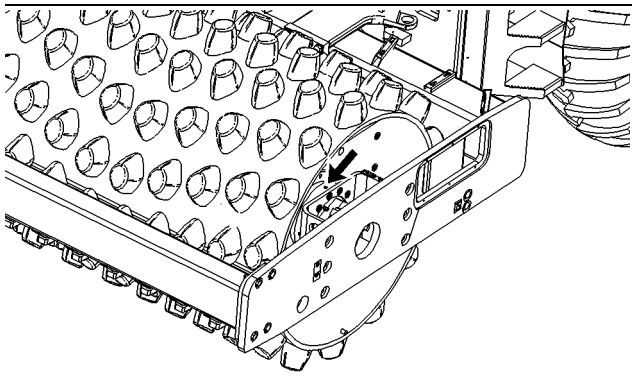

Illustration 117 g00998449

Obtain the oil sample according to the Operation and Maintenance Manual, “Maintenance Interval Schedule”.

Refer to the Operation and Maintenance Manual, “General Hazard Information” for information that pertains to containing fluid spillage.

Refer to the Special Publication, SEBU6250, “S·O·S Oil Analysis” for more information.

i02977542

Fuel System Primary Filter (Water Separator) - Replace

SMCS Code: 1261-510; 1263-510

S/N: BZE1-Up

S/N: TBE1-Up

S/N: BZG1-Up

S/N: DAK1-Up

S/N: ASL1-Up

S/N: TJL1-Up

S/N: ASM1-Up

S/N: DAM1-Up

1. Open the engine compartment.

The water separator element is located in the engine compartment on the right side of the machine.

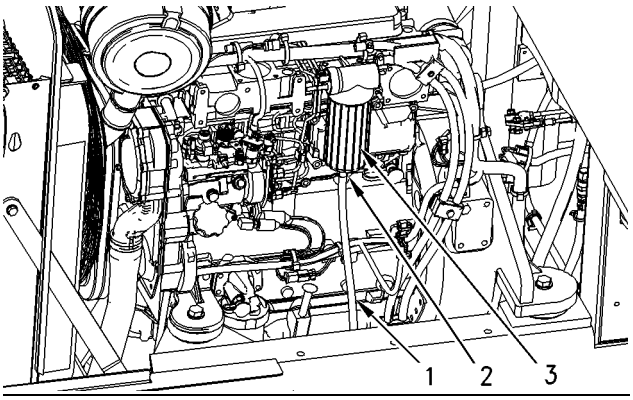

Illustration 118 g00997776

2. Open drain valve (2). Allow the fuel, the water and sediment to drain into a suitable container.

3. Remove housing (3) from the mounting base.

4. Remove the seal for housing (3).

5. Remove the filter element from housing (3).

6. Install the new filter element into housing (3).

7. Install a new seal for housing (3).

8. Install housing (3) onto the base.

9. Turn the engine start key to the ON position in order to prime the fuel system. Check for leaks.

10. Close the engine compartment.

i03338903

Fuel System Primary Filter (Water Separator) - Replace (If Equipped)

SMCS Code: 1261-510; 1263-510

S/N: TLH1-Up

S/N: TJL1-Up

1. Open the engine compartment.

The water separator element is located in the engine compartment next to the fuel tank filler cap.

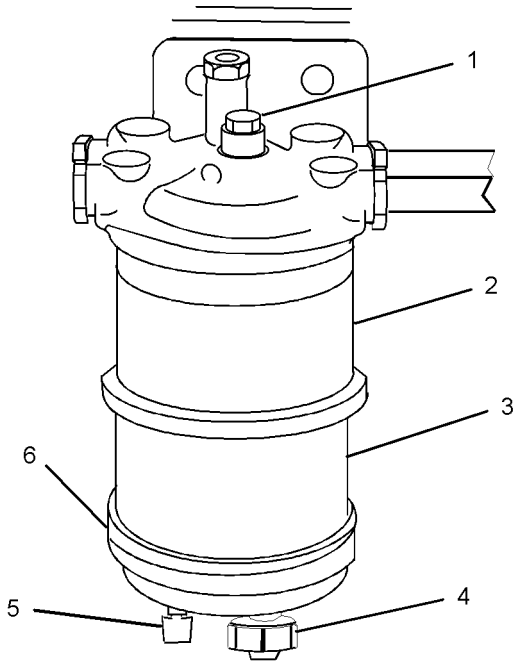

Illustration 119 g01118416

(1) Screw
(2) Element
(3) Glass bowl
(4) Sensor connection
(5) Drain
(6) Bottom cover

2. Turn the fuel supply valve (if equipped) to the OFF position.

3. Place a suitable container under the water separator. Clean the outside of the water separator.

4. Open the drain (5). Allow the fluid to drain into the container.

5. Tighten the drain (5) by hand pressure only.

6. Hold the element (2) and remove the screw (1). Remove the element and the glass bowl (3) from the base. Discard the old element.

7. Clean the glass bowl (4). Clean the bottom cover (6).

8. Install the new O ring seal. Install the bottom cover onto the new element. Install the assembly onto the base.

9. Install the screw (1) and tighten the screw to a torque of 8 N·m (6 lb ft).

10. Remove the container and dispose of the fuel safely.

11. Open the fuel supply valve.

12. Prime the fuel system.

i01915686

Fuel System Water Separator - Drain

SMCS Code: 1263-543

1. Open the engine compartment.

2. The water separator is located in the engine compartment on the right side of the machine.

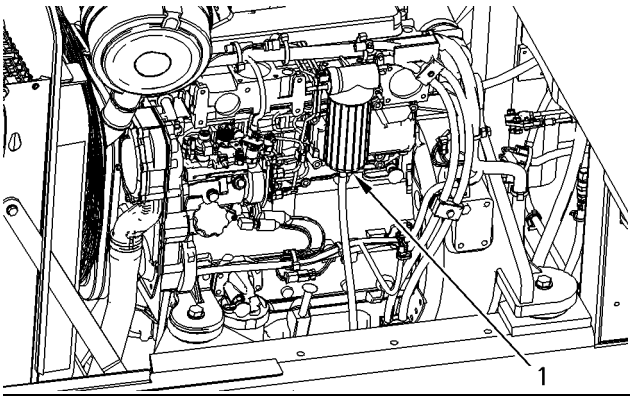

Illustration 120 g00997764

3. Open drain valve (1) that is located on the bottom of the separator element. Allow the water and sediment to drain into a suitable container.

