

V623



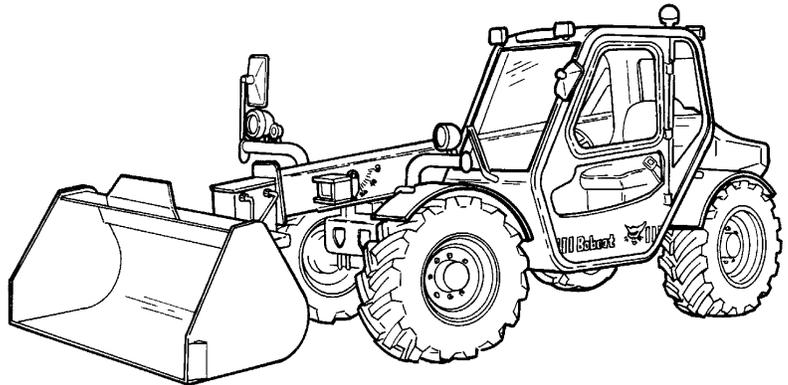
Bobcat®

VersaHANDLER

Service Manual

(S/N 367111001 - 367113000)

(S/N 367211001 - 367213000)



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MAINTENANCE SAFETY

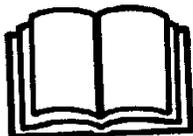


WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0903

CORRECT



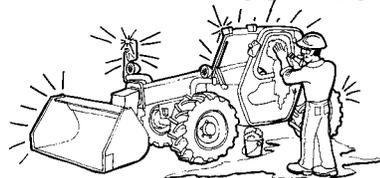
B-10731a

- ⚠ Never service the Bobcat VersaHANDLER without instructions.



Safety Alert Symbol: This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.

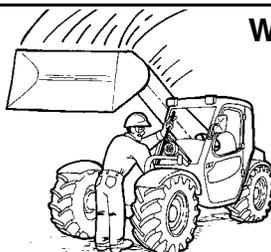
CORRECT



B-16082

- ⚠ Cleaning and maintenance are required daily.

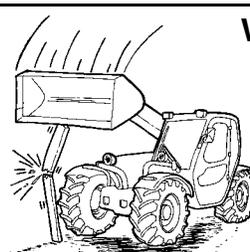
WRONG



B-16080

- ⚠ Disconnecting or loosening any hydraulic tube, hose, fitting, component or a part failure can cause boom to drop. Do not go under boom when raised unless supported by an approved boom stop. Replace if damaged.

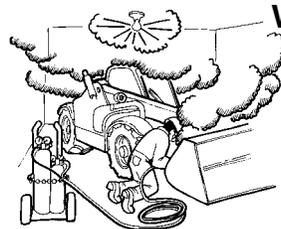
WRONG



B-16079

- ⚠ Never work on VersaHANDLER with boom up unless boom is held by an approved boom stop. Replace if damaged.
- ⚠ Never modify equipment or add attachments not approved by Bobcat Company.

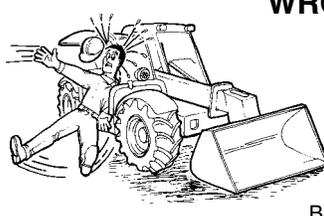
WRONG



B-16081

- ⚠ Have good ventilation when welding or grinding painted parts.
- ⚠ Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.
- ⚠ Avoid exhaust fume leaks which can kill without warning. Exhaust system must be tightly sealed.

WRONG



B-16078

- ⚠ Keep body, jewelry and clothing away from moving parts, electrical contact, hot parts and exhaust.
- ⚠ Wear eye protection to guard from battery acid, compressed springs, fluids under pressure and flying debris when engines are running or tools are used. Use eye protection approved for type of welding.

WRONG



B-6589

- ⚠ Lead-acid batteries produce flammable and explosive gases.
- ⚠ Keep arcs, sparks, flames and lighted tobacco away from batteries.
- ⚠ Batteries contain acid which burns eyes or skin on contact. Wear protective clothing. If acid contacts body, flush well with water. For eye contact flush well and get immediate medical attention.

Maintenance procedures which are given in the Operation & Maintenance Manual can be performed by the owner/operator without any specific technical training. Maintenance procedures which are **not** in the Operation & Maintenance Manual must be performed **ONLY BY QUALIFIED BOBCAT SERVICE PERSONNEL**. Always use **genuine Bobcat replacement parts**.



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**SAFETY &
MAINTENANCE**

**HYDRAULIC
SYSTEM**

**HYDROSTATIC
SYSTEM**

**DRIVE
SYSTEM**

MAIN FRAME

**ELECTRICAL
SYSTEM &
ANALYSIS**

**ENGINE
SERVICE**

HVAC

SPECIFICATIONS

FOREWORD

This manual is for the Bobcat VersaHANDLER mechanic. It provides necessary servicing and adjustment procedures for the Bobcat VersaHANDLER and its component parts and systems. Refer to the Operation & Maintenance Manual for operating instructions, Starting procedure, daily checks, etc.

