

SAFETY.CAT.COM™

MAINTENANCE INTERVALS

Operation and Maintenance
Manual Excerpt

Operation and Maintenance Manual

M312 and M315 Excavators

6TL1-Up (Machine)
7ML1-Up (Machine)

i01197903

Maintenance Interval Schedule

SMCS Code: 7000

Note: All safety information, warnings, and instructions must be read and understood before you perform any operation or any maintenance procedure.

Before each consecutive interval is performed, all of the maintenance requirements from the previous interval must also be performed.

When Required

Battery - Recycle	148
Battery, Battery Cable or Battery Disconnect Switch - Replace	149
Bucket Tips - Inspect/Replace	153
Cab Air Filter - Clean/Replace	155
Drum Brakes - Inspect	168
Engine Air Filter Primary Element - Clean/Replace	168
Engine Air Filter Secondary Element - Replace ..	170
Fuel System Priming Pump Strainer - Clean	181
Fuses - Replace	186
Oil Filter - Inspect	198
Refueling Pump Strainer - Clean	200
Windows - Clean	207
Window Washer Reservoir - Fill	208
Window Wiper - Inspect/Replace	208

Every 10 Service Hours or Daily for First 100 Hours

Boom, Stick and Bucket Linkage - Lubricate	150
Boom, Stick and Bucket Linkage - Lubricate	150

Every 10 Service Hours or Daily

Boom, Stick and Bucket Linkage - Lubricate	150
Brakes, Indicators and Gauges - Test	151
Cooling System Level - Check	165
Engine Oil Level - Check	175
Fuel System Water Separator - Drain	183
Fuel Tank Water and Sediment - Drain	185
Hydraulic System Oil Level - Check	196
Hydraulic System Oil Level - Check	197
Radiator Core - Clean	199
Seat Belt - Inspect	201
Travel Alarm - Test	204
Walk-Around Inspection	206

Every 10 Service Hours or Daily for Machines Used in Severe Applications

Boom, Stick and Bucket Linkage - Lubricate	150
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Every 50 Service Hours or Weekly

Boom, Stick and Bucket Linkage - Lubricate	150
Boom, Stick and Bucket Linkage - Lubricate	150
Drive Shaft Universal Joint - Lubricate	167
Tire Inflation - Check	203
Wheel Nut Torque - Check	207

Every 100 Service Hours or 2 Weeks

Axle Oscillation Bearings - Lubricate	148
Blade Linkage - Lubricate	149
Stabilizer Bearings - Lubricate	201

Every 250 Service Hours or Monthly

Air Conditioner - Test	145
Axle Bearings (Front) - Lubricate	146
Axle Oil Level (Front) - Check	147
Axle Oil Level (Rear) - Check	148
Braking System - Test	152
Condenser (Refrigerant) - Clean	155
Cooling System Hoses - Inspect	163
Engine Oil and Filter - Change	176
Final Drive Oil Level - Check	179
Swing Bearing - Lubricate	201
Transmission Oil Level - Check	204
V-Belts - Inspect/Adjust/Replace	205

Initial 500 Service Hours

Axle Oil (Front) - Change	146
Axle Oil (Rear) - Change	147
Final Drive Oil - Change	178
Transmission Oil - Change	203

Every 500 Service Hours or 3 Months

Drive Shaft Support Bearing Lubricant - Check ..	167
Fuel System Primary Filter/Water Separator Element - Replace	179
Fuel System Priming Pump - Operate	180
Fuel System Secondary Filter - Replace	182
Fuel Tank Cap and Strainer - Clean	184

Every 1000 Service Hours or 6 Months

Axle Oil (Front) - Change	146
Axle Oil (Rear) - Change	147
Battery Hold-Down - Tighten	149
Drum Brakes - Inspect	168
Final Drive Oil - Change	178
Overhead Guard - Inspect	199
Transmission Oil - Change	203

Every 2000 Service Hours or 1 Year

Cooling System Water Temperature Regulator - Replace	166
Engine Crankcase Breather Filter - Replace	171
Engine Crankcase Breather Filter - Replace	173
Engine Valve Lash and Fuel Injector Timing - Check	178

Hydraulic System Oil - Change 189
Hydraulic System Oil - Change 191
Hydraulic System Oil Filter - Clean 193
Hydraulic System Oil Filter - Replace 193
Hydraulic System Oil Filter - Replace 194
Hydraulic System Oil Filter - Replace 194
Hydraulic System Oil Filter - Replace 195
Hydraulic System Oil Filter - Replace 196
Swing Gear - Lubricate 202

Every 3 Years

Seat Belt - Replace 201

Every 3000 Service Hours or 3 Years

Cooling System Coolant Extender (ELC) - Add .. 160
Cooling System Coolant Extender (ELC) - Add .. 161

Every 4000 Service Hours or 2 Years

Engine Crankcase Breather Valve - Replace 174

Every 6000 Service Hours or 6 Years

Cooling System Coolant (ELC) - Change 156
Cooling System Coolant (ELC) - Change 158

i00679706

Air Conditioner - Test (If Equipped)

SMCS Code: 7320-081

WARNING

Inhaling air conditioner refrigerant gas through a lit cigarette or other smoking method or inhaling fumes released from a flame contacting air conditioner refrigerant gas can cause bodily harm or death. Do not smoke when servicing air conditioners or wherever refrigerant gas may be present.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

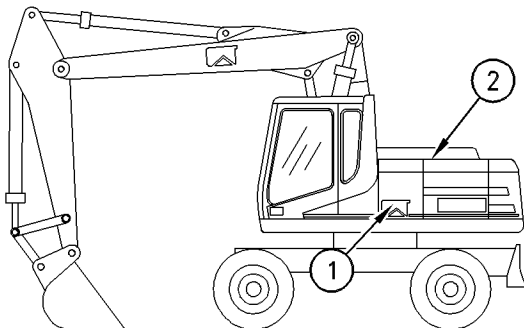


Illustration 254

g00290119

(1) Access door. (2) Top access cover.

1. Open access door (1) on the left side of the machine. Secure the access door.
2. Open access cover (2).
3. Start the engine. Turn the engine speed dial to the medium speed position.

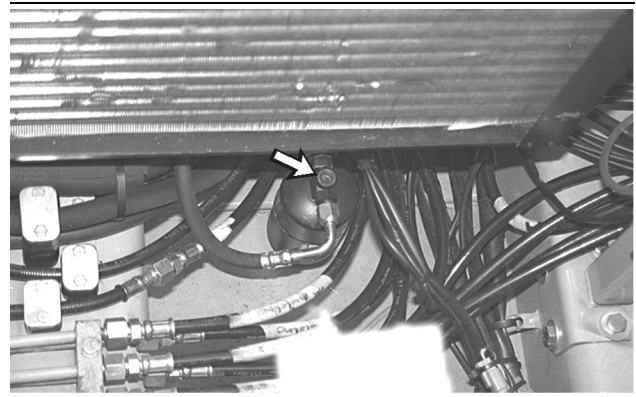


Illustration 255

g00101966

4. Look at the sight glass on the receiver-dryer and note the amount of refrigerant.

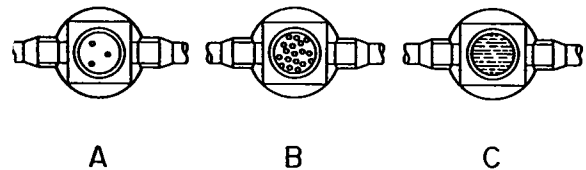


Illustration 256

g00101967

- Sight glass (A) contains only a few bubbles. This indicates that there is a satisfactory amount of refrigerant.
- In sight glass (B), many bubbles are present. This indicates that there is a lack of refrigerant.
- In sight glass (C), small amounts of vapor are present. This indicates that there is almost no refrigerant.

If the condition in sight glass (B) or in sight glass (C) is noticed, consult your authorized Caterpillar dealer for recharging.

Operation of the air conditioner without correct amounts of refrigerant could cause failure of the compressor.

The air conditioner should be kept ready for operation year-round. Operate the air conditioner for a few minutes during the week in order to rotate the compressor. This prevents the leakage of refrigerant. The leakage is caused by a dry seal on the compressor.

i00060139

Axle Bearings (Front) - Lubricate

SMCS Code: 3278-086

The front axle is the axle which steers the machine.
The rear axle is the one with the gearbox.

Wipe all grease fittings before you apply grease.

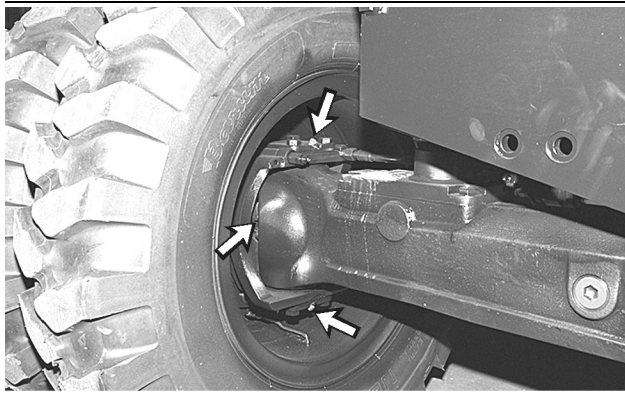


Illustration 257

g00102403

The fittings are behind the front tires.

A grease fitting is positioned on the top of the steering axle. Another grease fitting is positioned on the bottom of the steering axle. Apply grease to these fittings at each end of the steering axle.

For access to the U-joints, fully turn the wheels to the left or to the right. The machine wheels may require rotation in order to access the grease fittings.

i00310408

Axle Oil (Front) - Change

SMCS Code: 3278-044

The front axle is the axle which steers the machine.
The rear axle is the one with the gearbox.

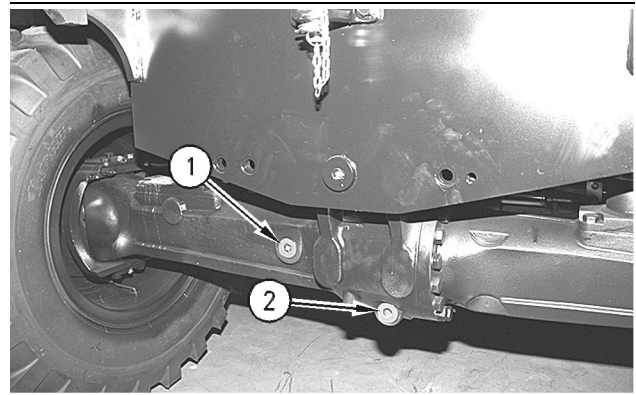


Illustration 258

g00242127

(1) Filler Plug. (2) Drain Plug.

1. Remove the dirt that is around filler plug (1) and around drain plug (2).

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

2. Remove drain plug (2). Allow the lubricant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

3. Clean drain plug (2).
4. Inspect the O-ring seal. If damage or wear is found, replace the O-ring seal.
5. Install drain plug (2).
6. Remove filler plug (1).
7. Add lubricant through the filler plug opening. Maintain the lubricant level to the bottom of the filler plug opening. Refer to Operation and Maintenance Manual, "Refill Capacities".
8. Clean filler plug (1).
9. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
10. Install filler plug (1).

i01011566

Axle Oil (Rear) - Change

SMCS Code: 3278-044

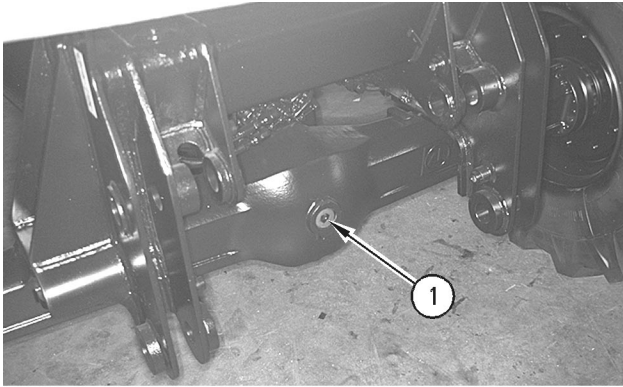


Illustration 259

g00102672

(1) Filler plug

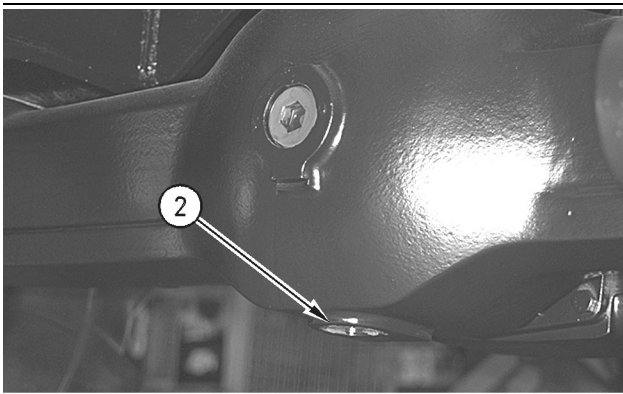


Illustration 260

g00333762

(2) Drain plug

Operate the machine for an adequate amount of time in order to warm the lubricant.

Filler plug (1) and drain plug (2) are located under the machine on the rear axle.

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

1. Remove the dirt that is around filler plug (1) and around drain plug (2).
2. Remove drain plug (2). Drain the lubricant into a suitable container.

Note: Dispose of any used lubricant according to local regulations.

3. Clean drain plug (2).

4. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
5. Install drain plug (2).
6. Remove filler plug (1).
7. Fill the axle with lubricant to the bottom of the filler plug opening. See Operation and Maintenance Manual, "Refill Capacities".
8. Clean filler plug (1).
9. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
10. Install filler plug (1).

i00312048

Axle Oil Level (Front) - Check

SMCS Code: 3278-535

The front axle is the axle which steers the machine. The rear axle is the one with the gearbox.

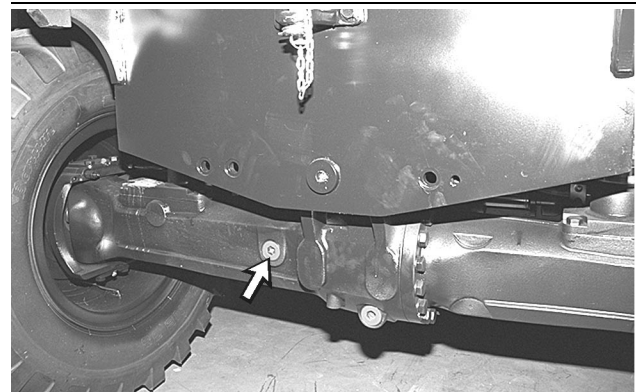


Illustration 261

g00102631

1. Remove the dirt that is around the filler plug.
2. Remove the filler plug.
3. Maintain the lubricant level to the bottom of the filler plug opening. Add lubricant through the filler plug opening, as needed.
4. Clean the filler plug.
5. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
6. Install the filler plug.

i00703208

Axle Oil Level (Rear) - Check

SMCS Code: 3278-535

The front axle is the axle which steers the machine.
The rear axle is the one with the gearbox.

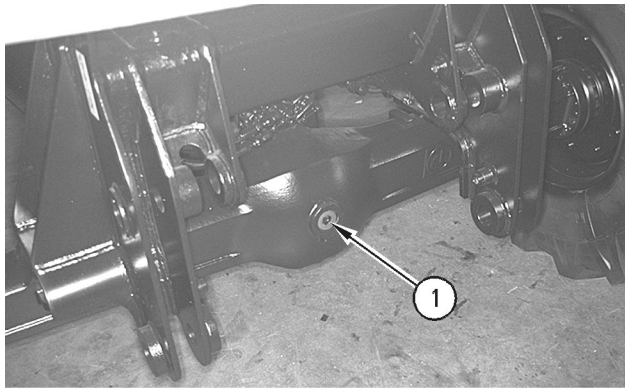


Illustration 262

g00102672

(1) Filler plug

1. Remove the dirt that is around the filler plug (1).
2. Remove filler plug (1).
3. Maintain the lubricant level to the bottom of the filler plug opening. Add lubricant through the filler plug opening, as needed.
4. Clean filler plug (1).
5. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
6. Install filler plug (1).

i00060143

Axle Oscillation Bearings - Lubricate

SMCS Code: 3268-086-BD; 3268; 3278-086-BD; 3278; 3282; 4313

Wipe all the grease fittings before you apply grease.

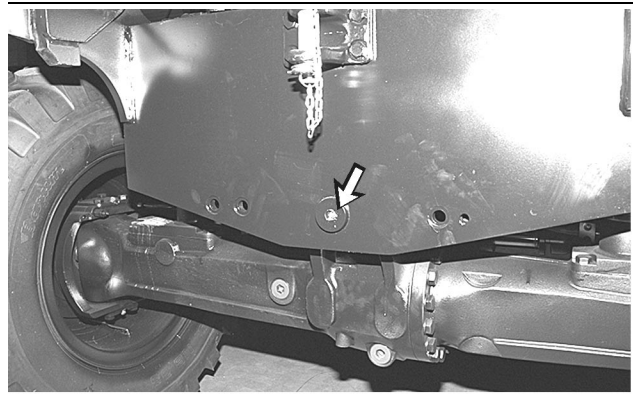


Illustration 263

g00102404

A steer axle pin is positioned at the front of the machine. A grease fitting is positioned on the front of the steer axle pin. Apply grease to this grease fitting.

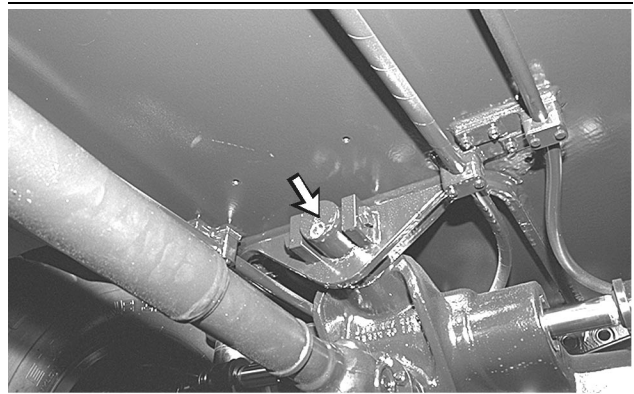


Illustration 264

g00102405

A grease fitting is also positioned on the rear of the steer axle pin. Apply grease to this grease fitting.

i00059329

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

i00934872

i01048535

Battery Hold-Down - Tighten

SMCS Code: 7257

Tighten the hold-downs for the battery in order to prevent the batteries from moving during machine operation.

i00663586

Battery, Battery Cable or Battery Disconnect Switch - Replace

SMCS Code: 1401-510; 1402-510; 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 disconnect switch key.
3. Remove the secondary steering fuse.
4. Disconnect the battery cable at the battery disconnect switch. The battery disconnect switch is connected to the machine frame.

Note: Do not allow the disconnected battery cable to contact the battery disconnect switch.

5. Disconnect the negative battery cable at the battery that is connected to the battery disconnect switch. If the machine has four 12 volt batteries, disconnect the negative battery cables of two batteries.
6. Make all of the necessary repairs or replace the battery.
7. Connect the negative battery cable at the battery.
8. Connect the negative battery cable at the battery that is connected to the battery disconnect switch.
9. Install the secondary steering fuse.
10. Connect the battery cable at the battery disconnect switch.
11. Install the disconnect switch key and turn the battery disconnect switch to the ON position.

Blade Linkage - Lubricate (If Equipped)

SMCS Code: 6060-086-KL

Note: Caterpillar recommends the use of **5P-0960** Molybdenum Grease for lubricating the boom, stick and bucket linkage. Refer to Operation and Maintenance Manual, SEBU6250, "Lubricating Grease" for more information on the Molybdenum Grease.

Wipe all fittings before lubricating.

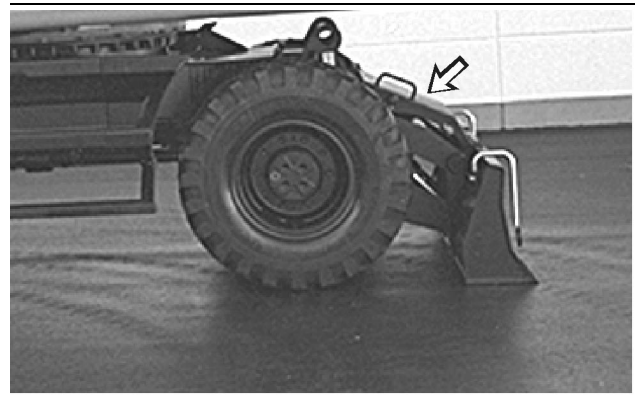


Illustration 265

g00103933

1. Raise the access cover.

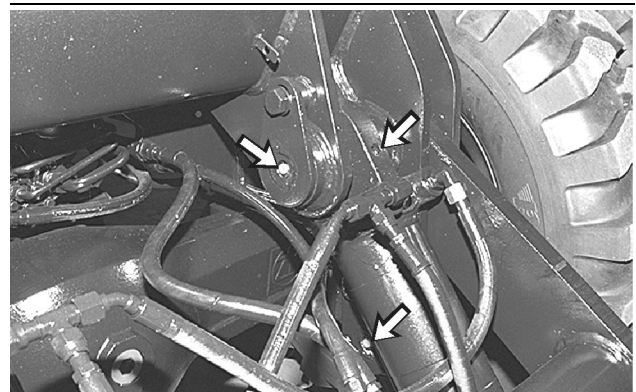


Illustration 266

g00103934

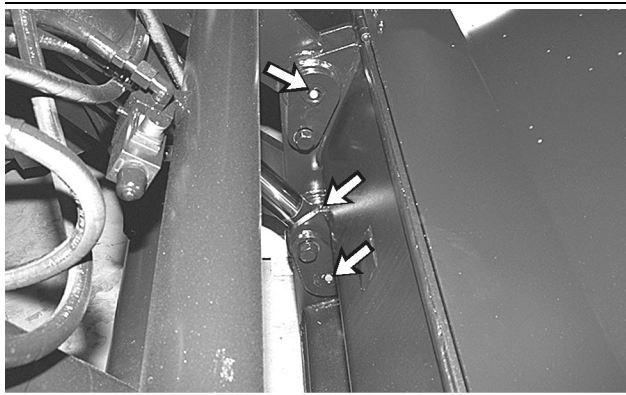


Illustration 267

g00103935

2. Apply lubricant through the six fittings that are shown in Illustrations 266 and 267 on each side of the blade. There are a total of 12 fittings.

3. Close the access cover.

i01047177

Boom, Stick and Bucket Linkage - Lubricate (Ditch Cleaning Bucket (If Equipped))

SMCS Code: 6501-086; 6502-086; 6513-086

Note: Caterpillar recommends the use of **5P-0960** Molybdenum Grease for lubricating the boom, stick and bucket linkage. Refer to Operation and Maintenance Manual, SEBU6250, "Lubricating Grease" for more information on the Molybdenum Grease.

1. Wipe all fittings before you apply lubricant.

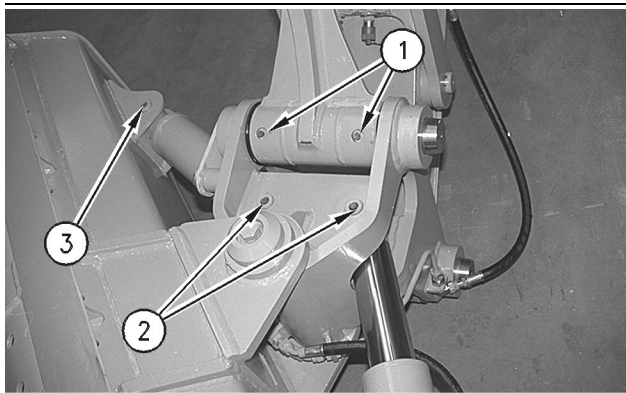


Illustration 268

g00354074

- (1) Fittings
- (2) Fittings
- (3) Fitting

2. Apply lubricant through fittings (1), (2) and (3).

i01047178

Boom, Stick and Bucket Linkage - Lubricate

SMCS Code: 6501-086; 6502-086; 6513-086

Note: Caterpillar recommends the use of **5P-0960** Molybdenum Grease for lubricating the boom, stick and bucket linkage. Refer to Operation and Maintenance Manual, SEBU6250, "Lubricating Grease" for more information on Molybdenum Grease.

1. Wipe all fittings before you apply lubricant.

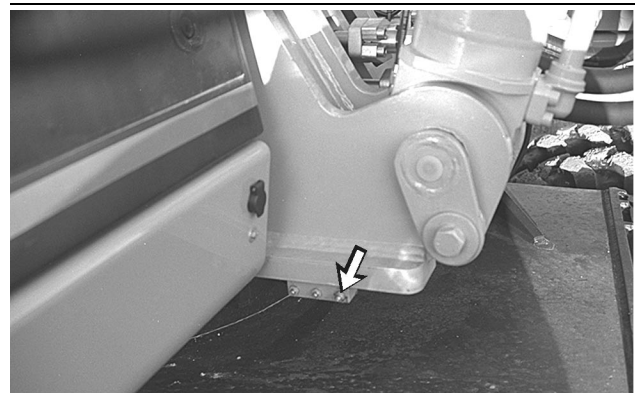


Illustration 269

g00102387

2. Apply lubricant through the front grease fitting that is by the head end of the right boom cylinder.

Note: This fitting supplies grease to all linkage bearings from the frame to the nose of the boom. The valve is designed to give the proper amount of grease to all bearings. If the valve will not accept grease, one of the lines is blocked.

Use Steps 2.a through 2.d to ensure proper lubrication.

- a. Apply grease through the grease fitting while the boom is raised and all of the implement is suspended.
- b. Lower the boom and the implement to the ground.
- c. Apply a slight downward pressure on the implement.
- d. Apply grease through the grease fitting.

i00664174

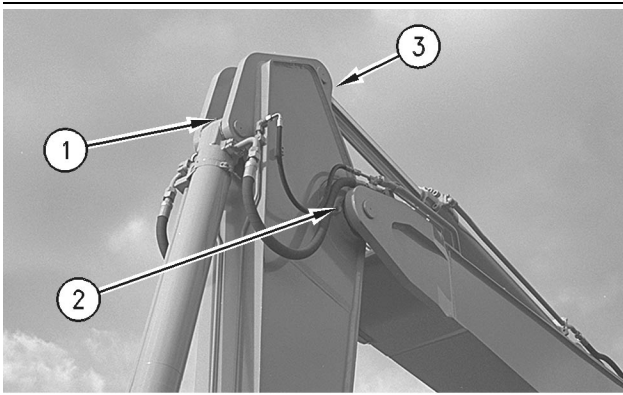


Illustration 270

g00105234

- (1) Fitting
- (2) Fittings
- (3) Fitting

3. Apply lubricant through fittings (1), (2), and (3).

Note: Fitting (2) is located on each side of the stick.