4. Close drain valve (1).

5. If the engine fails to start, change the fuel filter. If there is a power loss, change the fuel filter.

6. Close the engine compartment.

i02626433

Fuel Tank Cap Filter and Strainer - Replace/Clean

SMCS Code: 1273-070-Z2; 1273-070-STR; 1273-510-FI

1. The fuel tank is located on the rear of the machine. Open the access door for the fuel tank.

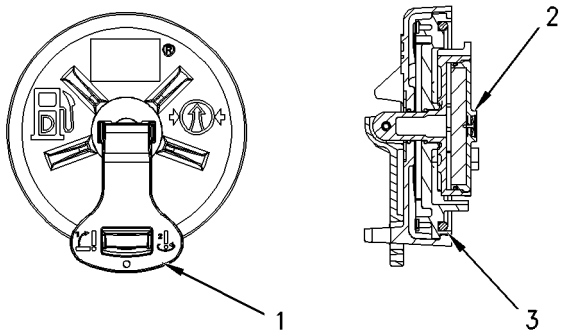

Illustration 121 g00896029

2. Lift lever (1) and turn lever (1) counterclockwise until the lever stops. Remove the cap.

3. Inspect filters (2). Clean the filters. Replace the filters, if necessary.

4. Inspect the O-ring seal (3) for damage. Replace the seal, if necessary.

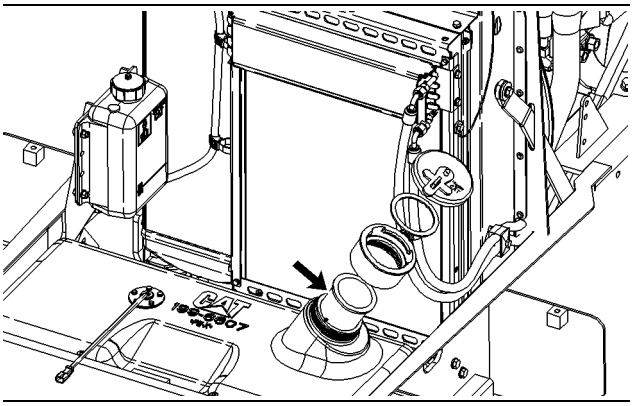

Illustration 122 g00936497

5. Remove the strainer that is located in the filler opening.

6. Wash the strainer and the fuel tank cap in a clean, nonflammable solvent.

7. Apply a thin film of fuel to the gasket of the fuel tank cap.

8. Install the fuel tank cap.

i01915741

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543-M&S

1. Remove the access plate.

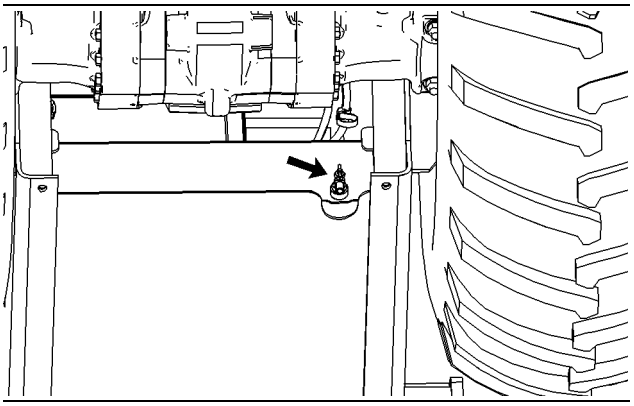

Illustration 123 g00997802

2. The drain valve is located on the bottom of the fuel tank. Drain the water and the sediment into a suitable container. Refer to the Operation and Maintenance Manual, “General Hazard Information” for information that pertains to containing fluid spillage.

3. Close the drain valve. Install the access plate.

Note: Dispose of all fluids according to local regulations.

i01920017

Fuses - Replace

SMCS Code: 1417-510

Fuse – The fuses protect the electrical system from damage that is caused by overloaded circuits. Change the fuse if the element separates. If the element of the new fuse separates, check the circuit. Repair the problem before you operate the machine.

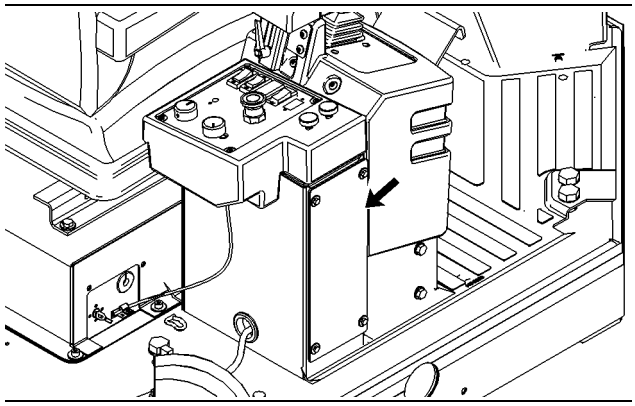

Illustration 124 g00999195

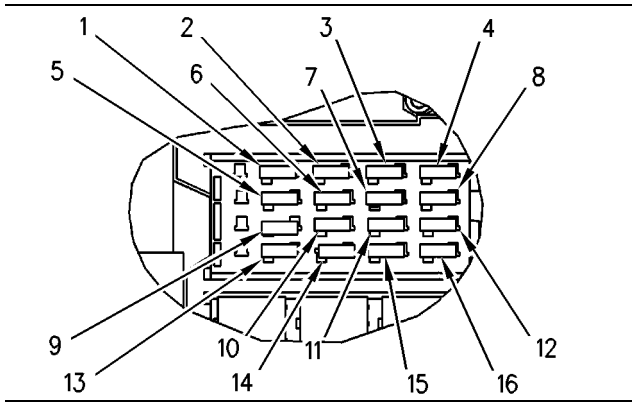

Illustration 125 g00999196

The compartment for the fuses is located on the right side of the machine. There are four screws that hold the cover on the compartment.

In order to access the compartment for the fuses, remove the four screws. Remove the cover.

All of the fuses for this machine are 10 amp.

(1) – Dome Light

(2) – Vital Information Management System

(3) – Ignition System

(4) – Horn

(5) – Thermal Starting Aid

(6) – Backup Alarm

(7) – Front Work Lights

(8) – Gauge Lights

(9) – Circulating Fan

(10) – Vibratory System

(11) – Rear Work Lights

(12) – Parking Brake

(13) – Spare

(14) – Spare

(15) – Front Windshield Wiper/Washer

(15) – Rear Windshield Wiper/Washer

(16) – Spare

i01986278

Hydraulic System Oil - Change

SMCS Code: 5050-044; 5056-044; 5095-044

NOTICE
Take extreme care to insure the cleanliness of the hydraulic oil. Keep the hydraulic oil clean in order to extend the component life and assure the maximum performance.

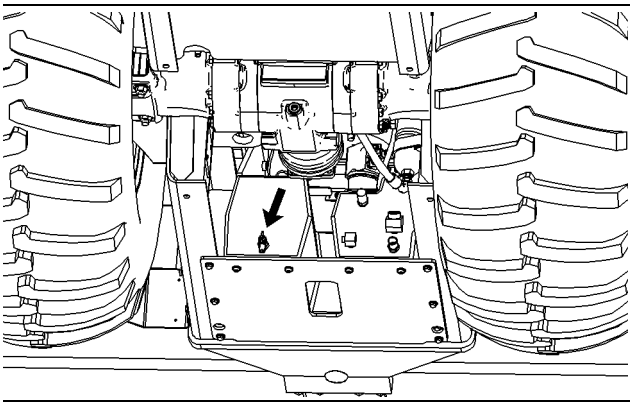

Illustration 126 g00997073

1. Connect a hose to the hydraulic oil tank drain valve. The drain valve is located on the bottom of the hydraulic oil tank. Drain the fluid into a suitable container.