A general inspection of the following items must be made after the VersaHANDLER has had service or repair:

1. Check that ROPS/FOPS (including right side window) is in good condition and is not modified.



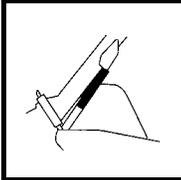
2. Check that ROPS mounting hardware is tightened and is Bobcat approved.



3. The seat belt must be correctly installed, functional and in good condition.



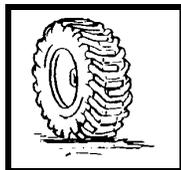
4. Check boom support device, replace if damaged.



5. Machine signs must be legible and in the correct location.



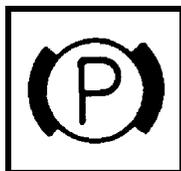
6. Check tires for wear and pressure. Use only approved tires.



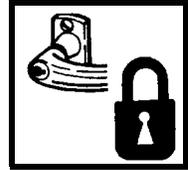
7. Check for correct function of the work lights.



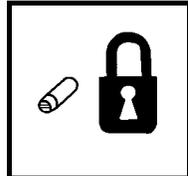
8. The parking brake must function correctly.



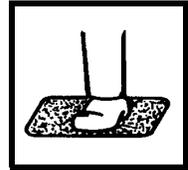
9. Enclosure door latches must open and close freely.



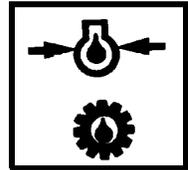
10. Attachment locking pins must function correctly and be in good condition.



11. Safety treads must be in good condition.



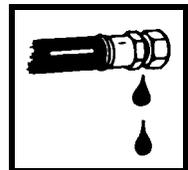
12. Check for correct function of indicator lamps and gauges.



13. Check hydraulic fluid level, engine oil level and fuel supply.



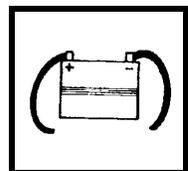
14. Inspect for fuel, oil or hydraulic fluid leaks.



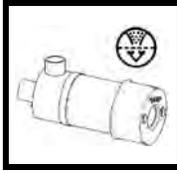
15. Lubricate the VersaHANDLER.



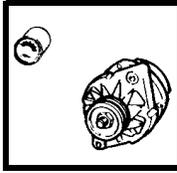
16. Check the condition of the battery and cables.



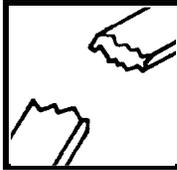
17. Inspect the air cleaner for damage or leaks. Check the condition of the element.



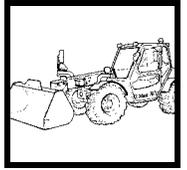
18. Check the electrical charging system.



19. Inspect for loosen or broken parts or connections.



20. Operate the VersaHANDLER and check all functions.



21. Check for any field modification not completed.



22. Recommend to the owner that all necessary corrections be made before the machine is returned to service.



**CALIFORNIA
PROPOSITION 65 WARNING**
Diesel engine exhaust and some of its constituents are known to the State of California to cause cancer, birth defects and other reproductive harm.



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SAFETY INSTRUCTIONS



Safety Alert Symbol

This symbol with a warning statement means:
“Warning, be alert! Your safety is involved!”
Carefully read the message that follows.



WARNING

Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.

W-2003-0903



WARNING

Warnings on the machine and in the manuals are for your safety. Failure to obey warnings can cause injury or death.

W-2044-1285

IMPORTANT

This notice identifies procedures which must be followed to avoid damage to the machine.

I-2019-0284

The following publications provide information on the safe use and maintenance of the Bobcat machine and attachments:

- The Delivery Report is used to assure that complete instructions have been given to the new owner and that the machine is in safe operating condition.
- The Operation & Maintenance Manual delivered with the machine or attachment contains operating information as well as routine maintenance and service procedures. It is a part of the machine and can be stored in a container provided on the machine. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat dealer.
- Machine signs (decals) instruct on the safe operation and care of your Bobcat machine or attachment. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat dealer.
- An Operator's Handbook fastened to the operator cab. It's brief instructions are convenient to the operator. The handbook is available from your dealer in an English edition or one of many other languages. See your Bobcat dealer for more information on translated versions.
- The AEM Safety Manual delivered with the machine gives general safety information.
- The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop-type service and repair work.
- The VersaHANDLER Operator Training Course is available through your local dealer or at www.training.bobcat.com or www.bobcat.com. This course is intended to provide rules and practices of correct operation of the VersaHANDLER.
- The VersaHANDLER Safety Video is available from your Bobcat dealer or at www.training.bobcat.com or www.bobcat.com.

SI VH-0206 SM

SAFETY INSTRUCTIONS (CONT'D)

The dealer and owner/operator review the recommended uses of the product when delivered. If the owner/operator will be using the machine for a different application(s) he or she must ask the dealer for recommendations on the new use.



Call Before You Dig

1-888-258-0808

When you call, you will be directed to a location in your state/city for information about buried lines (telephone, cable TV, water, sewer, gas, etc.)

