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MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

CATERPILLAR®

CATERPILLAR®

SEBU8458-01
November 2009

Operation and Maintenance Manual

906H, 907H and 908H Compact Wheel Loaders

SDH1-Up (906H Machine)
SJM1-Up (907H Machine)
LMD1-Up (908H Machine)

i03704302

Maintenance Interval Schedule

SMCS Code: 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.

Note: If Cat HYDO Advanced 10 hydraulic oil is used, the hydraulic oil change interval is extended to 3000 hours. S·O·S services may extend the oil change even longer. Consult your Caterpillar dealer for details.

Note: After the initial 250 hours the hystat system needs to be calibrated. A Caterpillar dealer must perform the calibration. Consult your Caterpillar dealer for information about the calibration.

When Required

Every 10 Service Hours or Daily

Every 50 Service Hours or Monthly

Initial 250 Service Hours

Every 250 Service Hours

Every 250 Service Hours or Monthly

Every 250 Service Hours or 3 Months

Every 250 Service Hours or 6 Months

Initial 500 Service Hours

Every 500 Service Hours

Every 500 Service Hours or 3 Months

Every 500 Service Hours or 1 Year

Every 1000 Service Hours or 6 Months

Every 1000 Service Hours or 1 Year

Every 3000 Service Hours

Every 3000 Service Hours or 2 Years

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

Every 6000 Service Hours

Every 6000 Service Hours or 4 Years

i02957879

Air Cleaner Dust Valve - Clean/Inspect

SMCS Code: 1051-571-VL

1. Open the engine hood.
2. The air filter housing is located on the right side of the engine compartment.

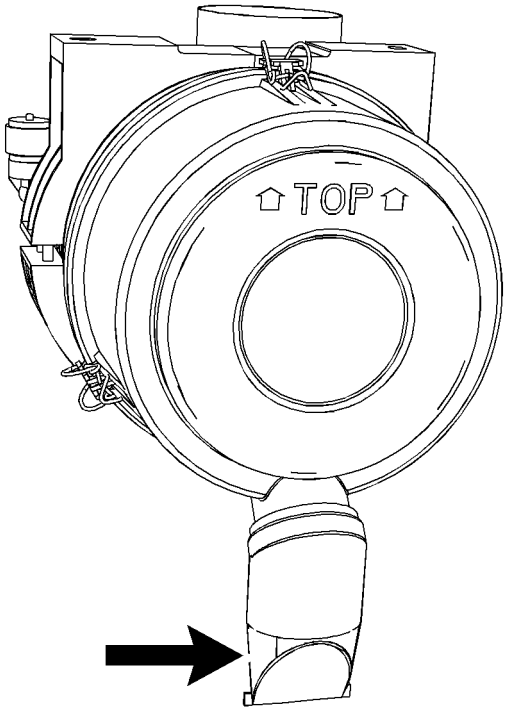


Illustration 99 g01379352

3. Check the dust valve after every ten service hours or at the end of each day. Actuate the valve by squeezing the lips of the valve in order to remove any accumulated debris.
4. Close the engine hood.

i02699187

Articulation Bearings - Lubricate

SMCS Code: 7057-086-BD; 7065-086-BD; 7066-086-BD

Wipe the grease fittings before you lubricate the grease fittings.

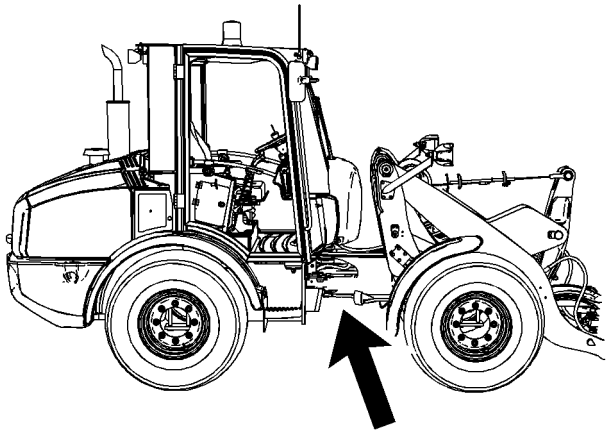


Illustration 100 g01355727

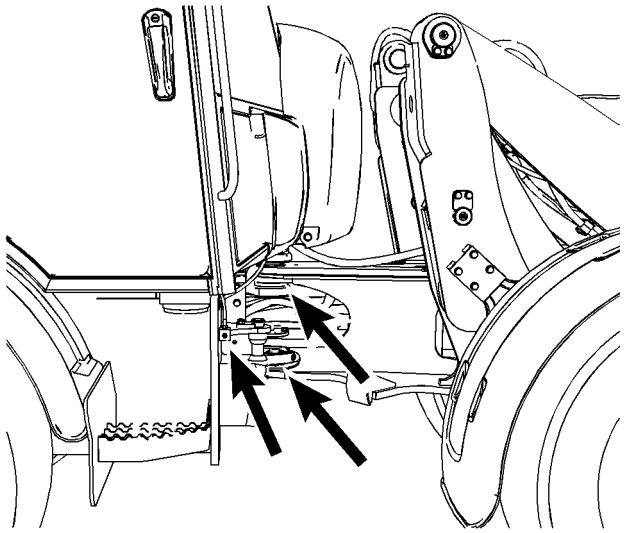


Illustration 101 g01355731

Apply lubricant to the grease fittings for the upper and lower bearing and for the oscillation bearing.

i01390799

Backup Alarm - Test

SMCS Code: 7406-081

The backup alarm is mounted below the radiator in the engine compartment.

The backup alarm has one sound level. The sound level is not adjustable.

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

Apply the service brake. Move the direction control switch to the REVERSE position.

The backup alarm should immediately sound. The backup alarm will continue to sound until the direction control switch is moved to the NEUTRAL position or to the FORWARD position.

i03704739

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. The battery is located under the hood on the right side of the machine. Open the hood.

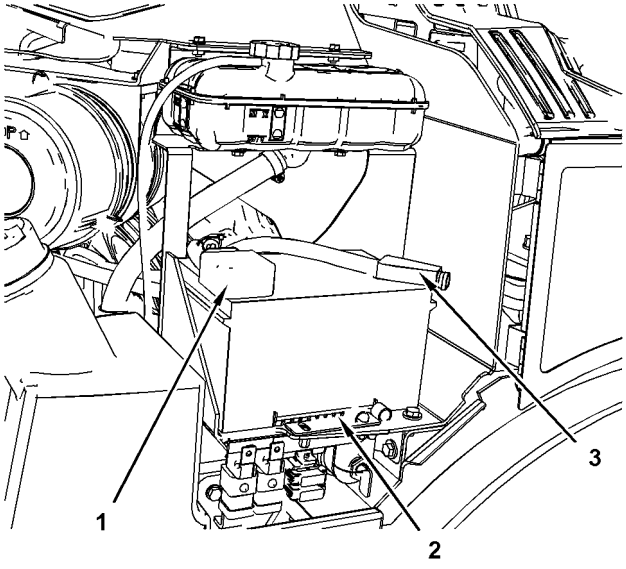


Illustration 102 g01355762

Battery on Right Side

(1) Positive Battery Terminal
(2) Battery Hold Down
(3) Negative Battery Terminal

⚠ WARNING

To avoid personal injury from electrical shock, ensure that the negative battery cable is disconnected first.

3. Disconnect the negative battery cable at the battery.
4. Perform the necessary repairs. Replace the cable or the battery, as needed.
5. Disconnect the positive battery cable. Remove the old battery from the machine.
6. Place the new battery in the machine. Connect the positive battery cable to the battery.
7. Connect the negative battery cable at the battery.

Recycle the Battery

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

i02699193

Brake Pads - Check

SMCS Code: 4267; 4273

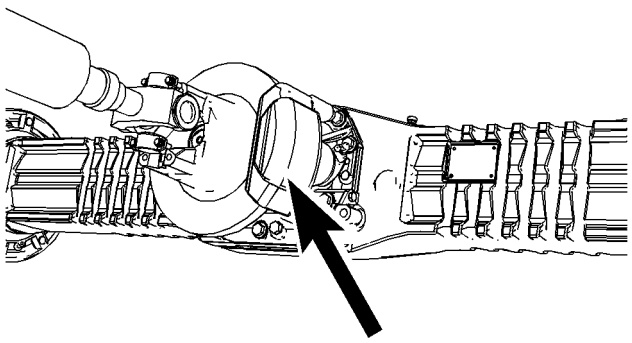


Illustration 103 g01355884

The brake pads are located behind the front axle on the drive shaft. Measure the thickness of the brake pads. If the thickness of either of the two brake pads is less than 4.00 mm (0.16 inch), replace the brake pads. Refer to Disassembly and Assembly, “Brake Caliper - Remove” and Disassembly and Assembly, “Brake Caliper - Install”.

i02699194

Brake System Fluid - Change (If Equipped)

SMCS Code: 4258-044; 7579-044-BRK

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

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 Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Note: Brake fluid reservoirs are available only on standard machines.

Purge valves for the brake system are located on service brake cylinders . The cylinders are located on the drive axle. Access the purge valves below the machine.

1. Park the machine on a hard, level surface. Stop the engine. Allow the fluid to cool for five minutes. However, the brake fluid should be warm for this procedure.

2. Thoroughly clean the outside of the purge valves. Attach a line to the purge valve. Drain the fluid from each purge valve into a suitable container.

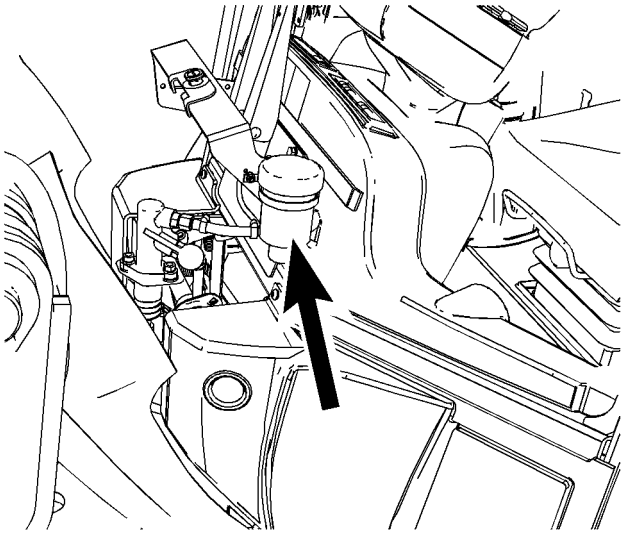


Illustration 104 g01355891

3. Remove the lid on the brake fluid reservoir. The fluid reservoir is located in the compartment in front of the cab. Add the correct type of brake fluid to the reservoir. Refer to Operation and Maintenance Manual, “Lubricant Viscosities Chart” for the correct fluid.

4. Open the purge valve.

5. Fully depress the service brake that is being purged.

6. Close the purge valve.

7. Release the service brake.

8. Repeat Steps 4 through 7 until no air is in the fluid that drains from the purge valve. Ensure that the reservoir remains full of fluid.

9. Start the engine. Run the machine for a few minutes. Check for any leaks. Maintain the fluid level between the marks on the reservoir.

i02699196

Brake System Fluid Level - Check (If Equipped)

SMCS Code: 4258-535-FLV; 7579-535-BRK

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

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 Dealer Service Tool Catalog” for tools and supplies suitable to collect and contain fluids on Caterpillar products.

Dispose of all fluids according to local regulations and mandates.

Note: Brake fluid reservoirs are available only on standard machines.

1. Park the machine on a hard, level surface.
2. The fluid reservoir is located in the compartment in front of the cab.
3. Check the fluid level when the engine is stopped.
4. Maintain the fluid level between the marks on the reservoir.
5. If the fluid level is low, add fluid.
   a. Remove the lid on the brake fluid reservoir.
   b. Add the correct type of brake fluid to the reservoir. Refer to Operation and Maintenance Manual, “Lubricant Viscosities Chart” for the correct fluid.
   c. Install the lid on the reservoir.
6. Check for any leaks. Maintain the fluid level between the marks on the reservoir.

i03751342

Braking System - Test

SMCS Code: 4011-081; 4267-081

Service Brake Holding Ability Test

⚠ WARNING

Personal injury can result if the machine moves while testing.

If the machine begins to move during test, reduce the engine speed immediately and engage the parking brake.

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

Make sure that the steering frame lock link is in the STORED position.

Test the brakes on a dry 25% slope.

Fasten the seat belt before you test the brakes.

The following tests are used to determine if the service brake is functional. These tests are not intended to measure the maximum brake holding effort.

1. Start the engine. Raise the work tool slightly.
2. Apply the service brake. Release the parking brake.

   The machine should not move under the following conditions.

   - The engine is at low idle.
   - The bucket is empty.
   - The machine is warmed up and the machine is fully stopped.
   - The service brake is firmly depressed.

   If the machine moves, consult your Caterpillar dealer.
3. Engage the parking brake. Lower the work tool to the ground. Stop the engine.

NOTICE
If the machine moved while testing the brakes, contact your Caterpillar dealer. Have the dealer inspect and, if necessary, repair the service brake before returning the machine to operation.

Parking Brake Holding Ability Test

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

Make sure that the steering frame lock link is in the STORED position.

Test the brakes on a dry 20% slope.

Note: The test condition is different from the Service Brake test.

Fasten the seat belt before you test the brakes.

The following tests are used to determine if the parking brake is functional. These tests are not intended to measure the maximum brake holding effort.

1. Start the engine. Raise the work tool slightly.
2. Engage the parking brake. Release the service brake gradually.

Note: The parking brake indicator light should come on. The parking brake light should flash if the machine is in gear.

The machine should not move under the following conditions.

- The engine is at low idle.
- The bucket is empty.
- The machine is warmed up and the machine is fully stopped.
- The parking brake is pulled up firmly.

If the machine moves, consult your Caterpillar dealer.

⚠ WARNING

If the machine begins to move, reduce the engine speed immediately and apply the service brake pedal.

3. Lower the bucket to the ground. Stop the engine.

NOTICE
If the machine moved while testing the brakes, contact your Caterpillar dealer.

Have the dealer inspect and, if necessary, repair the parking brakes before returning the machine to operation.

i01743875

Bucket Cutting Edges - Inspect/Replace

SMCS Code: 6801-040; 6801-510

⚠ WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket cutting edges.

1. Lower the lift arms fully. Tilt back the bucket so that the bucket cutting edge is accessible.
2. Place blocks under the raised edge of the bucket.
3. Remove the bolts. Remove the cutting edge and the end bits.
4. Clean the contact surfaces.
5. Use the opposite side of the cutting edge, if this side is not worn.
6. Install a new cutting edge, if both edges are worn.
7. Install the bolts.
8. Remove the blocks that are under the bucket.
9. After a few hours of operation, check the bolts for proper torque.

i01764331

Bucket Tips - Inspect/Replace

SMCS Code: 6805-040; 6805-510

⚠ WARNING

Personal injury or death can result from bucket falling.

Block the bucket before changing bucket cutting edges.

1. Lower the lift arms fully. Tilt back the bucket so that the bucket tips are accessible.
2. Place blocks under the raised edge of the bucket.
3. Remove the mounting bolts. Remove the bucket tips.
4. Clean the mounting surface.
5. Replace the bucket tips.
6. Install the bolts.
7. Remove the blocks that are under the bucket.
8. After a few hours of operation, check the bolts for proper torque.

i02708467

Cab Air Filter - Clean

SMCS Code: 7342-070

Clean Internal Filter Element

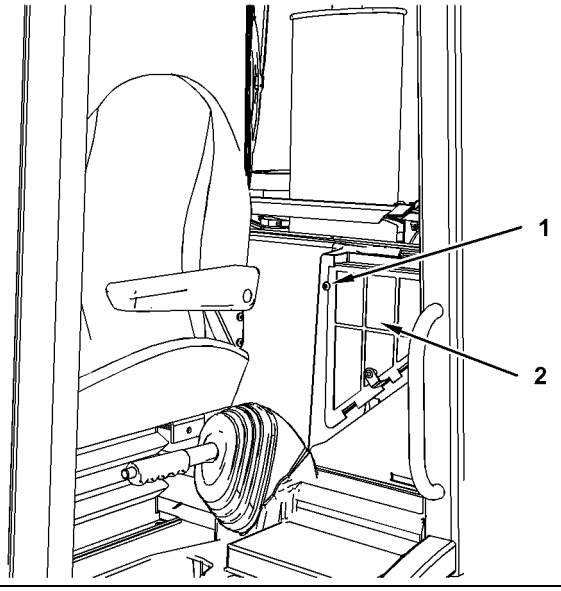


Illustration 105 g01359738

(1) Screws
(2) Internal Filter Element

The internal filter element is located in the cab on the left side. There may be a cover panel over the filter. If your machine has a storage box in the cab, the filter is behind the storage box.

1. Remove the cover panel or remove the storage box.
2. Remove the 2 screws that hold the filter in place.
3. Remove the filter element. Clean the filter element with compressed air. You can also wash the filter elements with a solution of warm water and of a nonsudsing household detergent.

   Do not wash the filter element while the filter element is installed on the machine.

   Replace the filter element if the filter element is damaged.
4. Rinse the filter element in clean water. Air dry the filter element thoroughly.
5. Install the filter element and replace the screws.
6. Install the cover panel or install the storage box.

i02699198

Cab Air Filter - Clean/Replace

SMCS Code: 7342-070; 7342-510

Note: Clean the filter elements more often in dusty conditions. If there is a noticeable reduction in the air flow from the air vents, check the filter elements.