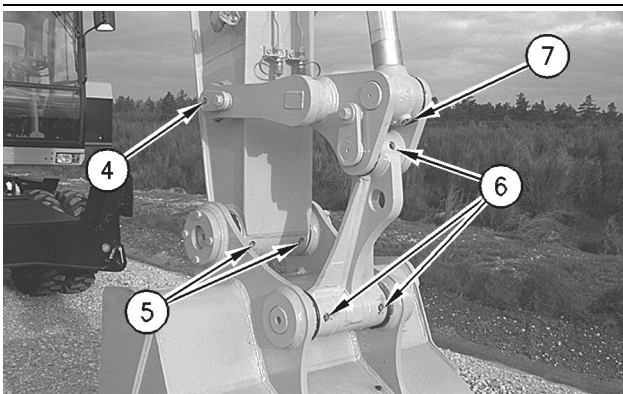


Illustration 271

g00105235

- (4) Fitting
- (5) Fittings
- (6) Fittings
- (7) Fitting

4. Apply lubricant through fittings (4), (5), (6), and (7).

Brakes, Indicators and Gauges - Test

SMCS Code: 4251-081; 4267-081; 4269-081;
7450-081; 7490-081

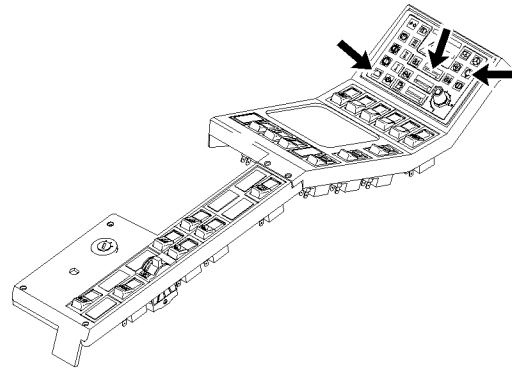


Illustration 272

g00291446

1. Look for broken lenses and for broken indicator lights.
2. Start the engine.
3. Look for inoperative gauges.
4. Turn on all machine lights. Check for proper operation.
5. Sound the horn.
6. Move the machine forward. Release the travel pedal. Depress the service brake pedal. The machine should stop.
7. Stop the engine.
8. Before you operate the machine, make all necessary repairs.

i00767599

Braking System - Test

SMCS Code: 3077-081; 4011-081; 4250-081;
4251-081; 4267-081

Service Brake Holding Ability Test

WARNING

Personal injury can result from a sudden stop during brake test.

Make sure the area is clear of personnel and obstructions before testing the brakes. Fasten the seat belt before moving the machine.

If the machine begins to move during the test, engage the parking brake immediately.

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

Test the service brakes on a dry, level surface.

Fasten the seat belt before you test the brakes.

The following test determines if the service brakes are functional. This test is not intended to measure the maximum brake holding effort. The maximum brake holding effort that is required to hold a machine stationary at a certain engine rpm varies between machines. These differences are caused by differences in the following factors:

- Engine setting
- Power train efficiency
- Brake holding ability
- Other factors

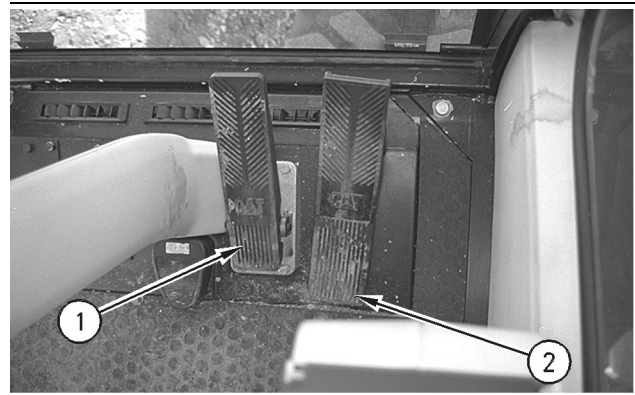


Illustration 273

g00102514

- (1) Service brake pedal
(2) Travel speed pedal

1. Start the engine. Keep the engine speed at low idle.
2. Slightly raise all implements.
3. Depress service brake pedal (1).

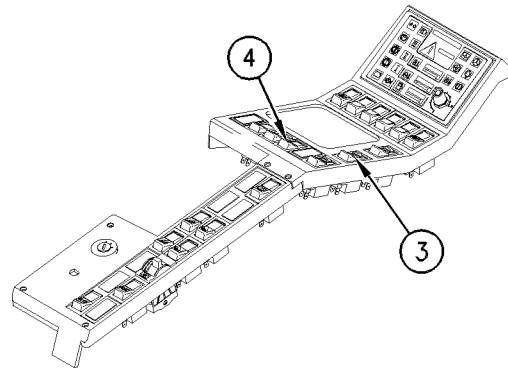


Illustration 274

g00291447

- (3) Parking brake switch
(4) Transmission control

4. Release the parking brake by using parking brake switch (3).
5. Place transmission control (4) in the FIRST GEAR position.
6. Without releasing the service brake pedal, depress the front of travel speed pedal (2) to the FORWARD position. The machine should not move. Release the travel speed pedal.
7. Engage parking brake (3). This is the end of the test of the service brakes.
8. Lower all the implements to the ground. Apply a slight downward pressure to the control lever.
9. Stop the engine.

NOTICE

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

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

Testing the Brake Accumulator

1. Move the engine start switch key to the ON position.

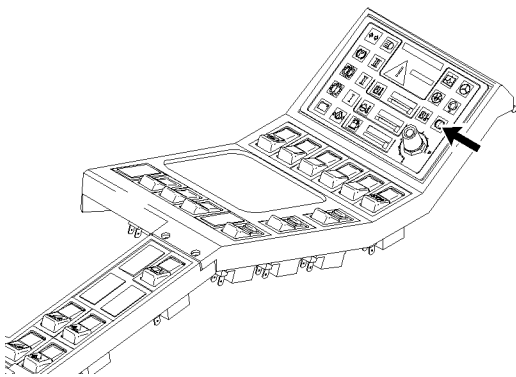


Illustration 275

g00291450

2. The low brake pressure indicator should come on if the accumulator is not at normal operating pressure.
3. Start the engine.
4. Run the engine for two minutes in order to increase the accumulator pressure. The low brake pressure indicator should turn off.
5. Stop the engine.
6. While the engine is stopped, turn the engine start switch to the ON position. Apply the service brakes five times. If the low brake pressure indicator comes on within five applications of the service brakes, consult your Caterpillar dealer.

i01117817

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 tips or side cutters.

Bucket Tips

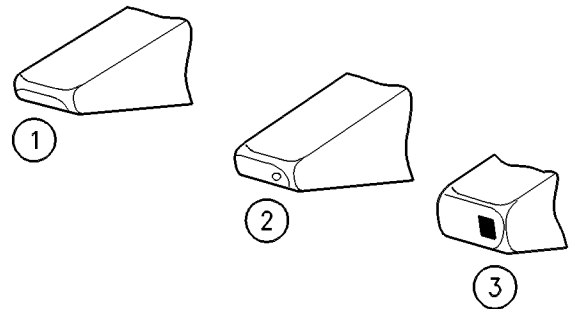


Illustration 276

g00101352

- (1) Usable
(2) Replace this bucket tip.
(3) Overworn

Check the bucket tips for wear. If the bucket tip has a hole, replace the bucket tip.

1. Remove the pin from the bucket tip. The pin can be removed by one of the following methods.
 - Use a hammer and a punch from the retainer side of the bucket to drive out the pin.
 - Use a Pin-Master. Follow Step 1.a through Step 1.c for the procedure.

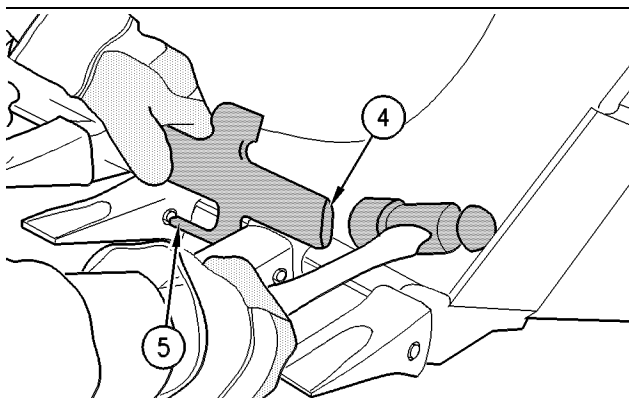


Illustration 277

g00590670

- (4) Back of Pin-Master
(5) Extractor

- a. Place the Pin-Master on the bucket tooth.
- b. Align extractor (5) with the pin.
- c. Strike the Pin-Master at the back of the tool (4) and remove the pin.

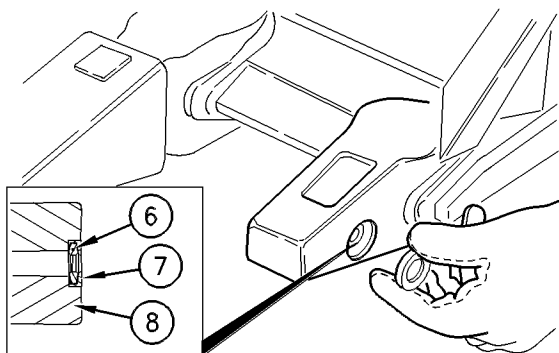


Illustration 278

g00590819

- (6) Retainer
(7) Retaining washer
(8) Adapter

2. Clean the adapter and the pin.
3. Fit retainer (6) into retaining washer (7). Install this assembly into the groove that is in the side of adapter (8).

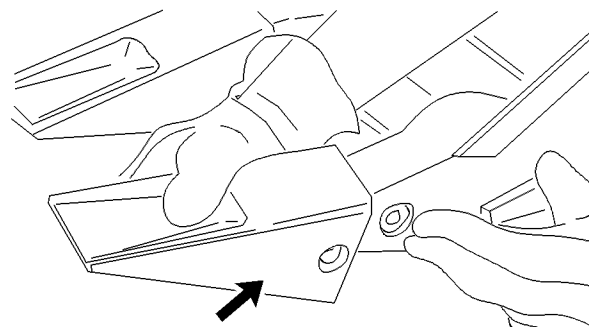


Illustration 279

g00101359

4. Install the new bucket tip onto the adapter.

Note: The bucket tip can be rotated by 180 degrees in order to allow greater penetration or less penetration.

5. Drive the pin through the bucket tip. The pin can be installed by using one of the following methods:

- From the other side of the retainer, drive the pin through the bucket tip, the adapter, and the retainer.
- Use a Pin-Master. Follow Step 5.a through Step 5.e for the procedure.

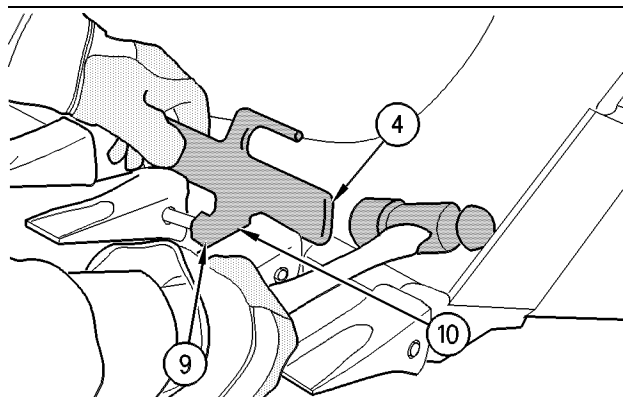


Illustration 280

g00590666

- (4) Back of Pin-Master
(9) Pin setter
(10) Pin holder

- a. Insert the pin through the bucket tooth.
- b. Place the Pin-Master over the bucket tooth and locate the pin in the hole of holder (10).
- c. Strike the tool with a hammer at the back of the tool (4) in order to start the pin.

- d. Slide pin holder (10) away from the pin and rotate the tool slightly in order to align pin setter (9) with the pin.
 - e. Strike the end of the tool until the pin is fully inserted.
6. After you drive the pin, make sure that the retainer fits snugly into the pin groove.

Side Cutters

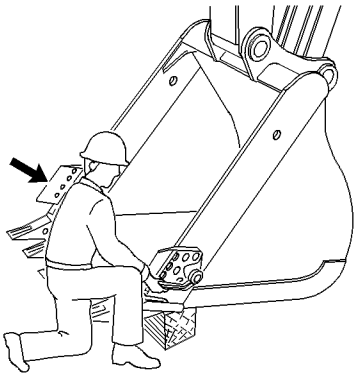


Illustration 281

g00114738

1. Remove the mounting bolts and the side cutters.
2. Clean the mounting surfaces.

Note: Some side cutters may be rotated for additional wear.

3. Install the new side cutters or the rotated side cutters.

i00706051

Cab Air Filter - Clean/Replace

SMCS Code: 7342-070; 7342-510

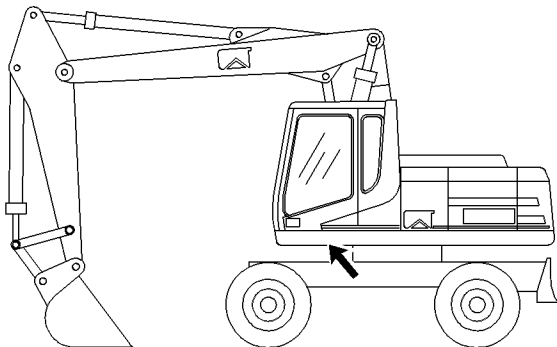


Illustration 282

g00291487

The cab air filters are under the cab.

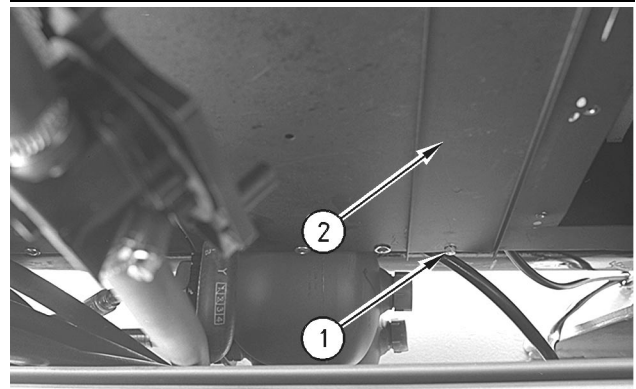


Illustration 283

g00102283

- (1) Screws
(2) Cover for the Cab Air Filter

1. Remove two screws (1) and cover (2).
2. Remove the filters.
3. Clean the filters with pressure air or wash the filters in a solution of warm water and nonsudsing household detergent.
4. Rinse the filters in clean water. Thoroughly air dry the filters.
5. Install the filters.
6. Install cover (2). Secure the cover with two screws (1).
7. Replace the access cover to the cab riser compartment.

i00662834

Condenser (Refrigerant) - Clean (If Equipped)

SMCS Code: 1805-070

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

NOTICE

If excessively dirty, clean condenser with a brush. To prevent damage or bending of the fins, do not use a stiff brush.

Repair the fins if found defective.

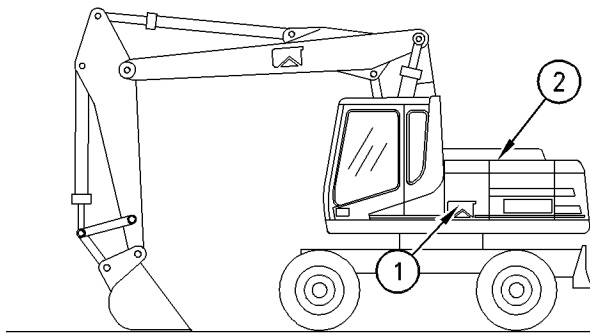


Illustration 284

g00290119

- (1) Access door
(2) Access cover

1. Open access door (1) that is on the left side of the machine. Secure the access door.
2. Open access cover (2).

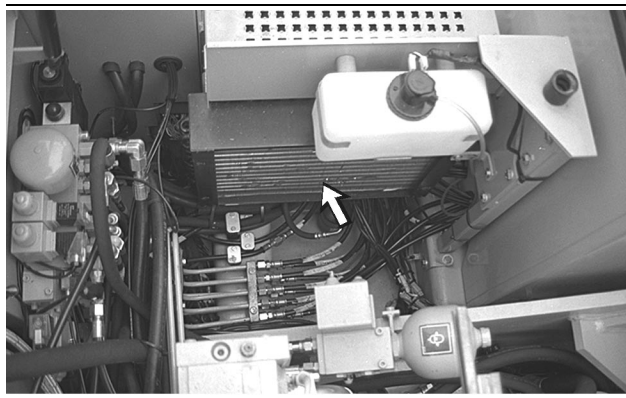


Illustration 285

g00101950

3. Inspect the condenser for debris. Clean the condenser, if necessary.
4. Use clean water to wash off all dust and dirt from the condenser.
5. Close the access door and the access cover.

i01047363

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044

S/N: 6TL1-539

S/N: 6TL542-634

S/N: 7ML1-1060

S/N: 7ML1065-1214

NOTICE

Do not change the coolant until you read and understand the material in the Operation and Maintenance Manual, "Cooling System Specifications".

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 Manual, "Extended Life Coolant (ELC)" under the topic ELC Cooling System Contamination.

This machine was filled with Extended Life Coolant at the factory.

If the coolant is dirty or if you observe any foaming in the cooling system, drain the coolant before the recommended interval.

If the coolant in the machine is changed to Extended Life Coolant from another type of coolant, see Operation and Maintenance Manual, SEBU6250, "Extended Life Coolant (ELC) Cooling System Maintenance".

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

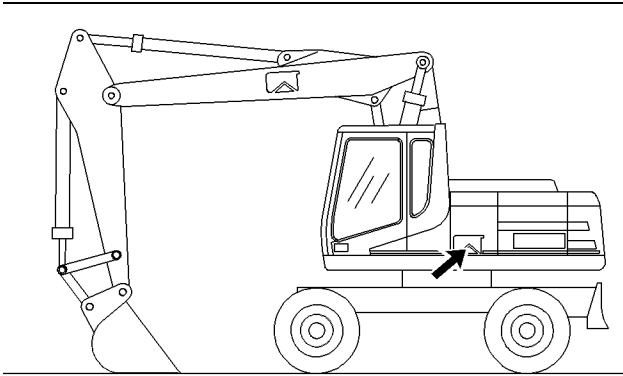


Illustration 286

g00289939

1. Open the access door on the left side of the machine. Secure the access door.

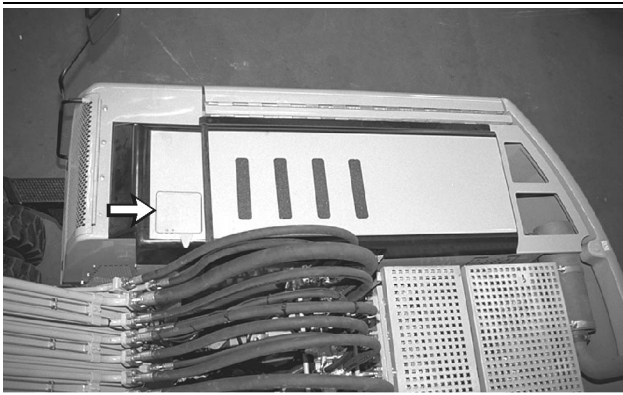


Illustration 287

g00309306

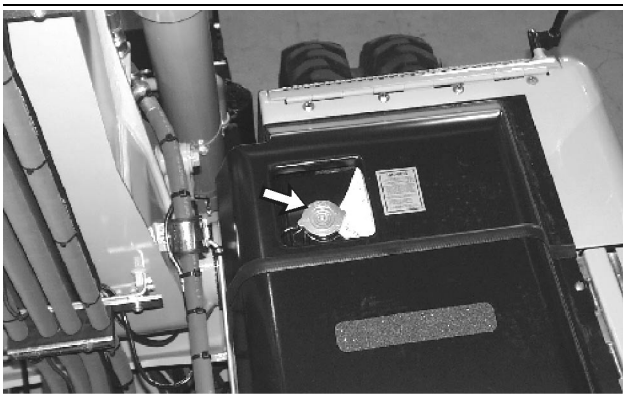


Illustration 288

g00518336

2. The radiator is at the top right of the machine. The cooling system pressure cap is above the radiator under the small access cover. Open the access cover to the pressure cap. Slowly loosen the pressure cap in order to relieve the pressure. Remove the pressure cap.
3. Remove the radiator cap.

4. There is a cover under the radiator. Remove the screws and the cover under the radiator in order to expose the drain valve in Illustration 289.

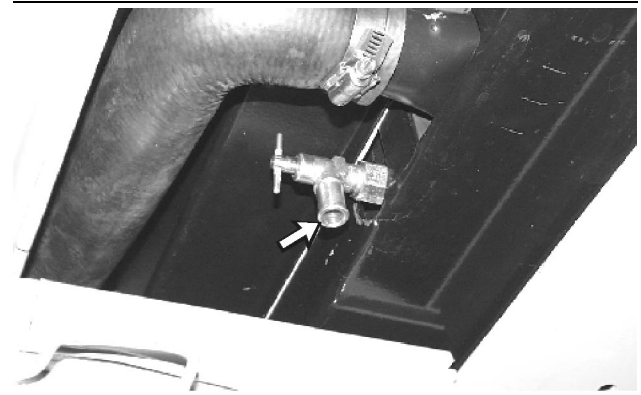


Illustration 289

g00518357

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

5. Open the drain valve. Allow the coolant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

6. Flush the cooling system with clean water until the draining water is clean.
7. Close the drain valve. Replace the cover under the radiator and secure the cover under the radiator.
8. Add the Extended Life Coolant. Refer to the following topics:
 - Operation and Maintenance Manual, SEBU6250, "Cooling System Specifications"
 - Operation and Maintenance Manual, "Refill Capacities"
9. Start the engine. Run the engine without the pressure cap. Run the engine until the water temperature regulator opens and the coolant level stabilizes.



Illustration 290

g00518359

- 10.** Open the radiator access cover. Secure the access cover.

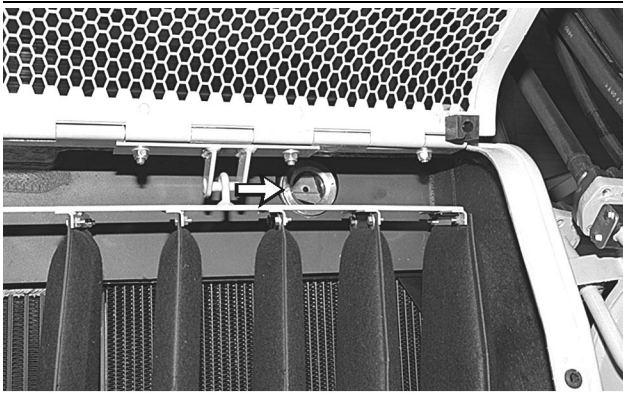


Illustration 291

g00102899

- 11.** Maintain the coolant level to the center of the sight gauge.
- 12.** Install the radiator cap.
- 13.** Stop the engine.
- 14.** Close all access covers and the access door. Secure all access covers and the access door.

Cooling System Coolant (ELC) - Change

SMCS Code: 1350-044

S/N: 6TL540-541

S/N: 6TL635-Up

S/N: 7ML1061-1064

S/N: 7ML1215-Up

NOTICE

Do not change the coolant until you read and understand the material in the Operation and Maintenance Manual, "Cooling System Specifications".

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 Manual, "Extended Life Coolant (ELC)" under the topic ELC Cooling System Contamination.

This machine was filled with Extended Life Coolant at the factory.

If the coolant is dirty or if you observe any foaming in the cooling system, drain the coolant before the recommended interval.

If the coolant in the machine is changed to Extended Life Coolant from another type of coolant, see Operation and Maintenance Manual, SEBU6250, "Extended Life Coolant (ELC) Cooling System Maintenance".

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

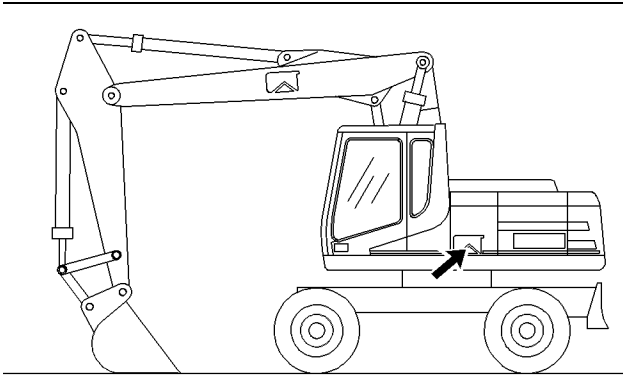


Illustration 292

g00289939

1. Open the access door on the left side of the machine. Secure the access door.

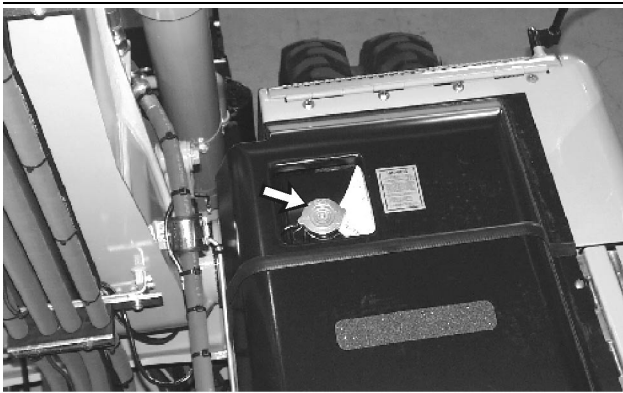


Illustration 293

g00518336

2. The radiator is at the top right of the machine. The cooling system pressure cap is above the radiator under the small access cover. Open the access cover to the pressure cap. Slowly loosen the pressure cap in order to relieve the pressure. Remove the pressure cap.
3. Remove the radiator cap.
4. There is a cover under the radiator. Remove the screws and the cover under the radiator in order to expose the drain valve in Illustration 294.

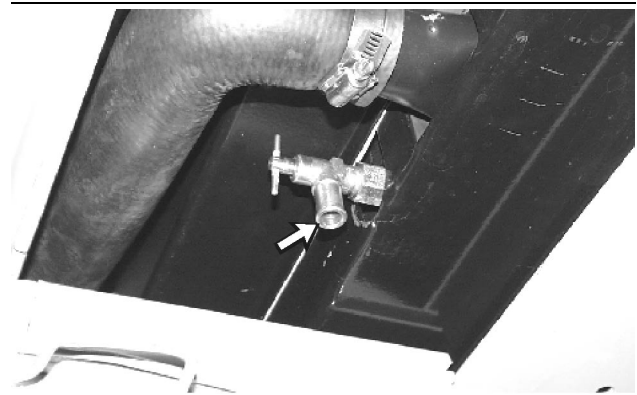


Illustration 294

g00518357

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

5. Open the drain valve. Allow the coolant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

6. Flush the cooling system with clean water until the draining water is clean.
7. Close the drain valve. Replace the cover under the radiator and secure the cover under the radiator.



Illustration 295

g00542482

8. Remove the vent plug and the seal. Refer to Illustration 295.
9. Add the Extended Life Coolant. Refer to the following topics:
 - Operation and Maintenance Manual, SEBU6250, "Cooling System Specifications"
 - Operation and Maintenance Manual, "Refill Capacities"

10. Install the vent plug and the seal. Tighten the vent plug to a torque of 9 ± 1 N·m (6.6 ± 0.7 lb ft).

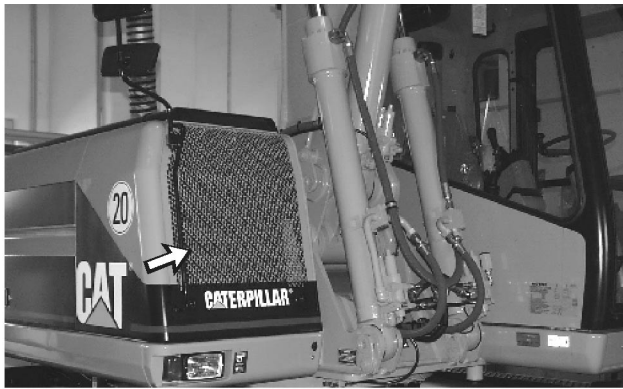


Illustration 296

g00518359

11. Open the radiator access cover. Secure the access cover.

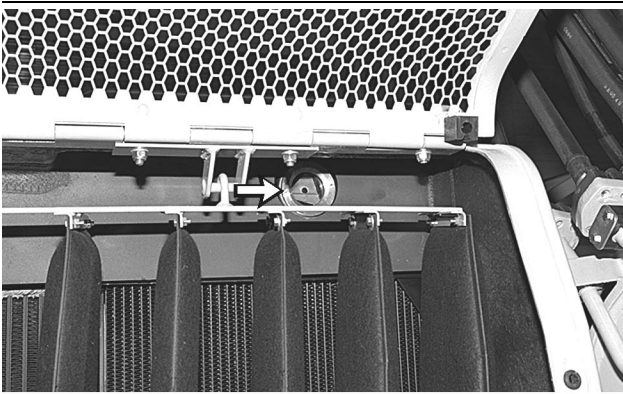


Illustration 297

g00102899

12. Add coolant until the coolant level is at the center of the sight gauge.
13. Start the engine and run the engine without the radiator cap. Run the engine until the coolant level stabilizes. If necessary, add coolant in order to maintain the coolant level at the center of the sight gauge.
14. Stop the engine.
15. Install the radiator cap.
16. Close all access covers and the access door. Secure all access covers and the access door.