SAFETY INSTRUCTIONS (CONT'D)

Fire Prevention

The machine and attachments have components that are at high temperature under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it will increase fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential hazard.

The spark arrestor muffler is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot.

- Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.
- The operator cab, engine compartment, and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazard and overheating.
- Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part.
- Check fuel and hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Tighten or replace any parts that show leakage. Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.
- Do not use ether or starting fluids on any engine which has glow plugs. These starting aids can cause explosion and injure you or bystanders.
- Always clean the machine, disconnect the battery, and disconnect the wiring from the controllers before welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the machine when welding. Have good ventilation when grinding or welding painted parts. Wear a dust mask when grinding painted parts. Toxic dust or gas can be produced.
- Stop the engine and let it cool before adding fuel. **NO SMOKING!**

- Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.
- Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrestor muffler (if equipped).

Figure 1



- Know where fire extinguishers and first aid kits are located and how to use them. Fire extinguishers are available from your Bobcat dealer [Figure 1].



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SERIAL NUMBER LOCATIONS

Always use the serial number of the VersaHANDLER when requesting service information or when ordering parts. Early or later models (identification made by serial number) may use different parts, or it may be necessary to use a different procedure in doing a specific service operation.

VersaHANDLER Serial Number

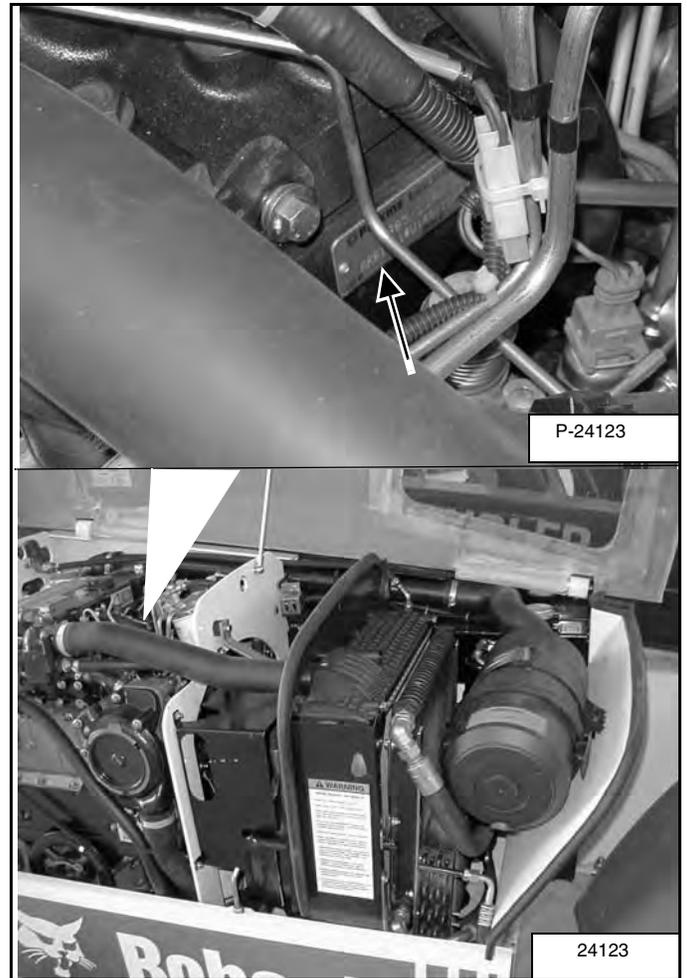
Figure 2



The front, on the right side of the chassis [Figure 2].

Engine Serial Number

Figure 3



The engine serial number is stamped on a plate near the injection pump or at the rear of the cylinder block [Figure 3]. Always use the full number when ordering replacement parts.

Other Serial Numbers

Some components may also have serial numbers. Always use these serial numbers when requesting parts.

DELIVERY REPORT

The Delivery Report must be filled out by the dealer and signed by the owner or operator when the VersaHANDLER is delivered. An explanation of the form must be given to the owner. Make sure it is filled out completely [Figure 4].