Clean External Filter Element

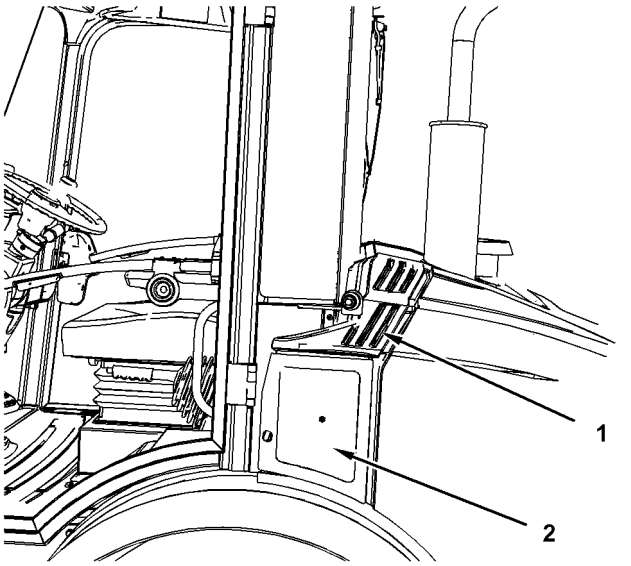


Illustration 106 g01355651

(1) Access Cover
(2) Access Door

1. Open the access door (2) on the left side of the machine.

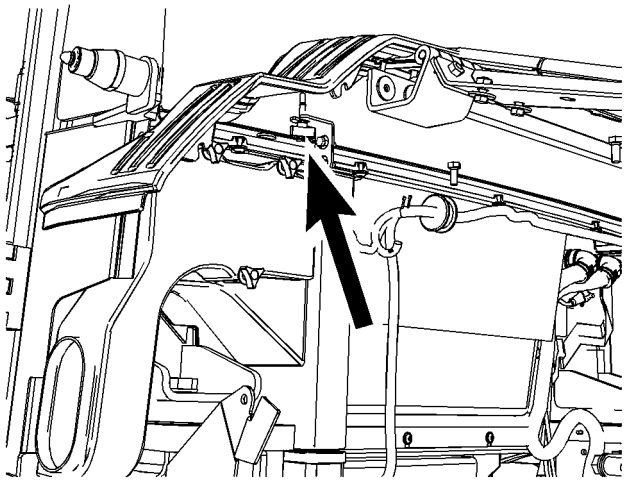


Illustration 107 g01355653

Thumb screw for the access panel

Note that the engine hood is removed for clarity.

2. Remove the access cover (1).

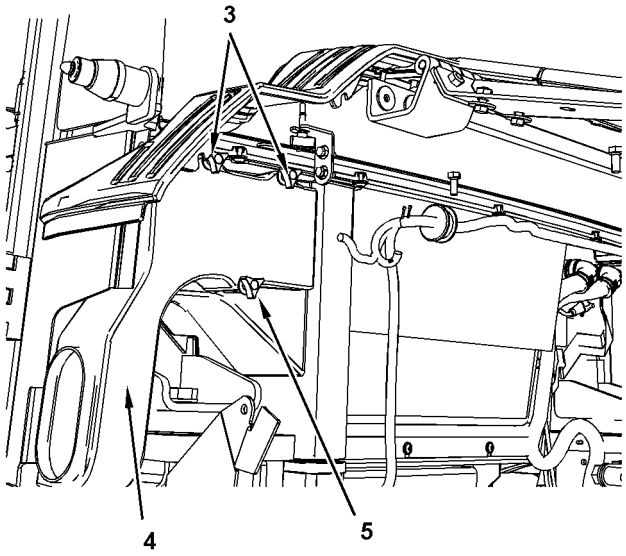


Illustration 108 g01355920

3. Loosen the 2 top thumb screws (3) that hold the air duct (4). Remove the bottom thumb screw (5).

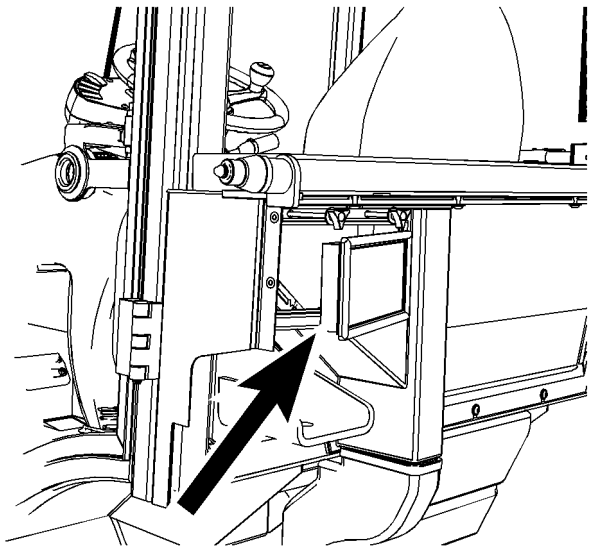


Illustration 109 g01355951

4. Remove the filter element. Clean the filter element with compressed air.
5. Install the filter element and replace the thumb screw.
6. Tighten all of the thumb screws.
7. Install the access panel.
8. Close the access door.

i02754409

Cooling System Coolant (ELC) - Change

SMCS Code: 1395-044-NL

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

NOTICE
Mixing ELC with other products will reduce the effectiveness of the coolant.

This could result in damage to cooling system components.

If Caterpillar products are not available and commercial products must be used, make sure they have passed the Caterpillar EC-1 specification for pre-mixed or concentrate coolants and Caterpillar Extender.

Note: The machine was shipped from the factory with Extended Life Coolant (ELC) in the cooling system.

For information about the addition of Extender to your cooling system, see the Operation and Maintenance Manual, “Cooling System Coolant (ELC) Extender - Add” or consult your Caterpillar dealer.

Drain the coolant whenever the coolant is dirty or whenever the coolant is foaming.

Allow the machine to cool before you change the coolant.

1. Open the engine hood. Refer to Operation and Maintenance Manual, “Access Doors and Covers”.

Note: The coolant tank is located on the right side of the engine compartment.

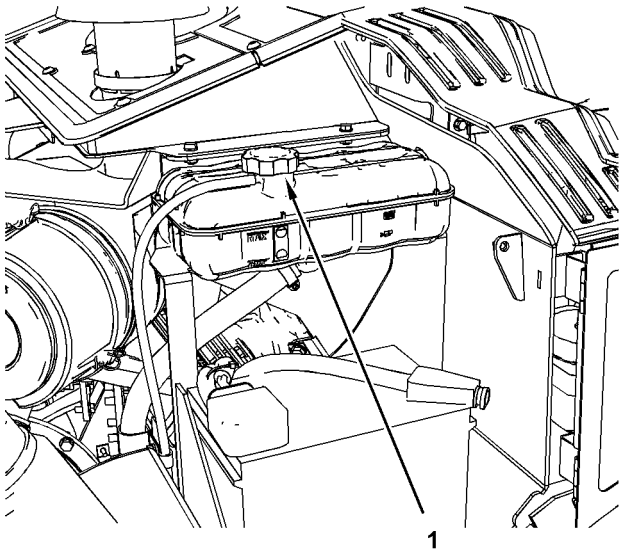


Illustration 110 g01357729

2. Slowly loosen the cap (1) in order to relieve system pressure. Remove the cap.

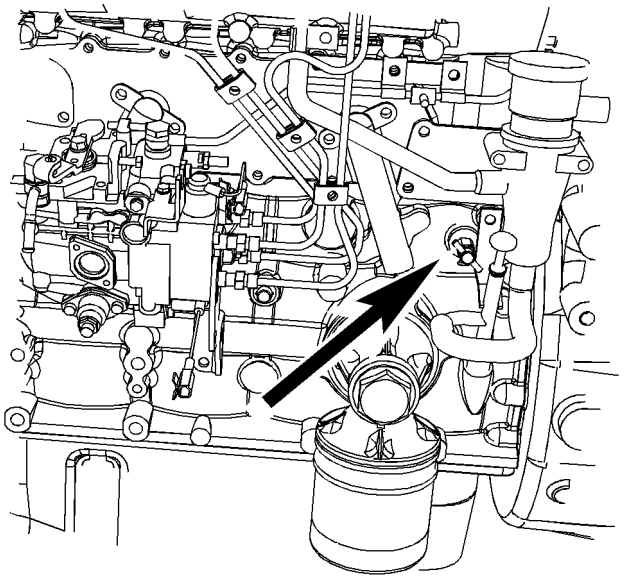


Illustration 111 g01357744

3. Locate the drain for the engine coolant on the side of the engine. Attach a drain hose to the drain valve that is shown in illustration 111. Open the drain and allow the coolant to drain into a suitable container.

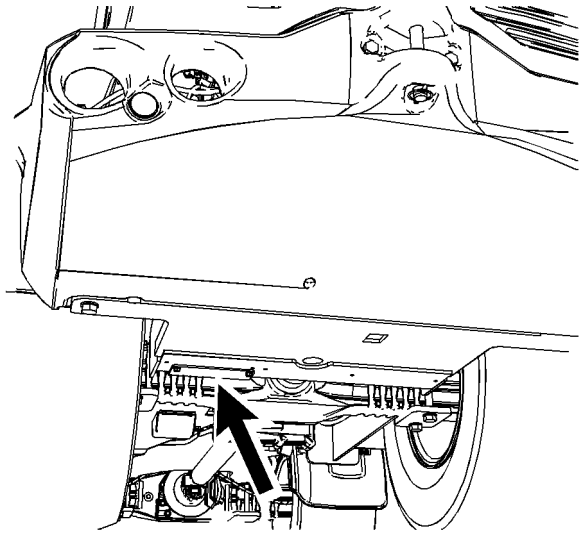


Illustration 112 g01359660

4. Remove the access panel under the rear of the machine.

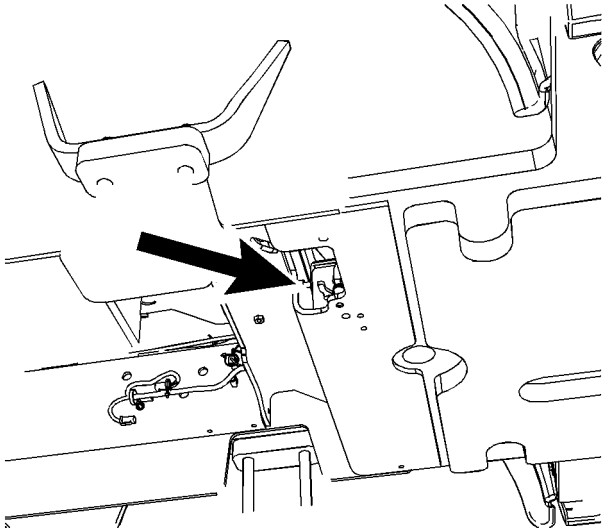


Illustration 113 g01380076

5. Open the drain and allow the coolant to drain from the radiator into a suitable container.

6. Close the drain.

7. Replace the access panel.

8. Replace the thermostat. See Operation and Maintenance Manual, “Cooling System Water Temperature Regulator - Replace” for the process for replacing the thermostat.

9. Add the coolant solution directly to the coolant tank. Refer to Operation and Maintenance Manual, “Capacities - (Refill)”. Refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations”.

Note: Premix the coolant solution before filling the cooling system. The coolant solution should contain 50 percent coolant and 50 percent distilled water.

Note: Add the coolant solution at a maximum rate of five liters per minute. This will reduce the chance of trapping air inside the engine block. A large amount of trapped air can cause localized heating to occur upon start-up. Localized heating may result in engine damage, which may lead to failure of the engine.

10. Start the engine. Run the engine without the radiator cap for 30 seconds. Stop the engine. Allow the engine to sit for 1 minute. Check the coolant level. If necessary, add coolant.

11. Check the coolant level in the coolant tank. Maintain the coolant level to the top mark on the tank.

12. Stop the engine. Inspect the cap for the coolant tank and the gasket. Replace the cap if the cap or the gasket is damaged. Install the cap.

13. Close the engine hood.

i01389522

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352-544-NL

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loose the cap slowly to relieve the pressure.

When a Caterpillar Extended Life Coolant is used, an extender must be added to the cooling system. See the Operation and Maintenance Manual, “Maintenance Interval Schedule” for the proper service interval. The amount of extender is determined by the cooling system capacity.

Table 29

RECOMMENDED AMOUNT OF EXTENDER BY COOLING SYSTEM CAPACITY	
Cooling System Capacity	**Recommended Amount of Extender**
22 to 30 L (6 to 8 US gal)	0.57 L (.60 qt)
30 to 38 L (8 to 10 US gal)	0.71 L (.75 qt)
38 to 49 L (10 to 13 US gal)	0.95 L (.95 qt)
49 to 64 L (13 to 17 US gal)	1.18 L (1.25 qt)

For additional information on the addition of extender, see Operation and Maintenance Manual, SEBU6250, “Cooling System Specifications” or consult your Caterpillar dealer.

i02699202

Cooling System Coolant Level - Check

SMCS Code: 1350-535-FLV

⚠ WARNING

Pressurized system: Hot coolant can cause serious burn. To open cap, stop engine, wait until radiator is cool. Then loosen cap slowly to relieve the pressure.

Open the engine hood. The coolant tank is located on the right side above the battery.

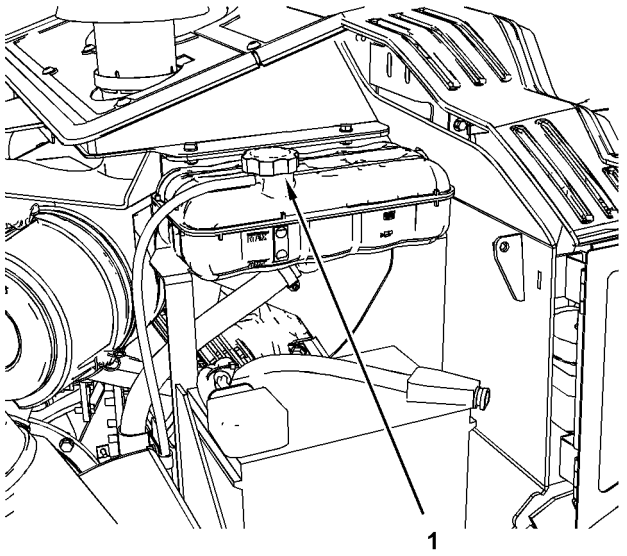


Illustration 114 g01357729

1. Remove the cap (1) from the coolant tank.

2. Maintain the coolant level between the marks on the side of the tank, when the cooling system is cool. If you need to add coolant daily, check the cooling system for leaks.

3. Replace the cap if the seal is damaged.

4. Install the cap on the tank.

i02699199

Cooling System Coolant Sample (Level 1) - Obtain

SMCS Code: 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.

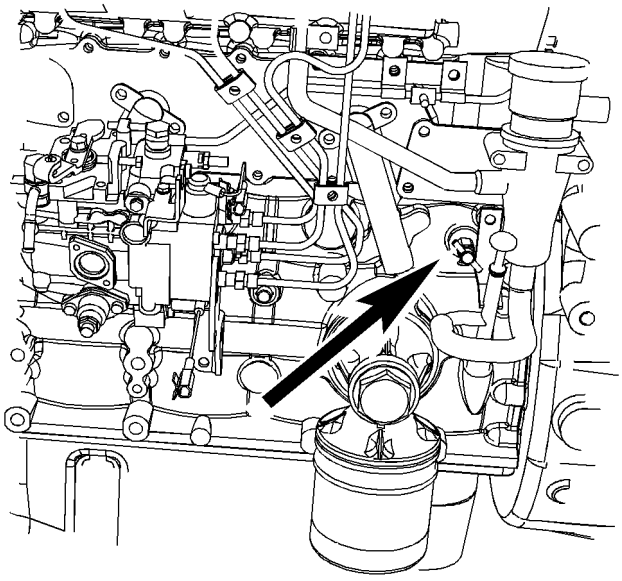


Illustration 115 g01357744
Coolant Drain Valve

1. Open the engine hood.
2. Open the coolant drain valve that is located on the side of the engine in order to sample the coolant.
3. Submit the sample for Level 1 analysis.

i02699201

Cooling System Coolant Sample (Level 2) - Obtain

SMCS Code: 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.

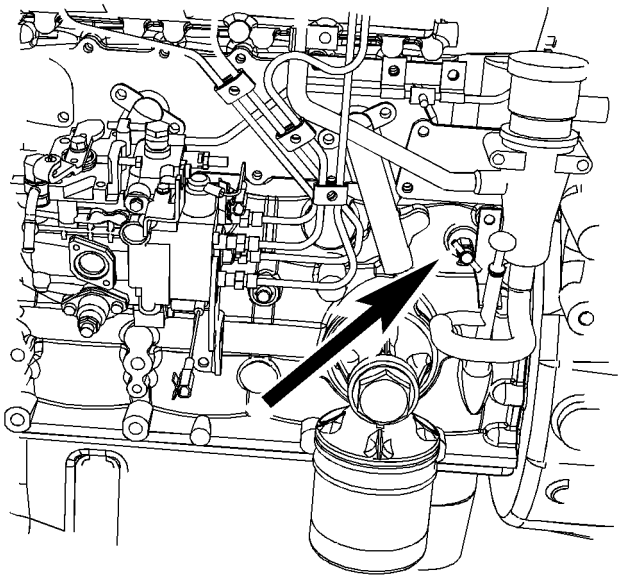


Illustration 116 g01357744

1. Open the engine hood.
2. Open the coolant drain valve that is located on the side of the engine in order to sample the coolant.

Submit the sample for Level 2 analysis.

i02998149

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510; 1393-010

Failure to replace the engine's thermostat on a regularly scheduled basis could cause severe engine damage.

The thermostat should be replaced after the cooling system has been cleaned. Replace the thermostat while the cooling system is completely drained or while the coolant is drained to a level that is below the thermostat housing.

Caterpillar engines incorporate a shunt design cooling system. It is mandatory to always operate the engine with a thermostat.