Note: Dispose of the used oil in a proper manner. Refer to the Operation and Maintenance Manual, “General Hazard Information” for information that pertains to containing fluid spillage.

2. Close the hydraulic oil tank drain valve. Remove the hose.

3. Refill the hydraulic tank with clean, filtered hydraulic oil. Refer to the Operation and Maintenance Manual, “ Capacities (Refill) and Lubricant Viscosities”.

4. Add the oil through the filler tube.

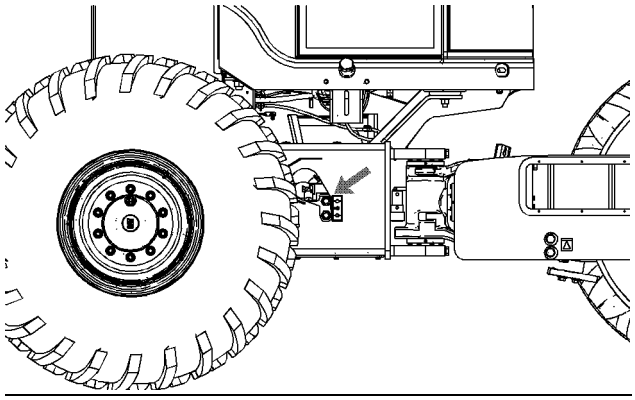

Illustration 127 g01029056

5. Maintain the oil level between the sight gauges.

i01914332

Hydraulic System Oil Filter - Replace

SMCS Code: 5068-510

NOTICE
Take extreme care to insure the cleanliness of the hydraulic oil. Keep the hydraulic oil clean in order to extend the component life and assure the maximum performance.

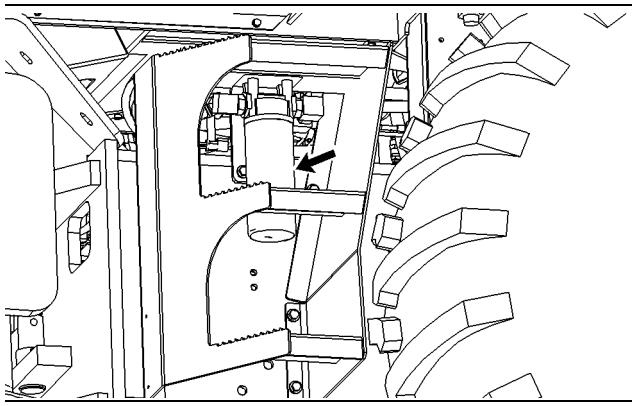

Illustration 128 g00997060

1. The filter is located on the left side of the machine. The filter is located behind the steps.

2. In order to catch any oil that spills, place a suitable container under the filter.

3. Remove the filter. Clean the filter base. Discard the filter in a proper manner. Refer to the Operation and Maintenance Manual, “General Hazard Information” for information that pertains to fluid spillage.

4. Coat the gaskets of the new filter with clean oil.

5. Install the new filter. Hand tighten the filter. When the gasket contacts the filter base, tighten the filter element for an additional 3/4 turn. This will tighten the filter sufficiently. The filters have index marks that are spaced at 90 degree intervals.

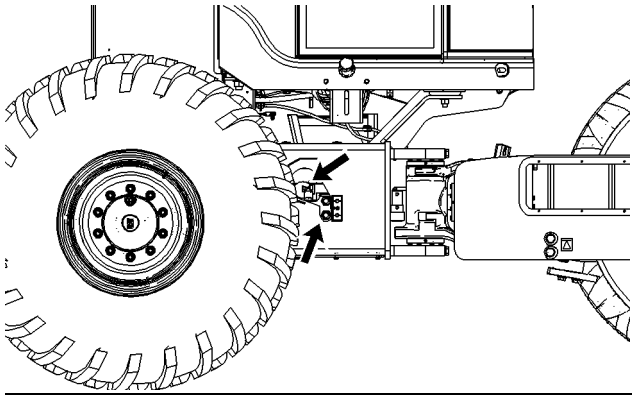

Illustration 129 g00994340

6. Start the engine. Allow the hydraulic oil to warm. Maintain the oil between the sight gauges. If necessary, add oil.

Refer to the Operation and Maintenance Manual, “Capacities (Refill)”. Refer to the Operation and Maintenance Manual, “Lubricant Viscosities”.

i02358955

Hydraulic System Oil Level - Check

SMCS Code: 5056-535-FLV; 5095-535-FLV

Note: Always check the hydraulic oil level when the machine is parked on a level surface.

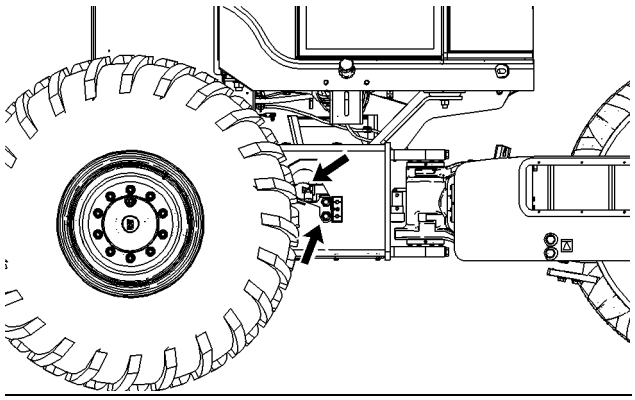

Illustration 130 g00994340

1. Observe the level of the hydraulic oil in the sight gauges. The bottom sight gauge must be full. The top sight gauge should be no more than half full.

2. If necessary, add oil.

Refer to the Operation Manual, “Daily Inspection” for the recommended types of hydraulic oil.