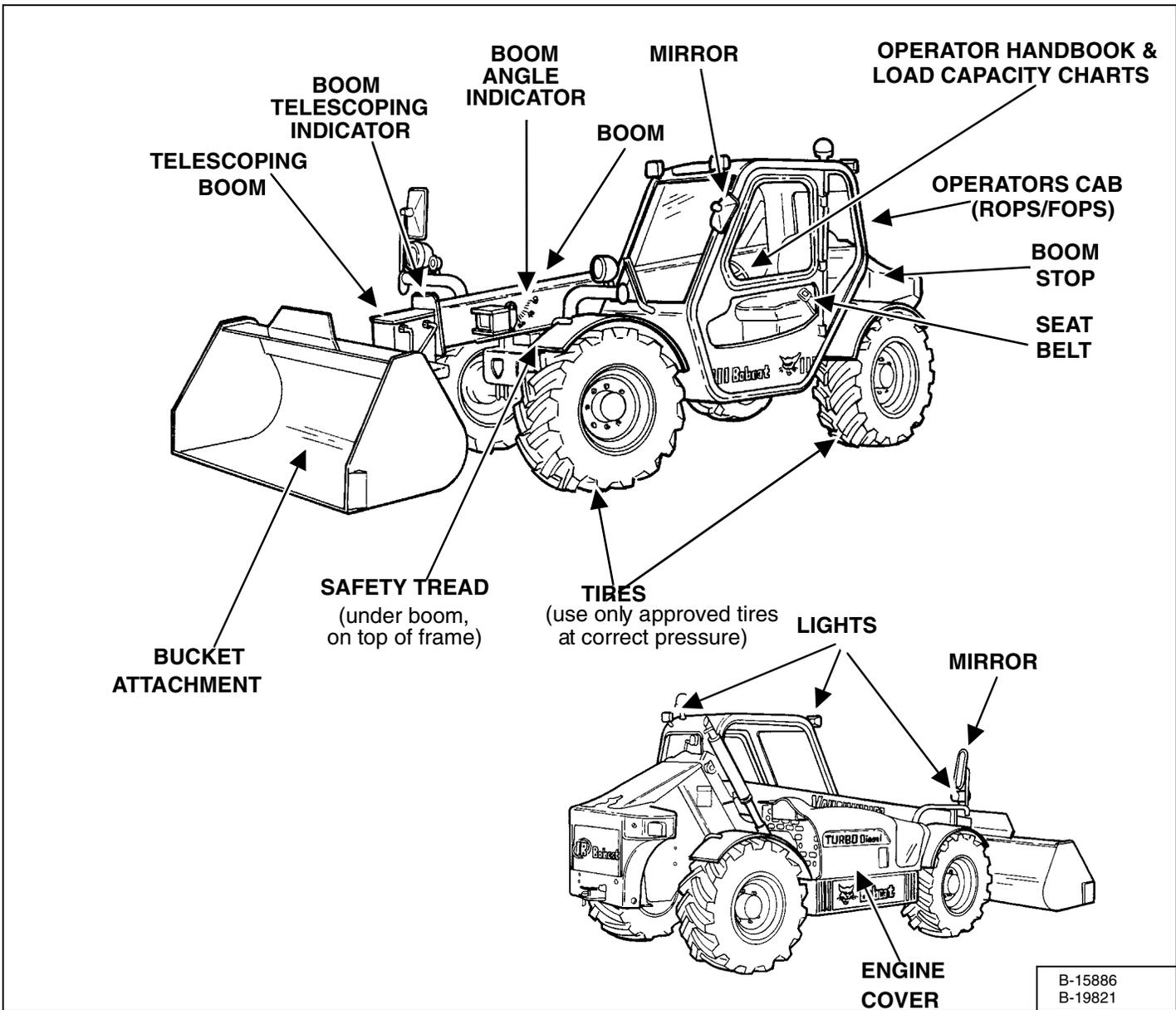
Figure 4

DELIVERY REPORT

WARNING

B-16315

BOBCAT VersaHANDLER IDENTIFICATION



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LIFTING AND BLOCKING THE VERSAHANDLER

Procedure

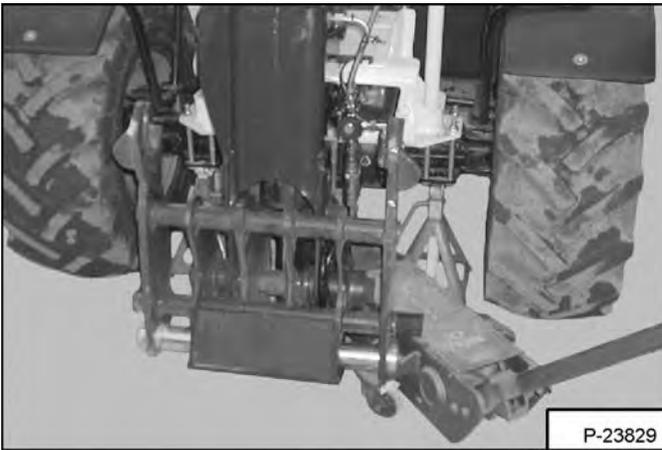
Always park the machine on a level surface.



Put jackstands under the front axles and rear corners of the frame before running the engine for service. Failure to use jackstands can allow the machine to fall or move and cause injury or death.

W-2017-0286

Figure 10-10-1



STOP the engine. Put the floor jack under the center of the front axle. Lift the Versa HANDLER and install jackstands [Figure 10-10-1].

Figure 10-10-2



Put the floor jack under the center of the rear axle. Lift the Versa HANDLER and install jackstands [Figure 10-10-2].



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OPERATOR CAB

Emergency Exit

The left door and rear window provide exits.