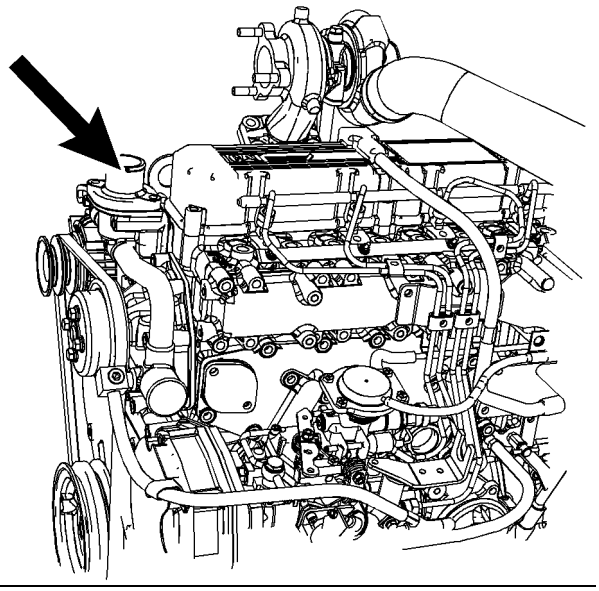


Illustration 117 g01520307

1. Loosen the hose clamp and remove the hose from the thermostat housing assembly.
2. Remove the bolts from the assembly and remove the assembly.
3. Remove the gasket, the thermostat, and the seal from the assembly.
4. Install a new seal in the assembly. Install a new thermostat and a new gasket. Install the assembly.
5. Install the hose. Tighten the hose clamp.
6. Refill the cooling system. See Operation and Maintenance Manual, SEBU6250, “Cooling System Specifications” and Operation and Maintenance Manual, “Refill Capacities”.

i02699128

Differential and Final Drive Oil - Change

SMCS Code: 3278-044; 4050-044

Wipe the covers and surfaces around openings before you check the oil. Wipe the covers and surfaces around openings before you add oil.

Differential Oil

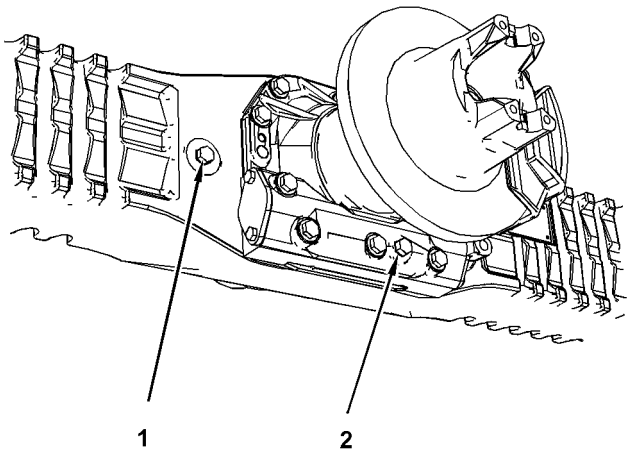


Illustration 118 g01357818

Front Differential

(1) Level/Fill Plug
(2) Drain Plug

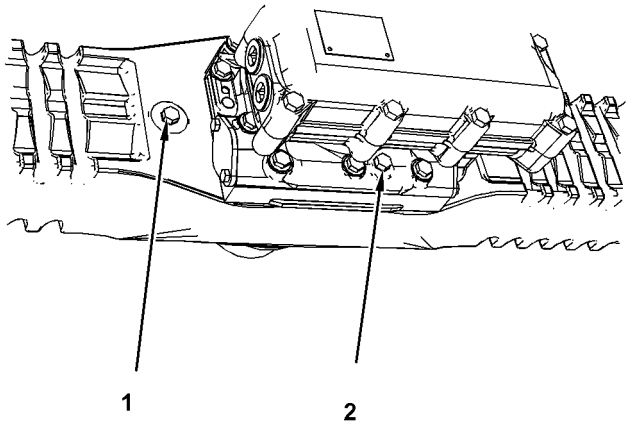


Illustration 119 g01357819

Rear Differential

(1) Level/Fill Plug
(2) Drain Plug

1. Remove the drain plugs (2) from both differentials. Allow the oil to drain into a suitable container.
2. Clean the drain plugs and reinstall the drain plugs.
3. Remove the differential level/fill plug (1) from both differentials.

4. Fill the differentials with oil. See Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Refill Capacities”.

5. Maintain the oil level at the bottom of the threads for the plug.

6. Clean the differential level/fill plugs and install the plugs for each differential. Operate the machine for a few minutes in order to allow the oil to flow completely through the axles. Remove the differential level/fill plugs and recheck the oil level. Add oil, if necessary. Install the differential level/fill plugs for each differential.

Oil for the Wheel

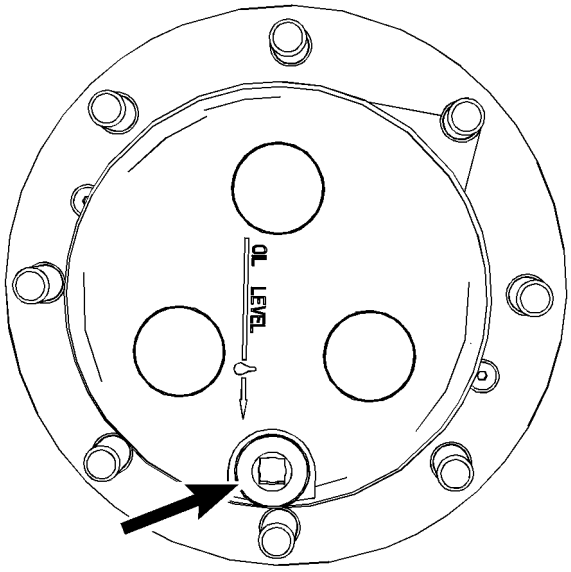


Illustration 120 g01357829

Wheel in the position for draining

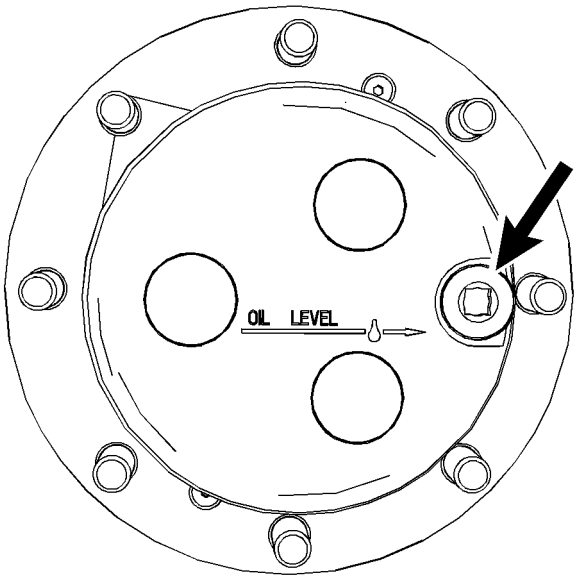


Illustration 121 g01357831

Wheel in the position for filling

Note: Work on one wheel at a time.

1. Move the machine so that the plug on the wheel is on the bottom of the wheel.

2. Remove the drain plug from the wheel. Allow the oil to drain into a suitable container.

3. Move the machine so that the plug on the wheel is in the horizontal position.

4. Fill the wheel with oil. See Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Refill Capacities” for information about the oil.

5. Maintain the oil level at the bottom of the threads for the plug.

6. Clean the plug and install the plug. Operate the machine for a few minutes in order to allow the oil to flow completely through the axles. Remove the plug and recheck the oil level. Add oil, if necessary. Install the plug.

7. Repeat steps 1 through 6 for each wheel.

i02699138

Differential and Final Drive Oil Level - Check

SMCS Code: 3278-535-FLV; 4050-535-FLV

Differential

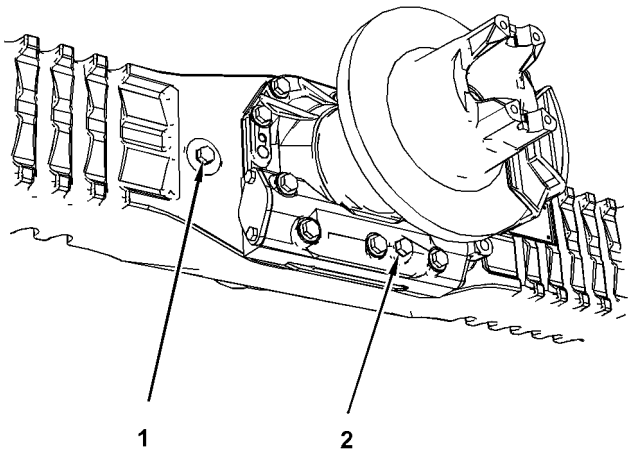


Illustration 122 g01357818

Front Differential

(1) Level/Fill Plug
(2) Drain Plug

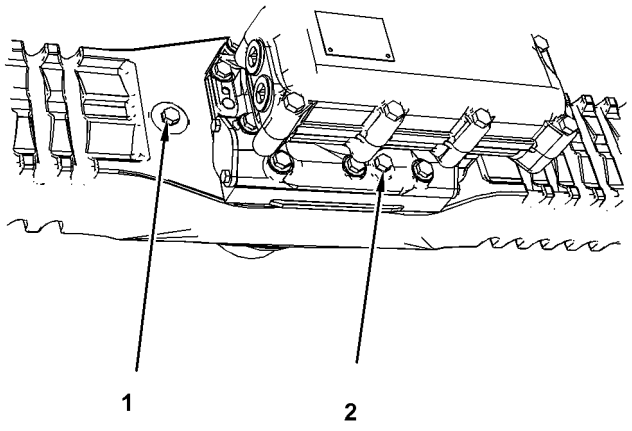


Illustration 123 g01357819

Rear Differential

(1) Level/Fill Plug
(2) Drain Plug

1. Remove the differential level/fill plugs (1) for the front axle and the rear axle.
2. The oil level should be at the bottom of the threads for the plug.
3. Add oil, if necessary.
4. Clean the plugs and install the plugs.

Wheels

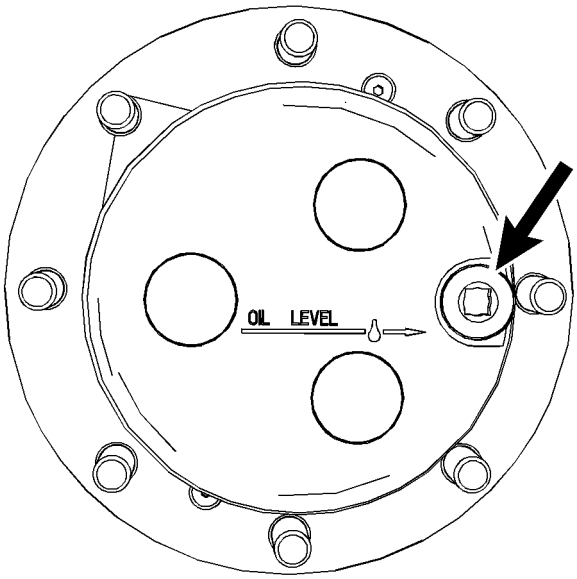


Illustration 124 g01357831

Wheel in the position for checking

Note: Work on one wheel at a time.

1. Move the machine so that the plug on the wheel is in the horizontal position.
2. Remove the level/fill plugs for the wheel.
3. The oil level should be at the bottom of the threads for the plug.
4. Maintain the oil level at the bottom of the threads for the plug.
5. Add oil, if necessary.
6. Clean the plug and install the plug.
7. Repeat steps 1 through 6 for each wheel.

i02699139

Differential and Final Drive Oil Sample - Obtain

SMCS Code: 3278-008; 4050-008; 4070-008; 7542

⚠ WARNING

Hot oil and components can cause personal injury.

Do not allow hot oil or components to contact skin.

1. Operate the machine for a few minutes before you obtain the fluid sample. This will thoroughly mix the fluid for a more accurate sample.

2. Obtaining a sample will require a vacuum pump or an equivalent. Withdraw the oil through the filler opening.

   Reference: For more information, refer to Special Publication, SEBU6250, “Caterpillar Machine Fluids Recommendations” and Special Publication, PEHP6001, “How To Take A Good Oil Sample”.

i02699204

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 if the air cleaner is serviced while the engine is running.

Service the air cleaner filter element when the yellow piston on the engine air filter service indicator enters the red zone. Refer to Operation and Maintenance Manual, “Engine Air Filter Service Indicator - Inspect”.

NOTICE
Caterpillar recommends certified air filter cleaning services that are available at 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.

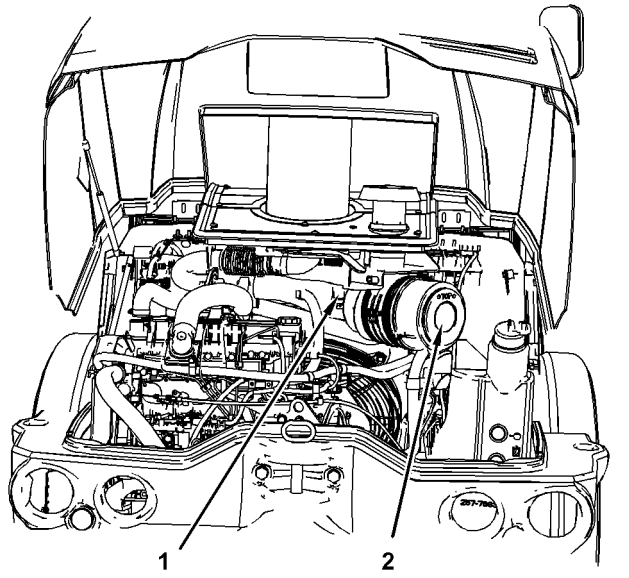


Illustration 125 g01357913

Location of the engine air filter

(1) Engine Air Filter Service Indicator
(2) Engine Air Filter

1. Open the engine hood.

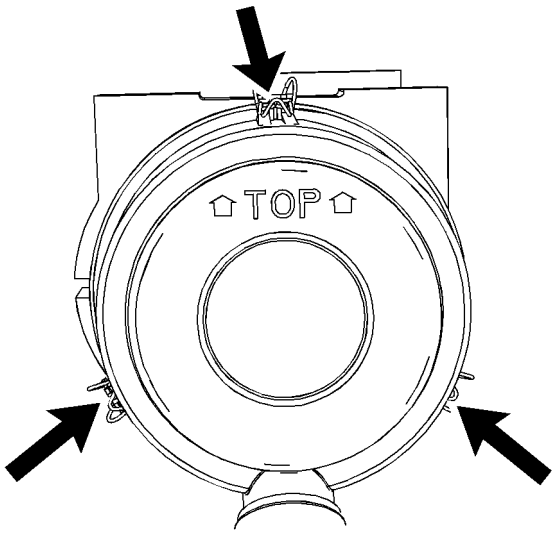


Illustration 126 g01379338

2. Release the 3 clips on the air cleaner housing cover. Remove the air cleaner housing cover.

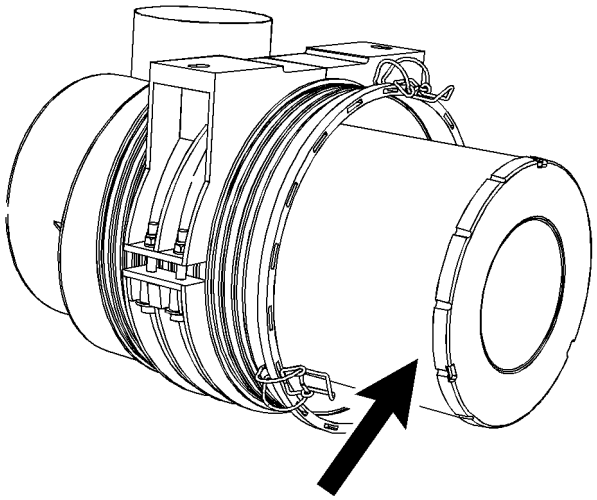


Illustration 127 g01379340

3. Remove the primary filter element.

4. Install a clean air filter element. Install the air cleaner housing cover and fasten the clips.

5. Reset the engine air filter service indicator.

If the yellow piston in the indicator remains in the red zone, replace the secondary element.

i02699205

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510-SE

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

The secondary filter element should be replaced at the time the primary element is serviced for the third time.

The secondary filter element should also be replaced if the yellow piston in the filter element indicator enters the red zone after installation of a clean primary element, or if the exhaust smoke is still black.

NOTICE
Service the air cleaner only with the engine stopped. Engine damage could result if the air cleaner is serviced while the engine is running.