3. In order to add the oil, remove the filler cap. Add the oil through the filler tube. Clean the oil filler cap and install the filler cap.

i02005494

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008; 5095-008

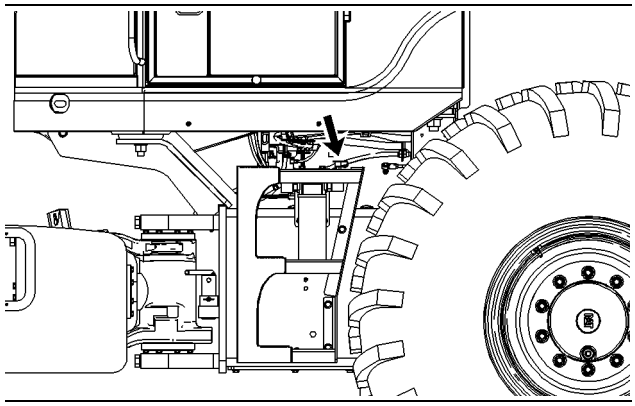

Illustration 131 g00997902

The sampling port for the hydraulic oil is located on the inlet line for the hydraulic oil filter. Refer to Special Publication, SEBU6250, “S·O·S Oil Analysis” for information that pertains to obtaining a sample of the hydraulic oil. Refer to Special Publication, PEHP6001, “How To Take A Good Oil Sample” for more information about obtaining a sample of the hydraulic oil.

i01945734

Hydraulic Tank Breather - Replace

SMCS Code: 5056-510-BRE

Illustration 132 g01012678

1. Open the engine compartment.
2. Remove the breather.
3. Replace the breather.
4. Close the engine compartment.

i01986289

Indicators and Gauges - Test

SMCS Code: 7450-081

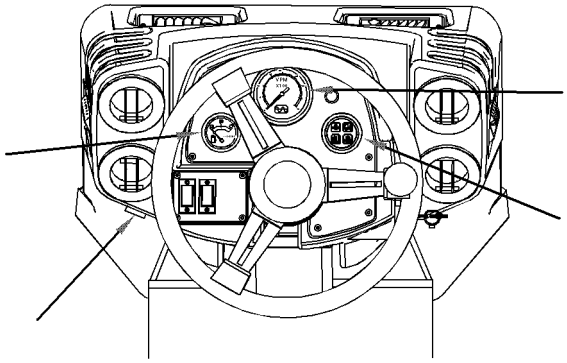

Illustration 133 g01029060

1. Look for broken lenses on the gauges, broken indicator lights, broken switches, and other broken components in the cab.
2. Start the engine.
3. Look for inoperative gauges.

4. Turn on all machine lights. Check for proper operation.

5. Stop the engine.

Note: When the engine is stopped and the engine start switch key is turned to the ON position, all of the indicator lights should illuminate. If the indicator lights do not illuminate, replace the lights.

6. Make any repairs that are required before operating the machine.

i02010895

Isolation Mounts - Inspect

SMCS Code: 5654-040

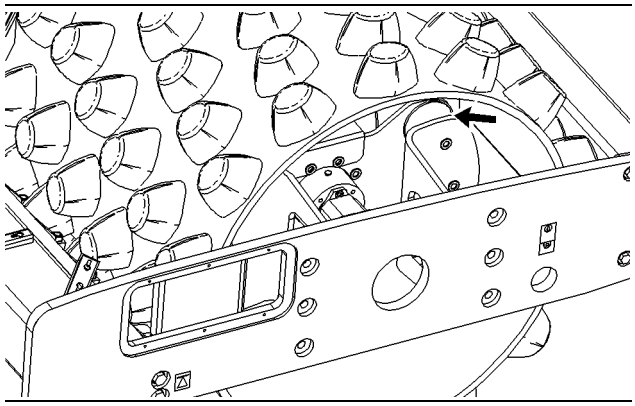

Illustration 134 g00997915

Inspect the isolation mounts for damage, cracking, or splitting. If an isolation mount has a crack that is larger than 25 mm (1.0 inch), replace the isolation mount. If an isolation mount has a crack that is smaller than 25 mm (1.0 inch), inspect the mount daily. Refer to the Disassembly and Assembly for further information on removing and installing the isolation mounts.

i02012413

Neutral Start Switch - Test

SMCS Code: 1424-025; 1424-081; 1424-535

⚠ WARNING

The machine may lurch forward if the neutral start switch is out of adjustment. Be sure the area is clear of all personnel and equipment before performing this test.

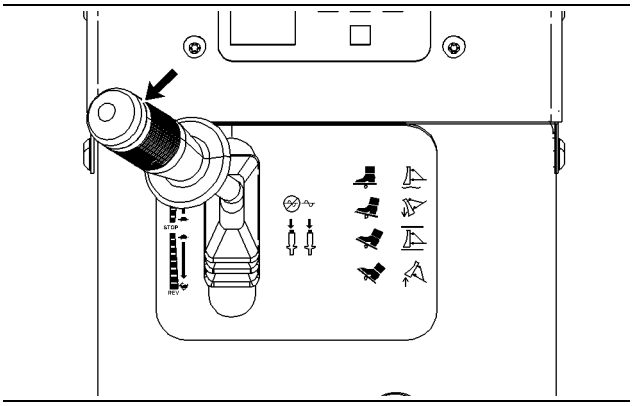

Illustration 135 g00934061

1. Place the propel lever in the FORWARD position.

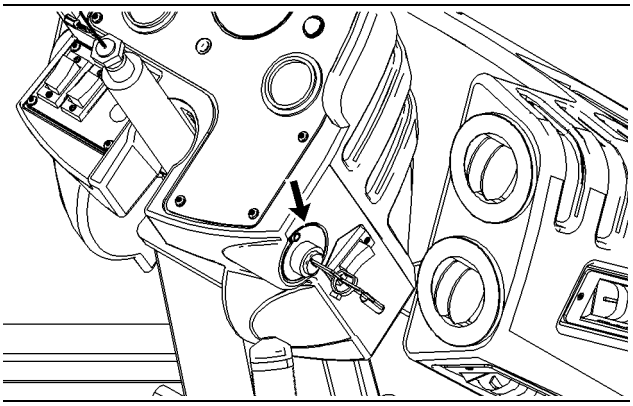

Illustration 136 g00994345

2. Hold the engine start switch in the START position. Slowly move the propel lever toward the STOP position.

3. If the engine starts before you move the propel lever to the STOP position, the neutral start switch requires adjustment. Do not operate the machine until the repairs have been made. Refer to the service manual for your machine for instructions on adjusting the neutral start switch.

i02106227

Oil Filter - Inspect

SMCS Code: 1308-507; 3004-507; 3067-507; 5068-507

Inspect a Used Filter for Debris

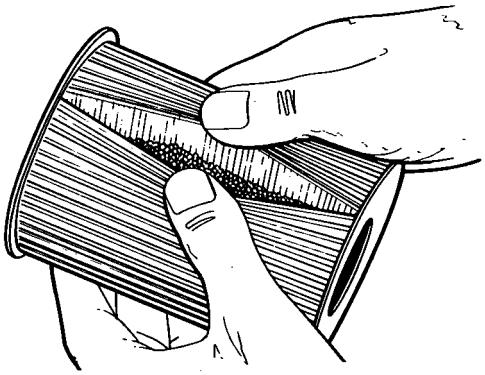

Illustration 137 g00100013

The element is shown with debris.

Use a filter cutter to cut the filter element open. Spread apart the pleats and inspect the element for metal and for other debris. An excessive amount of debris in the filter element can indicate a possible failure.

If metals are found in the filter element, a magnet can be used to differentiate between ferrous metals and nonferrous metals.