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352; 1353; 1395

S/N: 6TL1-539

S/N: 6TL542-634

S/N: 7ML1-1060

S/N: 7ML1165-1214

Note: This machine was filled with Caterpillar Extended Life Coolant at the factory.

When Caterpillar Extended Life Coolant (ELC) is used, a Caterpillar ELC Extender must be added to the cooling system. See the Operation and Maintenance Manual, SEBU6250, "Coolant Recommendations" for all cooling system requirements.

Use an **8T-5296** Coolant Conditioner Test Kit to check the concentration of the coolant.

NOTICE

Use only Caterpillar products or commercial products that have passed Caterpillar EC-1 specification for pre-mixed or concentrated coolants.

Use only Caterpillar Extender with Extended Life Coolant.

Mixing Extended Life Coolant with other products reduces the Extended Life Coolant service life. Failure to follow the recommendations can reduce cooling system components life unless appropriate corrective action is performed.

Note: Refer to Operation and Maintenance Manual, SEBU6250, "Extended Life Coolant (ELC)" for instructions regarding contamination of the ELC Cooling System.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

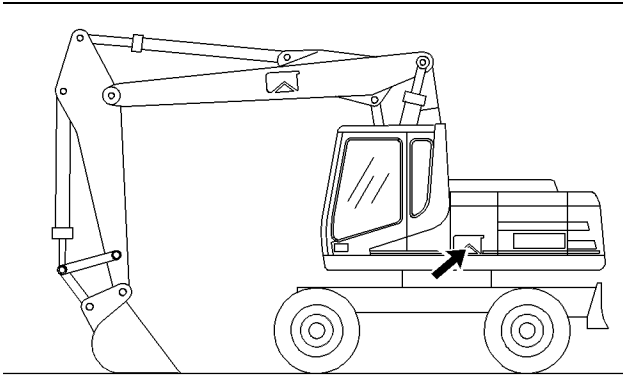


Illustration 298

g00289939

1. Open the access door on the left side of the machine. Secure the access door.

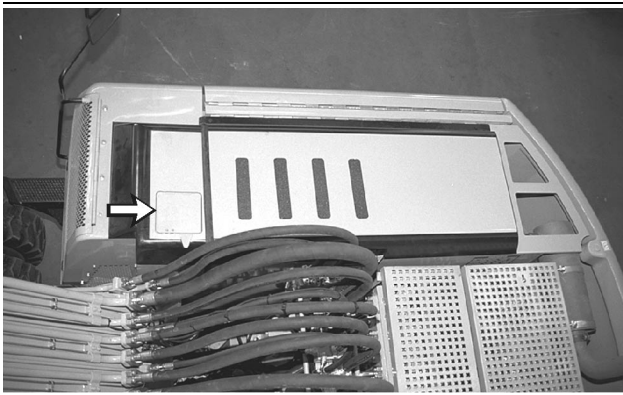


Illustration 299

g00309306

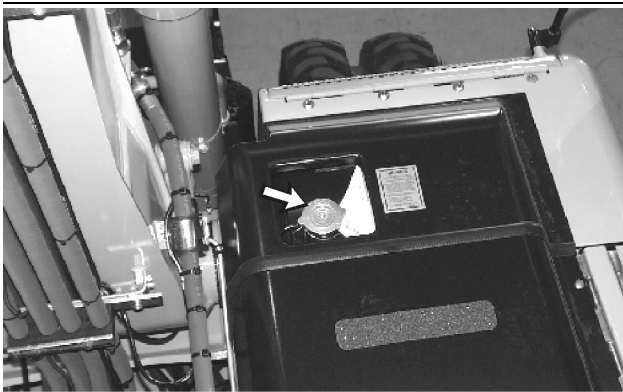


Illustration 300

g00518336

2. The radiator is at the top right of the machine. Open the access cover for the radiator cap. Slowly loosen the radiator cap in order to relieve the pressure. Remove the radiator cap.

3. You may be required to drain enough coolant from the radiator in order to allow the addition of the Caterpillar ELC Extender. If this is necessary, refer to Operation and Maintenance Manual, "Cooling System Coolant (ELC) - Change" for the location of the radiator drain valve.

Note: Dispose of drained fluids according to local regulations.

4. Add the proper amount of Caterpillar ELC Extender to the cooling system. Refer to Operation and Maintenance Manual, "Refill Capacities" and Operation and Maintenance Manual, SEBU6250, "Extended Life Coolant (ELC)" for the proper quantity.

5. Replace the radiator cap if the gasket is damaged. Install the radiator cap. Close the cover over the radiator cap.

6. Close and secure the access door on the left side of the machine.

i01237714

Cooling System Coolant Extender (ELC) - Add

SMCS Code: 1352; 1353; 1395

S/N: 6TL540-541

S/N: 6TL635-Up

S/N: 7ML1061-1064

S/N: 7ML1215-Up

Note: This machine was filled with Caterpillar Extended Life Coolant at the factory.

When Caterpillar Extended Life Coolant (ELC) is used, a Caterpillar ELC Extender must be added to the cooling system. See the Operation and Maintenance Manual, SEBU6250, "Coolant Recommendations" for all cooling system requirements.

Use an **8T-5296** Coolant Conditioner Test Kit to check the concentration of the coolant.

NOTICE

Use only Caterpillar products or commercial products that have passed Caterpillar EC-1 specification for pre-mixed or concentrated coolants.

Use only Caterpillar Extender with Extended Life Coolant.

Mixing Extended Life Coolant with other products reduces the Extended Life Coolant service life. Failure to follow the recommendations can reduce cooling system components life unless appropriate corrective action is performed.

Note: Refer to Operation and Maintenance Manual, SEBU6250, "Extended Life Coolant (ELC)" for instructions regarding contamination of the ELC Cooling System.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

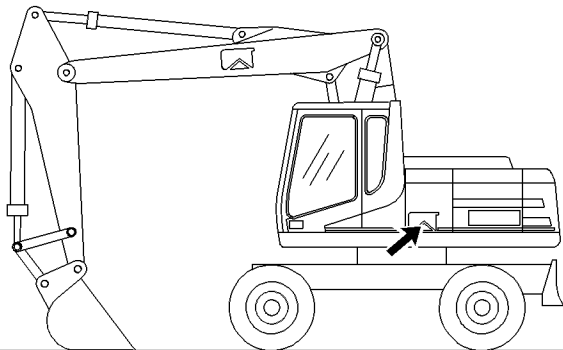


Illustration 301

g00289939

1. Open the access door on the left side of the machine. Secure the access door.

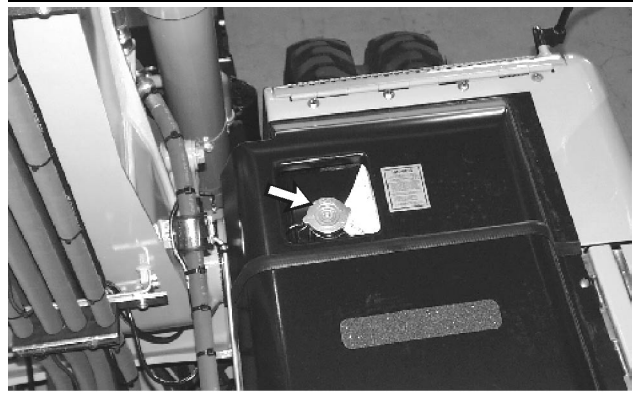


Illustration 302

g00518336

2. The radiator is at the top right of the machine. Open the access cover for the radiator cap. Slowly loosen the radiator cap in order to relieve the pressure. Remove the radiator cap.
3. You may be required to drain enough coolant from the radiator in order to allow the addition of the Caterpillar ELC Extender. If this is necessary, refer to Operation and Maintenance Manual, "Cooling System Coolant (ELC) - Change" for the location of the radiator drain valve.

Note: Dispose of drained fluids according to local regulations.

4. Add the proper amount of Caterpillar ELC Extender to the cooling system. Refer to Operation and Maintenance Manual, "Refill Capacities" and Operation and Maintenance Manual, SEBU6250, "Extended Life Coolant (ELC)" for the proper quantity.

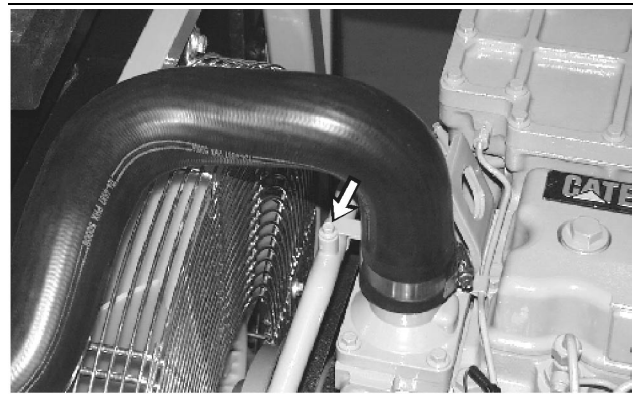


Illustration 303

g00542482

5. After the system has been filled with the extender, loosen the air purge valve in order to release the air from the system.
6. Replace the radiator cap if the gasket is damaged. Install the radiator cap. Close the cover over the radiator cap.

7. Close and secure the access door on the left side of the machine.

i01010703

Cooling System Hoses - Inspect

SMCS Code: 1380-040

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

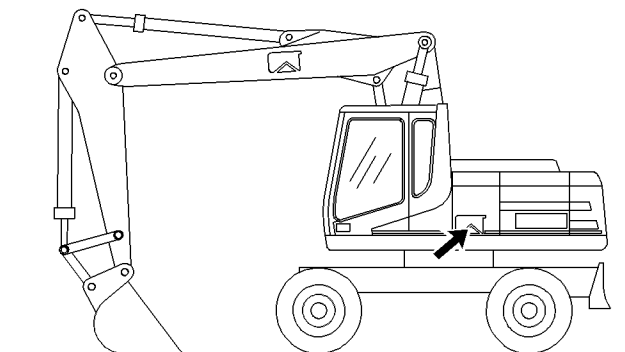


Illustration 304

g00289939

1. Open the access door on the left side of the machine. Secure the access door.

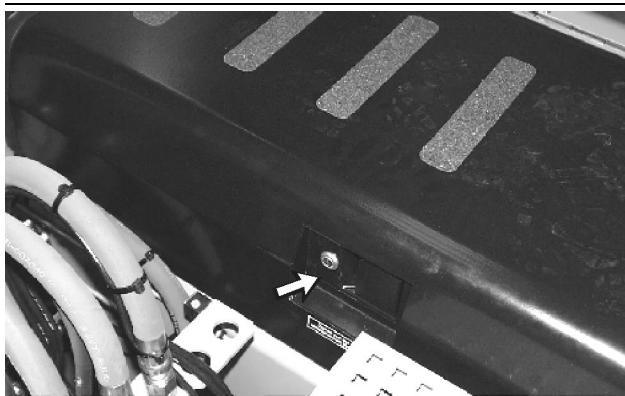


Illustration 305

g00518246

2. Open the access cover that is on the top of the machine.

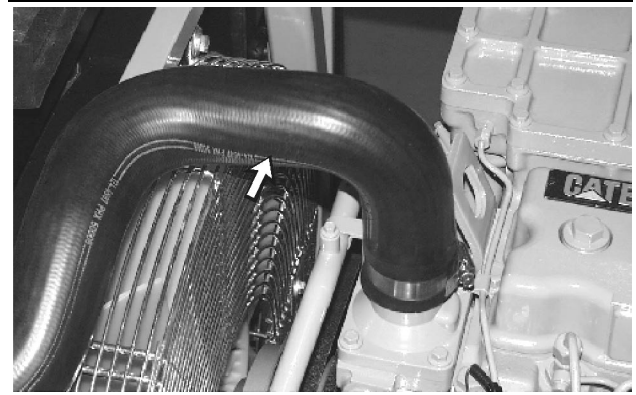


Illustration 306

g00518425

3. Inspect all hoses for leaks due to cracking, for softness next to the clamps, and for loose clamps.
4. Replace hoses that are cracked or soft and tighten any loose clamps.

Replace the Hoses

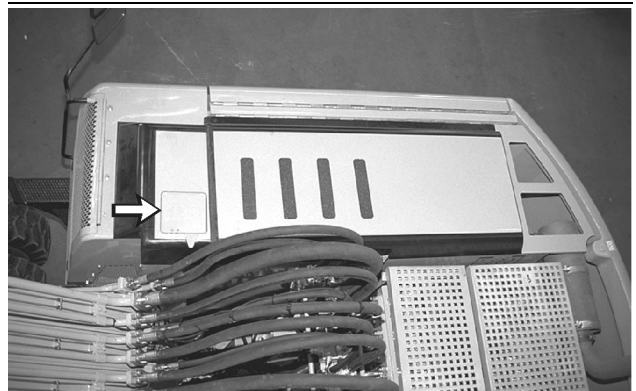


Illustration 307

g00309306

1. The radiator is at the top right of the machine. Open the access cover to the radiator cap.

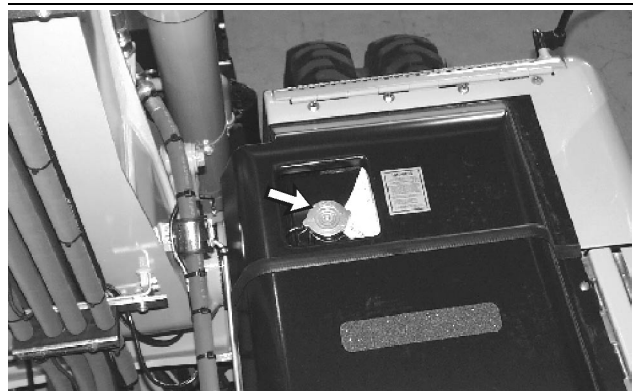


Illustration 308

g00518336

2. Slowly loosen the radiator cap in order to relieve the system pressure. Remove the radiator cap.
3. The drain valve is under the radiator. Open the access cover in order to gain access to the drain valve.

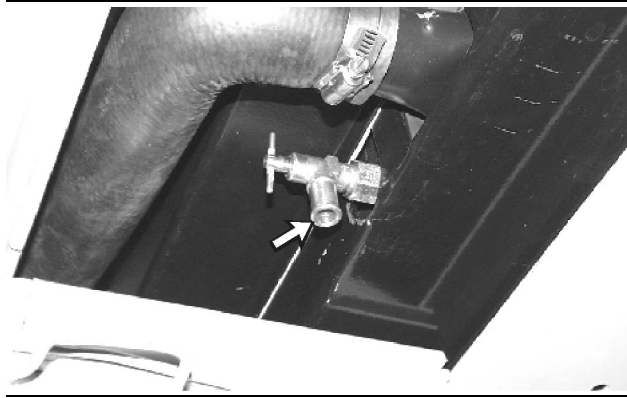


Illustration 309

g00518357

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

4. Open the drain valve. Allow the coolant to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

5. Close the drain valve.
6. Loosen the hose clamps and disconnect the damaged hose.
7. Replace the damaged hose with a new hose.
8. Add the coolant solution. Refer to the Operation and Maintenance Manual, "Refill Capacities".

Note: If you are using Caterpillar Antifreeze, do not add a supplemental coolant additive. If you are not using Caterpillar Antifreeze, add a supplemental coolant additive.

9. Start the engine. Run the engine without the radiator cap. Run the engine until the water temperature regulator opens and the coolant level stabilizes.

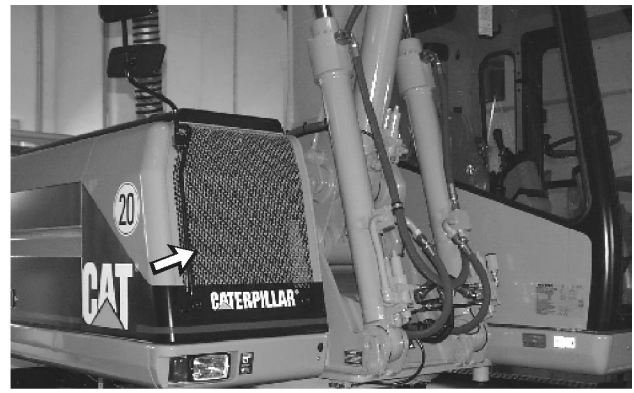


Illustration 310

g00518359

10. Open the radiator access cover. Secure the access cover.

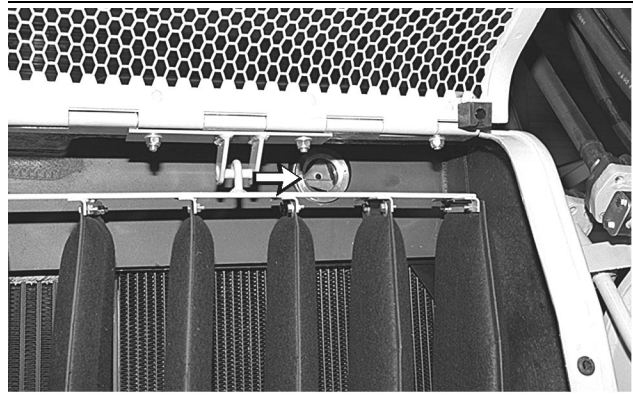


Illustration 311

g00102892

11. Maintain the coolant level to the center of the sight gauge.
12. Install the radiator cap.
13. Stop the engine.
14. Close and secure all of the access covers and all of the access doors.

i00995126

Cooling System Level - Check

SMCS Code: 1350-535



Illustration 312

g00518359

1. Open the radiator access cover. Secure the radiator access cover.

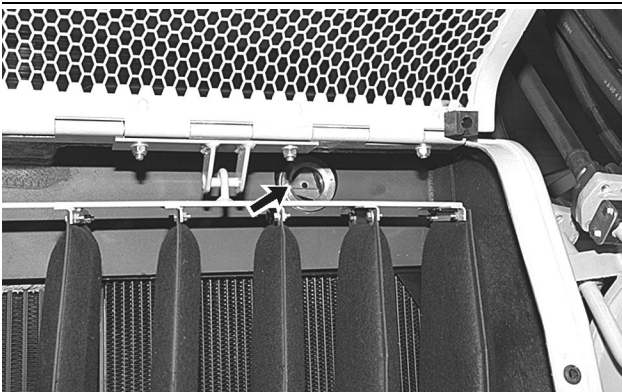


Illustration 313

g00102305

2. Maintain the coolant level to the center of the sight gauge.

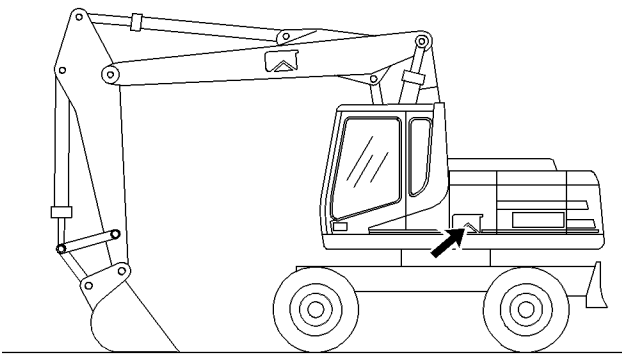


Illustration 314

g00289939

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" on containing fluid spillage.

3. If additional coolant is needed, open the access door on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

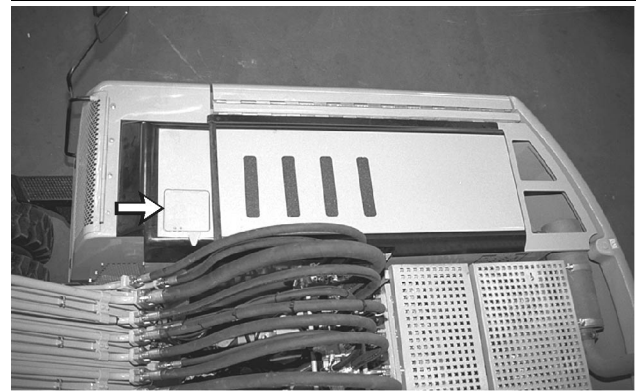


Illustration 315

g00309306

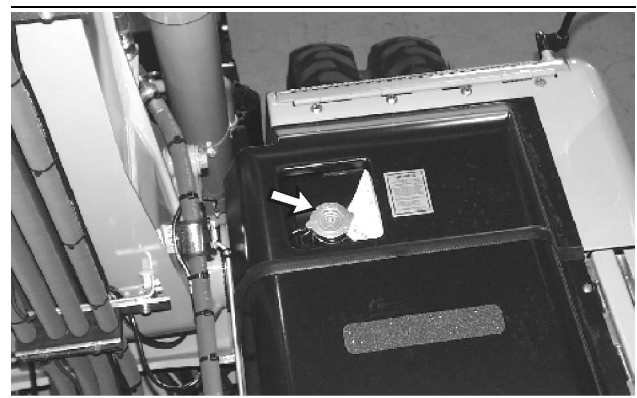


Illustration 316

g00518336

4. The radiator cap is on the top right side of the machine. Open the access cover to the radiator cap. Slowly loosen the radiator cap in order to relieve the system pressure.

If you must add coolant daily, check the coolant system for leaks.

5. Remove the radiator cap.
6. Add the coolant.

7. Inspect the radiator cap and the gasket for the following defects:

- Damage
- Deposits
- Foreign material

Clean the radiator cap with a clean cloth or replace the radiator cap if the radiator cap is damaged.

8. Install the radiator cap. Close the access cover to the radiator cap.
9. Close the access door on the left side of the machine.
10. Inspect the radiator core for debris. Clean the radiator core, as needed. See Operation and Maintenance Manual, "Radiator Core - Clean".
11. Close the radiator access cover. Secure the radiator access cover.

i00995133

Cooling System Water Temperature Regulator - Replace

SMCS Code: 1355-510

Note: Refer to the Service Manual, "Disassembly and Assembly" for detailed instructions regarding the cooling system.

Replacing the water temperature regulator prior to failure is a recommended preventive maintenance practice. This replacement will reduce the chances for cooling system problems and for unscheduled downtime.

If one of the following conditions is met, the replacement of the water temperature regulator can be done:

- The cooling system is drained and the cooling system is cleaned.
- The cooling system is drained to a level that is below the water temperature regulator housing. This is the best option if only the water temperature regulator is being replaced.

NOTICE

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

Never operate an engine without the water temperature regulator installed.

If the water temperature regulator is installed incorrectly, the engine may overheat, causing cylinder head damage. Ensure that the new water temperature regulator is installed in the original position.

Note: Always discard drained fluids according to local regulations.

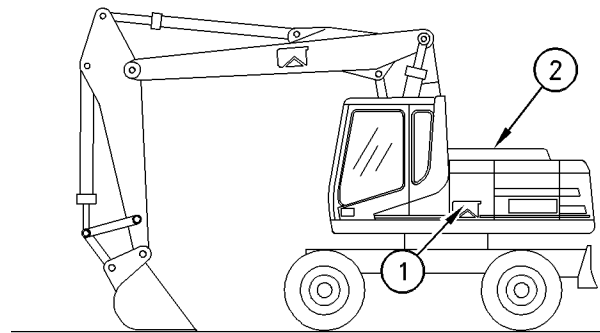


Illustration 317

g00317003

- (1) Access door
(2) Access cover

1. Access door (1) is on the left side of the machine. Open access door (1). Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

2. Open access cover (2).

i00687064

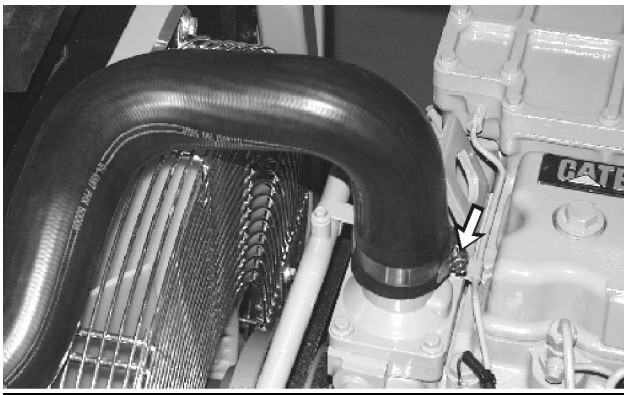


Illustration 318

g00518433

3. Loosen the hose clamp. Remove the hose from the elbow.
 4. Remove the bolts from the elbow. Remove the elbow. Remove the gasket.
 5. Remove the water temperature regulator from the water temperature regulator housing.
- Note:** Inspect the gasket before assembly. If wear or damage is found, replace the gasket.
6. Install a new water temperature regulator. Install the gasket. Install the elbow. Install the bolts in the elbow.
 7. Connect the hose to the elbow. Tighten the hose clamps.
 8. Restore the coolant level to the correct operating level. Refer to the Operation and Maintenance Manual, "Cooling System Level - Check" for details.
 9. Close and secure access cover (2). Close and secure access door (1).

Drive Shaft Support Bearing Lubricant - Check (If Equipped)

SMCS Code: 3267-535

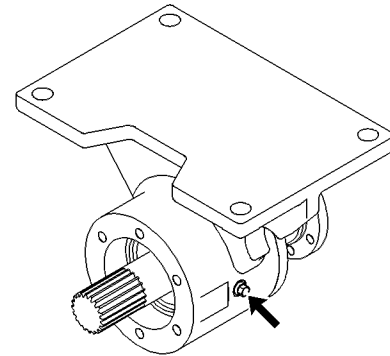


Illustration 319

g00102456

The drive shaft support bearings are located below the center of the machine.

1. Remove the plug.
2. Check the lubricant level. The bearings should be covered with lubricant.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

3. If necessary, add lubricant.

i00995144

Drive Shaft Universal Joint - Lubricate

SMCS Code: 3251-086; 3253-086

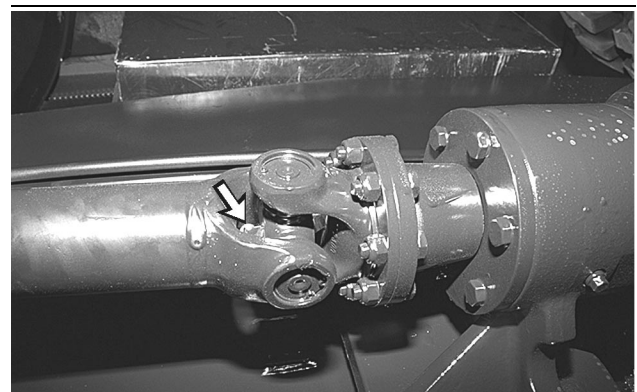


Illustration 320

g00102443

The grease fittings are located below the center of the machine.