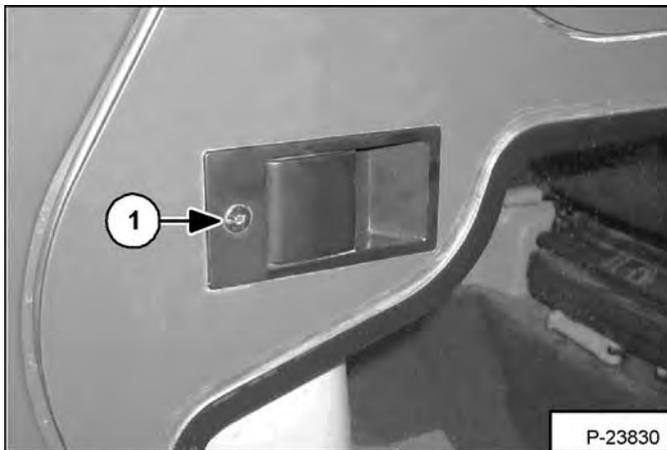
Figure 10-20-1



Turn the handle (Inset) and push the rear window open. Exit through the rear window opening [Figure 10-20-1].

Cab Door

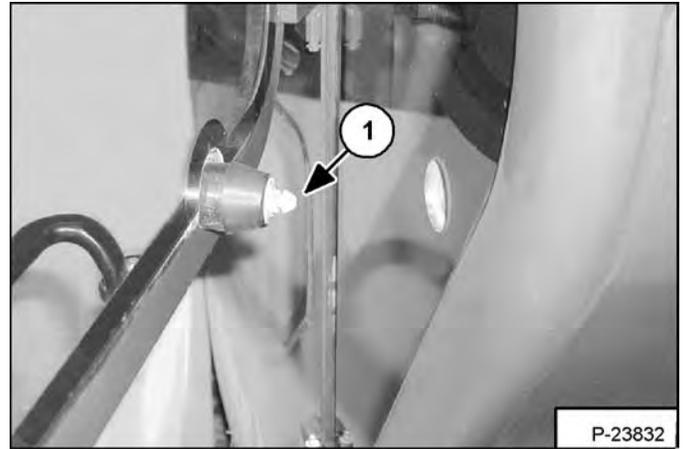
Figure 10-20-2



The cab door can be locked (Item 1) [Figure 10-20-2] with a key.

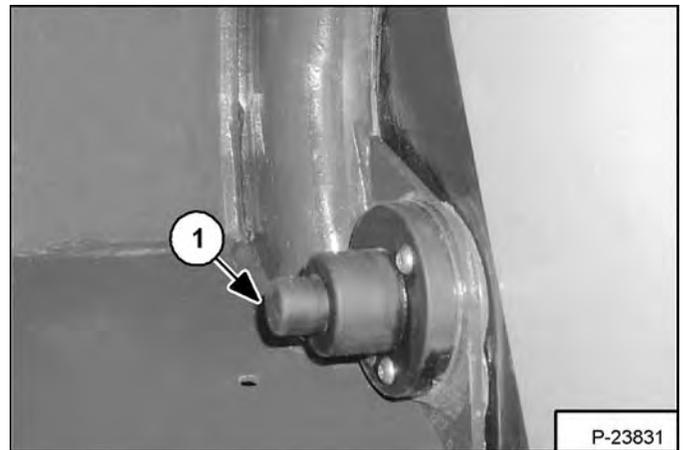
Cab Door Window

Figure 10-20-3



The cab door window can be opened completely. Push the window all the way open until the latch on the cab engages onto the door post (Item 1) [Figure 10-20-3] to hold the window in the open position.

Figure 10-20-4



Push the button (Item 1) [Figure 10-20-4] inside the cab to disengage the latch and close the window.



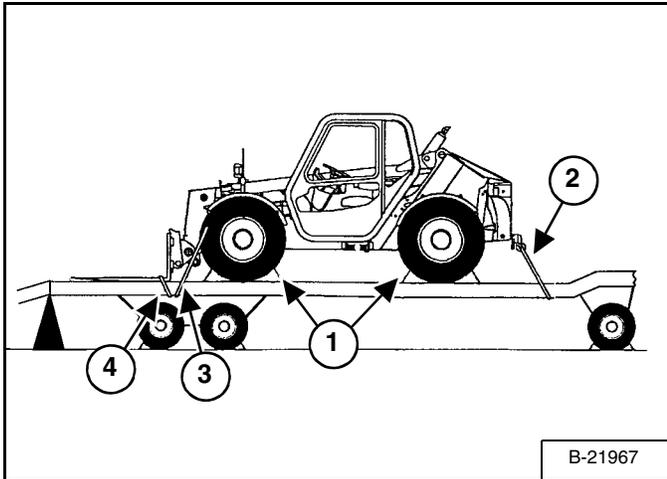
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TRANSPORTING THE VersaHANDLER

Procedure

Always drive the VersaHANDLER backwards (heavy end up) onto the transport vehicle.

Figure 10-30-1



The rear of the trailer must be blocked or supported [Figure 10-30-1] when loading or unloading the VersaHANDLER to prevent the front end of the trailer from raising up.

Be sure the transport and towing vehicles are of adequate size and capacity. (See VERSAHANDLER SPECIFICATIONS on Page SPEC-10-1.

Fasten the VersaHANDLER to the transport vehicle to prevent it from moving during sudden stops or when going up or down slopes.