Ferrous metals can indicate wear on steel parts and on cast iron parts.

Nonferrous metals can indicate wear on the aluminum parts of the engine such as main bearings, rod bearings, or turbocharger bearings.

Small amounts of debris may be found in the filter element. This could be caused by friction and by normal wear. Consult your Caterpillar dealer in order to arrange for further analysis if an excessive amount of debris is found.

Using an oil filter element that is not recommended by Caterpillar can result in severe engine damage to engine bearings, to the crankshaft, and to other parts. This can result in larger particles in unfiltered oil. The particles could enter the lubricating system and the particles could cause damage.

i02009470

Parking Brake - Check

SMCS Code: 4267-535

Note: If the machine configuration changes, the parking brakes need to be tested.

Check the area around the machine. Make sure that the machine is clear of personnel and clear of obstacles.

Put the steering frame lock in the UNLOCKED position.

Fasten the seat belt before checking the parking brake.

The following tests are used to determine if the parking brake is functional on a specified grade or a specified slope. These tests are not intended to measure the maximum brake holding effort. Read all of the steps before you perform the following procedure.

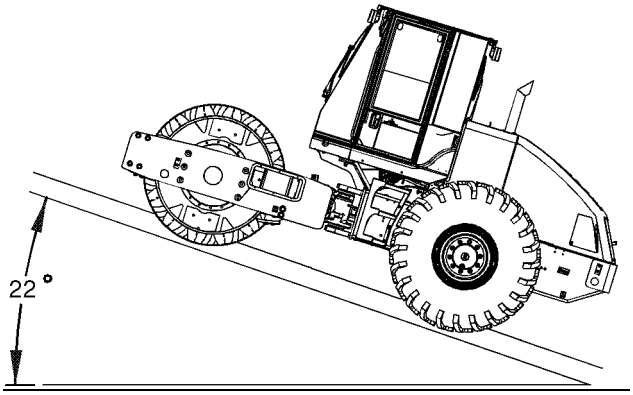

Illustration 138 g01039847

Position the machine on the incline of the slope, but near the base of the slope in order to check the parking brake. The test position should be 40 percent or a 22 degree slope.

1. Start the engine. Refer to the Operation and Maintenance Manual, “Engine Starting” for information on starting the engine.

2. If your machine is equipped with a leveling blade, raise the leveling blade. Move the machine into the test position.

3. Place the throttle control into the LOW IDLE position.

4. Engage the parking brake.

   The machine should not move under the following conditions.

- The engine is at low idle.
- The propel lever is in the NEUTRAL position.
- The blade (if equipped) is raised.
- The parking brake is engaged.
- The machine is positioned on the specified slope.

⚠ WARNING

Personal injury can result if the machine moves while testing.

If the machine begins to move, release the parking brake and use the propel lever in order to move the machine to a level surface.

5. Park the machine on a level surface. If your machine is equipped with a leveling blade, lower the leveling blade to the ground.
6. Stop the engine.

NOTICE
If the machine moved during the brake test, consult your Caterpillar dealer.

The dealer must inspect the brake system and make any necessary repairs before the machine is returned to operation.

i01829953

Radiator Core - Clean

SMCS Code: 1353-070-KO

Open the engine compartment. The radiator core is located at the rear of the machine.

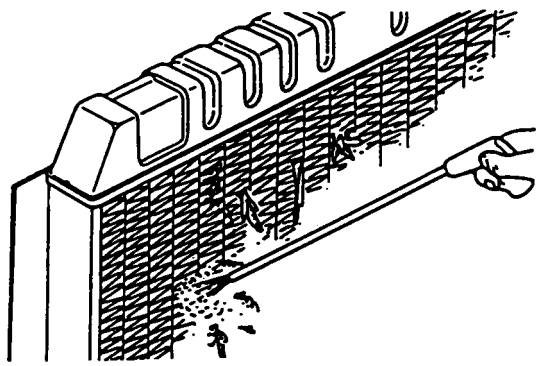

Illustration 139 g00101939

Inspect the radiator core for debris. If necessary, clean the radiator.

Compressed air is preferred, but high pressure water or steam can be used to remove dust and general debris from a radiator. Clean the radiator according to the condition of the radiator.

Note: High pressure water can bend the oil cooler and the radiator fins.

See Special Publication, SEBD0518, “Know Your Cooling System” for more information about cleaning radiator fins.

Close the engine compartment.

i02977292

Refrigerant Dryer - Replace

SMCS Code: 7322-510; 7322-710

Reference: For the correct procedure, refer to Air Conditioning and Heating Service Manual, SENR5664 or the Disassembly and Assembly Manual for your machine.

Note: A qualified mechanic should replace the components of the refrigerant system since special tooling and training are required.

i01986313

Rollover Protective Structure (ROPS) - Inspect

SMCS Code: 7323-040; 7325-040

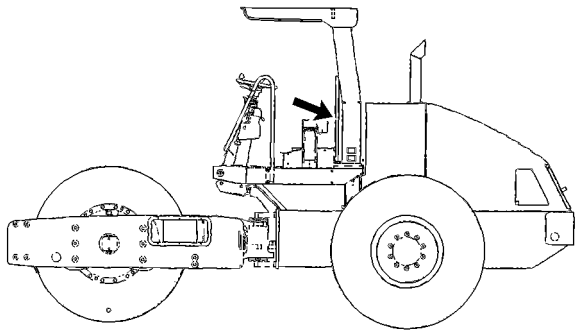

Illustration 140 g01007659

Inspect the rollover protective structure (ROPS) for cracks. Inspect the ROPS for any loose bolts or damaged bolts. Replace the damaged bolts with original equipment parts only.

Note: Apply oil to all ROPS bolt threads before you install the bolts. Failure to apply the oil to the threads can result in an improper bolt torque.

Replace the ROPS mounting support if the ROPS rattles.

Do not straighten the ROPS or repair the ROPS by welding reinforcement plates to the ROPS.

Consult your Caterpillar dealer for the repair of the ROPS.

i02429589

Seat Belt - Inspect

SMCS Code: 7327-040; 7327; 7520

Always check the condition of the seat belt and the condition of the seat belt mounting hardware before you operate the machine. Replace any parts that are damaged or worn before you operate the machine.

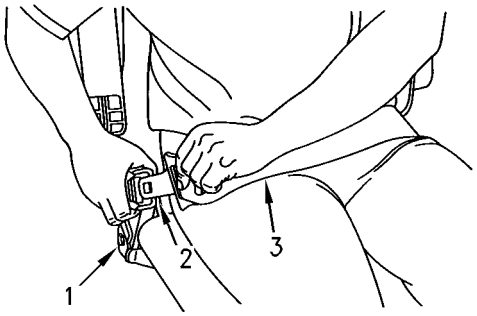

Illustration 141 g00932801

Typical example

Check the seat belt mounting hardware (1) for wear or for damage. Replace any mounting hardware that is worn or damaged. Make sure that the mounting bolts are tight.