Apply grease to the one fitting on the universal joint at both ends of the drive shaft. Some machines are equipped with two-piece drive shafts. The two-piece drive shaft has two additional fittings.

i00995186

Drum Brakes - Inspect (If Equipped)

SMCS Code: 4252-040

S/N: 7ML1-Up

The brake shoe pads should be inspected more frequently than every 1000 service hours or 6 months when the brake shoe pads are near replacement.

1. Remove the wheel on the rear axle.

Note: Refer to Disassembly and Assembly Manual, SENR6258, "Remove & Install Tire & Rim Assemblies (Rear)" for more information on removing the rear tire and installing the rear tire.

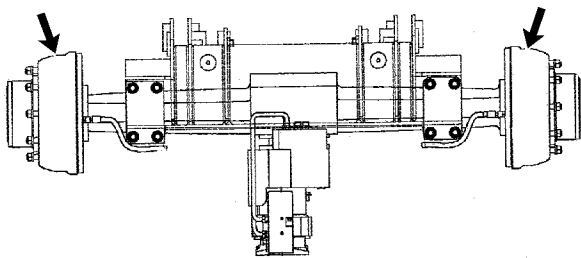


Illustration 321

g00103930

2. Remove the brake drums.
3. Visually inspect the brake line for leaks. Repair any leaks. Replace any parts that are worn or damaged.

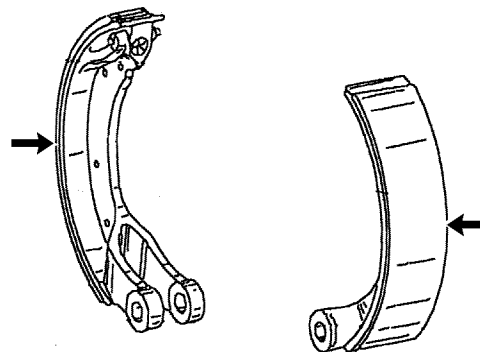


Illustration 322

g00103931

4. Measure the thickness of the brake shoe pad. If the thickness of the brake shoe pad is less than 2 mm (0.079 inch) at any point and the brake shoe pads are assembled with glue, then replace the brake shoes. For riveted brake shoe pads, if the thickness of the brake shoe pad is less than 1 mm (0.039 inch) at any point then replace the brake shoes. Refer to the Service Manual for the replacement procedure of brake shoes.
5. Install the brake drums.
6. Install the tires.

i00994381

Engine Air Filter Primary Element - Clean/Replace

SMCS Code: 1054-070; 1054-510

NOTICE

Never service the air cleaner with the engine running, since this will allow dirt to enter the engine.

Check the air duct for leaks. Make all repairs to leaky air ducts immediately, as dirt and debris could enter the engine causing damage to the turbocharger and engine components.

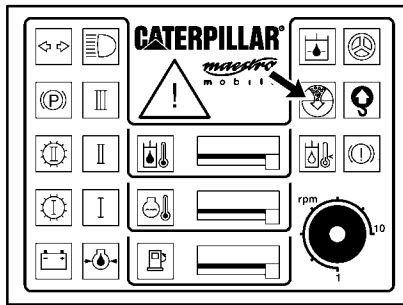


Illustration 323

g00106825

Service the air cleaner if the dash indicator light comes on and the engine is running at high idle. Stop the engine.

A primary element may be cleaned for a maximum of six times. Also replace the primary element if the primary element has been used for one year.

The secondary filter element should also be replaced when any one of the following conditions occurs:

- The primary filter element is serviced for the third time.
- The dash indicator light comes on and the engine is running at high idle after the primary filter element has been serviced.
- The exhaust smoke is black after the primary filter element has been serviced.

See Operation and Maintenance Manual, "Engine Air filter Secondary Element - Replace".

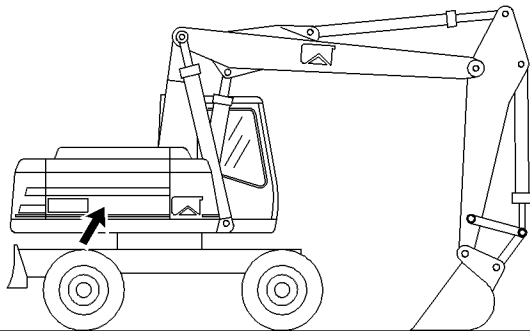


Illustration 324

g00290071

1. In order to access the filter elements, open the access cover on the right side of the machine.

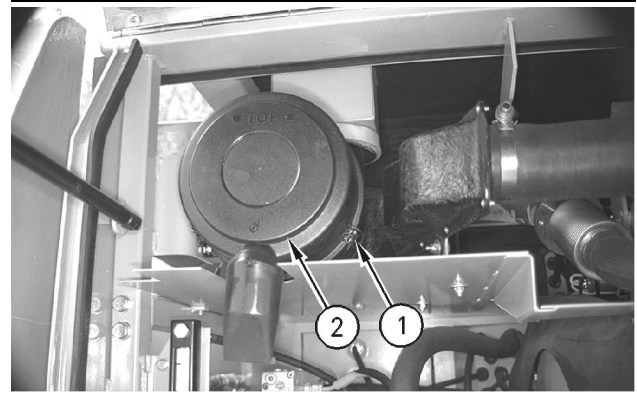


Illustration 325

g00309383

2. Release three clamps (1). Remove cover (2).



Illustration 326

g00309423

3. Remove the primary filter element from the air cleaner housing.
4. Clean the inside of the air cleaner housing.
5. Inspect the primary element. If the pleats, the gaskets, or the seals are damaged, discard the element. Replace a damaged primary element with a clean primary element.

NOTICE

Do not clean the filter elements by bumping or tapping them. Do not use filter elements with damaged pleats, gaskets or seals. Engine damage can result.

Make sure the cleaned filter elements are completely dry before installing into the filter housing. Water remaining in the elements can cause false indications of contamination in Scheduled Oil Sampling test results.

6. If the primary element is not damaged, clean the primary element.

The filter elements can be cleaned by using the following methods:

- Pressure air
- Pressure water
- Detergent washing

If you use pressure air, use a maximum air pressure of 205 kPa (30 psi). If you use pressure water, use a maximum water pressure of 280 kPa (40 psi).

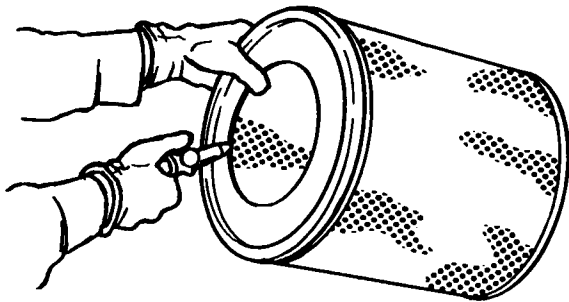


Illustration 327

g00102012

7. When you clean the inside pleats and the outside pleats, direct the air or the water along the pleats.

The element can be washed in a solution that consists of warm water and of nonsudsing household detergent. Fully rinse the pleats. Allow the filter to air dry completely.

8. Inspect the filter elements after you clean the filter elements. Do not use a filter if the pleats, the gaskets or the seals are damaged.
9. Cover the clean filter elements. Store the elements in a clean, dry location.
10. Install a clean primary filter element.
11. Clean the cover.
12. Install the cover and close the access cover.

i00726894

Engine Air Filter Secondary Element - Replace

SMCS Code: 1054-510

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 cleaned for the third time, the secondary filter element should be replaced.

The secondary filter element should also be replaced if the restricted Air Filter indicator comes on after the installation of a clean primary filter element or if the exhaust smoke is still black.

1. Remove the primary filter element and the cover. See the Operation and Maintenance Manual, "Engine Air Filter Primary Element - Clean/Replace".



Illustration 328

g00323623

2. Remove the secondary filter element.
3. Cover the air inlet opening. Clean the inside of the air cleaner housing.
4. Uncover the air inlet opening. Install a new secondary element.
5. Install the primary filter element and the cover. See Operation and Maintenance Manual, "Engine Air Filter Primary Element - Clean/Replace" for the necessary steps.

i01235794

Engine Crankcase Breather Filter - Replace

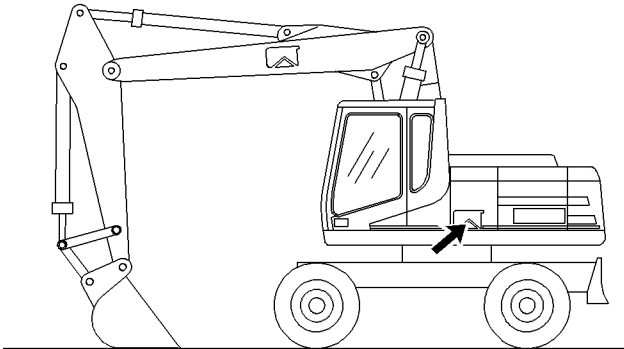
SMCS Code: 1317-510**S/N:** 6TL1-539**S/N:** 6TL542-589**S/N:** 6TL592-634**S/N:** 7ML1-1060**S/N:** 7ML1065-1160**S/N:** 7ML1163-1214

Illustration 329

g00289939

1. Open the access door that is on the left side of the machine. Secure the access door.

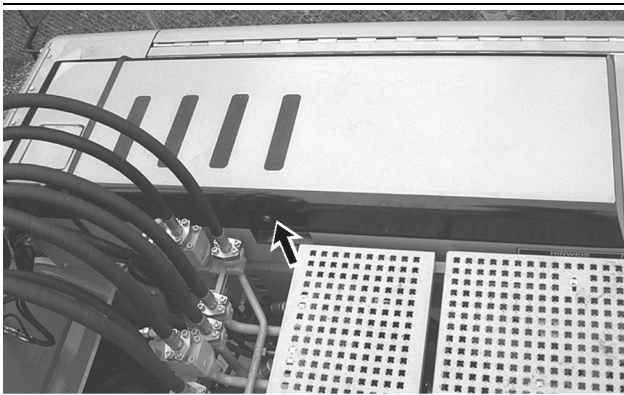


Illustration 330

g00306075

2. Open the access cover that is on the top of the machine.

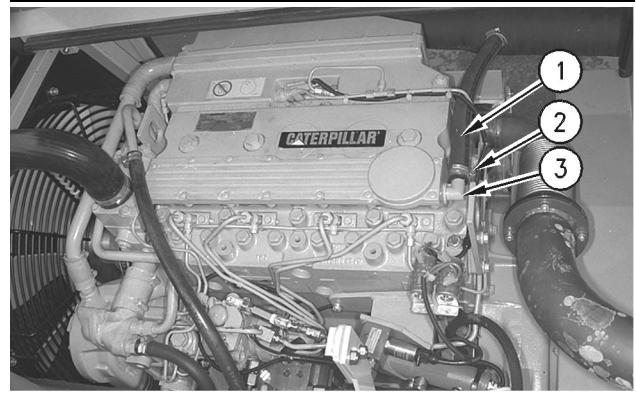


Illustration 331

g00306077

- (1) Hose
- (2) Hose clamp
- (3) Elbow

3. Loosen hose clamp (2) and carefully remove hose (1) from elbow (3).

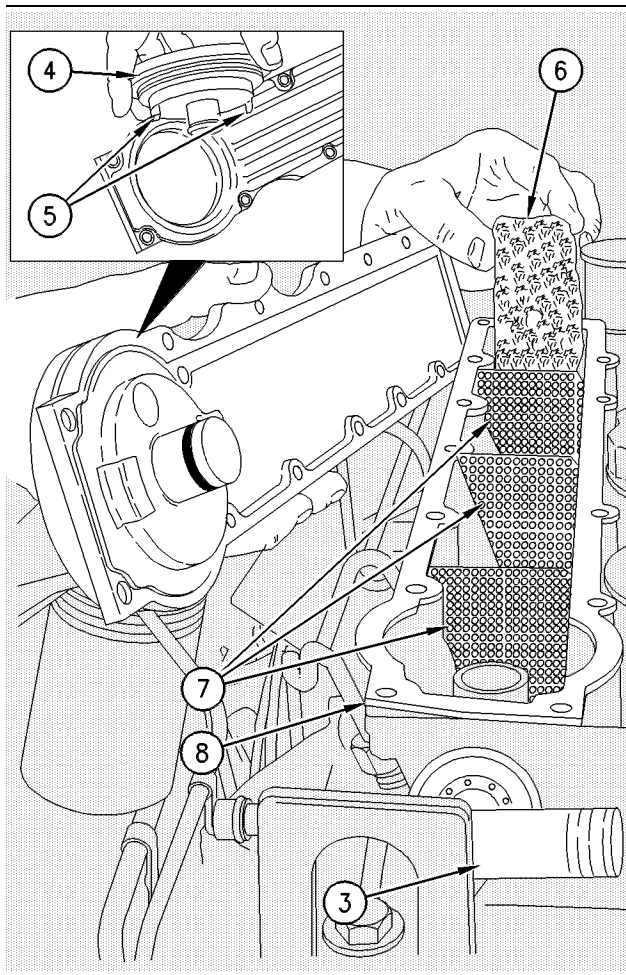


Illustration 332

g00293186

- (3) Elbow
- (4) Breather valve
- (5) Clip retainers
- (6) Breather filter
- (7) Baffle plates
- (8) Gasket

4. Remove the valve cover. Refer to the Service Manual for information on removing the valve cover.

Note: It may be necessary to use a suitable lever in order to remove the valve cover. Make sure that the lever does not damage the valve cover.

5. Remove gasket (8).
6. Discard gasket (8).
7. Release clip retainers (5) on breather valve (4). Push the breather valve out of the valve cover.
8. Remove breather filter (6).
9. Discard breather filter (6).
10. Remove baffle plates (7).

NOTICE

To prevent damage to the breather valve, remove the breather valve before the cover is washed.

NOTICE

Ensure that all the cleaning fluid is removed before the breather is assembled.

11. Use a clean nonflammable solvent in order to wash the breather body, the valve cover, baffle plates (7), and elbow (3). Thoroughly dry the components after cleaning.
12. Make sure that the holes in the bottom of the chamber for baffle plates (7) are not restricted. Clean the holes, if necessary.
13. Install baffle plates (7) into the grooves in the breather body.
14. Install a new breather filter (6) into the breather body.
15. Reinstall breather valve (4) into the valve cover. Make sure that clip retainers (5) are engaged correctly.
16. Install a new gasket (8). The gasket is installed dry.
17. Place the valve cover and breather valve (4) into position on the breather body.
18. Loosely install the bolts.
19. Tighten the bolts.

NOTICE

Do not use excessive force to fit the hose to the breather outlet elbow.

20. Make sure that nothing is restricting the air flow in elbow (3) or in hose (1).
21. Carefully install hose (1) on elbow (3).
22. Tighten hose clamp (2).
23. Close the access cover.
24. Close the access door.

i01236041

Engine Crankcase Breather Filter - Replace

SMCS Code: 1317-510

S/N: 6TL540-541

S/N: 6TL590-591

S/N: 6TL635-Up

S/N: 7ML1061-1064

S/N: 7ML1161-1162

S/N: 7ML1215-Up

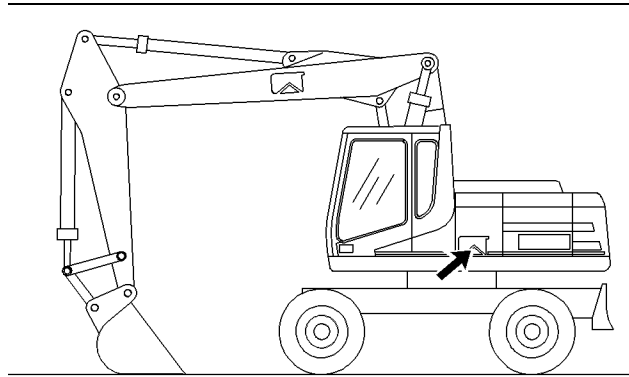


Illustration 333

g00289939

1. Open the access door that is on the left side of the machine. Secure the access door.



Illustration 334

g00518246

2. Open the access cover that is on the top of the machine.

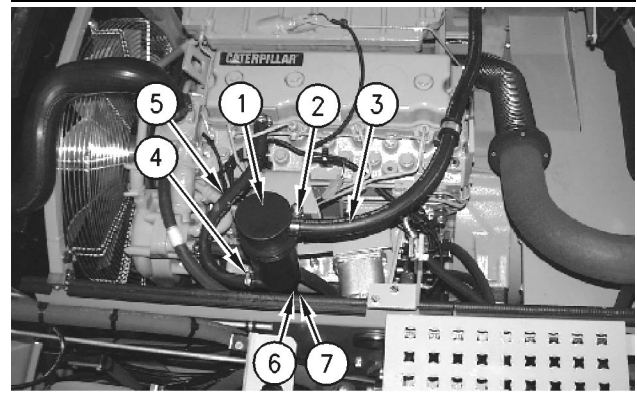


Illustration 335

g00660532

- (1) Cap
- (2) Hose clamp
- (3) Hose
- (4) Hose clamp
- (5) Hose
- (6) Hose clamp
- (7) Hose

3. Loosen hose clamps (2) and (4) and carefully remove hoses (3) and (5).

4. Loosen hose clamp (6) and carefully remove hose (7) at the bottom of the breather filter canister.

5. Remove the breather filter canister.

6. Remove cap (1).

NOTICE

Ensure that all the cleaning fluid is removed before the breather is assembled.

7. Use a clean nonflammable solvent in order to wash the breather canister and the filter mesh. Thoroughly dry the components after cleaning.

8. Reinstall the cap (1).

NOTICE

Do not use excessive force to fit the hose to the breather outlet elbow.

9. Make sure that nothing is restricting the air flow in hoses (3) and (5).

10. Make sure that nothing is restricting the oil flow in hose (7).

11. Carefully install hoses (3), (5) and (7).

12. Tighten hose clamps (2), (4) and (6).

13. Close the access cover.

14. Close the access door.

i01236331

Engine Crankcase Breather Valve - Replace

SMCS Code: 1317-510

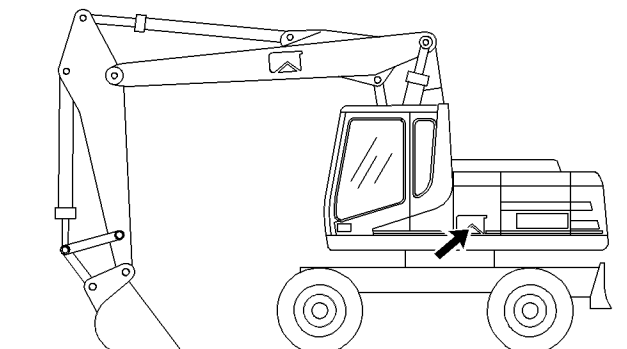


Illustration 336

g00289939

1. Open the access door that is on the left side of the machine. Secure the access door.

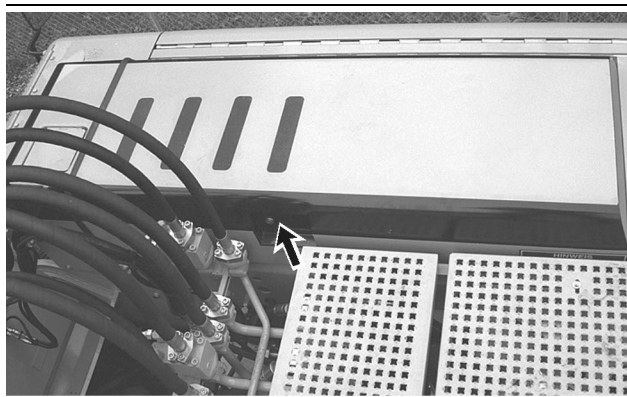


Illustration 337

g00306075

2. Open the access cover that is on the top of the machine.

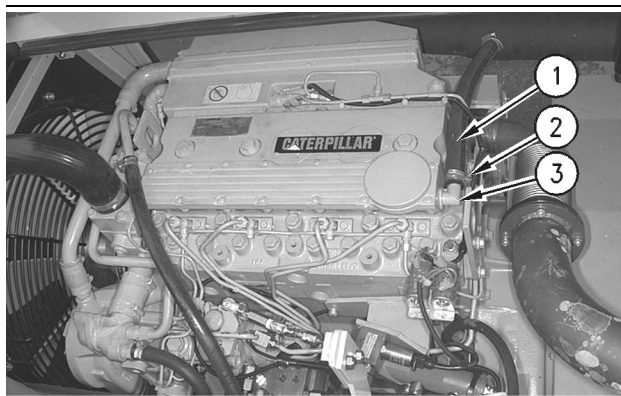


Illustration 338

g00306077

- (1) Hose
- (2) Hose clamp
- (3) Elbow

3. Loosen hose clamp (2) and carefully remove hose (1) from elbow (3).

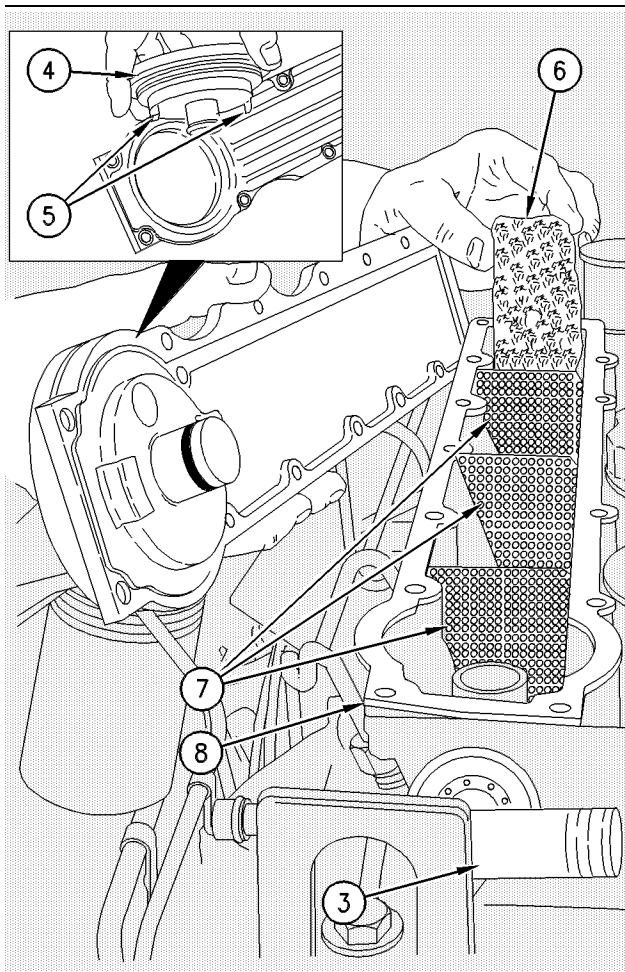


Illustration 339

g00293186

- (3) Elbow
- (4) Breather valve
- (5) Clip retainers
- (6) Breather filter
- (7) Baffle plates
- (8) Gasket

4. Remove the valve cover. Refer to the Service Manual for information on removing the valve cover.

Note: It may be necessary to use a suitable lever in order to remove the valve cover. Make sure that the lever does not damage the valve cover.

5. Remove gasket (8).
6. Discard gasket (8).
7. Release clip retainers (5) on breather valve (4). Push the breather valve out of the valve cover.
8. Discard breather valve (4).
9. Remove breather filter (6).
10. Discard breather filter (6).

11. Remove baffle plates (7).

NOTICE

Ensure that all the cleaning fluid is removed before the breather is assembled.

12. Use a clean nonflammable solvent in order to wash the breather body, the valve cover, baffle plates (7), and elbow (3). Thoroughly dry the components after cleaning.
13. Make sure that the holes in the bottom of the chamber for baffle plates (7) are not restricted. Clean the holes, if necessary.
14. Install baffle plates (7) into the grooves in the breather body.
15. Install a new breather filter (6) into the breather body.
16. Install a new breather valve (4) into the valve cover. Make sure that clip retainers (5) are engaged correctly.
17. Install a new gasket (8). The gasket is installed dry.
18. Place the valve cover and breather valve (4) into position on the breather body.
19. Loosely install the bolts.
20. Tighten the bolts.

NOTICE

Do not use excessive force to fit the hose to the breather outlet elbow.

21. Make sure that nothing is restricting the air flow in elbow (3) or in hose (1).
22. Carefully install hose (1) on elbow (3).
23. Tighten hose clamp (2).
24. Close the access cover.
25. Close the access door.

i00707018

Engine Oil Level - Check

SMCS Code: 1000-535

NOTICE

Do not overfill the crankcase. Engine damage can result.

Check the engine oil level while the engine is stopped.

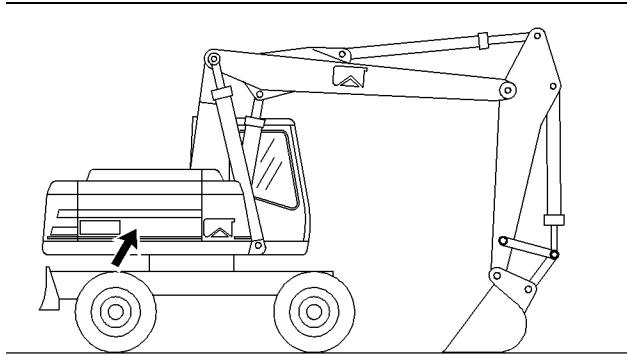


Illustration 340

g00290071

1. Open the access cover that is on the right side of the machine.

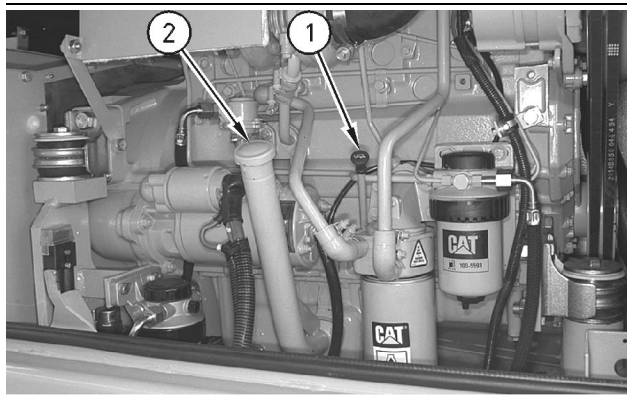


Illustration 341

g00309923

- (1) Dipstick
(2) Oil filler plug

WARNING

Hot engine components can cause injury from burns. Before performing maintenance on the engine, allow the engine and the components to cool.

2. Remove dipstick (1) in order to measure the oil level.

Oil which is badly contaminated or badly deteriorated should be replaced early. Replace the oil regardless of the time interval.

3. Remove the oil from dipstick (1).
4. Insert dipstick (1). Remove the dipstick again.

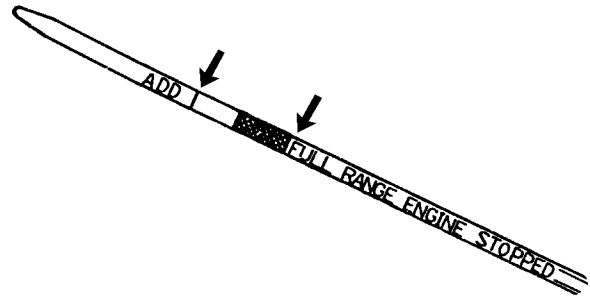


Illustration 342

g00102290

5. Maintain the oil level below the "FULL RANGE" mark on the dipstick and above the "ADD" on the dipstick. If the oil level is low, add oil.