- Block the wheels (Item 1) [Figure 10-30-1].
- Fasten the machine frame to the transport vehicle (Items 2 & 3) [Figure 10-30-1].
- Attach the forks or bucket attachment to the transport vehicle (Item 4) [Figure 10-30-1].

WARNING

Adequately designed ramps of sufficient strength are needed to support the weight of the machine when loading onto a transport vehicle. Wood ramps can break and cause personal injury.

W-2058-0494



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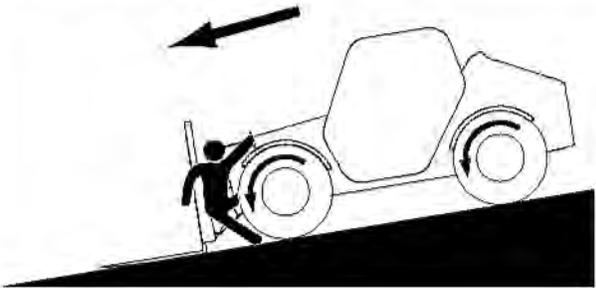
TOWING THE VersaHANDLER

Procedure

The VersaHANDLER can be towed a short distance such as removing it from mud or loading onto a transport vehicle.



WARNING



**Unexpected Machine Movement
Can Cause Serious Injury or Death**

Before adjusting screws to bypass the park brake system:

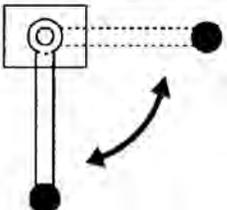
- Block wheels to prevent roll away.

Before operating machine:

- Return adjustment screws to the operating position.

41625
SW 01 6809622

TOW VALVE

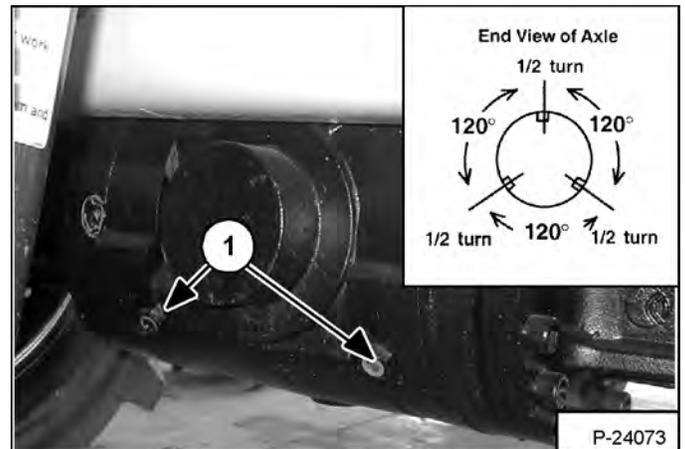


41625
SW 01 6810678

Block the wheels to prevent the machine from rolling.

Raise the engine cover.

Figure 10-40-1

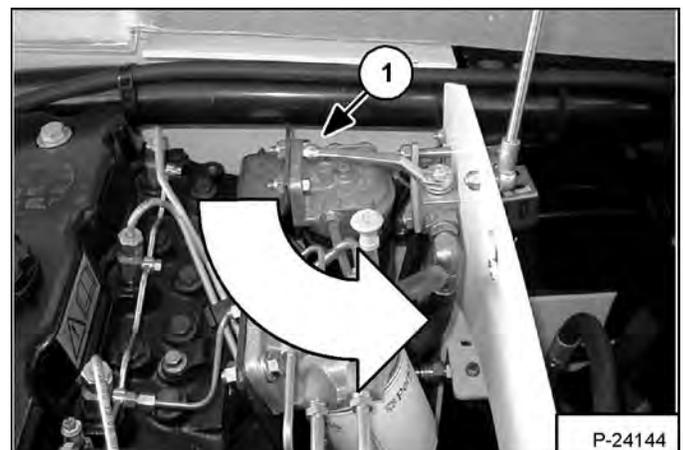


Releasing Brake Disks: To release the brake disks, turn each of the six (6) screws (Item 1) [Figure 10-40-1] in only one half turn at a time; then repeat until all six screws are all the way in. (It will take 4 & 1/2 to 5 turns to fully release the brakes.) Record the number of turns so that you can return them to the same position later.

NOTE: If one screw is turned all the way in before you start turning the others, the brake can be damaged.

There are three screws on each side (right and left) located 120° apart [Figure 10-40-1].

Figure 10-40-2



Turn the tow valve counterclockwise 90° (Item 1) [Figure 10-40-2] to TOWING POSITION.

Tow the VersaHANDLER at slow speed.

Engaging Brake Disks: After towing is completed, turn the tow valve (Item 1) [Figure 10-40-2] clockwise 90° to the OPERATING POSITION.

Turn all six screws out, 1/2 turn at a time, to their original position.



Bobcat®

SERVICE SCHEDULE

Chart

Maintenance work must be done at regular intervals. Failure to do so will result in excessive wear and early failures. The service schedule is a guide for correct maintenance of the Bobcat VersaHANDLER.