Check buckle (2) for wear or for damage. If the buckle is worn or damaged, replace the seat belt.

Inspect the seat belt (3) for webbing that is worn or frayed. Replace the seat belt if the seat belt is worn or frayed.

Consult your Caterpillar dealer for the replacement of the seat belt and the mounting hardware.

Note: Within three years of the date of installation or within five years of the date of manufacture, replace the seat belt. Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to the seat belt, the seat belt buckle, and the seat belt retractor.

If your machine is equipped with a seat belt extension, also perform this inspection procedure for the seat belt extension.

i02429594

Seat Belt - Replace

SMCS Code: 7327-510; 7327

Within three years of the date of installation or within five years of the date of manufacture, replace the seat belt . Replace the seat belt at the date which occurs first. A date label for determining the age of the seat belt is attached to the seat belt, the seat belt buckle, and the seat belt retractor.

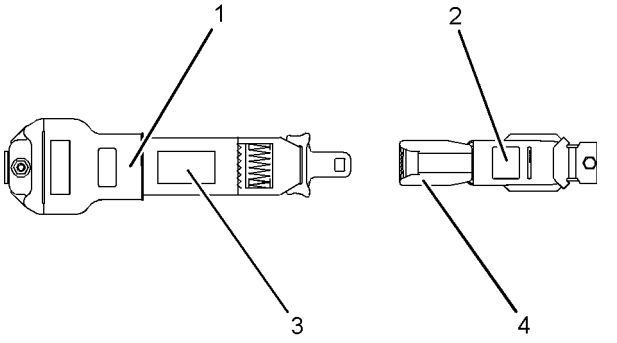

Illustration 142 g01152685

(1) Date of installation (retractor)
(2) Date of installation (buckle)
(3) Date of manufacture (tag) (fully extended web)
(4) Date of manufacture (underside) (buckle)

Consult your Caterpillar dealer for the replacement of the seat belt and the mounting hardware.

If your machine is equipped with a seat belt extension, also perform this replacement procedure for the seat belt extension.

i01915858

Steering Cylinder Ends - Lubricate

SMCS Code: 4303-086-BD

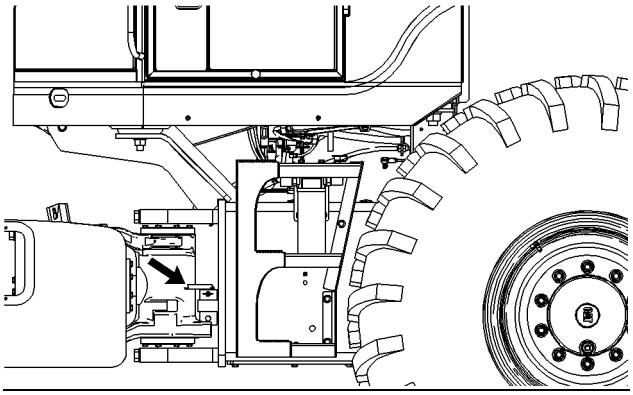

Illustration 143 g00997954

Lower the steering frame lock pin into the locked position.

Note: Wipe all of the fittings before you lubricate the fittings.

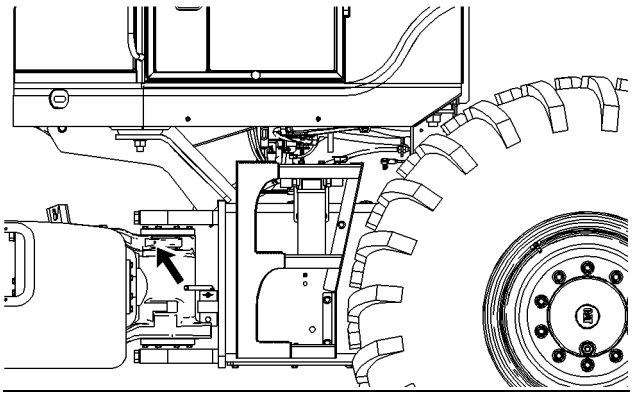

Illustration 144 g00997955

1. There are two steering cylinders. One steering cylinder is on the right side of the machine and one steering cylinder is on the left side of the machine. Lubricate the front lube fitting on each side of the machine.

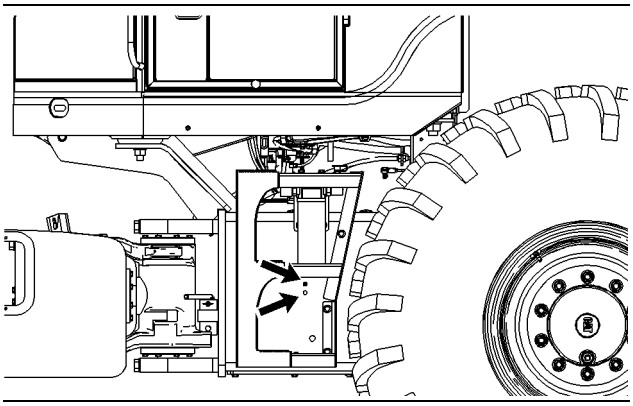

Illustration 145 g00997958

2. Both the lubrication fittings for the rear end of the steering cylinders are located on the left side of the machine. Lubricate the fittings for the rear end of the steering cylinders.

3. Raise the steering frame lock pin into the unlocked position.

i02651393

Tire Inflation - Check

SMCS Code: 4203-535-PX

The tire pressure in a warm shop area (18° to 21°C (65° to 70°F) average temperature) will significantly change when you move the machine into freezing temperatures. If you inflate the tire to the correct pressure in a warm shop, the tire will be underinflated in freezing temperatures. Low pressure shortens the life of a tire.

When you operate the machine in freezing temperatures, see Operation and Maintenance Manual, SEBU5898, “Cold Weather Recommendations”.

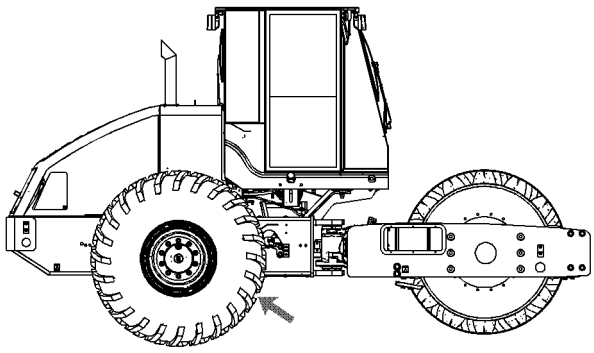

Illustration 146 g01029115

Tire Inflation Pressure

⚠ WARNING

The liquid ballast in tires is an irritant. Protect the eyes and face from the spray that comes out of the valve stem when checking the ballast level in the tires or when checking the tires air pressure. Failure to protect the eyes and face could result in personal injury.