Note: If the oil level is above the "FULL RANGE" mark, operating the engine could cause the crankshaft to dip into the oil. A crankshaft in the oil could lead to excessively high oil temperatures. Excessively high oil temperatures can reduce the lubricating characteristics of the oil. The reduction of lubricating characteristics of the oil causes bearing damage. Bearing damage leads to the loss of engine power.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

6. Remove oil filler plug (2) in order to add oil.
7. Add oil, if necessary.
8. Clean oil filler plug (2). Install the oil filler plug.
9. Close the access cover.

i00706875

Engine Oil and Filter - Change

SMCS Code: 1318-510

1. Park the machine on a level surface.
2. Engage the parking brake.
3. Lower the implements to the ground.
4. Stop the engine.

Note: Drain the crankcase while the oil is warm. This allows waste particles that are suspended in the oil to drain. As the oil cools, the waste particles will settle to the bottom of the crankcase. The particles will not be removed by draining the oil and the particles will recirculate in the engine lubrication system with the new oil.

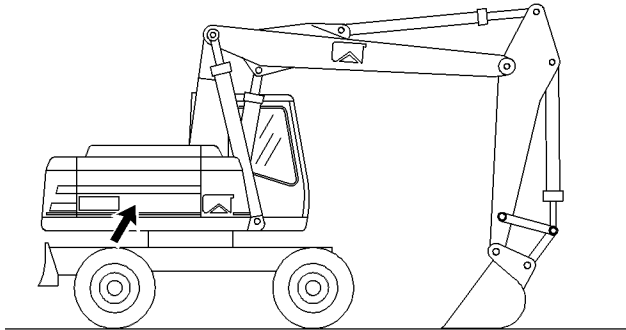


Illustration 343

g00290071

5. Open the access cover that is on the right side of the machine.

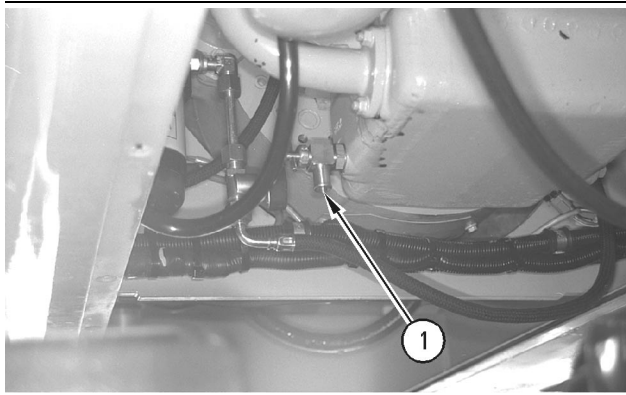


Illustration 344

g00309745

- (1) Crankcase drain valve

Note: Refer to the Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

6. Open crankcase drain valve (1). Allow the oil to drain into a suitable container. Close crankcase drain valve (1).

Note: Dispose of drained fluids according to local regulations.

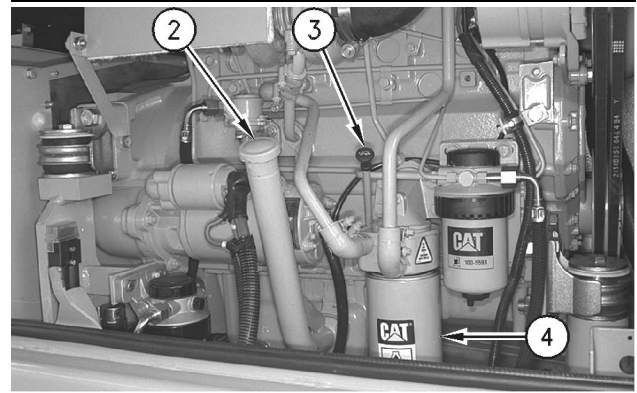


Illustration 345

g00309746

- (2) Oil filler plug
- (3) Dipstick
- (4) Oil filter

WARNING

Hot engine components can cause injury from burns. Before performing maintenance on the engine, allow the engine and the components to cool.

7. Remove used oil filter (4). See Operation and Maintenance Manual, "Oil Filter - Inspect".
8. Clean the filter housing base. Remove all of the old filter gasket.

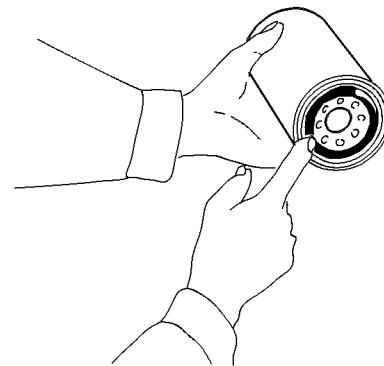


Illustration 346

g00102462

9. Apply a thin coat of engine oil to the gasket of the new filter.
10. Install the new filter by hand. When the gasket contacts the filter base, tighten the filter by an additional 3/4 turn.

Every new oil filter has rotation index marks that are spaced at increments of 1/4 turn. Use the rotation index marks as a guide for tightening the oil filter.

11. Remove oil filler plug (2).

NOTICE

Do not overfill the crankcase. Engine damage can result.

12. Fill the crankcase with new oil.

Note: Refer to the Operation and Maintenance Manual, "Refill Capacities".

13. Clean filler plug (2).

14. Install filler plug (2).

15. Start the engine. Run the engine at low idle for two minutes. Check for oil leaks. Stop the engine.

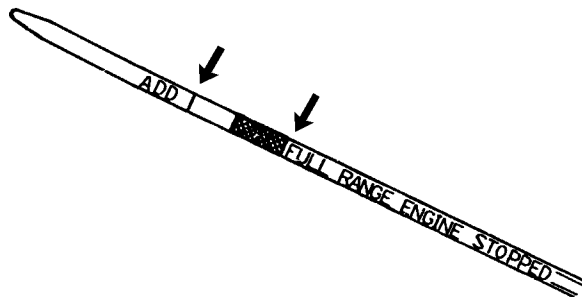


Illustration 347

g00102420

16. Wait for ten minutes in order to allow the oil to drain back into the crankcase. Check the oil level. Maintain the oil level between the "ADD" mark and "FULL" mark on dipstick (3).

17. Close the access cover.

i00707053

Engine Valve Lash and Fuel Injector Timing - Check

SMCS Code: 1102; 1105-025; 1105; 1290-531-FT; 1290

Refer to the Service Manual for the complete procedure for checking the engine valve lash. This procedure lists the steps for the engine valve lash adjustment and the steps in order to check the engine valve lash.

Note: Make sure that a qualified mechanic works on the injector fuel timing. Special tools and training are required.

Refer to the Service Manual for the complete procedure for checking the injector fuel timing or for adjusting the injector fuel timing.

Note: The correct fuel timing specification is given on the Engine Information Plate. Fuel timing specifications may differ for distinct engine applications and/or power ratings.

i00312950

Final Drive Oil - Change

SMCS Code: 4050-044-FLV

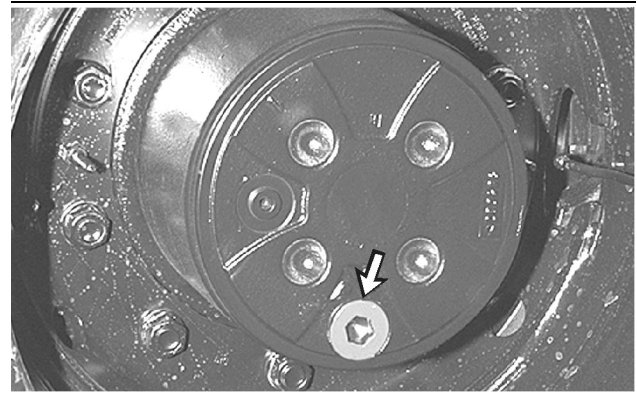


Illustration 348

g00102722

1. Turn the hub until the fill/drain plug is at the lowest position.
2. Remove the dirt that is around the fill/drain plug.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. Remove the fill/drain plug. Drain the oil into a suitable container.

Note: Dispose of used oil according to local regulations.

4. Turn the hub until the opening of the fill/drain plug is horizontal.
5. Fill the final drive with lubricant to the bottom of the opening of the fill/drain plug. See Operation and Maintenance Manual, "Refill Capacities".
6. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
7. Install the O-ring seal. Install the fill/drain plug.
8. Repeat Steps 1 through 7 for the remaining three axle hubs.

i00703977

Final Drive Oil Level - Check

SMCS Code: 4050-535-FLV

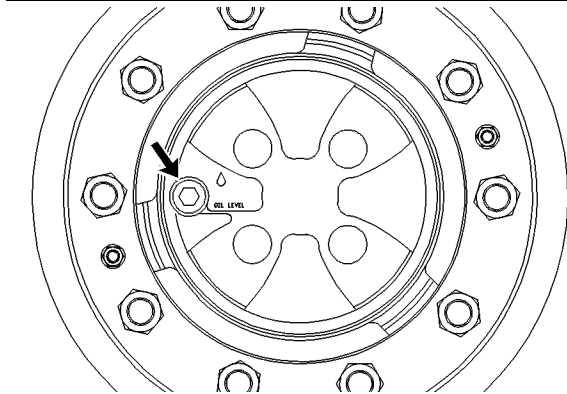


Illustration 349

g00311043

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

1. Turn the hub until the opening of the fill/drain plug is horizontal, as shown.
2. Remove the dirt that is around the fill/drain plug.
3. Fill the final drive with lubricant to the bottom of the opening of the fill/drain plug. See Operation and Maintenance Manual, "Refill Capacities".
4. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
5. Install the O-ring seal. Install the fill/drain plug.
6. Repeat Steps 1 through 5 for the remaining three axle hubs.

i01236398

Fuel System Primary Filter/Water Separator Element - Replace

SMCS Code: 1260-510; 1263-510

WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the start switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover over disconnected fuel system component.

1. Shut off the fuel supply.

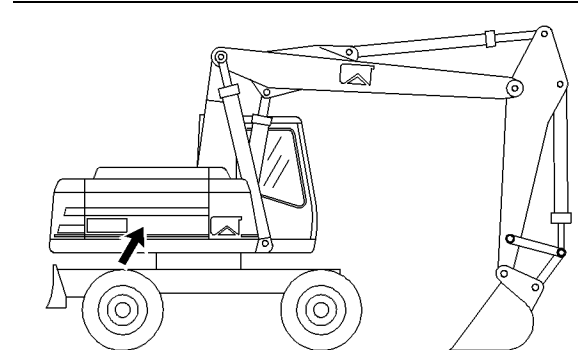


Illustration 350

g00290071

2. Open the access door on the right side of the machine.

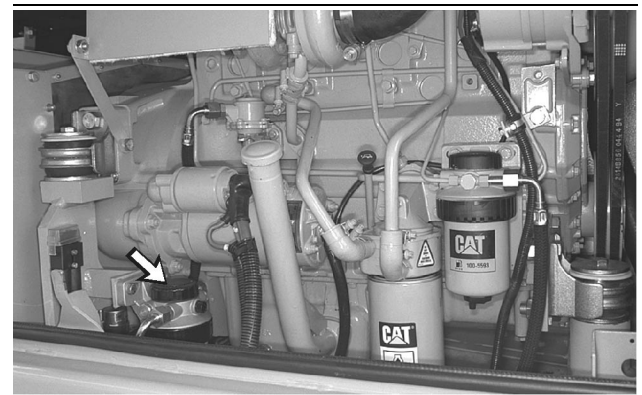


Illustration 351

g00660558

Primary filter/water separator

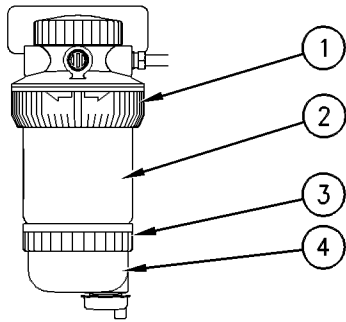


Illustration 352

g00293655

- (1) Locking ring
(2) Filter
(3) Locking ring
(4) Bowl

3. Clean the outside of the fuel filter assembly.
4. Place a tray under the fuel filter in order to catch any fuel that might spill. Clean up any spilled fuel immediately.
5. Turn the drain that is located at the bottom of filter (2) counterclockwise. Drain the fuel and water into a suitable container.

Note: Properly dispose of the drained fluids. Obey local regulations for the disposal of the fluid.

6. Close the drain valve.

NOTICE

Do not use a tool in order to remove the fuel filter. Attempting to remove the fuel filter with a filter wrench or a filter strap could damage the locking ring.

7. Hold filter (2) and rotate locking ring (3) counterclockwise.
8. Remove bowl (4).
9. Hold filter (2) and rotate locking ring (1) counterclockwise.
10. Remove filter (2) and discard filter (2).

NOTICE

Do not fill fuel filters with fuel before installing them. Contaminated fuel will cause accelerated wear to fuel system parts.

Note: The primary filter/water separator is a cartridge type filter. The filter cannot be reused.

11. Clean the inside surfaces of the filter head and of bowl (4).
12. Inspect the O-ring on bowl (4). Also inspect the seal in the filter head. Replace these seals if the seals are worn or damaged.
13. Push a new filter fully into the filter head.
14. Hold the new filter in place. Fit locking ring (1) into position. Rotate the locking ring clockwise in order to fasten the filter to the filter head.
15. Hold bowl (4) in place. Fit locking ring (3) into position. Rotate the locking ring clockwise in order to fasten the bowl to the filter.

Note: Do not start the engine until all service to the fuel system is complete. For instructions about priming the fuel system, refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate".

16. Close the access door.
17. Turn the fuel shutoff valve counterclockwise in order to open the fuel supply.

i00708256

Fuel System Priming Pump - Operate

SMCS Code: 1258

Priming the fuel system fills the fuel filter. Priming the fuel system removes air bubbles from the fuel system. Prime the fuel system under the following conditions:

- Fuel system that is run dry
- Storage
- Fuel filter maintenance
- Disconnecting fuel lines and installing fuel lines
- Repair of leaks in the fuel lines

WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the start switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Use a suitable container to catch any fuel that might spill. Clean up any spilled fuel immediately.

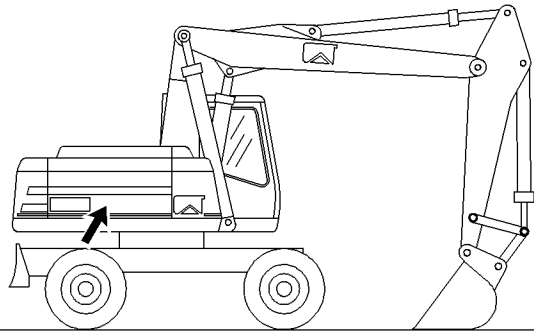


Illustration 353

g00290071

NOTICE

Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover over disconnected fuel system component.

1. Open the access cover on the right hand side of the machine.

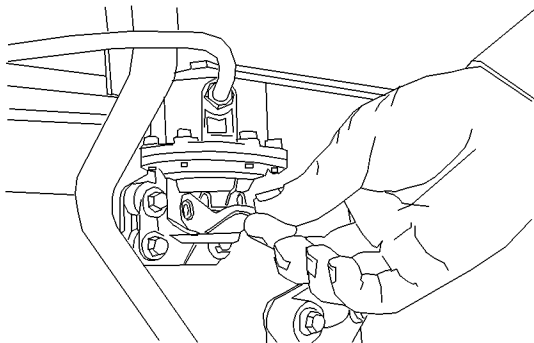


Illustration 354

g00286060

2. When the engine is cold, operate the priming lever for 2 minutes or operate the priming lever until resistance is felt.

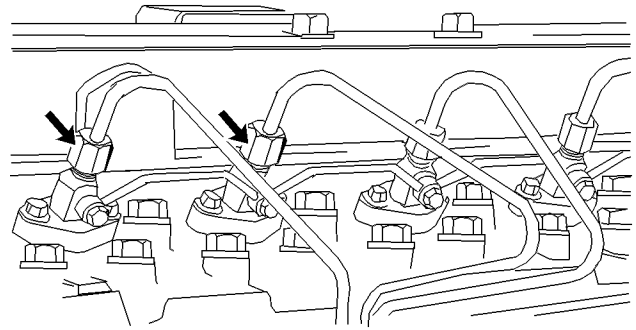


Illustration 355

g00286062

3. Loosen two of the fuel line nuts at two of the fuel injection nozzles in order to open two vents.

NOTICE

Do not crank the engine continuously for more than 30 seconds. Allow the starting motor to cool for two minutes before cranking the engine again.

4. Crank the engine until the flow of fuel from the vents is continuous and free of air bubbles. Tighten the fuel line nuts.
5. Ensure that all fuel line connections are secure and tightened to the proper torque. Ensure that any spilled fuel is cleaned up.
6. Start the engine. The engine may run rough. Run the engine at low idle until the engine runs well. If the engine will not start, further priming may be necessary. If the engine starts and if the engine continues to misfire or smoke, one or more of the following conditions may be present:
 - The fuel system requires more priming.
 - There may be an air leak in the fuel system.
7. Close the access cover.

i00708354

Fuel System Priming Pump Strainer - Clean

SMCS Code: 1258

The strainer in the fuel system priming pump should be cleaned when a loss of power from the engine is noticed.

⚠ WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the start switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover over disconnected fuel system component.

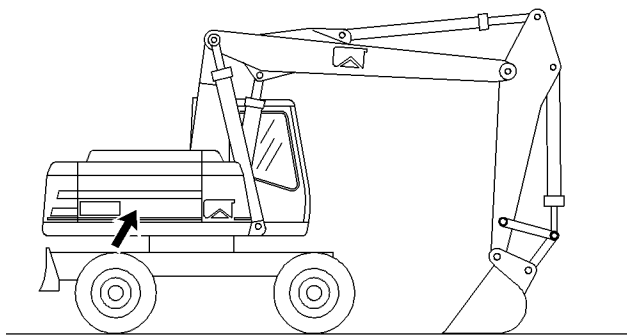


Illustration 356

g00290071

1. Open the access cover on the right hand side of the machine.

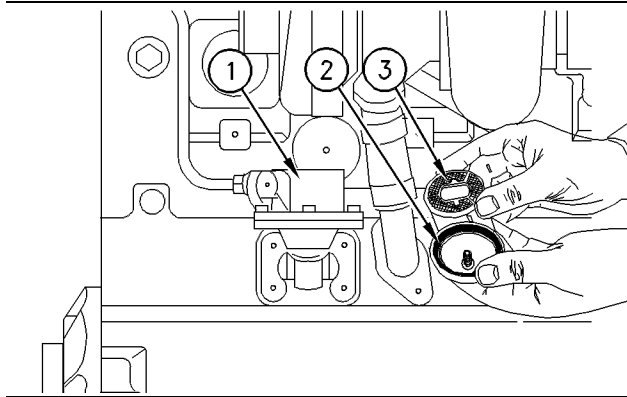


Illustration 357

g00286056

- (1) Fuel priming pump. (2) Cover and seal. (3) Strainer.

Note: It may be necessary to remove the heat shield (if equipped) that is between the priming pump and the turbocharger.

2. Remove the cover and seal (2) from the top of fuel priming pump (1).
3. Remove strainer (3).

4. Use nonflammable solvent in order to clean the strainer, the cover, and the seal. Carefully wash any sediment from the chamber of the fuel lift pump.

5. Assemble the clean, dry fuel priming pump.

NOTICE

Ensure that the lift pump cover is secure so that air does not enter the fuel system.

6. Prime the fuel system. Refer to the Operation and Maintenance Manual, "Fuel System Priming Pump - Operate" in the Maintenance Section for more information on priming the fuel system.

7. Install the heat shield (if equipped).

8. Close the access cover.

i01236455

Fuel System Secondary Filter - Replace

SMCS Code: 1261-510

⚠ WARNING

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire. To help prevent possible injury, turn the start switch off when changing fuel filters or water separator elements. Clean up fuel spills immediately.

NOTICE

Do not allow dirt to enter the fuel system. Thoroughly clean the area around a fuel system component that will be disconnected. Fit a suitable cover over disconnected fuel system component.

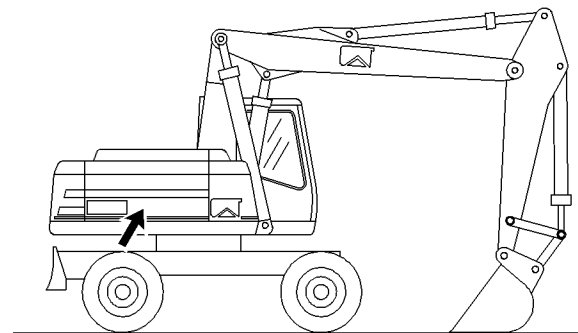


Illustration 358

g00290071

1. Open the access cover on the right hand side of the machine.

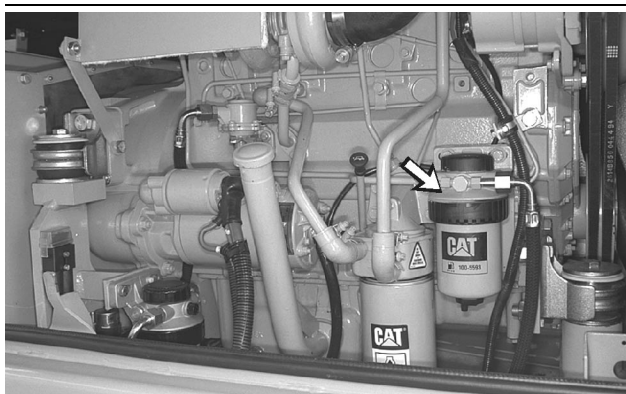


Illustration 359
Secondary filter

g00660563

2. Clean the outside of the fuel filter assembly.
3. Place a tray under the fuel filter in order to catch any fuel that might spill. Clean up any spilled fuel immediately.
4. Turn the drain that is located at the bottom of the filter counterclockwise. Drain the fuel and water into a suitable container.

Note: Properly dispose of the drained fluids. Obey local regulations for the disposal of the fluid.

5. Close the drain valve.

NOTICE

Do not use a tool in order to remove the fuel filter. Attempting to remove the fuel filter with a filter wrench or a filter strap could damage the locking ring.

6. Hold the filter and rotate the locking ring counterclockwise. Remove the locking ring. The used filter should be removed and discarded.

NOTICE

Do not fill fuel filters with fuel before installing them. Contaminated fuel will cause accelerated wear to fuel system parts.

7. Ensure that the filter head is clean.
8. Inspect the seal in the filter head. Replace the seal if the seal is worn or damaged.
9. Push a new filter fully into the filter head.
10. Hold the new filter in place. Fit the locking ring into position. Rotate the locking ring clockwise in order to fasten the filter to the filter head.

11. Prime the fuel system. Refer to Operation and Maintenance Manual, "Fuel System Priming Pump - Operate" in the Maintenance Section for more information.

12. Close the access cover.

i01236507

Fuel System Water Separator - Drain

SMCS Code: 1263

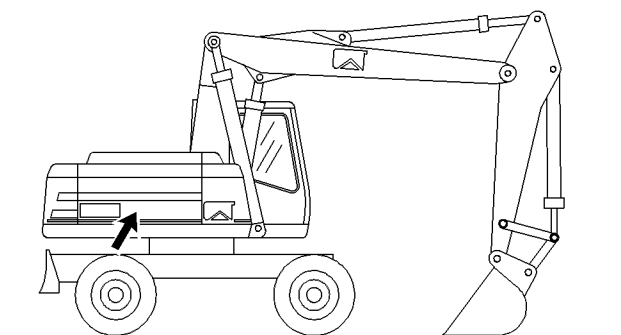


Illustration 360

g00290071

1. Open the access door on the right side of the machine.

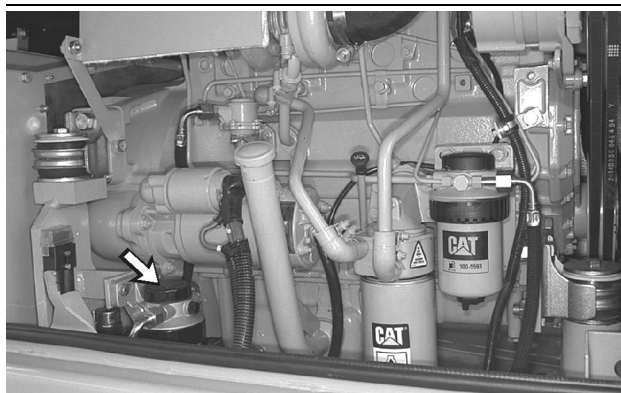


Illustration 361

g00660558

Primary filter/water separator

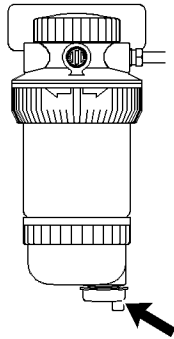


Illustration 362

g00293673

2. Turn the drain valve that is located at the bottom of the primary filter/water separator counterclockwise.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information on containing fluid spillage.

3. Drain the water and drain the sediment into a suitable container.

Note: Dispose of drained fluids according to local regulations.

4. Close the drain valve.
5. Close the access door.

i00995189

Fuel Tank Cap and Strainer - Clean

SMCS Code: 1273-070-STR

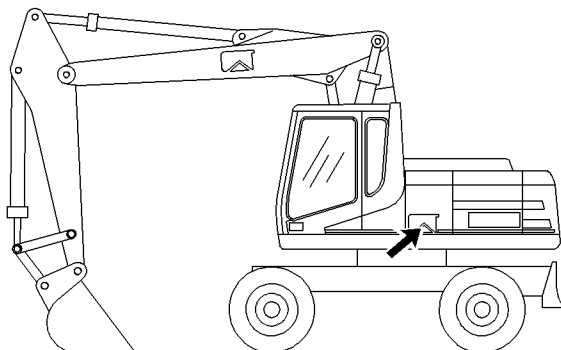


Illustration 363

g00289939

1. Open the access door that is on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

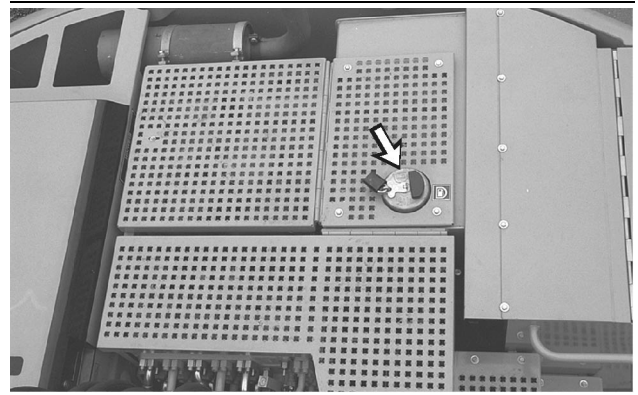


Illustration 364

g00311210

2. Remove the fuel tank cap and the fuel fill screen.
3. Wash the fuel fill screen and wash the fuel tank cap. Refer to the next two topics.
4. Install the screen into the filler opening.
5. Install the fuel tank cap.
6. Close the access door.

Type 1 Fuel Tank Cap

1. Inspect the gasket for damage. Replace the cap if the gasket is damaged.
2. Wash the fuel fill screen and wash the fuel tank cap. Wash these components in a clean, nonflammable solvent.