 <b style="font-size: 24pt; margin-left: 10px;">WARNING	<p>Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after adjustments, repairs or service. Untrained operators and failure to follow instructions can cause injury or death.</p> <p style="text-align: right; font-size: 10pt;">W-2408-0801</p>
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SERVICE SCHEDULE		HOURS					
ITEM	SERVICE REQUIRED	10	50	100	250	□ 500	■ 1000
Engine Oil	Check the oil level and add as needed.						
Hydraulic Fluid	Check fluid level and add as needed.						
Articulation Pins	Lubricate with multi-purpose lithium based grease.						
Safety Signs, Safety Tread and Mirrors	Check for damaged signs (decals) and safety tread and mirrors. Replace if damaged or worn.						
Fuel Filter	Clean the sediment bowl/water trap.						
Nut & Bolts	Check for loose nuts and bolts. Tighten as needed.						
Brakes	Check for function. Service as necessary.						
Back-up Alarm	Check for function.						
Tires	Check for wear or damage. Inflate to correct pressure. Be sure all tires are inflated to the same pressure. Use only approved tires.						
Air Filter	Clean the outer filter element. Do not use compressed air to clean the filter. Check air filter system for damage or leaks.						
King Pins, U-Joints, Axle Oscillation (Front & Rear). Attach. Frame Pivot(s), Tilt & Lift Cyl., Boom Pivot, Leveling Cyl. (If equipped)	Lubricate with multi-purpose lithium based grease.						
Telescopic Boom	Lubricate with multi-purpose lithium based grease. Check wear blocks for adjustment.						
Engine Cooling System	Clean debris from oil cooler, radiator and air conditioner condenser. Check coolant level cold in recovery tank. Add 53% propylene glycol premixed with 47% water as needed. Check cooling system for leaks.						
Hydraulic Hoses, Tubelines and Connections.	Check condition of hoses, tubelines and connectors. Repair or replace as needed.						
Battery	Check electrolyte level. Add distilled water as needed.						
Wheel Nuts	Check wheel nut torque. Tighten as needed to 217 ft. lbs. (159 Nm).	*					
Alternator and Air Conditioner Belt	Check belt tension and adjust as needed.		●				
Engine Oil and Filter	Replace the engine oil and filter. See Specifications Content Page SPEC-01 for correct capacity. Use a genuine Bobcat filter.		●				
Engine Air Filter	Replace the outer filter element. Use a genuine Bobcat filter.		●				
Fuel Filter	Replace the fuel filter element. Use a genuine Bobcat filter.		●				
Hydraulic Fluid Filter	Replace the hydraulic filter element. Use a genuine Bobcat filter.		●				
Hydraulic Fluid and Filter	Replace the hydraulic fluid and filter element. See Specifications Contents Page SPEC-01 for correct capacity. Use a genuine Bobcat filter.						
Front & Rear Axle Fluid	Replace the axle fluid. See Specifications Contents Page SPEC-01 for correct capacity.			▼		^	
Engine Coolant	Check freeze protection of antifreeze -34°F (-30°C). Flush cooling system and replace coolant with premixed 53% propylene glycol and 47% water.						

* Check wheel nut torque every 8 hours for the first 24 hours.

● Perform service first time, then as indicated in chart.

▼ Check level.

^ Replace fluid first time, then as indicated in chart.

□ Or every 6 months.

■ Or every 12 months.



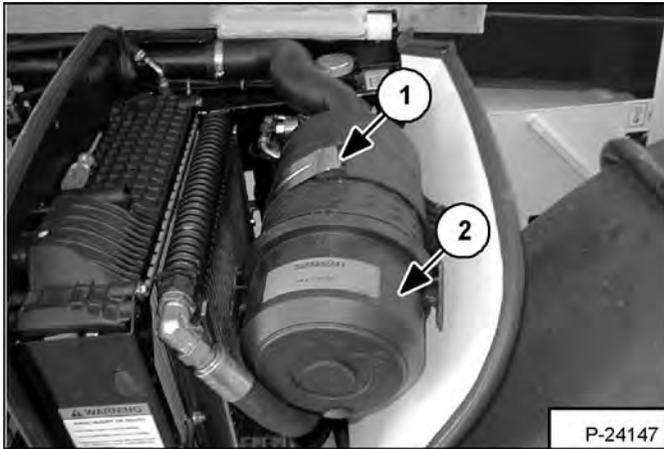
Bobcat®

AIR CLEANER SERVICE

Replacing Filter Element

Outer Filter

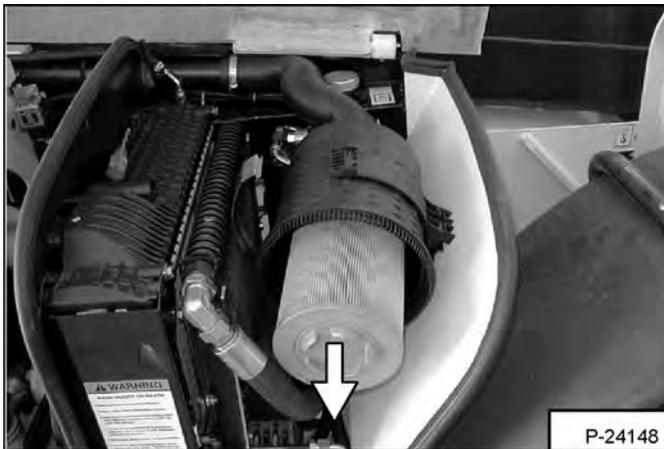
Figure 10-60-1



Loosen the filter housing clamp (Item 1) [Figure 10-60-1].