The tires are filled with liquid ballast from the factory. When you check the tire pressure, move the machine so that the valve stem for the tire is in the twelve o'clock position in order to prevent the liquid ballast from spraying out of the valve stem. Use 1P-0545 Pressure Gauge for tires that are equipped with a liquid ballast.

Note: There will be a slight amount of liquid ballast in the valve stem after moving the machine into position. Depress the valve stem in order to allow the liquid ballast to be blown out of the valve stem before attaching the pressure gauge.

Tire Operating Pressures

Since operating conditions can vary, inflate the tires to the following pressures:

Low Pressure Limit – Adjust the tire pressure to the low pressure limit in order to improve traction. Lowering the tire pressure will also provide a smoother ride.

Normal Operating Pressure – Adjust the tire pressure to the normal operating pressure when special conditions do not exist.

High Pressure Limit – Adjust the tire pressure to the high pressure limit in order to improve stability. Raising the tire pressure will also reduce the flex in the sidewall.

Maximum Shipping Pressure – Adjust the tire pressure to the maximum shipping pressure when you ship the machine.

Note: After shipping the machine, return the tire pressure to the correct operating pressure before operating the machine.

Table 11

Ply Rating	Low Pressure Limit	Normal Operating Pressure	High Pressure Limit	Maximum Shipping Pressure
8	12	16	16	30
10	12	16	20	30
12	12	16	24	30
14	12	16	28	30

Liquid Ballast

The liquid ballast for tires is a solution of water and calcium chloride powder $CaCl_2$. Calcium chloride powder $CaCl_2$ is an additive which will provide an antifreeze protection and additional weight. If a tire is repaired or replaced, the tire must be filled with the correct amount of liquid ballast before the machine returns to operation. The correct mixture for the liquid ballast is 300 grams of calcium chloride powder $CaCl_2$ per 1 Liter of water. Fill each tire with 430 L (114 US gal) of thirty percent calcium chloride and seventy percent water.

1. Move the machine to a flat surface and park the machine with the valve stem in the 9 o'clock position.
2. Remove the cap for the valve stem.
3. Check for fluid by depressing the stem in the valve stem. The liquid ballast should spray from the stem.
4. Move the machine so that the valve stem is in the 11 o'clock position.
5. Depress the stem in the valve stem. A light mist should spray from the valve stem.

i01915888

Vibratory Support Oil - Change

SMCS Code: 5656-044-OC

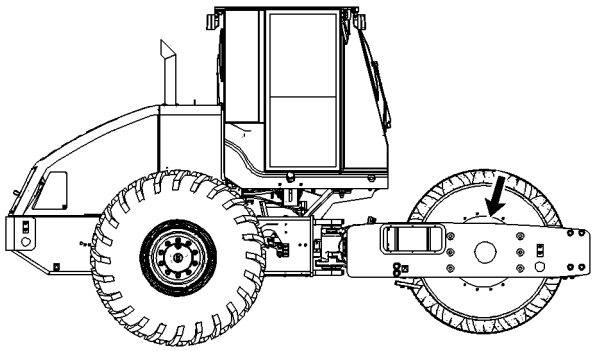

Illustration 147 g00999092

The vibratory support is located on the right side of the drum.

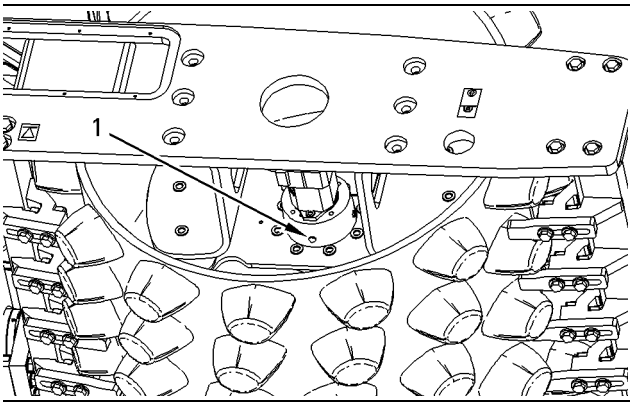

Illustration 148 g00998085

1. Remove drain plug (1). Drain plug (1) is located on the bottom. Drain the oil into a suitable container. Dispose of the oil in an acceptable manner.

Note: Refer to Operation and Maintenance Manual, “General Hazard Information” for information that pertains to containing fluid spillage.

2. After the oil is drained, clean the drain plug. Install drain plug (1).

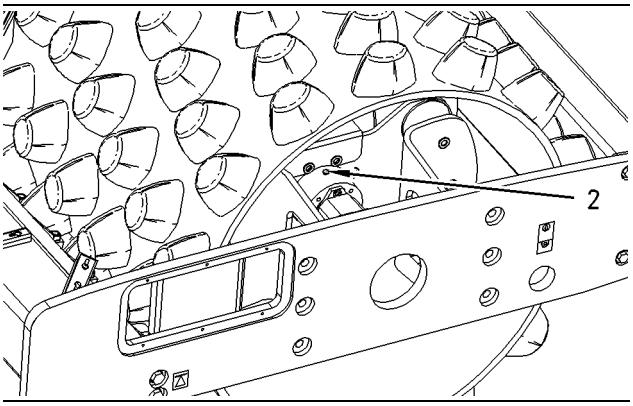

Illustration 149 g00998083

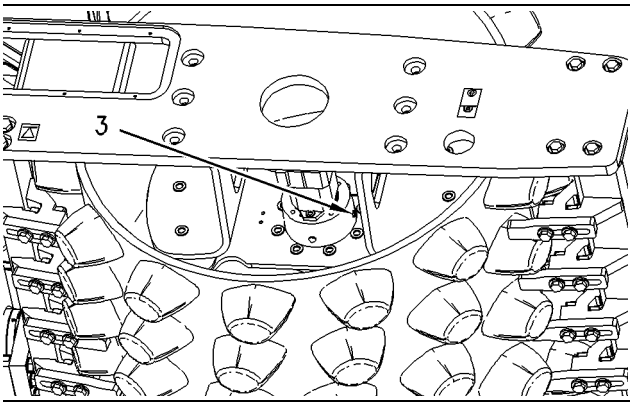

Illustration 150 g00999122

3. Filler plug (2) is located at the top of the support. Remove filler plug(2).

Note: When a machine is equipped with a sensor for the VPM gauge, there is a guard over the fill port hole. The level check plug can be used as a filler plug in this case.

4. Level check plug (3) is located on the side of the support. Remove level check plug (3).

5. Fill the support until the oil is at the bottom of the level check plug opening (3). Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Capacities (Refill)”.