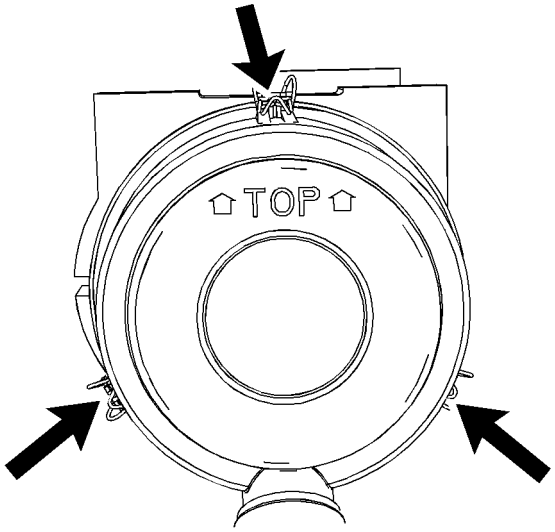


Illustration 128 g01379338

1. Release the 3 clips on the air cleaner housing cover. Remove the air cleaner housing cover.

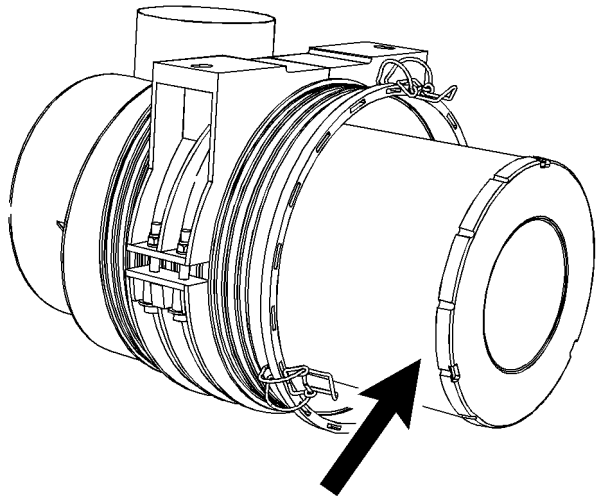


Illustration 129 g01379340

2. Remove the primary filter element.

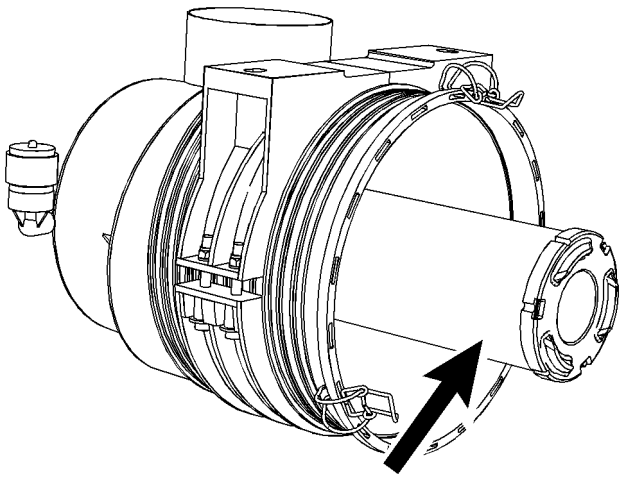


Illustration 130 g01379368

3. Remove the secondary filter element.

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

5. Inspect the gasket between the air inlet pipe and the air cleaner housing. Replace the gasket if the gasket is damaged.

6. Uncover the air inlet opening. Install a new secondary element.

7. Install the primary element.

8. Install the air cleaner housing cover and install the clip.

9. Reset the engine air filter service indicator.

i02699207

Engine Air Filter Service Indicator - Inspect/Replace

SMCS Code: 7452-040; 7452-510

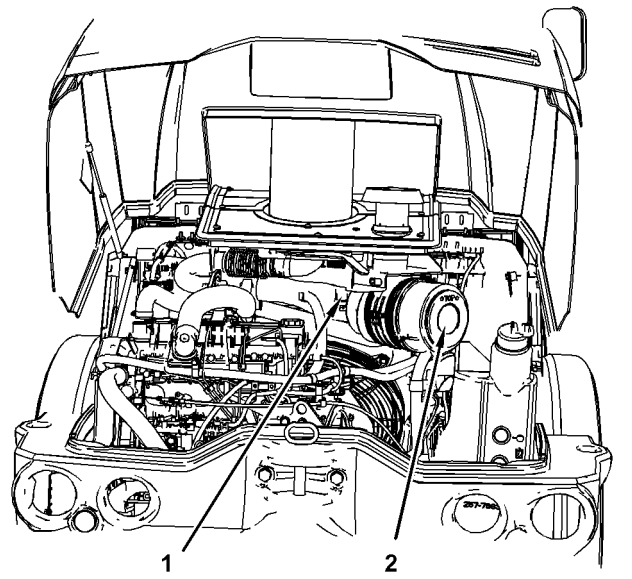


Illustration 131 g01357913

Location of the engine air filter

(1) Engine Air Filter Service Indicator
(2) Engine Air Filter

1. Mount the machine.

2. Fasten the seat belt and start the engine.

3. Run the engine at high idle.

4. Stop the engine.

5. Open the engine hood.

6. Inspect the indicator. If the yellow piston in the indicator enters the red zone, service the air cleaner.

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

7. Reset the indicator.

Note: To check the condition of the service indicator, try resetting the service indicator. This should require less than three pushes of the reset button. Next, check the movement of the yellow piston in the service indicator. Start the engine and accelerate the engine to high idle for a few seconds. After the governor control pedal is released, the yellow piston should remain at the highest position that was achieved during acceleration. If either of these conditions are not met, replace the service indicator.

i02708486

Engine Compartment - Clean

SMCS Code: 1000-070-CPA

Inspect the engine compartment for dirt buildup or debris. Remove any dirt or debris from the engine compartment.

1. Open the engine hood. Refer to Operation and Maintenance Manual, “Access Doors and Covers”.

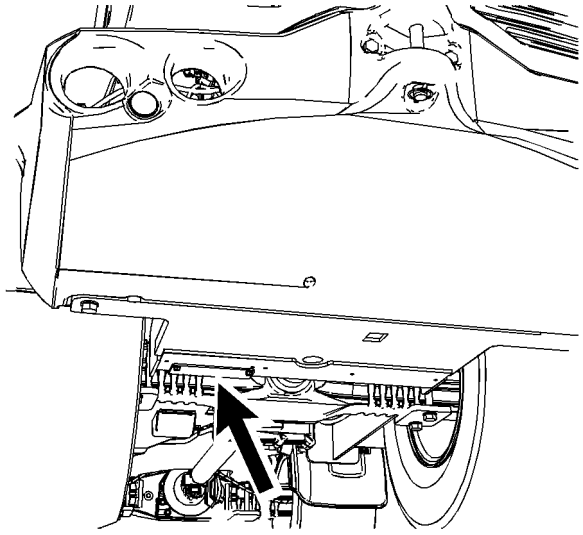


Illustration 132 g01359660

2. Remove any debris or dirt from the engine compartment. If necessary, remove the belly plate in order to clean out the engine compartment. The belly plate is located under the rear of the machine on the left side.

Note: Use care when you clean the engine compartment. Damage to the machine may occur.

3. Install the belly plate. Close the engine hood.

i02699208

Engine Crankcase Breather (Closed Circuit) - Replace

SMCS Code: 1317-510

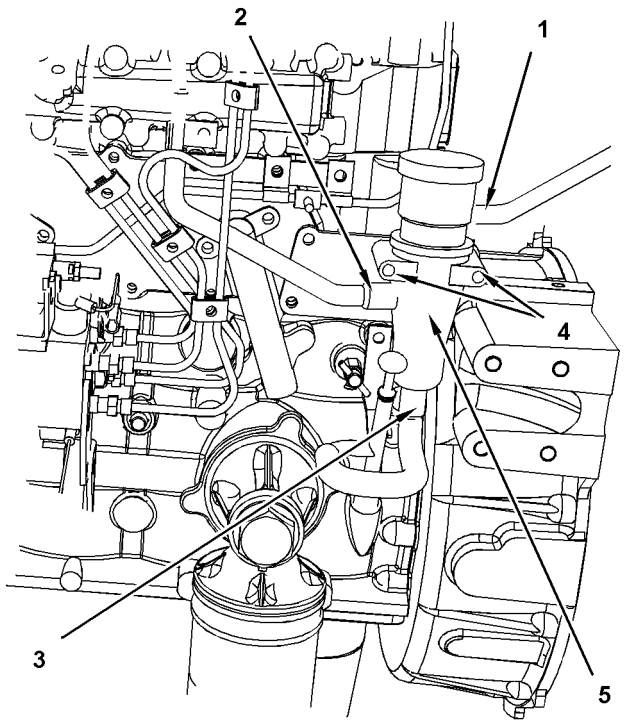


Illustration 133 g01357934

The engine crankcase breather is located inside the engine compartment.

1. Loosen the three hose clamps and remove hoses (1), (2), and (3) from the breather.

2. Remove two bolts (4) and washers from the breather.

3. Remove breather (5) from the bracket.

4. Inspect the hoses for damage. If the hoses are worn or damaged, replace the hoses.

5. Replace new breather (5) with washers and two bolts (4).

6. Install hoses (3), (2), and (1) to the breather and tighten the hoses.

7. Close the engine hood.

i02998164

Engine Oil Level - Check

SMCS Code: 1348-535-FLV

NOTICE
Do not overfill the crankcase. Engine damage can result.

1. Open the engine hood.

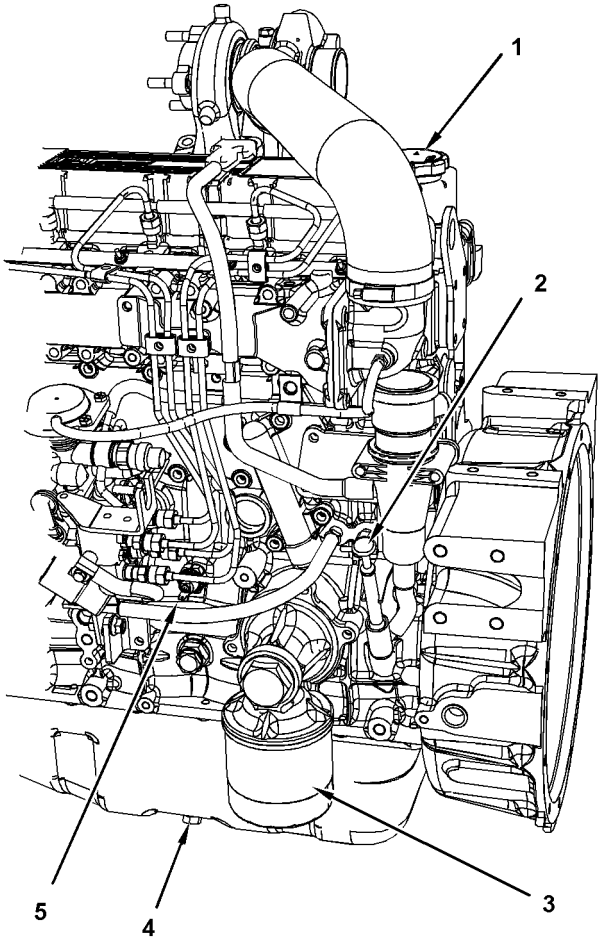


Illustration 134 g01520314

(1) Oil Filler Cap
(2) Oil Dipstick
(3) Oil Filter
(4) Oil Drain Valve
(5) Oil Sample Port

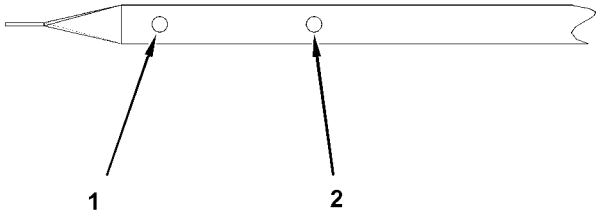


Illustration 135 g01277108

(1) Oil level add mark
(2) Full mark

2. Maintain the oil level between the mark (1) and the mark (2) on the dipstick.

Note: After ten minutes, check the oil level on the dipstick.

3. If necessary, remove the oil filler cap and add oil.

4. Clean the oil filler cap and install the oil filler cap.

5. Close the engine hood.

i02998169

Engine Oil Sample - Obtain

SMCS Code: 1348-008; 7542

Open the engine hood.

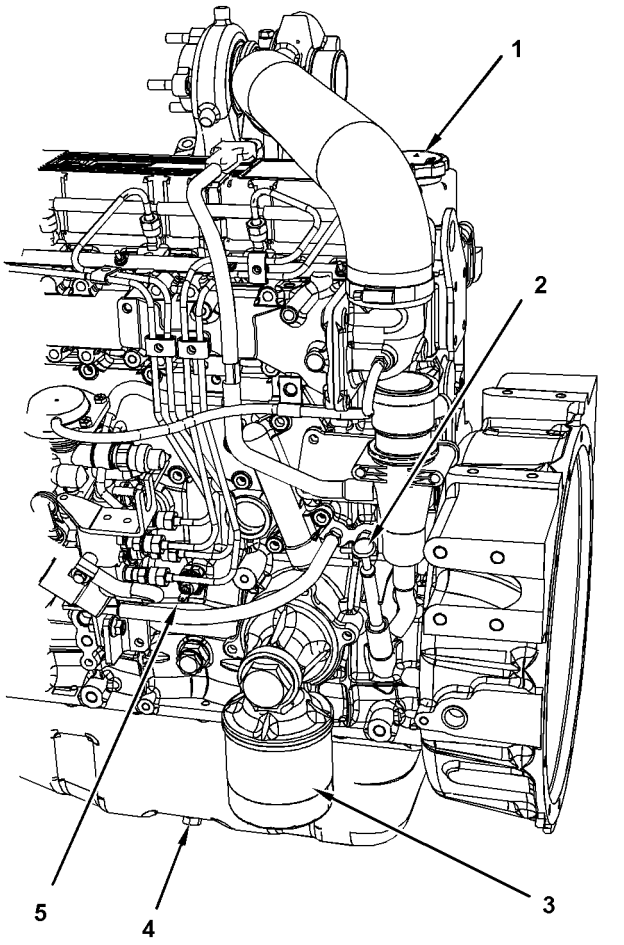


Illustration 136 g01520314

(1) Oil Filler Cap
(2) Oil Dipstick
(3) Oil Filter
(4) Oil Drain Valve
(5) Oil Sample Port

The sampling port for the engine oil is located on the right side of the engine block next to the oil filter base.

i02998175

Engine Oil and Filter - Change

SMCS Code: 1308-510; 1348-044

The normal engine oil change interval is every 500 service hours or one year. If the engine is operated under severe conditions or if the oil is not Caterpillar oil, change the oil after every 250 service hours or after six months. Severe conditions include the following factors: high temperatures, continuous high loads, and extremely dusty conditions.

Refer to the results of the S·O·S oil analysis in order to determine if the engine oil change interval should be decreased. Consult your Caterpillar dealer for detailed information regarding the optimum engine oil change interval.

1. Open the engine hood.

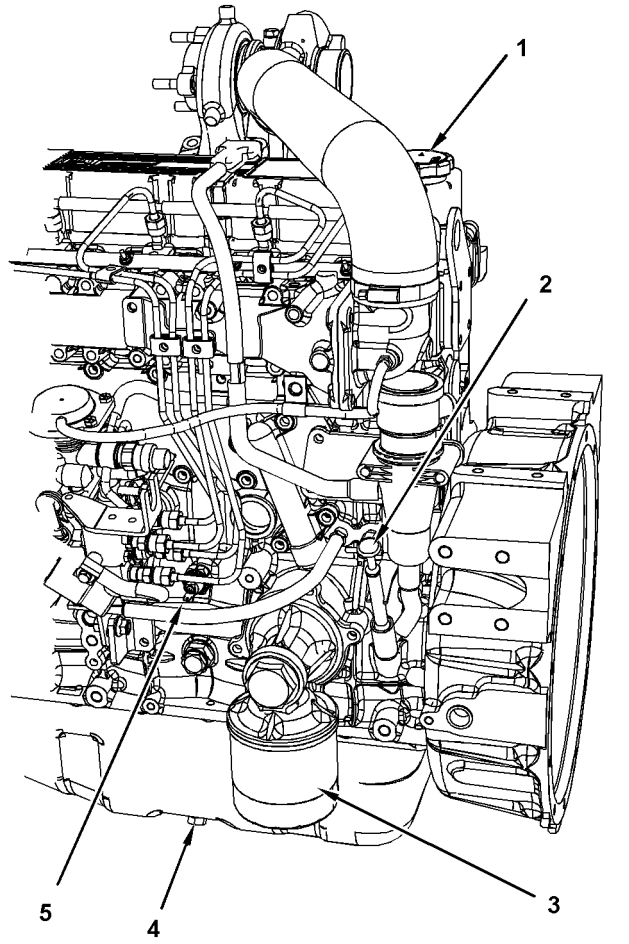


Illustration 137 g01520314

(1) Oil Filler Cap
(2) Oil Dipstick
(3) Oil Filter
(4) Oil Drain Valve
(5) Oil Sample Port

2. Open the crankcase drain valve and drain the oil into a suitable container.

3. Close the crankcase drain valve.

4. Remove the filter element with a strap type wrench. Refer to Operation and Maintenance Manual, “Oil Filter - Inspect”.

5. Clean the filter mounting base with a clean cloth. Make sure that the old filter gasket has been removed.

6. Apply a thin film of clean engine oil to the sealing surface of the new filter element.

7. Install a new engine oil filter hand tight until the seal of the engine oil filter contacts the base. Note the position of the index marks on the filter in relation to a fixed point on the filter base.

Note: There are rotation index marks on the engine oil filter that are spaced 90 degrees or 1/4 of a turn away from each other. When you tighten the engine oil filter, use the rotation index marks as a guide.

8. Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide. For non-Caterpillar filters, use the instructions that are provided with the filter.

Note: You may need to use a Caterpillar strap wrench, or another suitable tool, in order to turn the filter to the amount that is required for final installation. Make sure that the installation tool does not damage the filter.

9. Wipe the area around the oil filler cap. Remove the oil filler cap. Fill the crankcase with new oil. Refer to Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Refill Capacities”. Clean the oil filler cap and install the oil filler cap.

10. Start the engine and allow the oil to warm. Check for leaks.

Note: After you stop the engine, you must wait for ten minutes before you check the oil level. This is done in order to allow the oil to drain back into the oil pan.

11. Stop the engine and wait for ten minutes in order to allow the oil to drain into the oil pan. Maintain the oil level in the crosshatched region of the engine oil dipstick. Add oil, if necessary.

12. Close the engine hood.

i00664189

Engine Valve Lash - Check

SMCS Code: 1105-025

Refer to the Service Manual for the complete adjustment procedure for the engine valve lash.

A qualified mechanic should adjust the engine valve lash and the fuel injector timing because special tools and training are required.

i03005669

Fuel System Filter and Water Separator - Replace

SMCS Code: 1261-510; 1263-510

The fuel system filter/water separator element is located in the engine compartment on the left side.