Type 2 Fuel Tank Cap

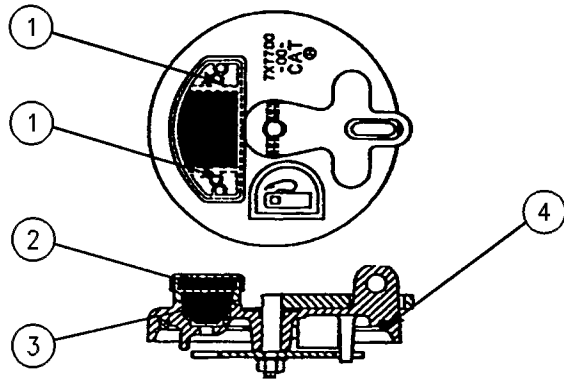


Illustration 365

g00102605

- (1) Screws
- (2) Filter Assembly
- (3) Valve
- (4) Gasket

1. Inspect gasket (4) for damage. Replace the gasket, as needed.
2. Remove the following items: screws (1), filter assembly (2), valve (3), and gasket (4).
3. Wash the fuel fill screen and wash the fuel cap. Wash these components in a clean, nonflammable solvent.

i00995193

Fuel Tank Water and Sediment - Drain

SMCS Code: 1273-543

WARNING

Personal injury or death can result from a fire.

Fuel leaked or spilled onto hot surfaces or electrical components can cause a fire.

Clean up all leaked or spilled fuel. Do not smoke while working on the fuel system.

Turn the disconnect switch OFF or disconnect the battery when changing fuel filters.

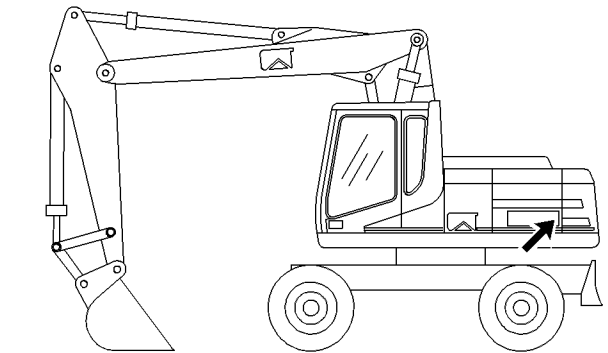


Illustration 366

g00294897

The fuel tank is on the left side of the machine. The drain valve is under the fuel tank.

1. Remove the cover under the fuel tank in order to access the drain valve.

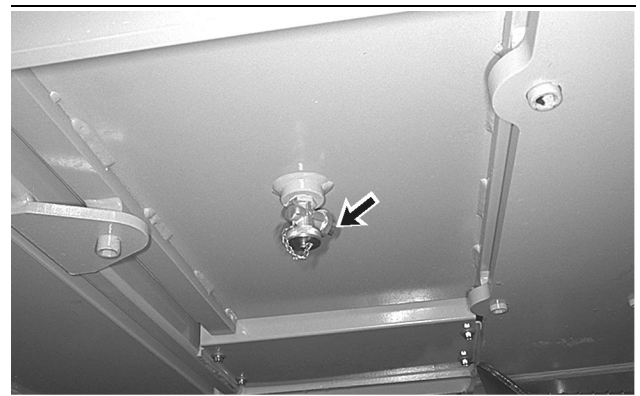


Illustration 367

g00102343

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

2. Remove the cap that is on the bottom of the drain valve. Open the drain valve in order to drain the water and the sediment. Drain these foreign materials into a suitable container.

Note: Always dispose of drained fluid according to local regulations.

3. Close the drain valve and install the cap. Install the cover over the drain valve.

Fill the Fuel Tank

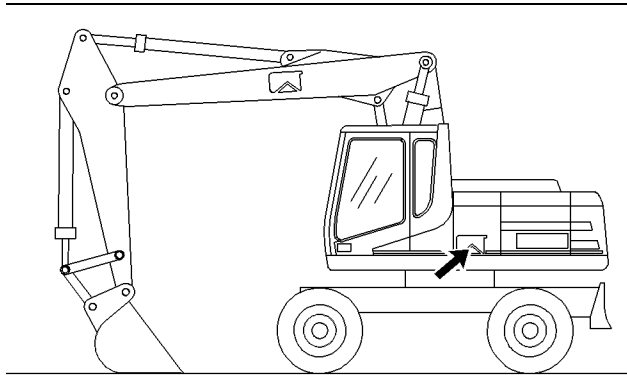


Illustration 368

g00289939

1. Open the access door and secure the access door on the left side of the machine.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

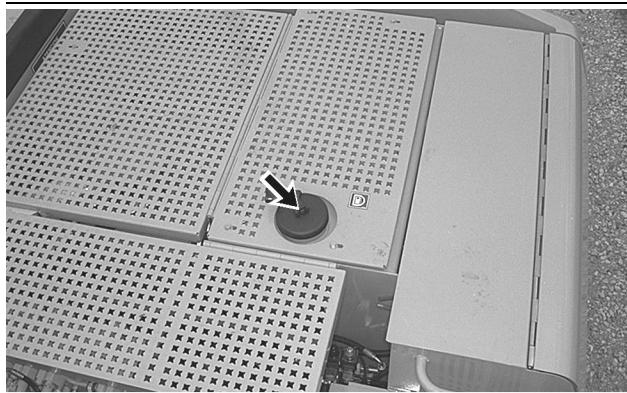


Illustration 369

g00102345

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

2. To add fuel, remove the fuel filler cap.

Note: Fuel can also be added to the tank by using the electric refueling pump (if equipped). Refer to Operation and Maintenance Manual, "Refueling Pump" for instructions on operating the electric refueling pump.

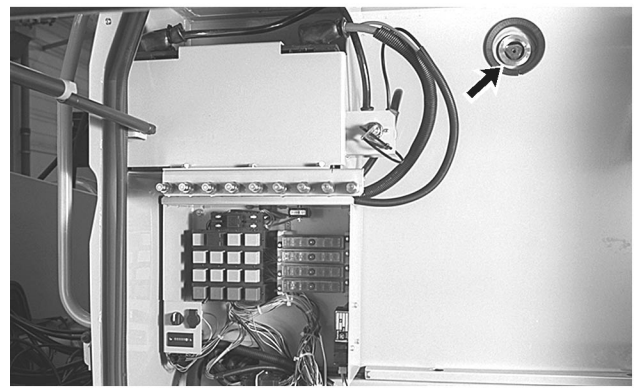


Illustration 370

g00102346

3. Add fuel until the fuel level is in the sight gauge. The sight gauge is located inside the access cover on the left side of the machine.
4. Replace the fuel tank filler cap. To protect against vandalism, lock the fuel filler cap.
5. Close the access door and close the access cover.

i00709254

Fuses - Replace

SMCS Code: 1417-510



Fuses – The fuses protect the electrical system from damage that is caused by overloads. If the element separates, change the fuse. If the element of the new fuse separates, check the circuit and repair the circuit.

NOTICE

Always replace fuses with the same type and capacity fuse that was removed. Otherwise, electrical damage could result.

NOTICE

If it is necessary to replace fuses frequently, an electrical problem may exist.

Contact your Caterpillar dealer.

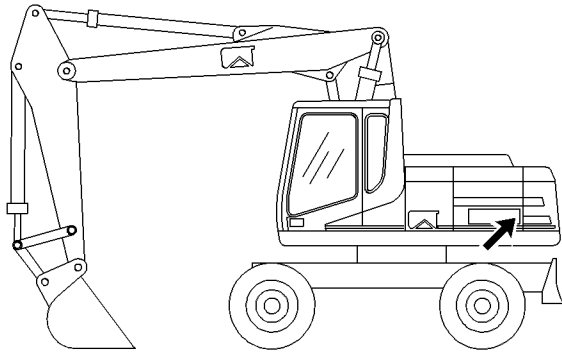


Illustration 371

g00294897

Open the access cover on the left side of the machine.

The following fuses protect the listed circuits. The amperage of each fuse is also listed.

Black Fuse Block

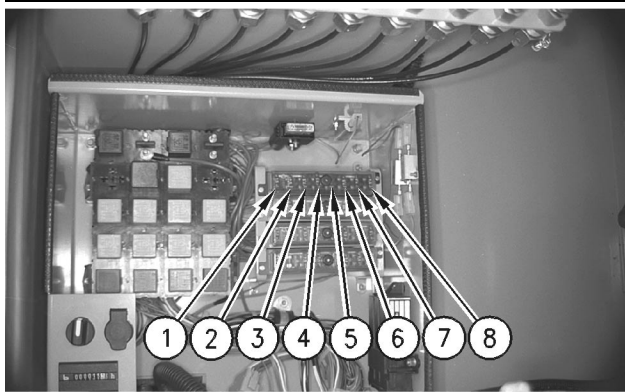


Illustration 372

g00311789

Right Side Parking Lights (1) – 7.5 Amp

Left Side Parking Lights (2) – 7.5 Amp

Instrument Lights (3) – 7.5 Amp

Right Side Low Beam Lights (4) – 7.5 Amp

Left Side Low Beam Lights (5) – 7.5 Amp

Right Side High Beam Lights (6) – 7.5 Amp

Left Side High Beam Lights (7) – 7.5 Amp

Control Lights and Turn Signal (8) – 7.5 Amp

Yellow Fuse Block

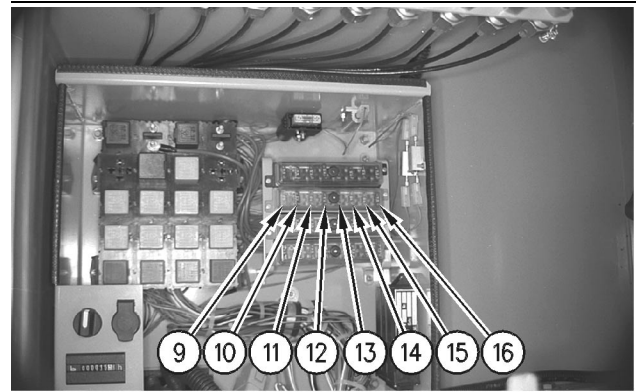


Illustration 373

g00311792

Electrical Fuel Lift Pump (9) – 25 Amp

Warning Light (10) – 7.5 Amp

Engine Start Switch, Main Power Relay and Main Power Light (11) – 15 Amp

24 Volt to 12 Volt Converter and Radio (12) – 7.5 Amp

Start/Stop Relay and Starting Aid (13) – 7.5 Amp

Air Horn Compressor (14) – 15 Amp

Heater Fan (15) – 15 Amp

Lighter, Plug, and Dome Light (16) – 7.5 Amp

Green Fuse Block

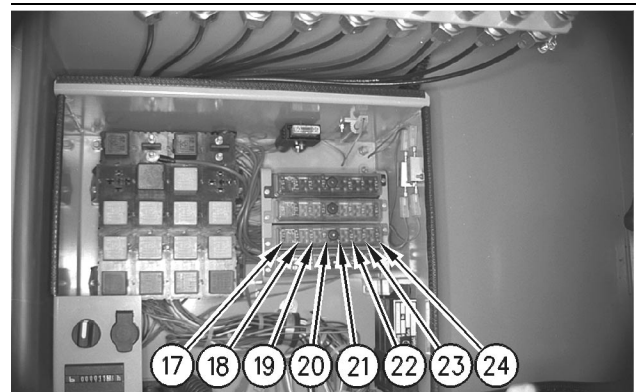


Illustration 374

g00311794

Backup Alarm (17) – 7.5 Amp

Power Mode Selection (18) – 7.5 Amp

Individual Stabilizers (19) – 7.5 Amp

Working Lights (20) – 15 Amp

Frequency Adjustment for Hammer Blow and Flow Control (21) – 7.5 Amp

Electronics (22) – 7.5 Amp

Rotating Beacons (23) – 15 Amp

Pneumatic Operator Seat and Priority (24) – 7.5 Amp

Red Fuse Block

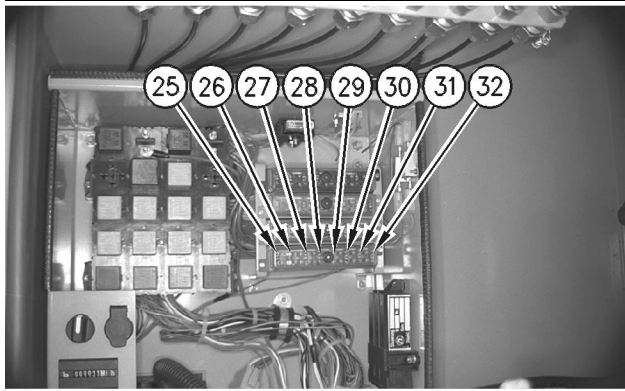


Illustration 375

g00311796

Stop Light (25) – 7.5 Amp

Air Conditioner (26) – 20 Amp

Horn, Overload Buzzer and Third Pressure Drop Warning Buzzer (27) – 7.5 Amp

Reverse Steering Warning Light and Travel Alarm (28) – 7.5 Amp

Switch for Armrest, Swing Brake, Miscellaneous Function, Travel Cutoff Relay, Park Brake, Transmission Speed, and Creeper Speed (29) – 15 Amp

Supplemental Steering (30) – 7.5 Amp

Upper Windshield Wiper and Pump (31) – 7.5 Amp

Lower Windshield Wiper and Pump (32) – 7.5 Amp

Additional Fuses

Fuse for Main Power

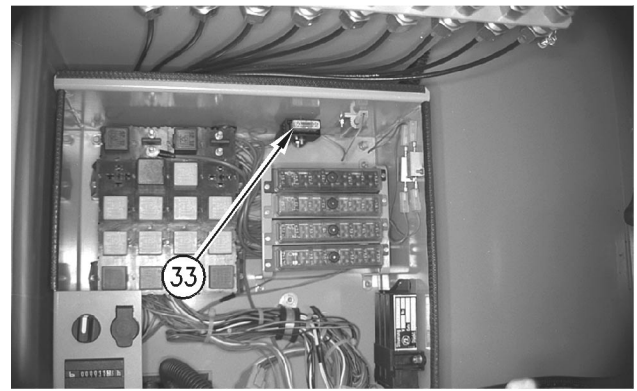


Illustration 376

g00311798

An additional fuse is positioned in the fuse box.

Main Power (33) – 60 Amp

Fuse For Starter Motor And For Alternator

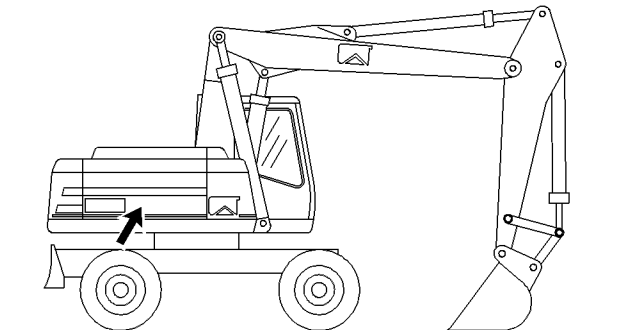


Illustration 377

g00290071

This fuse is located behind the access cover that is on the right side of the machine.

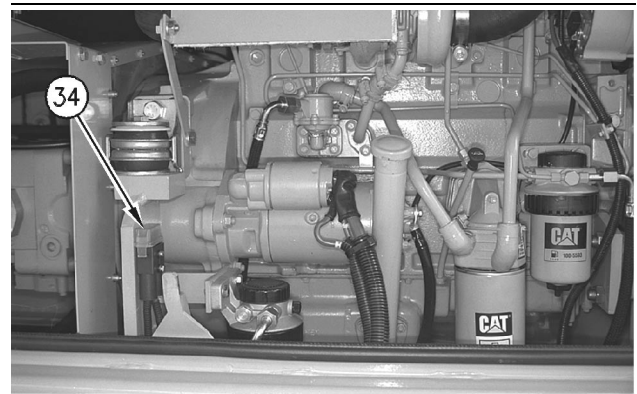


Illustration 378

g00311799

Starter Motor and Alternator (34) – 70 Amp

i00995196

Hydraulic System Oil - Change

SMCS Code: 5056-044**S/N:** 6TL1-Up

Drain the Oil

1. Operate the machine for an adequate period of time in order to warm the oil.
2. Park the machine on a level surface.
3. Engage the parking brake.
4. Lower the implements to the ground with the stick in a vertical position, as shown.
5. Stop the engine.

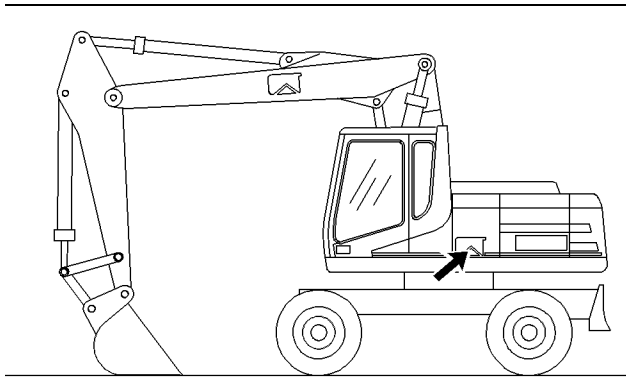


Illustration 379

g00289939

6. Open the access door on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

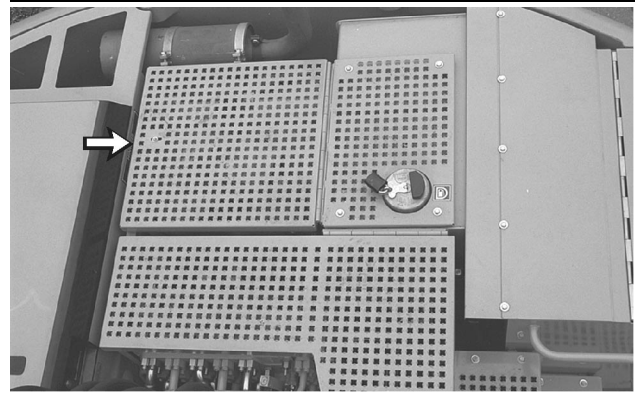


Illustration 380

g00312243

7. Open the access cover on the top of the machine.



Illustration 381

g00312244

8. Slowly loosen the breather in order to relieve system pressure.

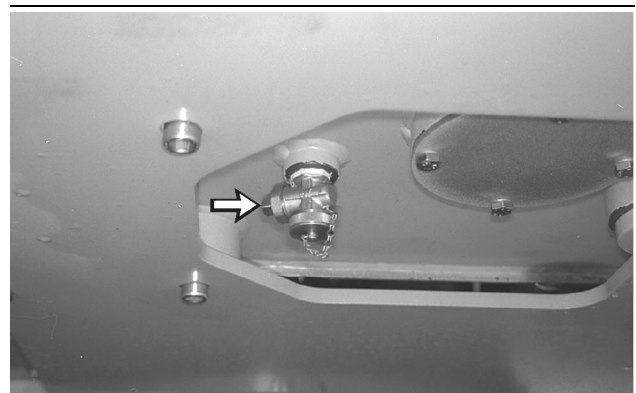


Illustration 382

g00312245

The drain valve is under the middle of the machine.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

9. Remove the cap at the bottom of the drain valve. Open the drain valve. Allow the oil to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

10. Close the drain valve. Install the cap.

11. Tighten the breather in Step 8.

Service the Hydraulic System Filters

Note: The hydraulic oil system must be empty when the filters are being serviced. Service the filters before refilling the machine with hydraulic oil.

Refer to the following topics in order to service the hydraulic system filters:

- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Clean (Return In-line Filters)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Hydraulic Swing Circuit Filter)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Pilot Filter)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Return Filter)"

Fill the Hydraulic Tank

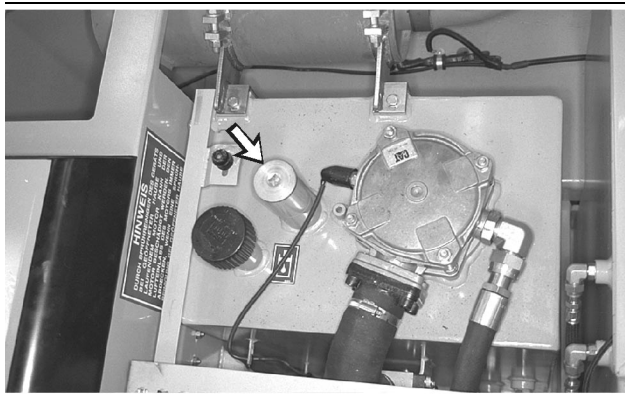


Illustration 383

g00312371

1. Remove the filler plug from the hydraulic tank.
2. Fill the hydraulic oil tank. See Operation and Maintenance Manual, "Refill Capacities".
3. Clean the filler plug. Inspect the O-ring seal. Replace the O-ring seal if the seal is worn or damaged.

4. Install the filler plug.

5. Start the engine. Operate the engine at idling speed for a few minutes.

6. Operate the control levers in order to allow the hydraulic oil to circulate through all hydraulic circuits.

Note: Air may become trapped in the hydraulic system. The pump may cavitate or the machine may move in jerks for several seconds. If these symptoms continue then air is trapped in the hydraulic system. Refer to Testing and Adjusting, RENR1180, "Hydraulic System Pressure - Release" for instructions on releasing the air.

7. Lower the implement to the ground. The stick should be vertical.

8. Stop the engine.

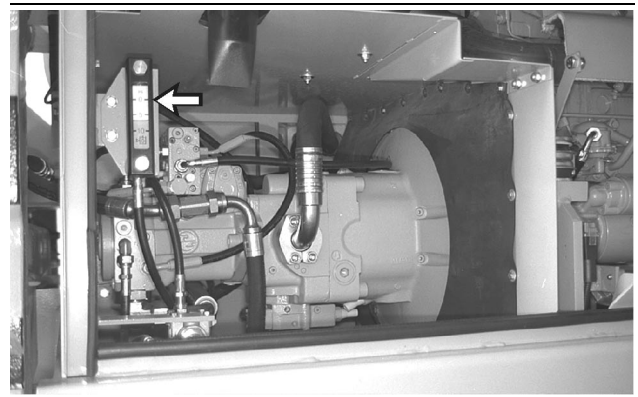


Illustration 384

g00311264

The sight gauge is located in the engine compartment on the right side of the machine.

9. Maintain the oil level to the "0" mark on the sight gauge. The number on the sight gauge indicates the quantity of oil in liters that is needed to fill the tank.
10. Install the cover under the hydraulic tank.
11. Close all access covers and access doors. Secure all access covers and access doors.

i00995199

Hydraulic System Oil - Change

SMCS Code: 5056-044**S/N:** 7ML1-Up

Drain the Oil

1. Operate the machine for an adequate period of time in order to warm the oil.
2. Park the machine on a level surface.
3. Engage the parking brake.
4. Lower the implements to the ground with the stick in a vertical position, as shown.
5. Stop the engine.

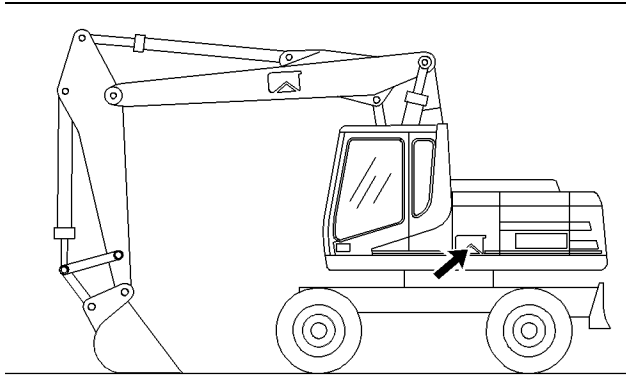


Illustration 385

g00289939

6. Open the access door on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

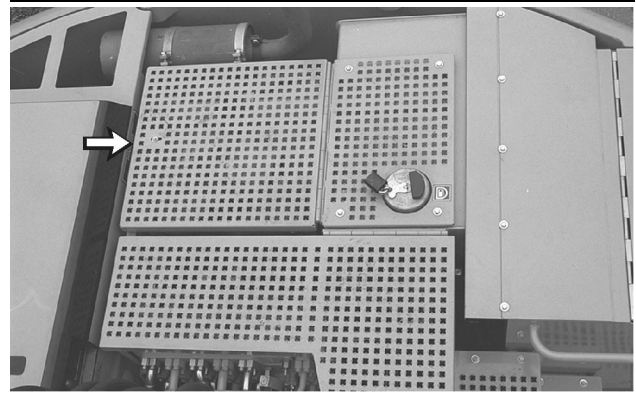


Illustration 386

g00312243

7. Open the access cover on the top of the machine.

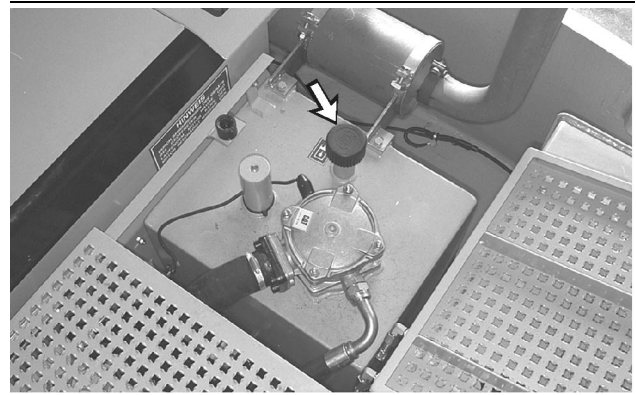


Illustration 387

g00314243

8. Slowly loosen the breather in order to relieve system pressure.

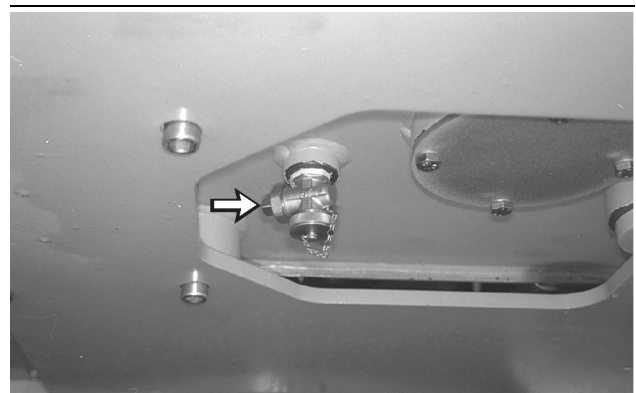


Illustration 388

g00312245

The drain valve is under the middle of the machine.

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

9. Remove the cap at the bottom of the drain valve. Open the drain valve. Allow the oil to drain into a suitable container.

Note: Dispose of drained fluids according to local regulations.

10. Close the drain valve. Install the cap.

11. Tighten the breather in Step 8.

Service the Hydraulic System Filters

Note: The hydraulic oil system must be empty when the filters are being serviced. Service the filters before refilling the machine with hydraulic oil.

Refer to the following topics in order to service the hydraulic system filters:

- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Clean (Return In-line Filters)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Hydraulic Swing Circuit Filter)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Pilot Filter)"
- Operation and Maintenance Manual, "Hydraulic System Oil Filter - Replace (Return Filter)"

Fill the Hydraulic Tank

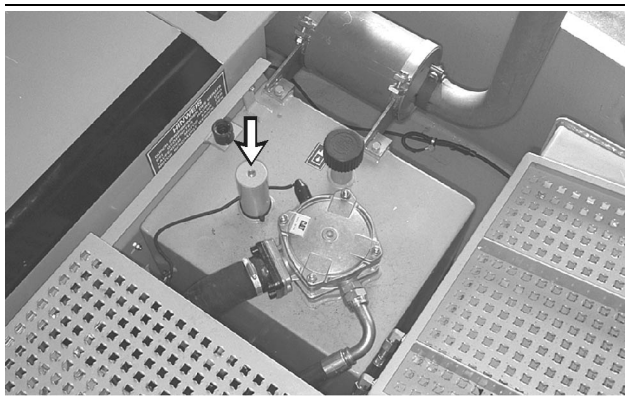


Illustration 389

g00314246

1. Remove the filler plug from the hydraulic tank.
2. Fill the hydraulic oil tank. See Operation and Maintenance Manual, "Refill Capacities".
3. Clean the filler plug. Inspect the O-ring seal. Replace the O-ring seal if the seal is worn or damaged.