6. Clean plugs (2) and (3). Install plugs (2) and (3).

i01915893

Vibratory Support Oil Level - Check

SMCS Code: 5656-535-FLV

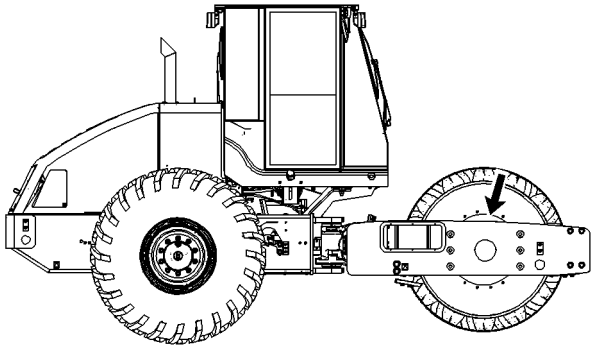

Illustration 151 g00999092

The vibratory support is located on the right side of the drum.

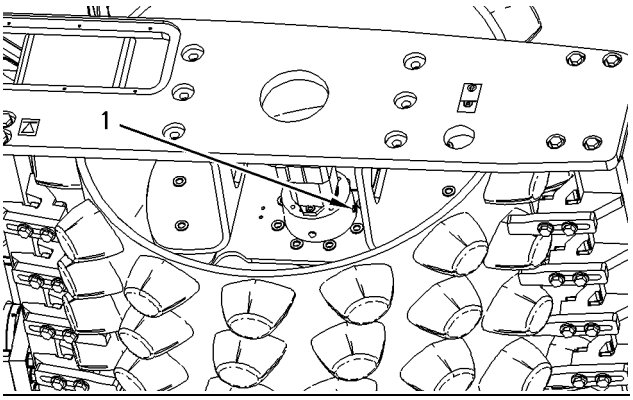

Illustration 152 g00999093

1. The level check plug (1) is located at the three o'clock position.
2. Remove level check plug (1). Check the level of the oil. Maintain the level of the oil at the bottom of the level check plug opening.

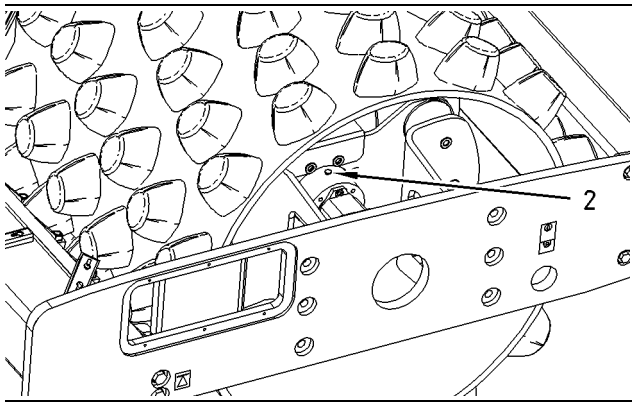

Illustration 153 g00999094

Note: When a machine is equipped with a sensor for the VPM gauge, there is a guard over the fill port hole. The level check plug can be used as a filler plug in this case.

3. If the oil level is low, remove filler plug (2).
4. In order to maintain the proper oil level, add oil.
5. Refer to the Operation and Maintenance Manual, “Lubricant Viscosities and Capacities (Refill)”.
6. Clean the plugs and install the plugs.

i01915902

Vibratory Support Oil Sample - Obtain

SMCS Code: 5656-008

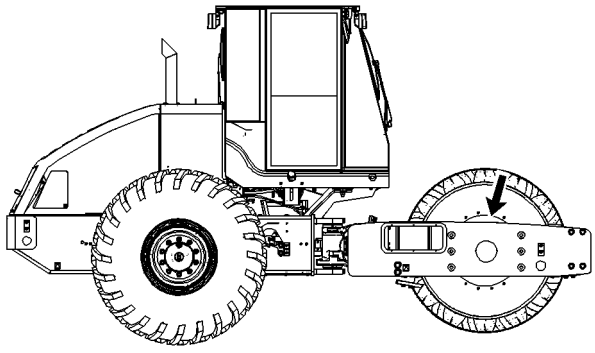

Illustration 154 g00999092

Refer to the Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” for information on obtaining the oil sample.

Note: After you obtain an oil sample, add oil in order to maintain the proper level.

i01850674

Wheel Nuts - Tighten

SMCS Code: 4210-527

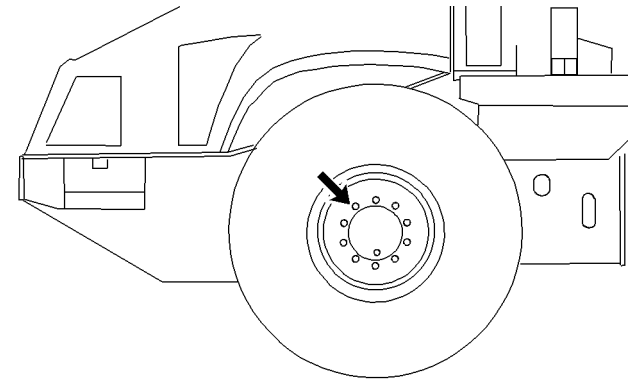

Illustration 155 g00942683

Tighten the wheel nuts to a torque of 460 ± 60 N·m (340 ± 45 lb ft).

i01909035

Window Washer Reservoir - Fill

SMCS Code: 7306-544

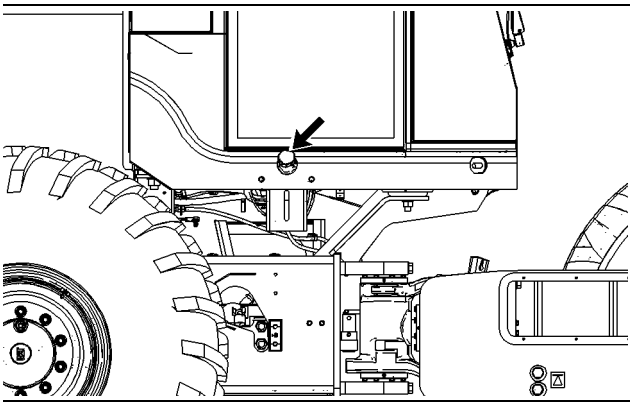

Illustration 156 g00994889

The window washer reservoir is located on the right side of the cab.

If the level of the cleaning solution is low, refill the reservoir.

i01986422

Window Wiper - Inspect/Replace

SMCS Code: 7305-040; 7305-510

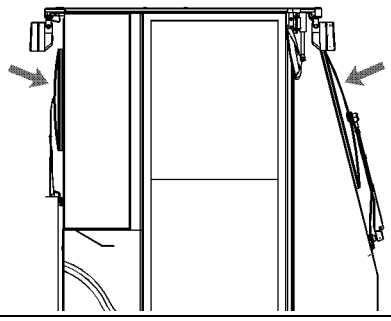

Illustration 157 g01029128

Inspect the front windshield wiper blade and the rear windshield wiper blade. If necessary, replace the windshield wiper blades.

i00851568

Windows - Clean

SMCS Code: 7310-070

Use commercially available window cleaning solutions in order to clean the windows. Clean the outside of the cab windows from the ground unless handholds are available.