1. Open the engine access door.

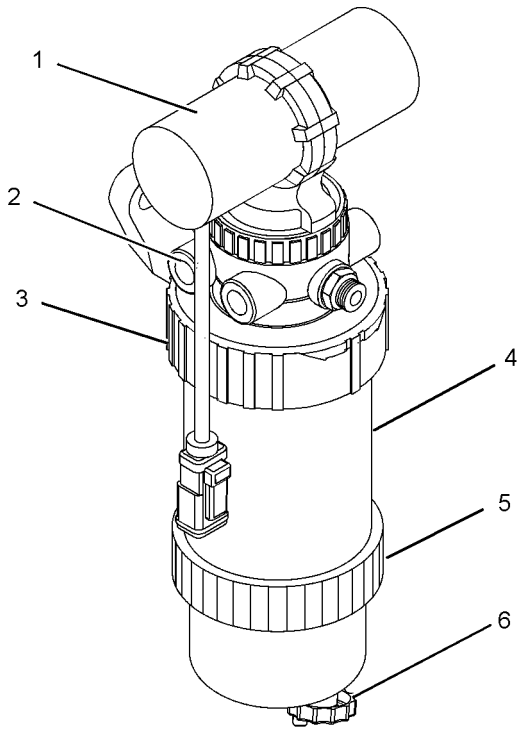


Illustration 138 g01355125

(1) Electric fuel priming pump
(2) Fuel filter base
(3) Quick release collar
(4) Fuel filter
(5) Sediment bowl
(6) Drain valve for fuel filter

2. Open the drain on the water separator bowl. Allow the water and fuel to drain into a suitable container.

3. Support the water separator element and rotate the locking ring counterclockwise. Remove the locking ring.

4. Remove the water separator bowl from the bottom of the fuel filter/water separator element.

Note: The water separator bowl is reusable. Do not discard the water separator bowl.

5. Inspect the O-ring seal of the water separator bowl for damage. Replace the O-ring seal, if necessary.

6. Lubricate the O-ring seal with clean diesel fuel or lubricate the O-ring seal with motor oil. Place the seal in the water separator bowl.

7. Spin the water separator bowl onto the new filter element by hand until the fuel filter/water separator is snug. Do not use tools to tighten the fuel filter/water separator element to the bowl.

8. Clean the filter mounting base.

9. Install the new element. Rotate the locking ring clockwise in order to fasten the filter to the mounting base.

10. In order to activate the electric fuel priming pump, turn the ignition switch to the START position and release the ignition switch. This process will activate the relay for the electric fuel priming pump which allows power to reach the electric fuel priming pump. The electrically operated fuel pump will fill the water separator element with fuel.

i03005672

Fuel System Water Separator - Drain

SMCS Code: 1263-543

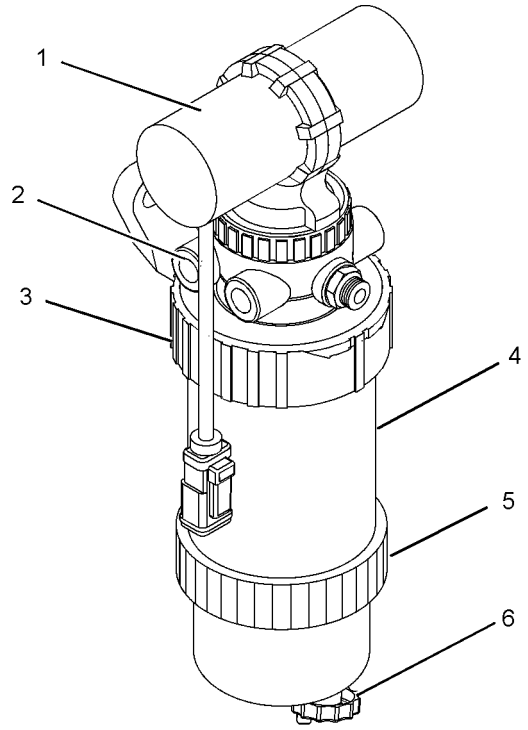


Illustration 139 g01355125

(1) Electric fuel priming pump
(2) Fuel filter base
(3) Quick release collar
(4) Fuel filter
(5) Sediment bowl
(6) Drain valve for fuel filter

1. Open the engine hood.

2. Pull the drain hose outside the engine compartment.

3. Loosen the drain valve on the bottom of the water separator. Allow the water and the sediment to drain into a suitable container.

4. Tighten the drain valve and put the drain hose inside the engine compartment.

5. Close the engine hood.

i02724242

Fuel Tank Cap and Strainer - Clean

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

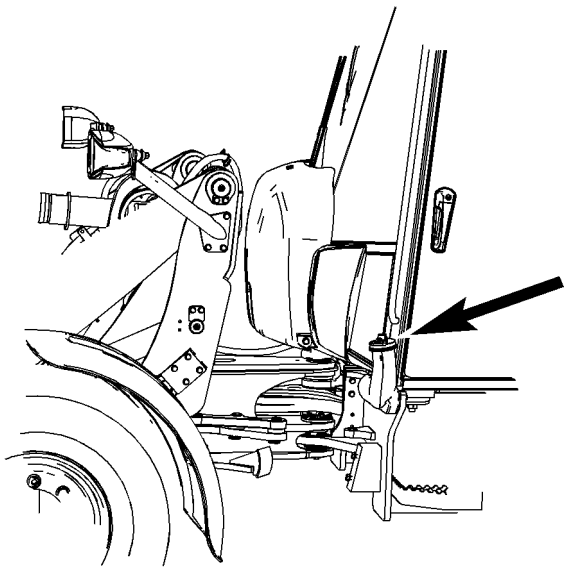


Illustration 140 g01366657

The fuel cap is located in the center on the left side of the machine.

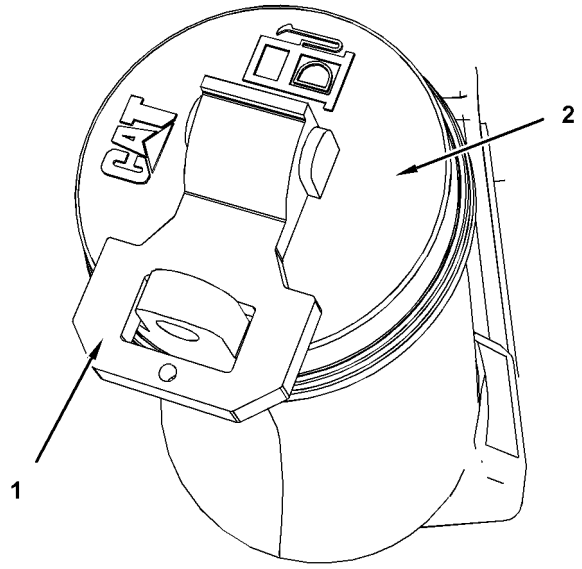


Illustration 141 g01366659

1. Lift the lever (1) and turn the lever counterclockwise until the lever stops. Remove the cap (2).
2. Inspect the seal for damage. Replace the seal, if necessary.
3. Remove the strainer that is located in the filler opening.
4. Wash the strainer and the fuel tank cap in a clean, nonflammable solvent.
5. Install the strainer into the filler opening.
6. Install the fuel tank cap. Close the engine access door.

i02699147

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543-M&S

Release the pressure in the fuel tank by loosening the fuel tank cap.

The fuel tank drain valve is located in the center on the left side underneath the machine.

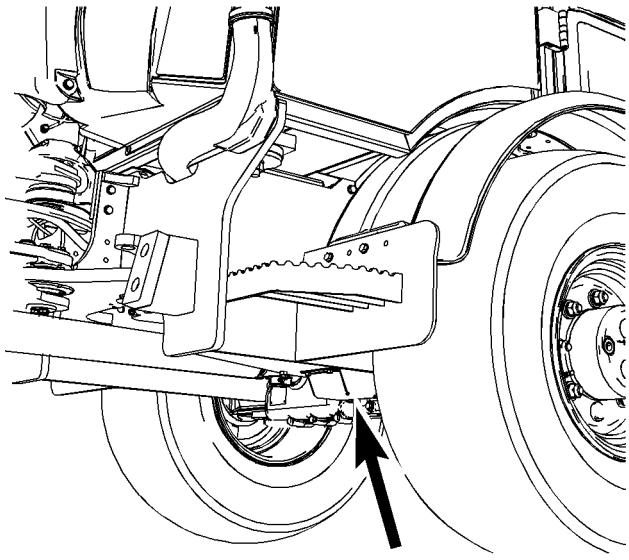


Illustration 142 g01358191

Remove the cover.

Open the fuel tank drain valve. Allow the water and sediment to drain into a suitable container. Close the fuel tank drain valve.

Replace the cover.

i02699211

Fuses - Replace

SMCS Code: 1417-510

Fuses

Fuses – Fuses protect the electrical system from damage that is caused by overloaded circuits. Replace the fuse if the element separates. If the element of a new fuse separates, check the circuit. Repair the circuit, if necessary.

NOTICE
Replace the fuses with the same type and size only. Otherwise, electrical damage can result.

If it is necessary to replace fuses frequently, an electrical problem may exist. Contact your Caterpillar dealer

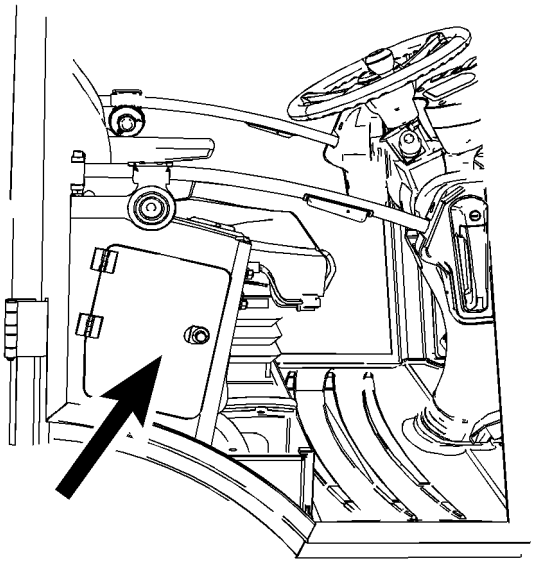


Illustration 143 g01356828

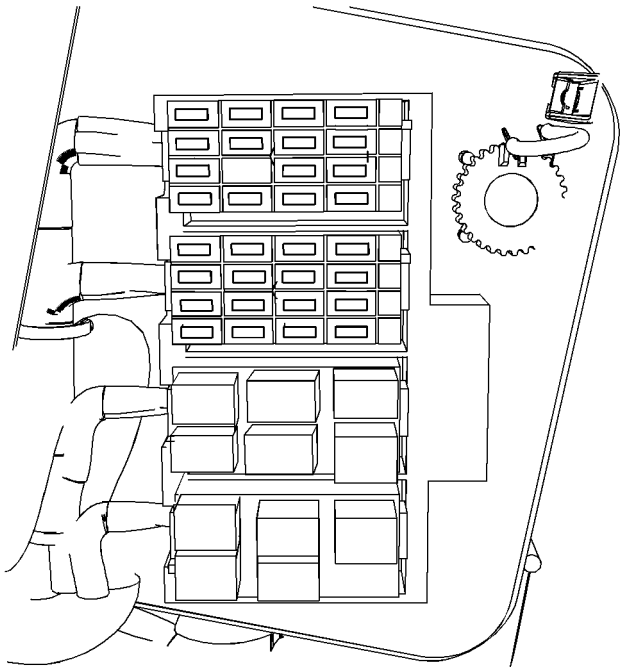


Illustration 144 g01356829

The fuse panel is located on the right side of the cab. In order to access the fuse panel, you must open the right side door.

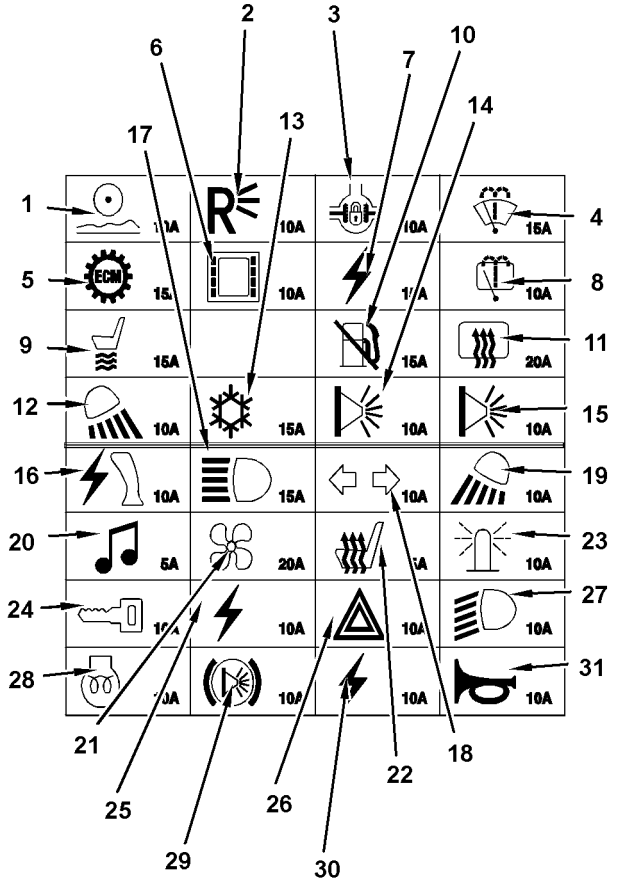


Illustration 145 g01356830

1 – Ride Control (10 Amp)

2 – Reverse Light (10 Amp)

3 – Differential Lock (10 Amp)

4 – Front Wiper and Washer (15 Amp)

5 – ECM (15 Amp)

6 – Electronic Display (10 Amp)

7 – Work Tool Circuit (15 Amp)

8 – Rear Wiper and Washer (10 Amp)

9 – Air Suspension Seat (15 Amp)

10 – Fuel Shutoff (15 Amp)

11 – Rear Window Defroster (20 Amp)

12 – Rear Work Lights (10 Amp)

13 – Air Conditioner (15 Amp)

14 – Left Tail Light (10 Amp)

15 – Right Tail Light (10 Amp)

16 – Implement Detent (10 Amp)

17 – High Beam Lights (15 Amp)

18 – Directional Signal Lights (10 Amp)

19 – Front Work Lights (10 Amp)

20 – Radio (5 Amp)

21 – HVAC Blower Fan (20 Amp)

22 – Heated Seat (5 Amp)

23 – Beacon (10 Amp)

24 – Ignition Switch (10 Amp)

25 – Electrical Power (10 Amp)

26 – Hazard Lights (10 Amp)

27 – Lights (10 Amp)

28 – Starting Aid (10 Amp)

29 – Brake Lights (10 Amp)

30 – Electrical Power (10 Amp)

31 – Horn (10 Amp)

Relays

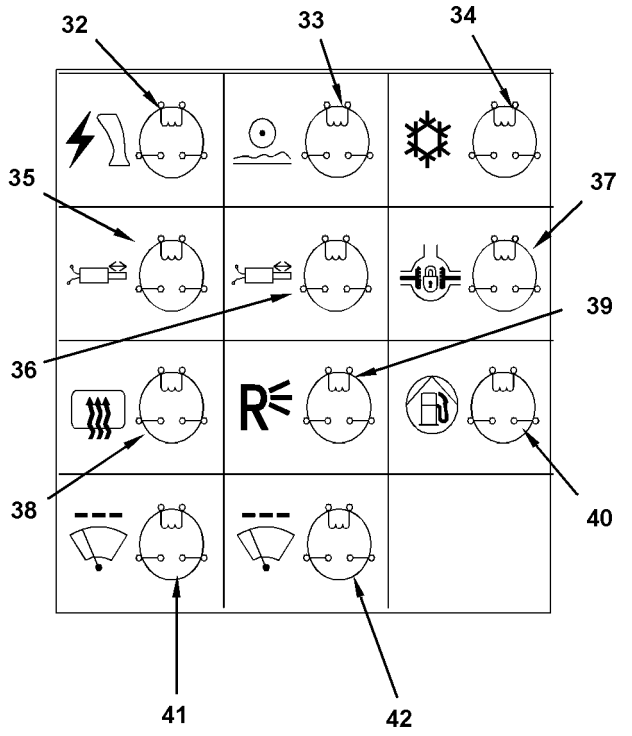


Illustration 146 g01356831

32 – Implement Detent

33 – Ride Control

34 – Clutch for the Air Conditioner Compressor

35 – Hydraulic

36 – Hydraulic

37 – Differential Lock

38 – Rear Window Defroster

39 – Reverse Light

40 – Fuel Pump

41 – Intermittent Windshield Wiper

42 – Intermittent Windshield Wiper

Main Fuses

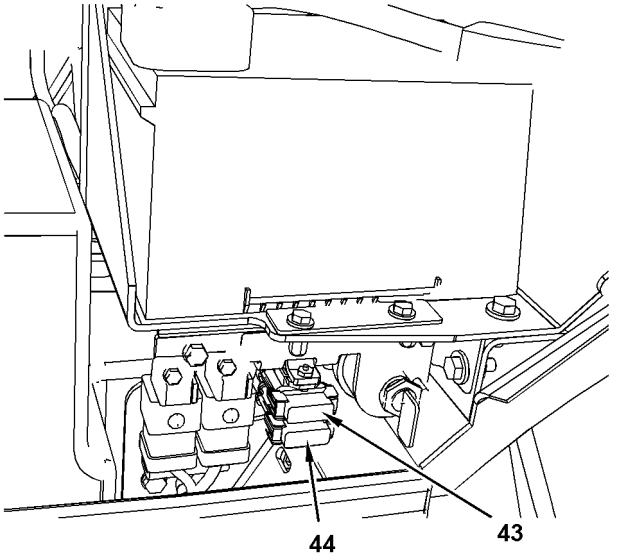


Illustration 147 g01357092

(43) 80 Amp Fuse
(44) 60 Amp Fuse

There are 2 main fuses in the engine compartment on the right side under the battery. If the element of either one of these fuses is separated, investigate the cause before operating the machine.

i01416931

Hinges - Lubricate

SMCS Code: 7000-086-HNG

Use dry film lubricant for the following applications: all moving door latches, hinges, door locks, lock for the hood, hinges for the hood, and throttle pedal linkage.

i03751352

Hydraulic System Oil (HYDO Advanced 10) - Change

SMCS Code: 5095-044

Cat HYDO Advanced 10 is the preferred oil for use in most Caterpillar machine hydraulic and hydrostatic transmission systems when ambient temperature is between −20 °C (−4 °F) and 50 °C (122 °F). Cat HYDO Advanced 10 has an SAE viscosity grade of 10W. **Cat HYDO Advanced 10 has a 50% increase in the standard oil drain interval** (up to 3000 hours) for machine hydraulic systems over second and third choice oils when you follow the maintenance interval schedule for oil filter changes and for oil sampling that is stated in the Operation and Maintenance Manual. 6000 hour oil drain intervals are possible when using S·O·S Services oil analysis. When you switch to Cat HYDO Advanced 10, cross contamination with the previous oil should be kept to less than 10%. Consult your Cat dealer for details about the benefits from the improved performance designed into Cat HYDO Advanced 10.