4. Install the filler plug.

5. Start the engine. Operate the engine at idling speed for a few minutes.

6. Operate the control levers in order to allow the hydraulic oil to circulate through all hydraulic circuits.

Note: Air may become trapped in the hydraulic system. The pump may cavitate or the machine may move in jerks for several seconds. If these symptoms continue then air is trapped in the hydraulic system. Refer to Testing and Adjusting, RENR1181, "Hydraulic System Pressure - Release" for instructions on releasing the air.

7. Lower the implement to the ground. The stick should be vertical.

8. Stop the engine.

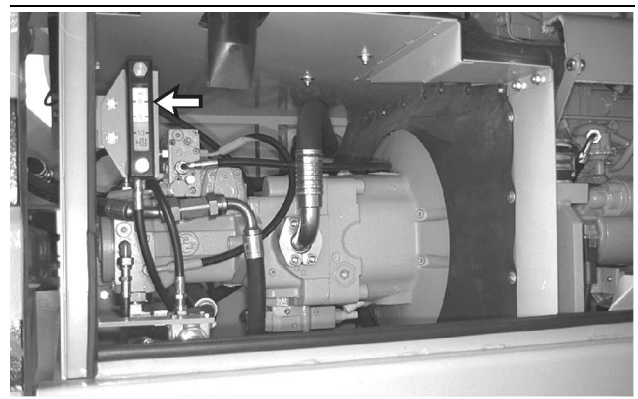


Illustration 390

g00311264

The sight gauge is located in the engine compartment on the right side of the machine.

9. Maintain the oil level to the "0" mark on the sight gauge. The number on the sight gauge indicates the quantity of oil in liters that is needed to fill the tank.
10. Install the cover under the hydraulic tank.
11. Close all access covers and access doors. Secure all access covers and access doors.

i00764909

Hydraulic System Oil Filter - Clean (Return In-line Filters)

SMCS Code: 5068-070

Note: The hydraulic oil system must be empty when the filters are being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

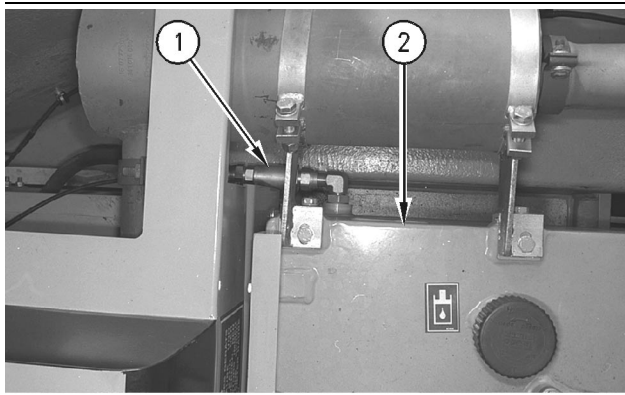


Illustration 391

g00312363

In-line filter (1) is positioned at the right rear of hydraulic tank (2).

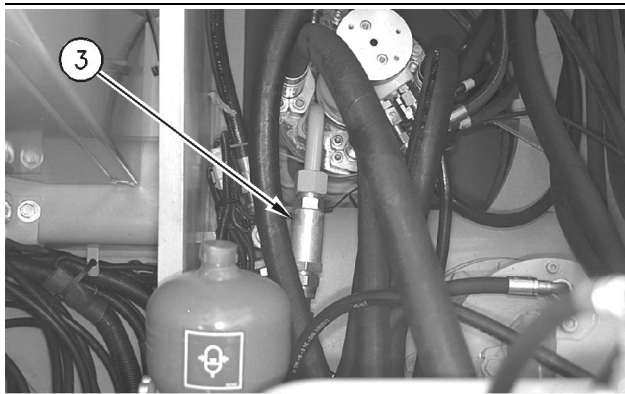


Illustration 392

g00312366

In-line filter (3) is positioned between the swing motor and the swivel.

1. Separate the hydraulic lines at in-line filter (1) and at in-line filter (3).
2. Remove the in-line filter from the holders.
3. Wash the in-line filter in a clean, nonflammable solvent. Allow the in-line filter to dry.
4. Clean the holders. Inspect the O-ring seals of the holders. If damage or wear is found, replace the O-ring seals.

5. Install in-line filter (1) and in-line filter (3). Install the in-line filter into the holders.

6. Connect the hydraulic lines.

i00764914

Hydraulic System Oil Filter - Replace (Pilot Filter)

SMCS Code: 5068-510

S/N: 6TL1-409

S/N: 7ML1-859

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

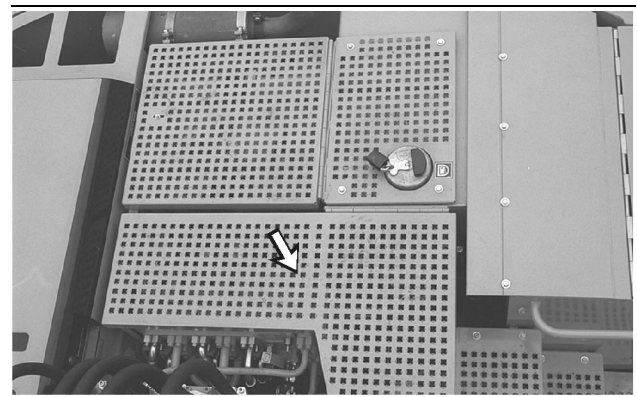


Illustration 393

g00312367

1. Open the top access cover.

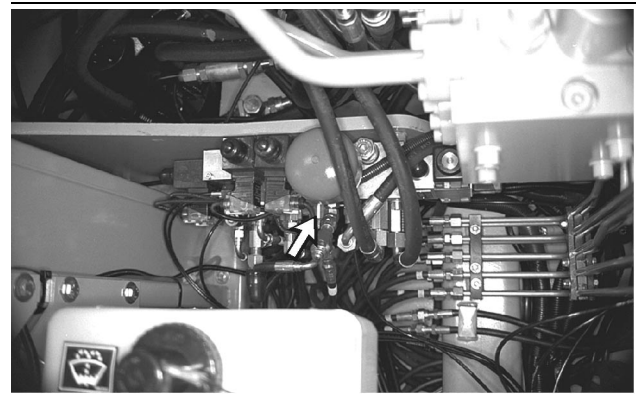


Illustration 394

g00312368

The pilot filter is located below the pilot manifold.

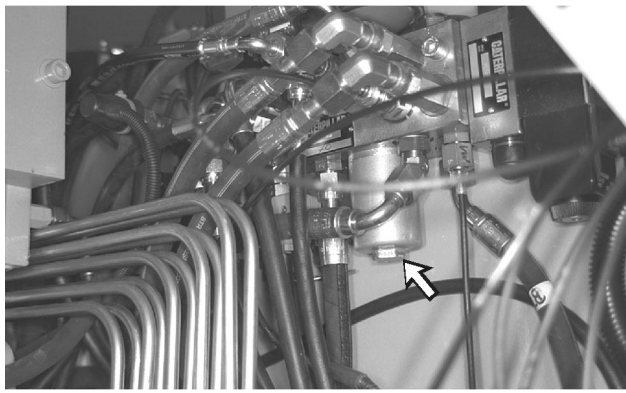


Illustration 395

g00312369

Typical Example

2. Remove the filter housing.
3. Remove the filter element. Discard the filter element.

Note: Dispose of used filter elements according to local regulations.

4. Clean the filter housing.
5. Install a new filter element in the filter housing.
6. Install the filter housing.

i00765062

Hydraulic System Oil Filter - Replace (Return Filter)

SMCS Code: 5068-510

S/N: 6TL1-Up

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

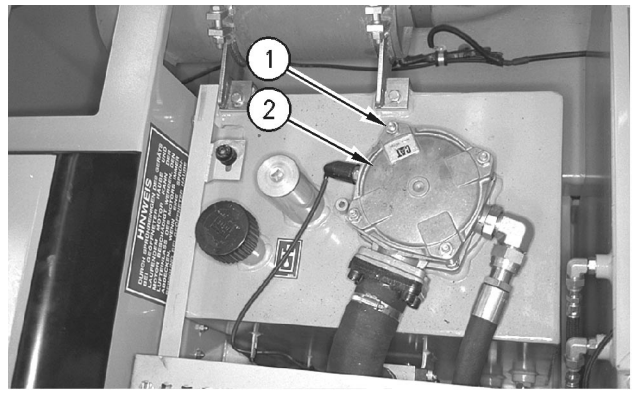


Illustration 396

g00312246

- (1) Nuts
 (2) Filter Cover

1. Remove four nuts (1) and lock washers. Remove filter cover (2).
2. Remove the filter element. Discard the filter element.

Note: Dispose of used filter elements according to local regulations.

3. Install a new filter element.
4. Clean filter cover (2). Inspect the cover seal. If damage or wear is found, replace the cover seal.
5. Install filter cover (2). Install four lock washers and nuts (1).

i00765078

Hydraulic System Oil Filter - Replace (Hydraulic Swing Circuit Filter)

SMCS Code: 5068-510

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

i00703730

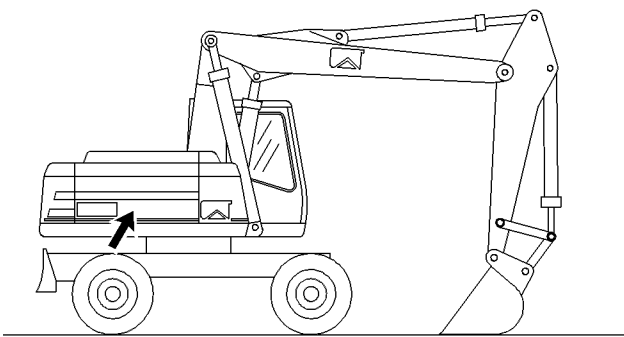


Illustration 397

g00290071

The hydraulic swing circuit filter is in the engine compartment on the right side of the machine.

1. Open the access cover on the right side of the machine.

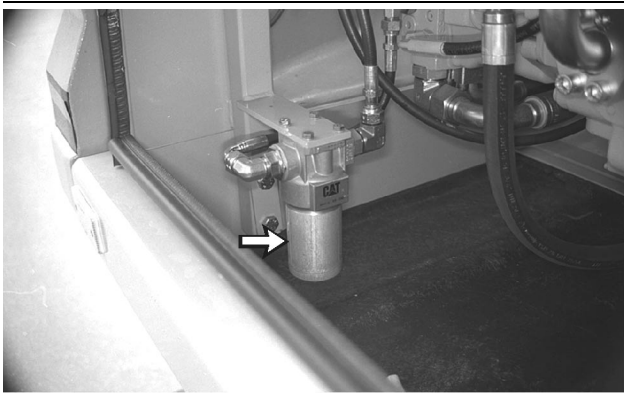


Illustration 398

g00312370

2. Remove the filter housing.
 3. Remove the filter element. Discard the filter element.
- Note:** Dispose of used filter elements according to local regulations.
4. Clean the filter housing. Inspect the O-ring seal of the filter housing. Replace the seal if the seal is worn or damaged.
 5. Install a new filter element in the filter housing.
 6. Install the filter housing.
 7. Close the access cover on the right side of the machine.

Hydraulic System Oil Filter - Replace (Pilot Filter)

SMCS Code: 5068-510

S/N: 6TL410-Up

S/N: 7ML860-Up

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

Note: The pilot filter is located under the operator compartment.

1. Remove the lower access cover.

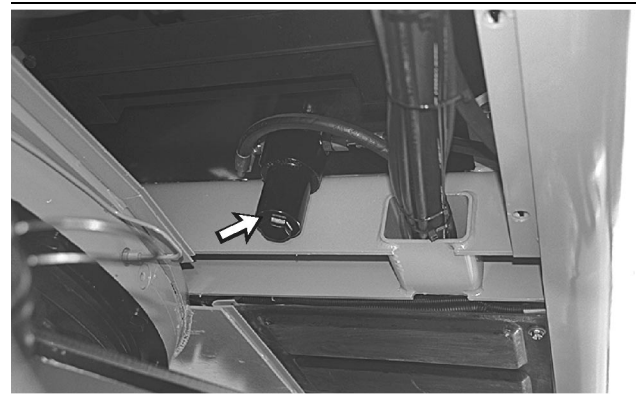


Illustration 399

g00290375

2. Clean the area in order to prevent dirt from entering the filter base.
 3. Remove the used pilot filter element from the filter base.
 4. Remove the filter element. Dispose of the used filter element.
- Note:** Dispose of used filter elements according to local regulations.
5. Clean the filter base.

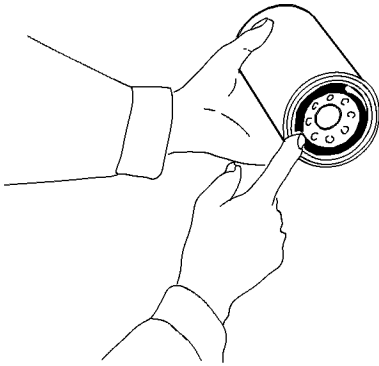


Illustration 400

g00101502

6. Install the new filter by hand. When the gasket contacts the filter base, tighten the filter by an additional 3/4 turn.

Every new oil filter has rotation index marks that are spaced at 1/4 turn. Use the rotation index marks as a guide for tightening the oil filter.

7. Install the lower access cover.

i00765075

Hydraulic System Oil Filter - Replace (Return Filter)

SMCS Code: 5068-510

S/N: 7ML1-Up

Note: The hydraulic oil system must be empty when the filter is being serviced. Refer to Operation and Maintenance Manual, "Hydraulic System Oil - Change".

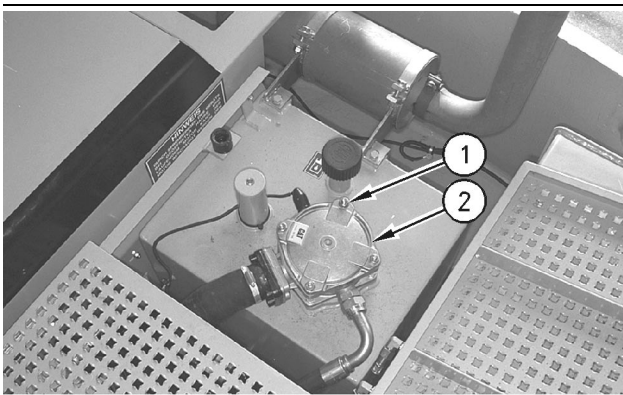


Illustration 401

g00314245

- (1) Nuts
(2) Filter Cover

1. Remove four nuts (1) and lock washers. Remove filter cover (2).

2. Remove the filter element. Discard the filter element.

Note: Dispose of used filter elements according to local regulations.

3. Install a new filter element.
4. Clean filter cover (2). Inspect the cover seal. If damage or wear is found, replace the cover seal.
5. Install filter cover (2). Install four lock washers and nuts (1).

i00708361

Hydraulic System Oil Level - Check

SMCS Code: 5050-535

S/N: 6TL1-Up

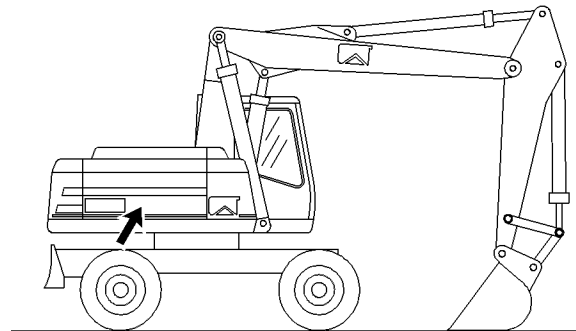


Illustration 402

g00290071

1. Open the access cover that is on the right side of the machine.
2. Lower the dozer (if equipped) and stabilizers (if equipped) to the ground.
3. Place the stick in the vertical position. Place the bucket on the ground. This position is shown in Illustration 402.

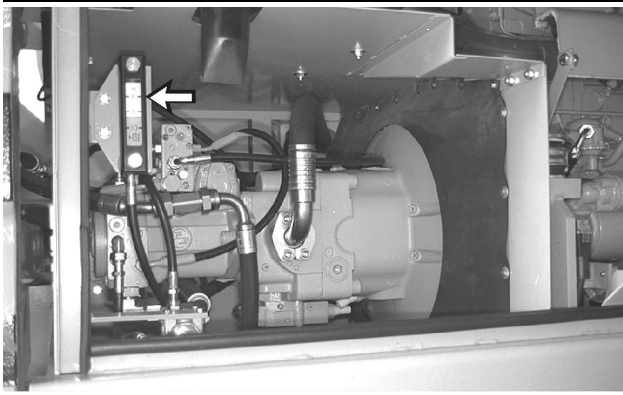


Illustration 403

g00311264

4. Maintain the oil level to the "0" mark on the sight gauge. The numbers on the sight gauge indicate the number of liters of oil that must be added in order to fill the system.

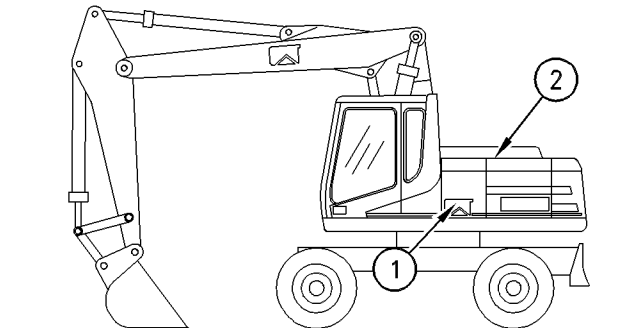


Illustration 404

g00290119

- (1) Access Door
- (2) Top Access Cover

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

5. If the system needs oil, add the necessary amount of oil. Open the access door (1) that is on the left side of the machine. Secure the access door (1). Open the access cover (2) on the top of the machine.

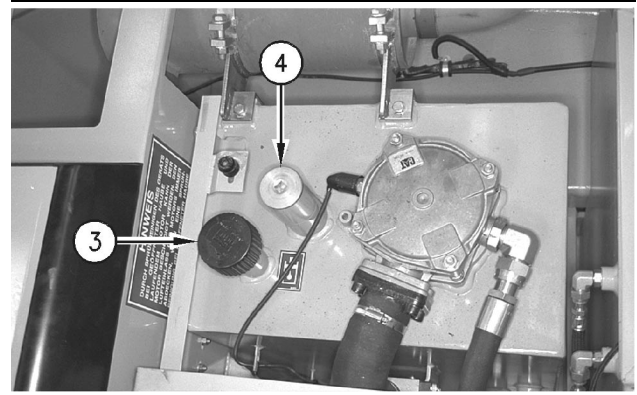


Illustration 405

g00311265

- (3) Breather
- (4) Filler Plug
6. Slowly loosen breather (3) in order to relieve the system pressure. Remove filler plug (4). Add the oil through the filler tube.
7. Clean filler plug (4). Install the filler plug. Replace the seal O-ring if the O-ring is worn or damaged.
8. Tighten breather (3).
9. Close the access covers and the access door.

i00708535

Hydraulic System Oil Level - Check

SMCS Code: 5050-535

S/N: 7ML1-Up

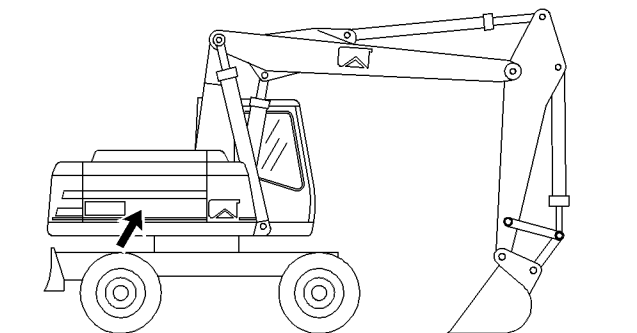


Illustration 406

g00290071

1. Open the access cover that is on the right side of the machine.
2. Lower the dozer (if equipped) and stabilizers (if equipped) to the ground.

3. Place the stick in the vertical position. Place the bucket on the ground. This position is shown in Illustration 406.

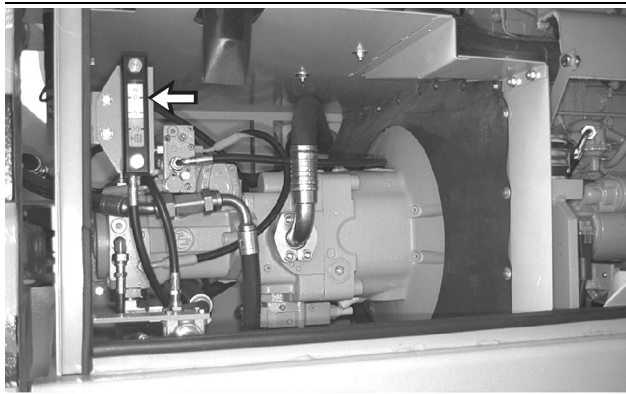


Illustration 407

g00311264

4. Maintain the oil level to the "0" mark on the sight gauge. The numbers on the sight gauge indicate the number of liters of oil that must be added in order to fill the system.

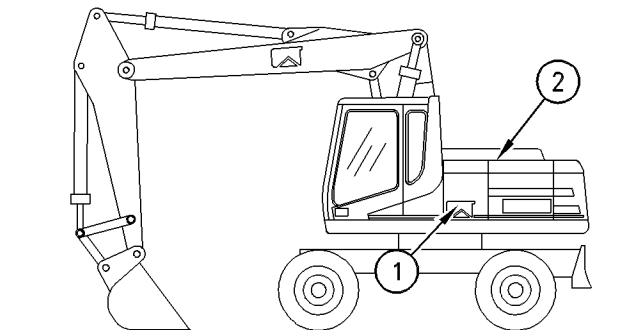


Illustration 408

g00290119

- (1) Access Door
(2) Top Access Cover

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in Containing Fluid Spillage.

5. If the system needs oil, add the necessary amount of oil. Open the access door (1) that is on the left side of the machine. Secure the access door (1). Open the access cover (2) on the top of the machine.

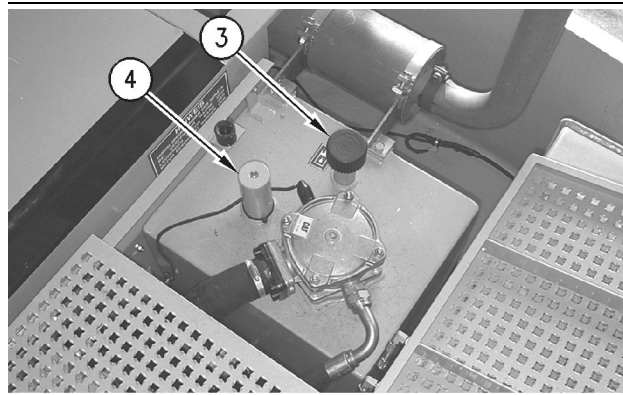


Illustration 409

g00311443

- (3) Breather
(4) Filler Plug

6. Slowly loosen breather (3) in order to relieve the system pressure. Remove filler plug (4). Add the oil through the filler tube.
7. Clean filler plug (4). Install the filler plug. Replace the seal O-ring if the O-ring is worn or damaged.
8. Tighten breather (3).
9. Close the access covers and the access door.

i00052234

Oil Filter - Inspect

SMCS Code: 1308-507; 5068-507

Inspect A Used Filter for Debris

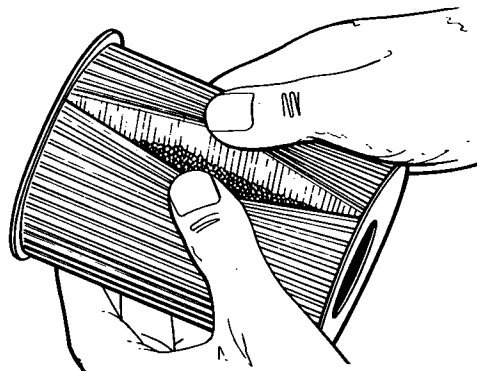


Illustration 410

g00100013

The element is shown with debris.

Use a **4C-5084** 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.

i00699883

Overhead Guard - Inspect (If Equipped)

SMCS Code: 7159-040

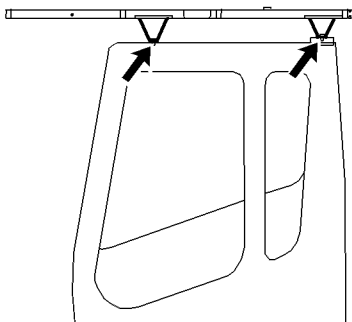


Illustration 411

g00102876

1. Inspect the overhead guard for any bolts that are loose or damaged. Replace bolts that are damaged or missing. Use original equipment parts only. Tighten the bolts.

Note: Apply oil to all the bolt threads before you install the bolts. Failure to oil the threads can cause improper bolt torque.

2. If the overhead guard rattles during machine operation or if the overhead guard makes noises during machine operation, replace the mounting supports for the overhead guard.

Do not repair the overhead guard by welding reinforcement plates to the overhead guard.

Consult your Caterpillar dealer for repair of cracks in the welds on the overhead guard. Consult your Caterpillar dealer for repair of cracks in any metal section of the overhead guard.

i01220682

Radiator Core - Clean

SMCS Code: 1353-070

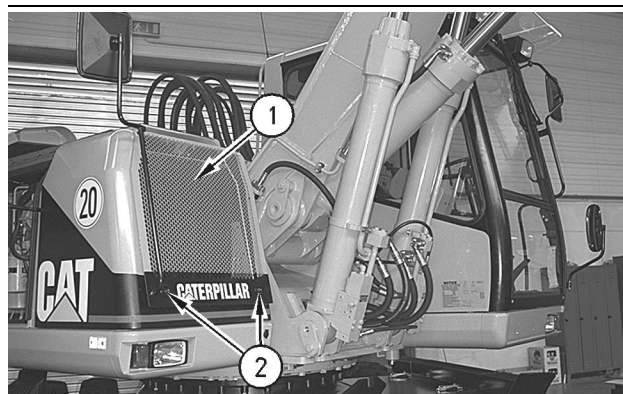


Illustration 412

g00379606

- (1) Standard radiator access cover
(2) Hex head screw

1. Remove foreign material from the radiator access cover (1).
2. Unlock the two hex head screws (2) and rotate up the radiator access cover (1).