Operate the machine for a few minutes in order to warm the hydraulic system oil.

The machine should be on level ground. Lower the bucket to the ground and apply slight downward pressure. Engage the parking brake and stop the engine.

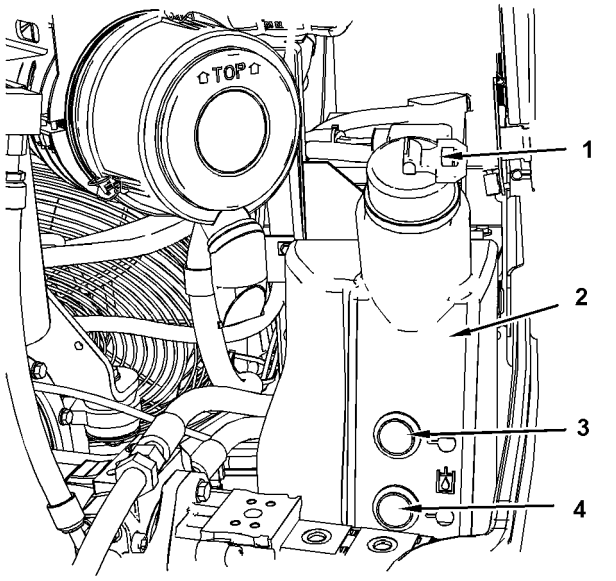


Illustration 148 g01358251

(1) Filler Cap
(2) Hydraulic Tank
(3) Upper Sight Gauge
(4) Lower Sight Gauge

1. Open the engine hood.

2. Remove the hydraulic tank filler cap.

3. The hydraulic tank drain plug is located on the bottom of the hydraulic tank on the underside of the machine. Remove the drain plug and allow the hydraulic oil to drain into a suitable container.

4. Install the drain plug.

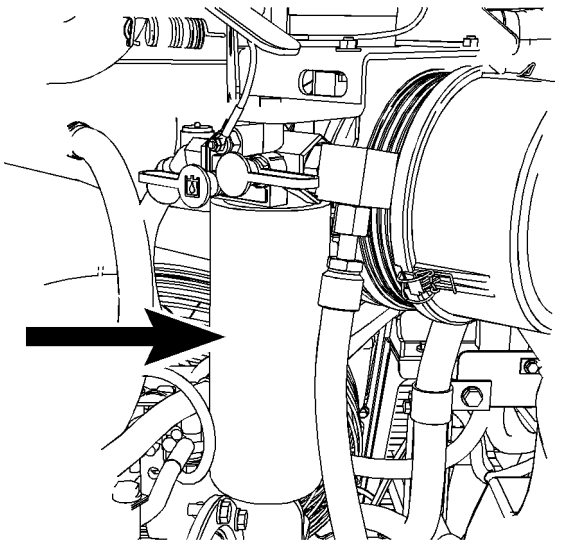


Illustration 149 g01358262

Hydraulic Oil Filter

5. Change the hydraulic system filter. Refer to Operation and Maintenance Manual, “Hydraulic System Oil Filter (Return) - Change”.

6. Fill the hydraulic system oil tank with hydraulic oil. Refer to Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Refill Capacities”.

Note: Observe the sight gauges for the hydraulic oil level as you fill the hydraulic system oil tank. Do not overfill the tank.

7. The sight gauges for the hydraulic oil level are located on the side of the tank below the filler cap. Maintain the hydraulic oil level in the center of the top sight gauge. Add oil, if necessary.

Note: The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses and hose clamps.

8. Inspect the gasket on the hydraulic tank filler cap for damage. Replace the gasket, if necessary.

9. Install the hydraulic tank filler cap.

10. Close the engine hood.

i02699149

Hydraulic System Oil - Change

SMCS Code: 5095-044

Operate the machine for a few minutes in order to warm the hydraulic system oil.

The machine should be on level ground. Lower the bucket to the ground and apply slight downward pressure. Engage the parking brake and stop the engine.

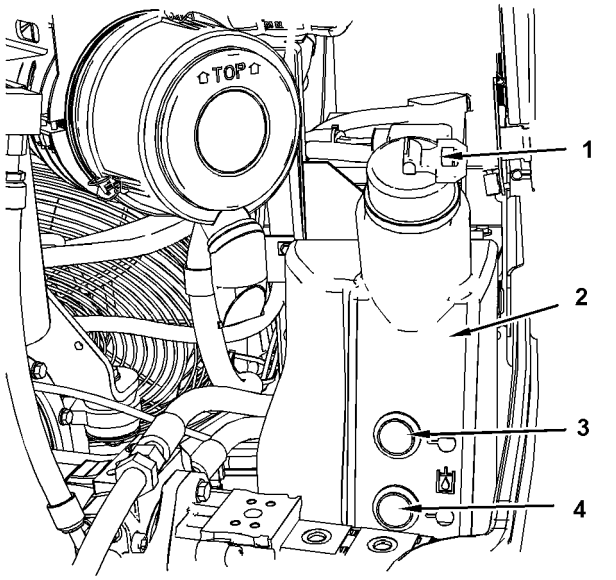


Illustration 150 g01358251

(1) Filler Cap
(2) Hydraulic Tank
(3) Upper Sight Gauge
(4) Lower Sight Gauge

1. Open the engine hood.

2. Remove the hydraulic tank filler cap.

3. The hydraulic tank drain plug is located on the bottom of the hydraulic tank on the underside of the machine. Remove the drain plug and allow the hydraulic oil to drain into a suitable container.

4. Install the drain plug.

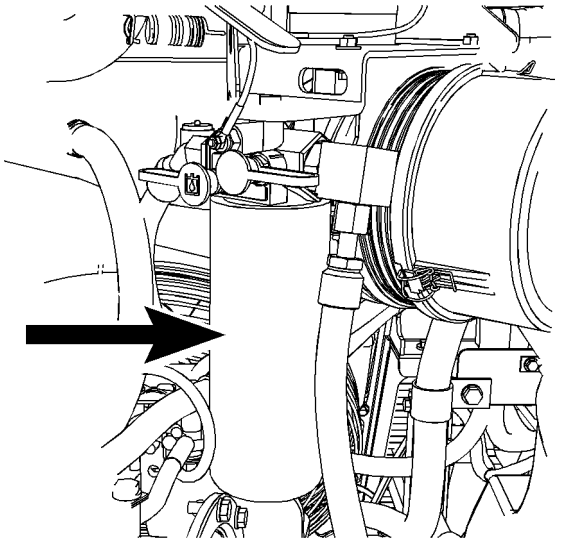


Illustration 151 g01358262
Hydraulic Oil Filter

5. Change the hydraulic system filter. Refer to Operation and Maintenance Manual, “Hydraulic System Oil Filter (Return) - Change”.

6. Fill the hydraulic system oil tank with hydraulic oil. Refer to Operation and Maintenance Manual, “Lubricant Viscosities” and Operation and Maintenance Manual, “Refill Capacities”.

Note: Observe the sight gauges for the hydraulic oil level as you fill the hydraulic system oil tank. Do not overfill the tank.

7. The sight gauges for the hydraulic oil level are located on the side of the tank below the filler cap. Maintain the hydraulic oil level in the center of the top sight gauge. Add oil, if necessary.

Note: The oil must be free of bubbles. If bubbles are present in the oil, air is entering the hydraulic system. Inspect the suction hoses and hose clamps.

8. Inspect the gasket on the hydraulic tank filler cap for damage. Replace the gasket, if necessary.

9. Install the hydraulic tank filler cap.

10. Close the engine hood.

i02699150

Hydraulic System Oil Filter (Return) - Replace

SMCS Code: 5068-510-RJ

1. Open the engine hood.

2. Remove the hydraulic tank filler cap.

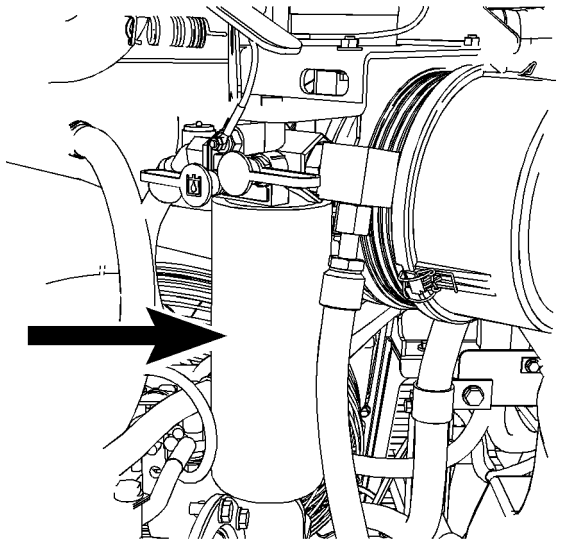


Illustration 152 g01358262

3. The hydraulic oil filter is located in the engine compartment.

4. Remove the filter element with a strap type wrench.

5. Clean the filter element mounting base. Remove any part of the filter element gasket that remains on the filter element base.

6. Apply a light coat of oil to the gasket of the new filter element.

7. Install a new filter hand tight until the seal of the filter contacts the base. Note the position of the index marks on the filter in relation to a fixed point on the filter base.

Note: There are rotation index marks on the filter that are spaced 90 degrees or 1/4 of a turn away from each other. When you tighten the filter, use the rotation index marks as a guide.

8. Tighten the filter according to the instructions that are printed on the filter. Use the index marks as a guide. For non-Caterpillar filters, use the instructions that are provided with the filter.

Note: You may need to use a Caterpillar strap wrench, or another suitable tool, in order to turn the filter to the amount that is required for final installation. Make sure that the installation tool does not damage the filter.

9. Maintain the hydraulic oil level at the middle of the top sight gauge. Add oil, if necessary.

10. inspect the gasket on the hydraulic tank filler cap for damage. Replace the gasket, if necessary.

11. Install the hydraulic tank filler cap.

12. Close the engine hood.

i02699152

Hydraulic System Oil Level - Check

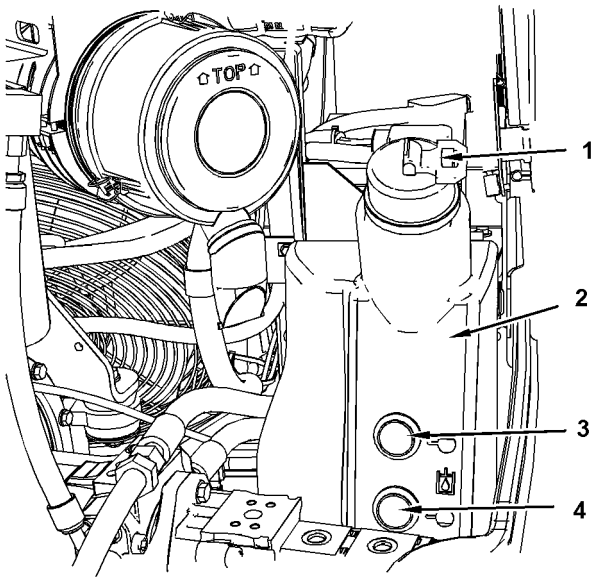
SMCS Code: 5095-535-FLV

Note: Check the hydraulic system oil level with the machine on a level surface.

1. Lower the work tool to the ground. Turn off the engine.

2. Open the engine hood.

3. Wait for about five minutes before checking the level of the hydraulic oil. The hydraulic tank is located on the right side of the engine compartment.



g01358251

Illustration 153

(1) Filler Cap
(2) Hydraulic Tank
(3) Upper Sight Gauge
(4) Lower Sight Gauge

4. Maintain the oil level to the middle of the upper sight gauge. **Do not overfill the hydraulic tank.** Never allow the hydraulic oil level below the center of the lower sight gauge.

5. Remove the hydraulic tank filler cap and add hydraulic oil, if necessary.

6. Clean the hydraulic tank filler cap. Install the hydraulic tank filler cap.

7. Close the engine hood.

i02998097

Hydraulic System Oil Sample - Obtain

SMCS Code: 5050-008; 5056-008; 7542

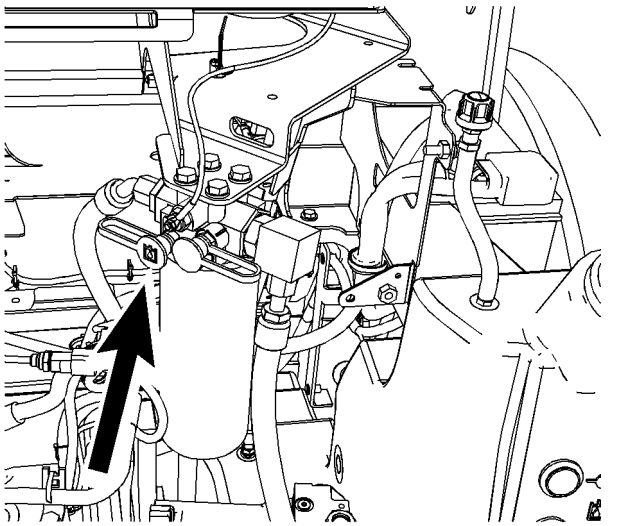


Illustration 154 g01520287

Open the engine hood.

The sampling port for the hydraulic oil is located on the hydraulic oil filter base.

i02699155

Lift Arm and Cylinder Linkage - Lubricate

SMCS Code: 5102-086-BD; 6107-086-BD

Wipe all of the grease fittings before you apply lubricant.

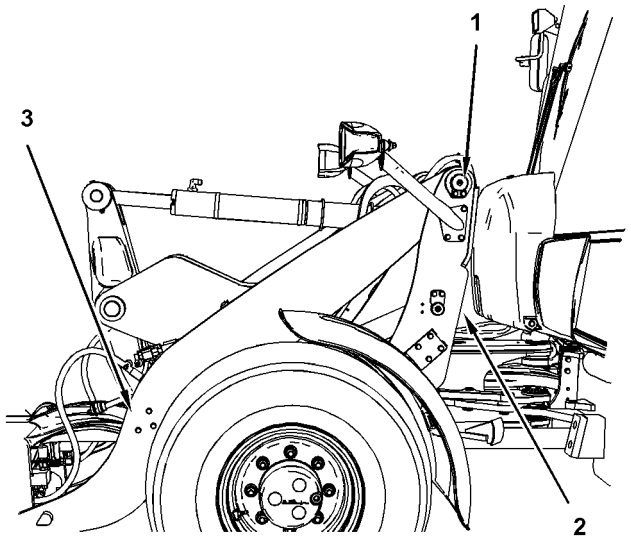


Illustration 155 g01358346

Apply lubricant to the grease fittings (1) for the frame and for the lift arm. There is a grease fitting for each side of the machine.

Apply lubricant to the grease fitting (2) for the head end of the lift cylinder. There is a grease fitting for each side of the machine.

Apply lubricant to the grease fitting (3) for the rod end of the lift cylinder. There is a grease fitting for each side of the machine.

i02106227

Oil Filter - Inspect

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

Inspect a Used Filter for Debris

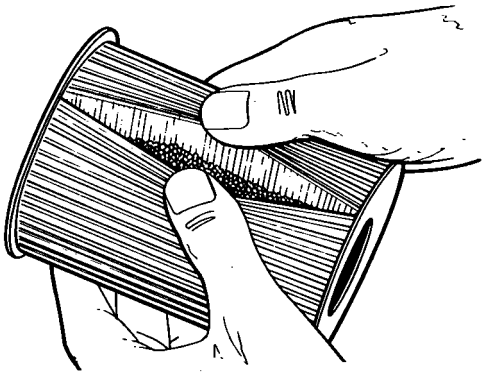


Illustration 156 g00100013

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.

i02708481

Quick Coupler - Clean/Inspect

SMCS Code: 6129-040; 6129-070

⚠ WARNING

Personal injury or death can result from improperly checking for a leak.

Always use a board or cardboard when checking for a leak. Escaping air or fluid under pressure, even a pin-hole size leak, can penetrate body tissue causing serious injury, and possible death.

If fluid is injected into your skin, it must be treated immediately by a doctor familiar with this type of injury.

Note: Do not weld on the quick coupler without consulting your Caterpillar dealer.

1. Clean the quick coupler prior to inspection in order to properly inspect the quick coupler. Remove the work tool.

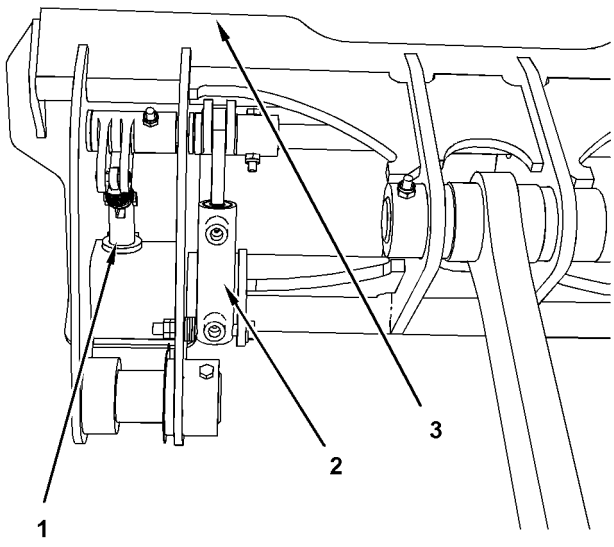


Illustration 157 g01359685

This is the back side of the quick coupler. The lift arm and the tilt cylinder are removed for clarity.

(1) Coupler Pins
(2) Hydraulic Cylinder
(3) Top Edge

2. Tilt the quick coupler all the way forward in order to clean the debris away from the pins.

3. Move the coupler pins (1). Ensure that the pins are not bent or broken.

4. Make sure that the coupler pins extend through the bottom of the quick coupler assembly. Check the pins for wear and check the pins for damage.

5. Check the top edges (3) of the quick coupler assembly for wear or for damage. Check the face of the quick coupler assembly for wear or for damage.

6. Inspect the components inside the quick coupler for the following problems:loose bolts, oil leaks, broken parts, missing parts, and cracked components

7. Inspect the hydraulic lines and the hydraulic fittings for damage or for wear. Repair any worn components or replace any worn components. Repair any leaking components.

8. Inspect the steel material of the quick coupler for cracks.

Note: Perform all repairs before placing the quick coupler back into operation.

i02998386

Quick Coupler - Lubricate

SMCS Code: 6129-086

Vertical Pin Coupler

Wipe the grease fittings before you apply lubricant to the grease fittings.

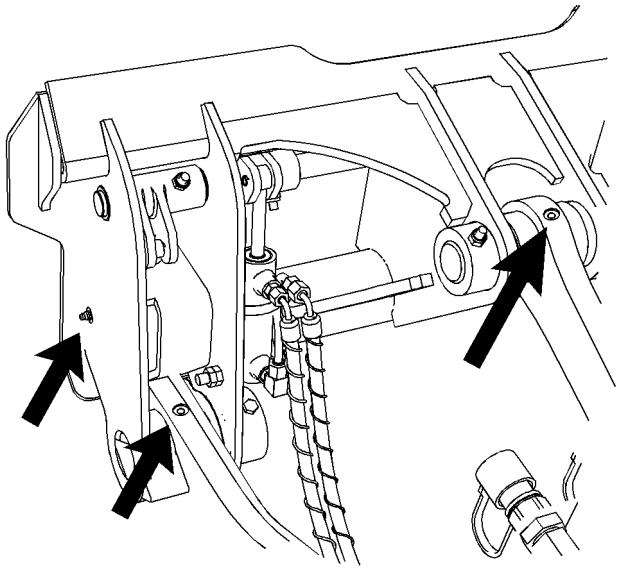


Illustration 158 g01520459

Apply lubricant to the grease fittings for the pins of the work tool coupler. There is a grease fitting for each side of the machine.

Horizontal Pin Coupler

Wipe the grease fittings before you apply lubricant to the grease fittings.

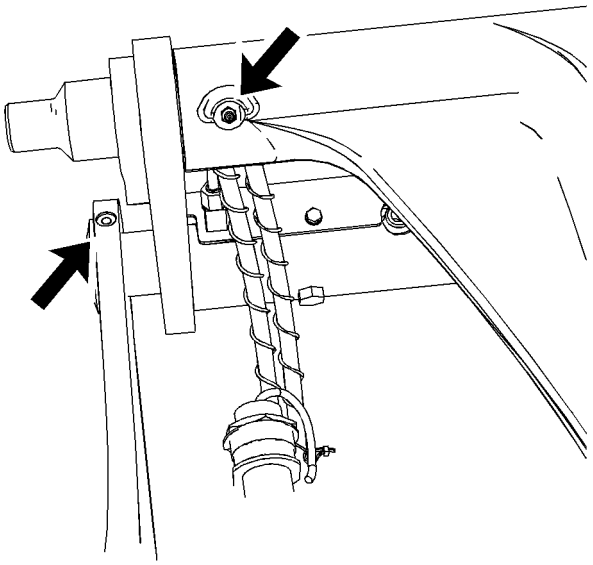


Illustration 159 g01358390

Apply lubricant to the grease fittings for the pins of the work tool coupler. There is a grease fitting for each side of the machine.

i02699162

Radiator Core - Clean

SMCS Code: 1353-070-KO

1. Open the engine hood. Refer to Operation and Maintenance Manual, “Access Doors and Covers”.

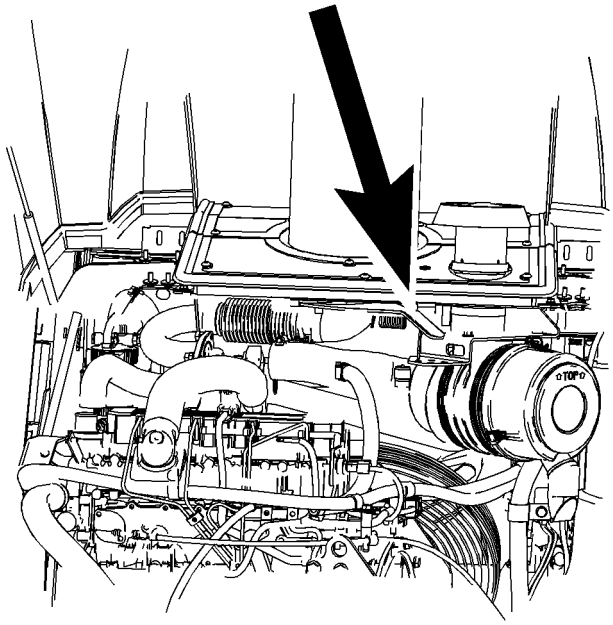


Illustration 160 g01358453

2. Move the lever to the left in order to move the hydraulic oil cooler away from the radiator.

3. Open the side access doors. The hydraulic oil cooler and the radiator may be reached from the left side and from the right side.

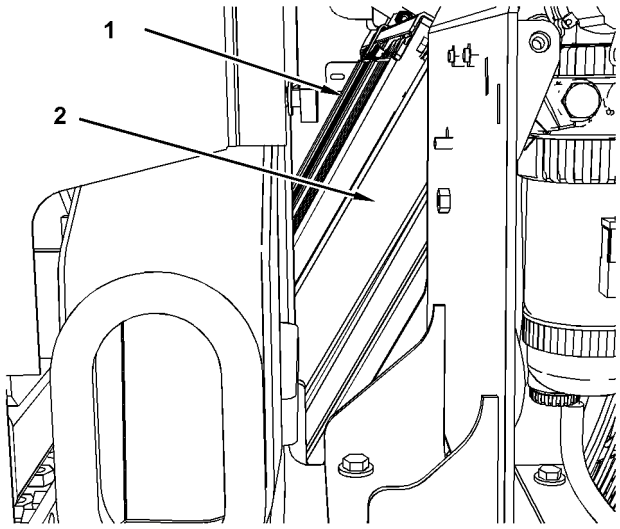


Illustration 161 g01358454

View From the Left Side

(1) Hydraulic Oil Cooler
(2) Radiator

NOTICE
When you are using compressed air or high pressure water to clean the radiator fins, ensure that the air or water is directed parallel to the fins. If the compressed air or high pressure water is not directed parallel to the radiator fins, the radiator fins could be bent or damaged.

4. You can use compressed air, high pressure water, or steam to remove dust and other debris from the radiator fins. However, the use of compressed air is preferred.

5. Clean the hydraulic oil cooler and the radiator.

6. Move the lever to the right in order to lower the hydraulic oil cooler to the original position.

Note: Ensure that the hydraulic oil cooler is returned to the original position. Failure to return the hydraulic oil cooler may cause overheating of the hydraulic oil.

7. Close the side access doors.

8. Close the engine hood.

i02293385

Rollover Protective Structure (ROPS) - Inspect

SMCS Code: 7323-040; 7325-040

Inspect the ROPS for loose bolts or for damaged bolts. Replace any damaged bolts or missing bolts with original equipment parts only.

Tighten the bolts that hold the ROPS to the frame to a torque of 460 ± 60 N·m (339 ± 44 lb ft). There are twelve ROPS retaining bolts.

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

Consult your Caterpillar dealer for repair of any cracks in the ROPS.

i02429589

Seat Belt - Inspect

SMCS Code: 7327-040

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.

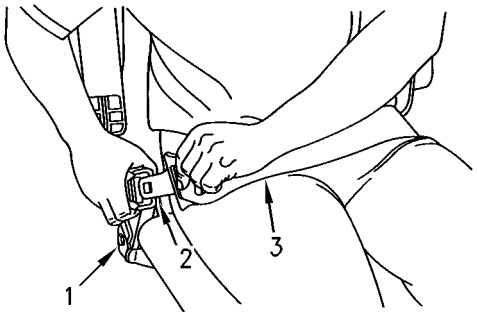


Illustration 162 g00932801

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.

i01970036

Seat Belt - Replace

SMCS Code: 7327-510

Within three years of the date of installation (2) or within five years of the date of manufacture (1), 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 each seat belt.

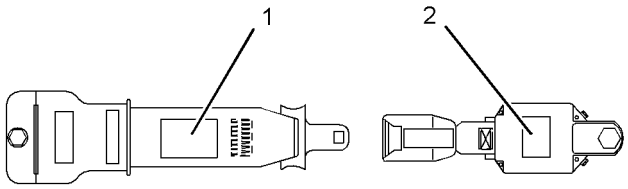


Illustration 163 g01022746

(1) Date of Manufacture
(2) Date of Installation

Contact your Caterpillar dealer for the replacement of the seat belt.

i03589859

Steering Column Play - Check

SMCS Code: 4310-535

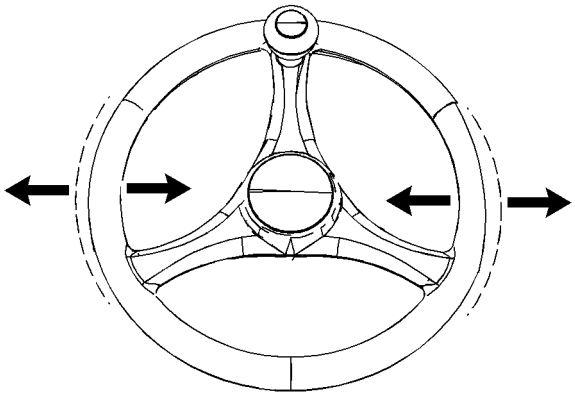


Illustration 164 g01408466

1. Hold the steering wheel with both hands.
2. Try to move the steering wheel from one side to the other side. The maximum allowed movement in the steering column should not exceed 25 mm (1.0 inch). If the value is not within the limit, perform the following steps:
   a. Inspect the pivot joint for loose bolts.
   b. Tighten the bolts if the bolts are loose.

Note: Apply 9S-3263 Thread Lock Compound to the bolts before tightening.

c. Inspect the pivot joint for excessive wear.

d. Replace the bushings if there is excessive wear.

⚠ WARNING

Failure to perform this inspection and repair may cause loss of steering control, which may result in personal injury or death.

Do not operate the machine until the inspection and repair are completed.

Contact your Caterpillar dealer for any other required service.

i02934544

Steering Column Spline (HMU Steering) - Lubricate

SMCS Code: 4310-086-JF; 4343-086-JF

The metering pump is located under the cab.

⚠ WARNING

Crushing Hazard. Connect the steering frame lock between front and rear frames before servicing the machine in the articulation area. Disconnect the steering frame lock and secure it in the stored position before resuming operation. Failure to do so could result in serious injury or death.

Refer to Operation and Maintenance Manual, “Steering Frame Lock” before entering the articulation joint.

Note: Do not disconnect any hydraulic lines from the metering pump.

Use the following steps to lubricate the splines on the steering column:

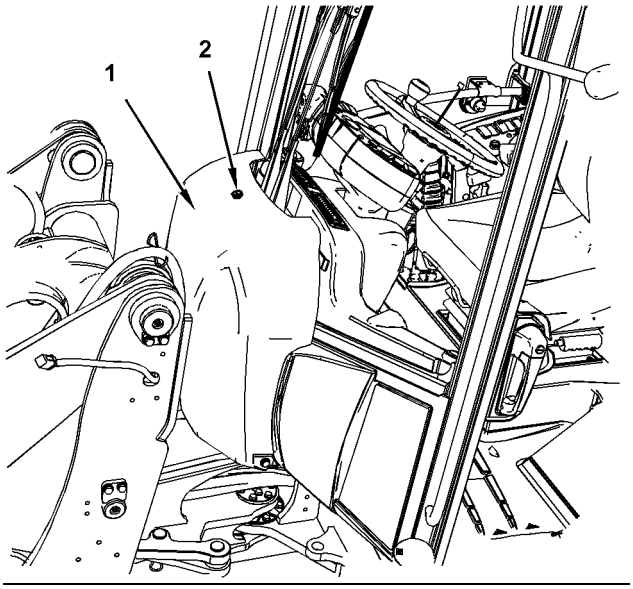


Illustration 165 g01358974

1. Open the access door on the front of the cab. Refer to Operation and Maintenance Manual, “Access Doors and Covers” for information about the access door.

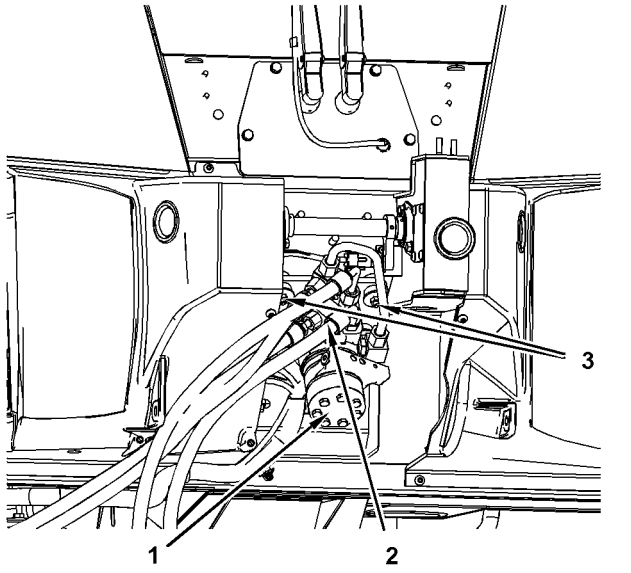


Illustration 166 g01358589

2. Support the metering pump (1). Loosen the four bolts (3) that hold the pump. Do not loosen the hose couplings (2).

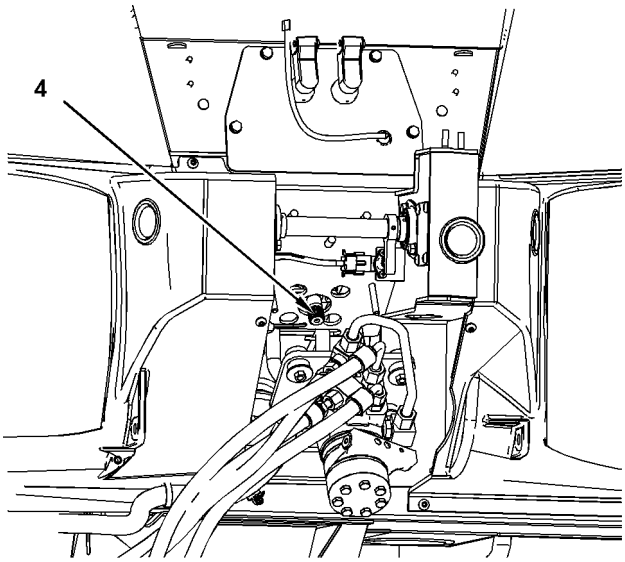


Illustration 167 g01358591

3. Lower the pump in order to expose the splines (4).

4. Clean the male splines on the steering column. Clean the female splines in the pump.

5. Apply proper grease to the splines. Refer to Operation and Maintenance Manual, “Lubricant Viscosities” for selecting the proper grease.

6. Push the pump into position.

7. Tighten the four bolts that hold the pump.

8. Test the steering system.

i02724032

Steering Cylinder Bearings - Lubricate

SMCS Code: 4303-086-BD

Wipe all grease fittings before you apply any lubricant to the grease fittings.