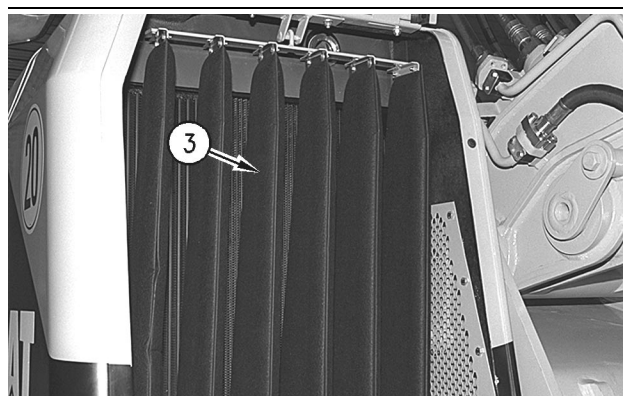


Illustration 413

g00652861

- (3) Baffles

3. Remove baffles (3).

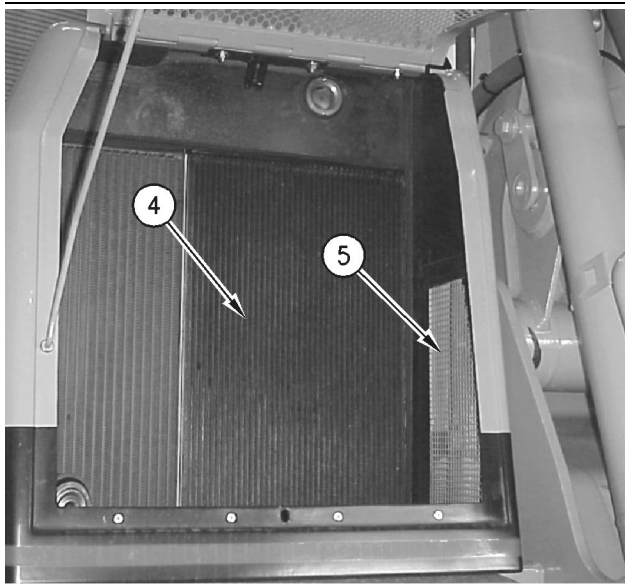


Illustration 414

g00652838

4. Check radiator fins (4) and screen (5) for debris.
5. Remove foreign material from the radiator fins (4) and from screen (5).

Note: To remove dust from a radiator and debris from a radiator, compressed air is preferred. High pressure water can be used and steam can also be used. Clean the radiator, as needed.

See Special Publication, SEBD0518, "Know Your Cooling System" for detailed information on cleaning the radiator fins.

Enclosure for Radiator (If Equipped)

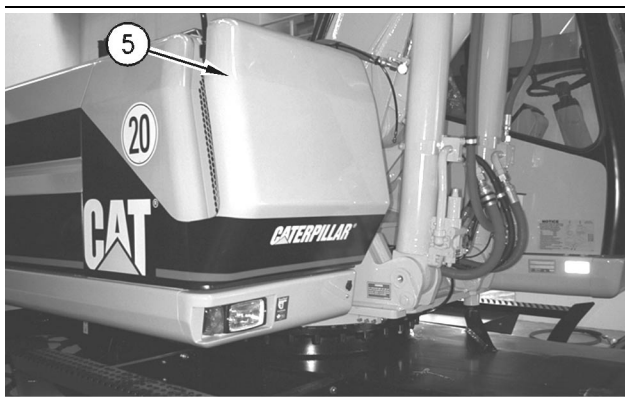


Illustration 415

g00378632

(5) Sound Suppression Cover

If the machine has a sound suppression cover (5), it may not be possible to easily access the radiator core. If it is not possible to access the radiator core, then refer to step 2.

Note: The sound suppression cover (5) will rotate with the radiator access cover (1).

i00688010

Refueling Pump Strainer - Clean (If Equipped)

SMCS Code: 1295-070-STR

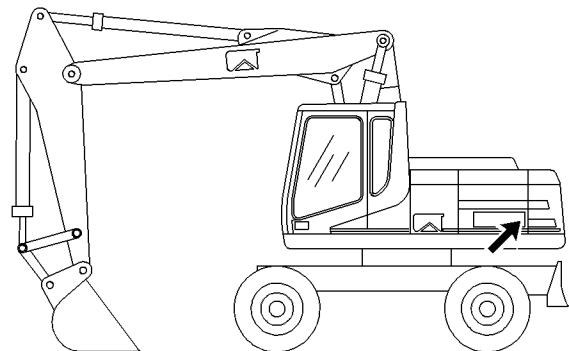


Illustration 416

g00294897

1. Open the access cover on the left side of the machine.

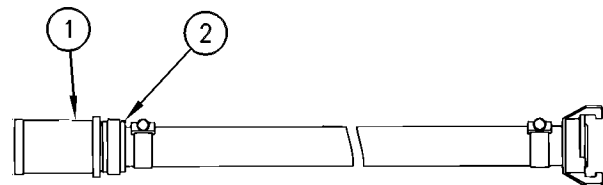


Illustration 417

g00102274

- (1) Screen
(2) Coupling

2. Remove screen (1) from coupling (2).

Note: Refer to Operation and Maintenance Manual, "General Hazard Information" for information in containing fluid spillage.

3. Wash screen (2) in a clean, nonflammable solvent. Dry the screen.
4. Install the screen to coupling (2).
5. Close the access cover.

i00060103

Seat Belt - Inspect

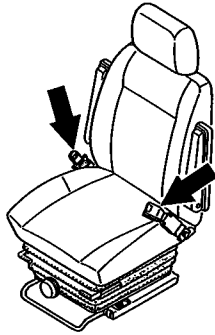
SMCS Code: 7327-040

Illustration 418

g00102359

When this machine was shipped from Caterpillar, Inc., this machine was equipped with a seat belt and with a seat belt installation. At the time of installation, the seat belt and the seat belt installation met "SAE J386 JUN85" for an industrial machine and "SAE J386 JUN93". Consult your Caterpillar dealer for all replacement parts.

Replace the seat belt after three year of usage regardless of appearance.

The seat belt and the mounting hardware must be inspected for wear and for damage before operating the machine. Replace the belt or the mounting hardware if wear or damage is found.

i00731002

Seat Belt - Replace

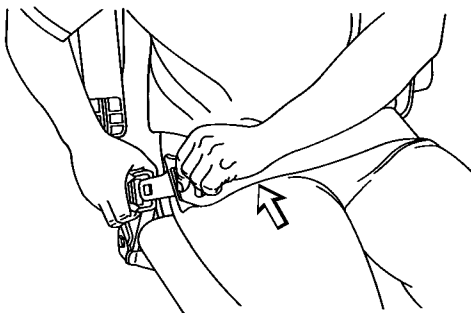
SMCS Code: 7327-510

Illustration 419

g00037721

Regardless of the appearance, replace the seat belt once during every three year interval.

i00699946

Stabilizer Bearings - Lubricate (If Equipped)

SMCS Code: 7222-086-BD

Wipe all fittings before you apply the grease.

Note: Perform the following procedure for each stabilizer.



Illustration 420

g00102409

Apply lubricant to the one fitting that is on the pin for the stabilizer pad.

Apply lubricant to one fitting that is on the pin for the stabilizer arm.

Apply lubricant to the fitting that is on the rod end of the stabilizer cylinder.

Apply lubricant to the fitting on the pin at the head end of the stabilizer cylinder.

i00060418

Swing Bearing - Lubricate

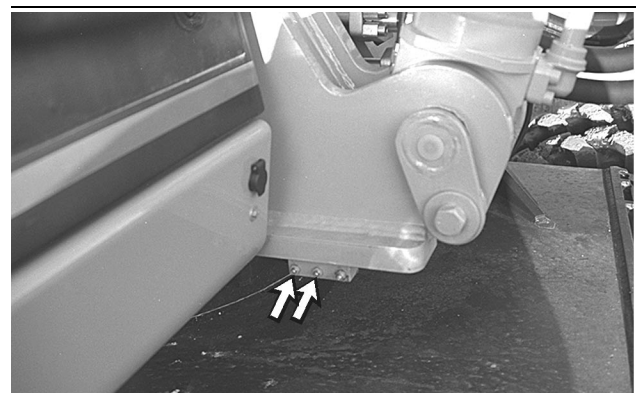
SMCS Code: 7063-086

Illustration 421

g00102507

Apply grease to the two rearward fittings that are positioned by the head end of the right boom cylinder. Apply grease to the fitting until the grease overflows the bearing seal.

i00995226

Swing Gear - Lubricate

SMCS Code: 7063-086

NOTICE

Improper lubrication can cause damage to machine components.

To avoid damage, make sure that the proper amount of grease is applied to the swing drive.

When the amount of grease in the compartment becomes too large, the agitation loss becomes large, thereby accelerating grease deterioration.

Grease deterioration can cause damage to the pinion gear of the swing drive and swing internal gear.

Not enough grease will result in poor gear lubrication.



Illustration 422

g00519844

1. Remove the inspection cover that is located near the boom base. Inspect the grease.

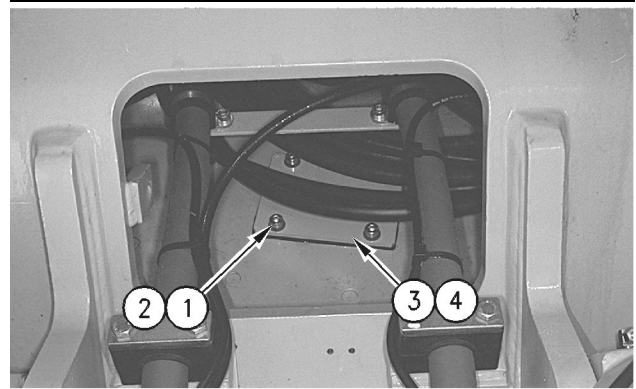


Illustration 423

g00290391

- (1) Bolts
- (2) Bumper springs
- (3) Cover
- (4) Gasket

2. Remove bolts (1) and bumper springs (2). Remove cover (3) and gasket (4).
 3. Inspect gasket (4). Replace the gasket if damage is evident.
 4. Check the level of grease. The grease should be evenly distributed on the floor of the pan.
- Note:** Add grease, as needed. Remove grease, as needed. Too much grease will result in the deterioration of the grease because of excessive movement of the grease. Too little grease will result in poor lubrication of the swing gear.
5. Check for contamination and for discolored grease.

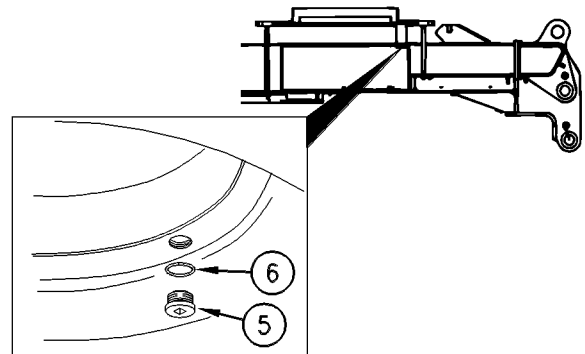


Illustration 424

g00309463

- (5) Plug
- (6) O-ring seal

6. If the grease is contaminated or if the grease is discolored with water, change the grease. Remove plug (5) in order to allow the water to drain. When you reinstall plug (5), inspect the O-ring seal (6). Replace the O-ring seal if damage is evident.
7. Raise the boom. Turn the upper structure by 1/12 of a turn. This is the same angle as the angle between the hours of an analog clock. Lower the implement to the ground.
8. Repeat Step 4 to Step 7 twelve times. Add grease, as needed.
9. Install gasket (4), cover (3), bumper springs (2) and bolts (1).

i00735307

Tire Inflation - Check

SMCS Code: 4203-535-AI; 4203-535-PX

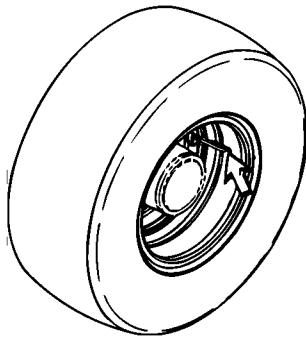


Illustration 425

g00102393

Measure the air pressure on each tire. Consult your Caterpillar dealer for the correct load rating and for the correct operating pressures.

If necessary, inflate the tires. See Operation and Maintenance Manual, "Tire Inflation Information".

i01011331

Transmission Oil - Change

SMCS Code: 3080-044; 3080

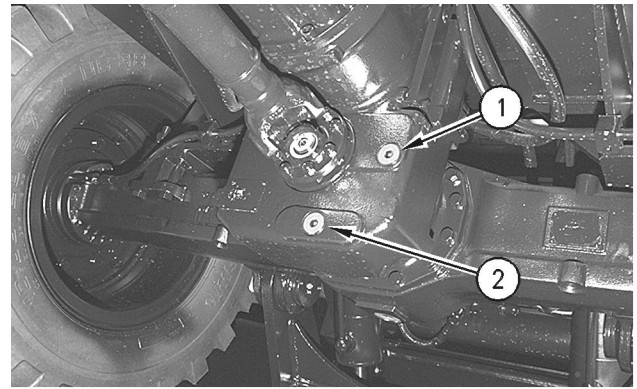


Illustration 426

g00102674

- (1) Filler plug
(2) Drain plug

Operate the machine for an adequate amount of time in order to warm the lubricant.

1. Remove the dirt that is around filler plug (1) and around drain plug (2).
2. Remove drain plug (2). Drain the lubricant into a suitable container.

Note: Dispose of any used lubricants according to local regulations.

3. Clean drain plug (2).
4. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
5. Install drain plug (2).
6. Remove filler plug (1).
7. Fill the gearbox with lubricant to the bottom of the filler plug opening. See Operation and Maintenance Manual, "Refill Capacities".
8. Clean filler plug (1).
9. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
10. Install filler plug (1).

i01225442

Transmission Oil Level - Check

SMCS Code: 3080

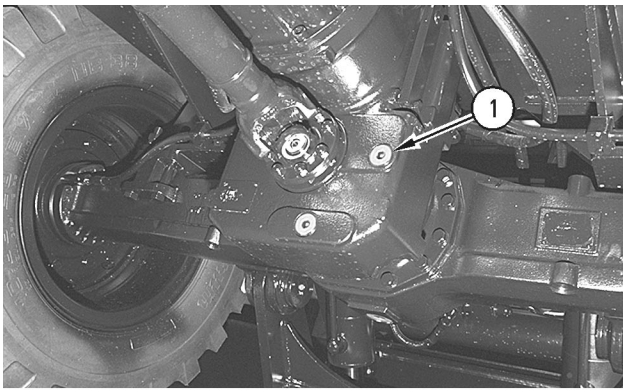


Illustration 427

g00655082

(1) Filler plug

1. Remove filler plug (1).
2. Check the lubricant level. The lubricant level should be at the bottom of the opening for filler plug (1).
3. If necessary, fill the gearbox with lubricant to the bottom of the opening for filler plug (1).
4. Clean filler plug (1).
5. Inspect the O-ring seal. If damage or wear is noticed on the O-ring seal, replace the seal.
6. Install filler plug (1).

i00700594

Travel Alarm - Test (If Equipped)

SMCS Code: 7429-081



Illustration 428

g00102374

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

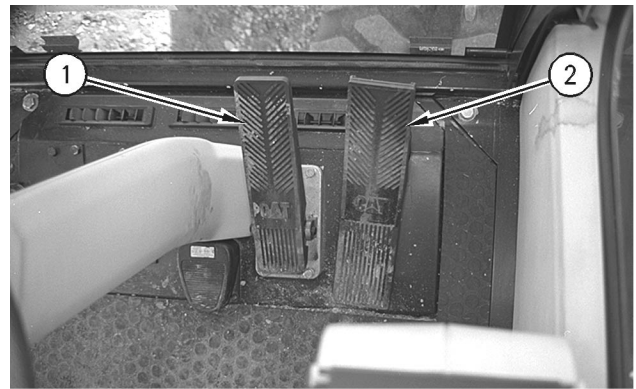


Illustration 429

g00102376

- (1) Service brake
(2) Travel speed pedal

2. Apply service brake (1). Depress travel speed pedal (2) for forward travel or for reverse travel.



Illustration 430

g00102377

- (3) Travel alarm cancel switch

The travel alarm should sound immediately. The alarm will sound until the travel speed pedal is released or until travel alarm cancel switch (3) is depressed. The travel alarm will sound for a minimum of 10 ± 4 seconds.

i00714139

V-Belts - Inspect/Adjust/Replace

SMCS Code: 1357-025; 1357-040; 1357-510;
1359-025; 1359-040; 1359-510; 1361-025;
1361-040; 1361-510; 1405-025; 1405-040;
1405-510; 7320-025; 7320-040; 7320-510

Your engine can be equipped with an alternator belt, with a fan drive belt and with accessory drive belts. 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.

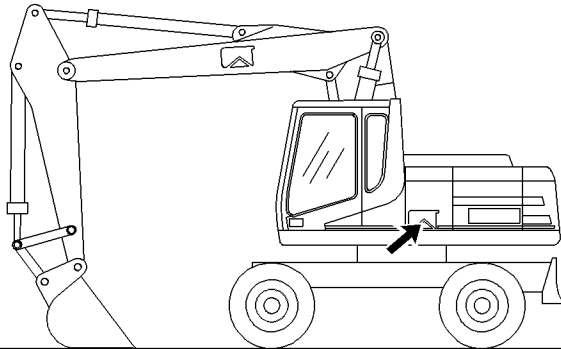


Illustration 431

g00289939

Alternator Belt and Fan Belt

1. Open the access door on the left side of the machine. Secure the access door.

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

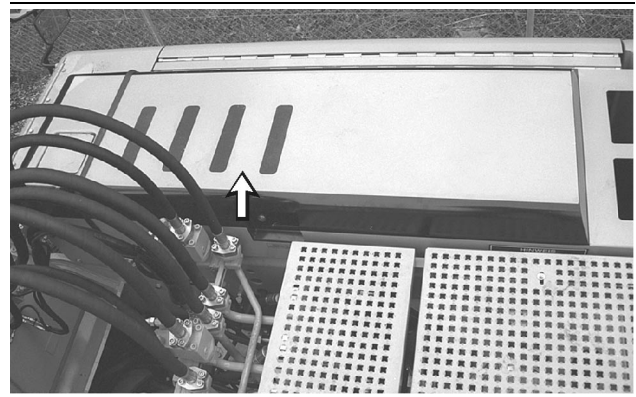


Illustration 432

g00305688

2. Open the access cover on the top of the machine.

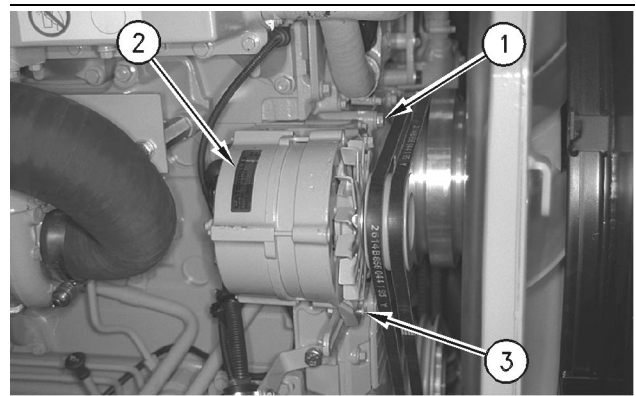


Illustration 433

g00315873

- (1) Mounting bolt. (2) Alternator. (3) Bracket bolt.

3. Check the belt tension.

Note: To check the belt tension, apply 110 N (25 lb) of force midway between the pulleys. Correctly adjusted belts will deflect 13 to 19 mm (1/2 to 3/4 inch).

4. To adjust the alternator belt and the fan belt, loosen bracket bolt (3) and mounting bolt (1) on the alternator bracket.
5. To achieve the correct adjustment, move the alternator (2) inward or move the alternator (2) outward, as required.
6. If necessary, use a pry bar in the square hole in the mounting bracket in order to move alternator (2) to the correct position.
7. When the adjustment is correct, tighten mounting bolt (1) and bracket bolt (3).
8. If new belts are installed, check the belt adjustment again after 30 minutes of engine operation at the rated speed.

Air Conditioner Belt

NOTICE

The V-belt must be tensioned correctly. Failure to tension the belt properly could cause damage to the belt and/or to the air conditioner compressor.

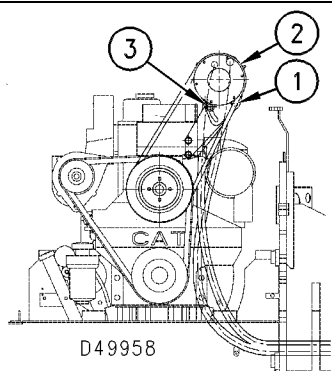


Illustration 434

g00315876

(1) Mounting bolt. (2) Compressor. (3) Bracket bolt.

1. Check the belt tension.

Note: To check the belt tension, apply 110 N (25 lb) of force midway between the pulleys. Correctly adjusted belts will deflect 13 to 19 mm (1/2 to 3/4 inch).

2. To adjust the air conditioner belt, loosen bracket bolt (3) and mounting bolt (1) on the air conditioner assembly.
3. To achieve the correct adjustment, move the compressor (2) inward or move the compressor (2) outward, as required.
4. If necessary, use a pry bar in order to move compressor (2) to the correct position.
5. When the adjustment is correct, tighten mounting bolt (1) and bracket bolt (3).
6. If new belts are installed, check the belt adjustment again after 30 minutes of engine operation at the rated speed.
7. Close all access covers and access doors. Secure all access covers and access doors.

Walk-Around Inspection

i00995282

SMCS Code: 7000

NOTICE

Accumulated grease and oil on a machine is a fire hazard. Remove this debris with steam cleaning or high pressure water, at least every 1000 hours or each time any significant quantity of oil is spilled on a machine.

NOTICE

Spray cleaning the machine with the engine access cover open and engine running could result in engine damage.

To avoid engine damage, always shut the engine down and cover the engine air inlet opening before spray cleaning with the hood open.

Note: Watch closely for leaks. If you observe a leak, find the source of the leak and correct the leak. If you suspect a leak or you observe a leak, check the fluid levels more frequently. Refer to Operation and Maintenance Manual, "Maintenance Interval Schedule" for the correct intervals.

Check the implement cylinders and the linkage. Repair these components if these components are damaged or excessively worn.

Inspect the lights for broken bulbs and for broken lenses. Replace any broken bulbs or broken lenses.

Inspect the engine compartment. Remove any trash buildup that is in the engine compartment.

Inspect the cooling system for leaks, for faulty hoses, and for any trash buildup. Correct any leaks and remove any trash from the radiator.

Inspect all belts. Replace any belts if the following conditions exist:

- The belts are worn.
- The belts are cracked.
- The edges of the belts are frayed.

Inspect the hydraulic system for leaks. Inspect the following components. Repair all leaks.

- Tank
- Cylinder rod seals
- Hoses

i00124062

- Tubes
- Plugs
- Assembled joints
- Fittings

Inspect the swing drive. Repair all leaks.

Inspect the steering axle, the axle hubs, and the axle gearbox. Correct any leaks.

Inspect the wheel brakes for oil leaks. Repair any leaks.

Inspect the transmission for leaks. Correct any leaks.

Inspect all tires for damage and for proper inflation. Replace any missing valve caps.

Inspect the covers for damage and the guards for damage. Also make sure that these components are securely attached.

Inspect the following components for condition and for cleanliness. Repair the components or clean the components, as needed.

- Steps
- Walkways
- Handholds

Inspect the Falling Objects Protective Structure (if equipped) for damage. Tighten any loose bolts. Make any necessary repairs.

Inspect the operator's compartment for cleanliness. Keep the operator's compartment clean.

Adjust the rearview mirrors for best visibility.

Wheel Nut Torque - Check

SMCS Code: 4210-535

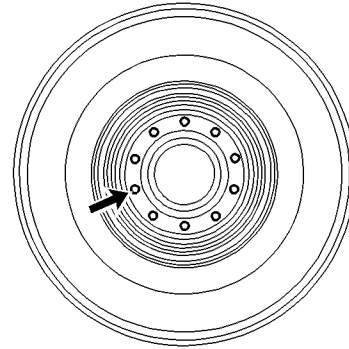


Illustration 435

g00102965

Check the torque on the ten wheel nuts on each of the four wheels. The torque needs to be 350 to 400 N·m (260 to 300 lb ft). If necessary, tighten the wheel nuts.

i01077829

Windows - Clean

SMCS Code: 7310-070; 7340-070

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

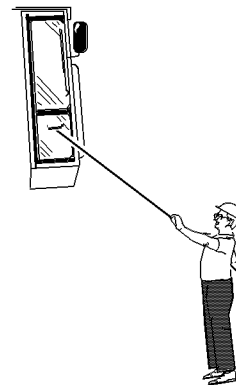


Illustration 436

g00566124

Typical example

Use a pole with a squeegee in order to reach the high areas of the window.

Cleaning Methods

Aircraft Windshield Cleaner

Apply the cleaner with a soft cloth. Rub the window with moderate pressure until all the dirt is removed. Allow the cleaner to dry. Wipe off the cleaner with a clean soft cloth.

Soap and Water

Use a clean sponge or a soft cloth. Wash the windows with a mild soap or with a mild detergent. Also use plenty of lukewarm water. Rinse the windows thoroughly. Dry the windows with a moist chamois or with a moist cellulose sponge.

Stubborn Dirt and Grease

Wash the windows with a good grade of naphtha, of isopropyl alcohol, or of Butyl Cellosolve. Then, wash the windows with soap and with water.

i01220995

Window Washer Reservoir - Fill

SMCS Code: 7306-544-KE

NOTICE

When operating in freezing temperatures, use Caterpillar or any commercially available nonfreezing window washer solvent.

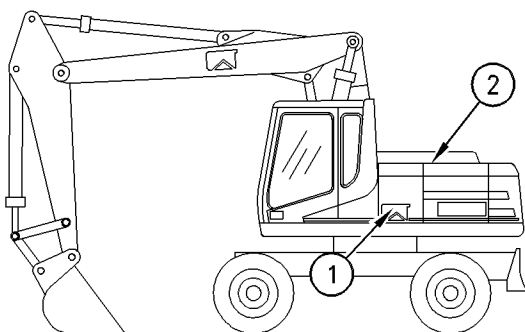


Illustration 437

g00290119

- (1) Access door
(2) Top access cover

1. Open and secure access door (1) on the left side of the machine.
2. Open top access cover (2).

WARNING

Bodily injury can occur from unexpected contact with open cab doors on machines equipped with a fixed cab riser.

To avoid injury, close the cab door before climbing onto the rear of the machine.

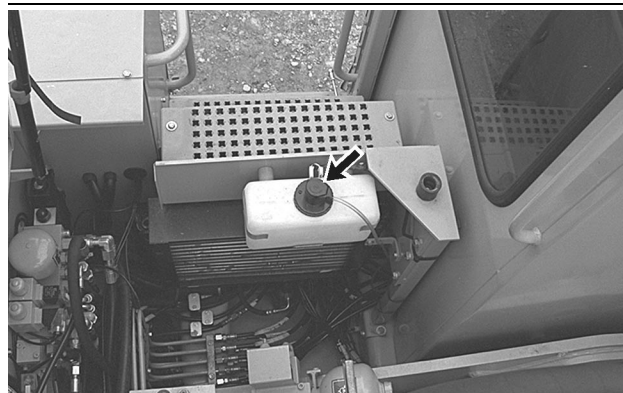


Illustration 438

g00102266

3. Fill the fluid reservoir through the filler opening on the top of the reservoir. If the machine is equipped with a lower window wiper/washer, a second fluid reservoir is mounted in this area. Fill the second fluid reservoir through the filler opening on the top of the fluid reservoir.
4. Close top access cover (2) and access door (1).

i01221005

Window Wiper - Inspect/Replace

SMCS Code: 7305-040; 7305-510

Inspect the window wiper blades. Replace the wiper blades if the wiper blades are worn or damaged. Also replace the wiper blades if the wiper blades cause streaks.