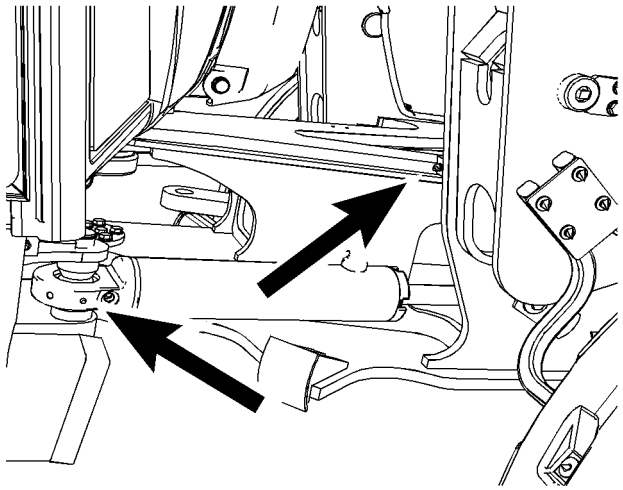


Illustration 168 g01378086

Access both grease fittings on the right side of the machine. Apply lubricant to the grease fitting for the rod end of the steering cylinder and for the head end of the steering cylinder.

i02699164

Tilt Cylinder Bearings and Bucket Linkage Bearings - Lubricate

SMCS Code: 5104-086-BD; 6107-086-BD

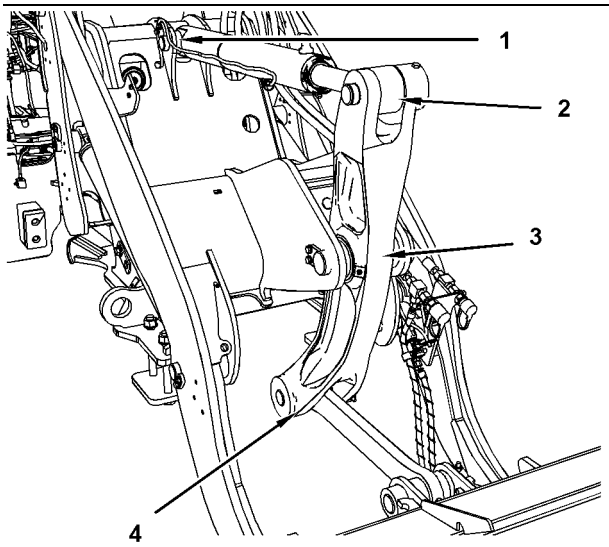


Illustration 169 g01358743

Wipe all grease fittings before you apply lubricant.

Lubricate the grease fitting (1) for the head end of the tilt cylinder.

Lubricate the grease fitting (2) for the rod end of the tilt cylinder. There is one grease fitting in the center of the machine.

Lubricate the grease fitting (3) for the upper pivot pin of the tilt linkage. There is one grease fitting in the center of the machine.

Lubricate the grease fittings (4) for the lower pivot pin of the tilt linkage. There is one grease fitting in the center of the machine.

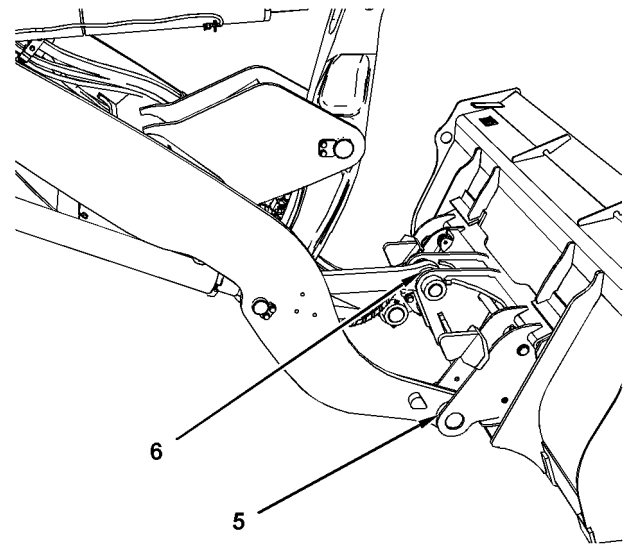


Illustration 170 g01358746

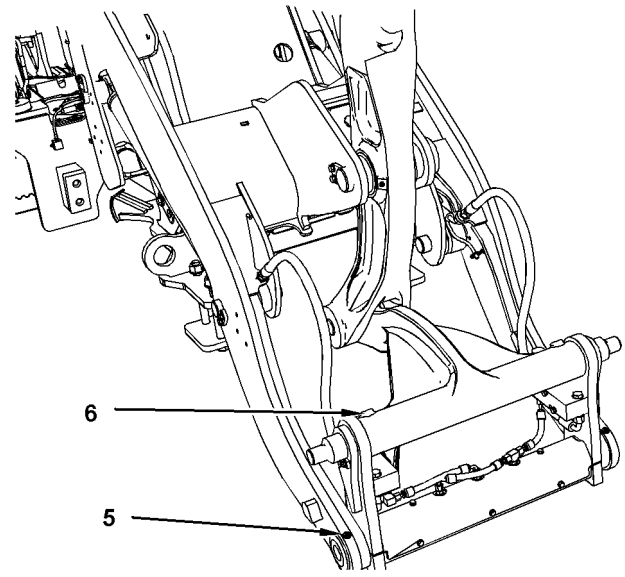


Illustration 171 g01358749

Lubricate the grease fitting (5) for the upper pivot pin of the quick coupler assembly. There is one grease fitting in the center of the machine.

Lubricate the grease fittings (6) for the lower pivot pin of the quick coupler assembly. There is a grease fitting for each side of the machine.

i01409489

Tire Inflation - Check

SMCS Code: 4203-535-AI

Measure the tire pressure on each tire. Consult your Caterpillar dealer for the correct load rating and for the correct operating pressures. These correct load ratings and correct operating pressures can also be obtained from your tire dealer.

Inflate the tires, if necessary. See Operation and Maintenance Manual, “Tire Inflation with Air” or Operation and Maintenance Manual, “Tire Inflation with Nitrogen”.

i02699169

Transfer Drive (Hydrostatic) Oil - Change

SMCS Code: 3159-044-OC

The transfer drive is located underneath the machine in front of the rear axle. There are 2 styles of transfer drive:

- Standard Drive
- “Speeder” Drive

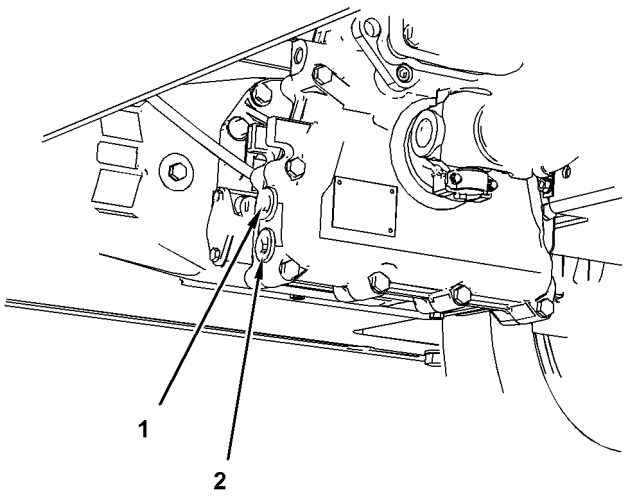


Illustration 172 g01358806

Standard Drive

(1) Level/Fill Plug
(2) Drain Plug

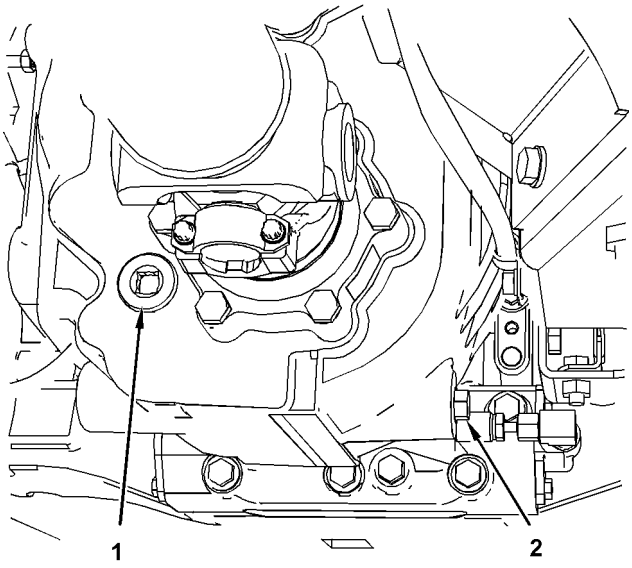


Illustration 173 g01358807

“Speeder” Drive

(1) Level/Fill Plug
(2) Drain Plug

1. Remove the drain plug (2) and allow the oil to drain into a suitable container.

2. Clean the drain plug and install the drain plug.

3. Remove the oil level/fill plug (1). Add oil until the oil is level with the bottom of the plug threads. Refer to the Operation and Maintenance Manual, “Lubricant Specifications” and Operation and Maintenance Manual, “Refill Capacities”.

4. Clean the oil level/fill plug and install the oil level/fill plug.

i02708167

Transfer Drive (Hydrostatic) Oil Level - Check

SMCS Code: 3159-535-OC

The transfer drive is located underneath the machine in front of the rear axle. There are 2 styles of transfer drive:

- Standard Drive
- “Speeder” Drive

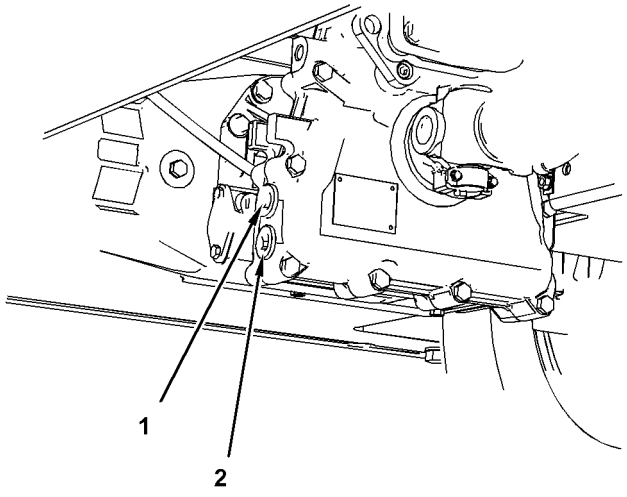
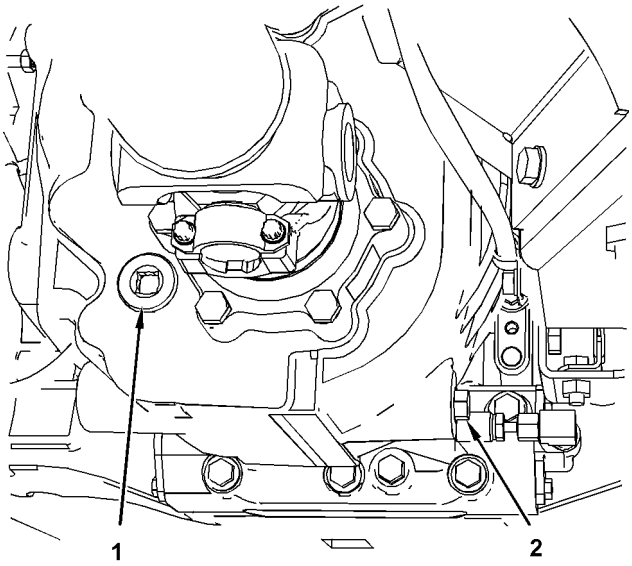


Illustration 174 g01358806

Standard Drive

(1) Level/Fill Plug
(2) Drain Plug



g01358807

Illustration 175

"Speeder" Drive

(1) Level/Fill Plug
(2) Drain Plug

1. Remove the oil level/fill plug. The oil should be level with the bottom of the plug threads.

2. Add oil, if necessary. Refer to the Operation and Maintenance Manual, "Lubricant Specifications" and Operation and Maintenance Manual, "Refill Capacities".

3. Clean the oil level/fill plug and install the oil level/fill plug.

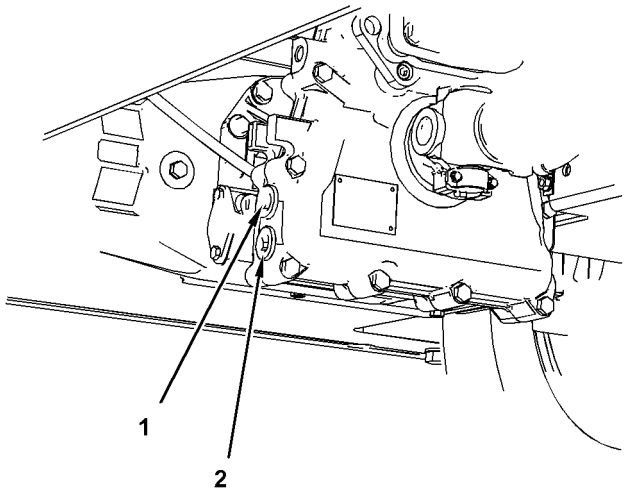
i02708170

Transfer Drive (Hydrostatic) Oil Sample - Obtain

SMCS Code: 3159-008; 7542

The transfer drive is located underneath the machine in front of the rear axle. There are 2 styles of transfer drive:

- Standard Drive
- "Speeder" Drive

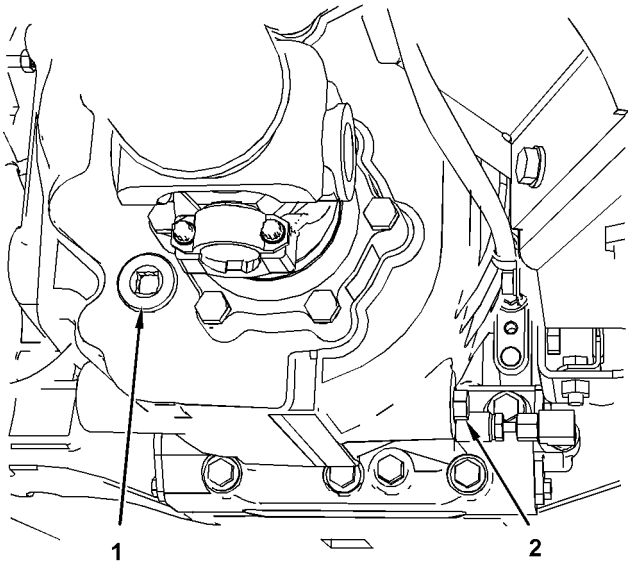


g01358806

Illustration 176

Standard Drive

(1) Level/Fill Plug
(2) Drain Plug



g01358807

Illustration 177

"Speeder" Drive

(1) Level/Fill Plug
(2) Drain Plug

Remove the filler plug for the transfer drive. Sample the oil through the hole for the filler plug. Install the plug after obtaining the sample.

i03599802

Wheel Nut Torque - Check

SMCS Code: 4210-535

Check the torque on new wheels or repaired wheels after every ten service hours until the specified torque is maintained.

The nut and the stud should be clean and dry for reassembly. Apply one drop of lubricating oil to the stud before installing the nut onto the stud.

Torque the wheel nuts to a torque of 360 ± 25 N·m (266 ± 18 lb ft). Use a star pattern when you torque the nuts.

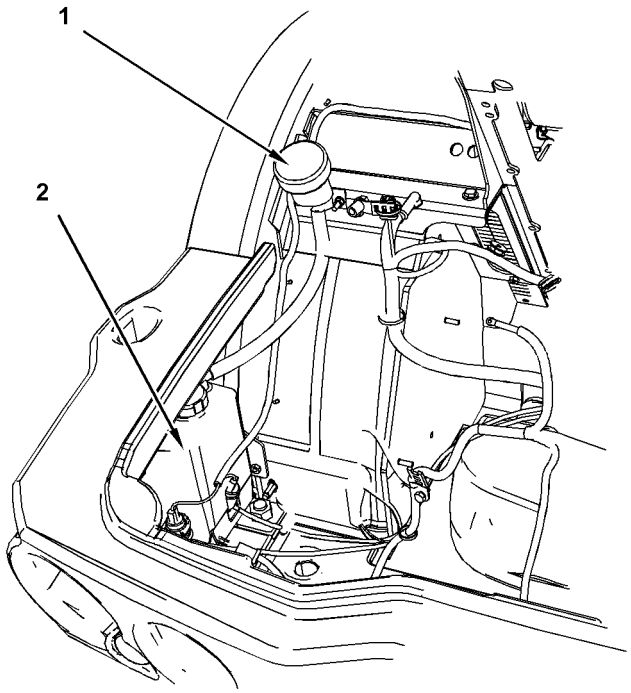
Check the nuts on all four wheels.

i02699172

Window Washer Reservoir - Fill

SMCS Code: 7306-544

NOTICE
When operating in freezing temperatures, use Caterpillar nonfreezing window washer solvent or equivalent. System damage can result from freezing.



g01359225

Illustration 178

(1) Fill Pipe
(2) Windshield Washer Reservoir

The windshield washer reservoir is located in the engine compartment on the left side.

Pour the window cleaning solution into the fill pipe.

The reservoir is located under the counterweight.

i01258249

Window Wiper - Inspect/Replace

SMCS Code: 7305-040; 7305-510

Inspect the condition of the wiper blades. Replace the wiper blades if the wiper blades are worn or damaged or if streaking occurs.

i01409502

Windows - Clean

SMCS Code: 7310-070

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

i02608161

Work Tool - Lubricate

SMCS Code: 6700-086

Apply lubricant to the grease fitting for all pivot pins.

Apply lubricant to the grease fitting for the rod end of all cylinders.

Apply lubricant to the grease fitting for the head end of all cylinders.

i01809997

Work Tool Mounting Bracket - Inspect

SMCS Code: 6700-040-BK

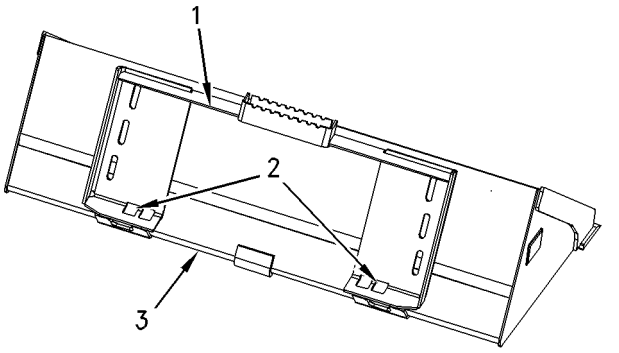


Illustration 179 g00925058

Inspect upper angled plate (1) and ensure that the plate is not bent or otherwise damaged. Inspect holes (2) for wear and for damage. Inspect lower angled plate (3) and ensure that the plate is not bent or otherwise damaged. If any wear is suspected or any damage is suspected, consult your Caterpillar dealer before you use the work tool.