Release the fastener and remove the cover (Item 2) [Figure 10-60-1].

Figure 10-60-2



Pull the element straight out [Figure 10-60-2].

NOTE: Make sure all sealing surfaces are free of dirt and debris.

Install a new outer element.

Install the dust cover and fasten [Figure 10-60-1].

Connect the filter housing clamp.

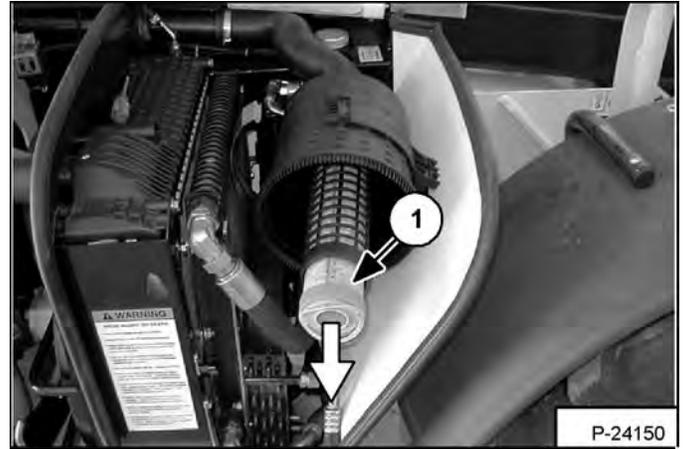
Check the air intake hose and the air cleaner housing for damage. Make sure all connections are tight.

Inner Filter

Remove the outer element. (See above.)

NOTE: Make sure all sealing surfaces are free of dirt and debris.

Figure 10-60-3



Remove the inner filter (Item 1) [Figure 10-60-3] and install a new element.

Install the outer element.

Install the dust cover and fasten [Figure 10-60-1].

Connect the filter housing clamp (Item 1) [Figure 10-60-1].



Bobcat®

ENGINE COOLING SYSTEM

Cleaning The Cooling System

Check the cooling system every day to prevent overheating, loss of performance or engine damage.

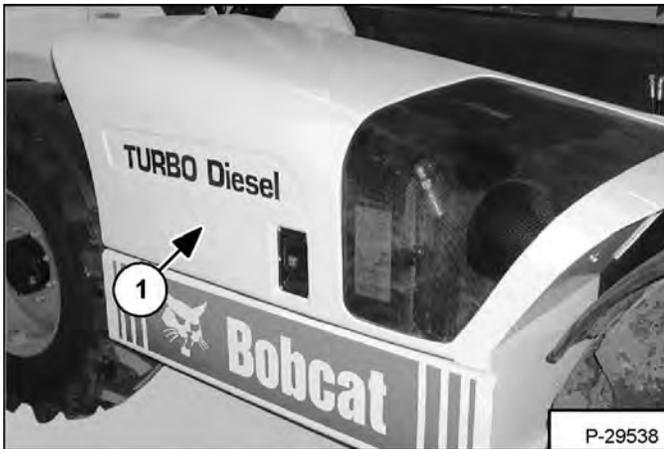


Wear safety glasses to prevent eye injury when any of the following conditions exist:

- When fluids are under pressure.
- Flying debris or loose material is present.
- Engine is running.
- Tools are being used.

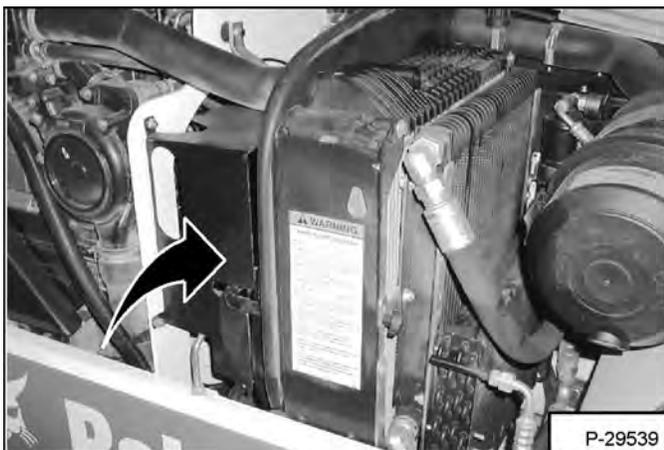
W-2019-1285

Figure 10-70-1



Open the engine cover (Item 1) [Figure 10-70-1].

Figure 10-70-2



Use low air pressure or water pressure to clean the radiator and oil cooler [Figure 10-70-2].

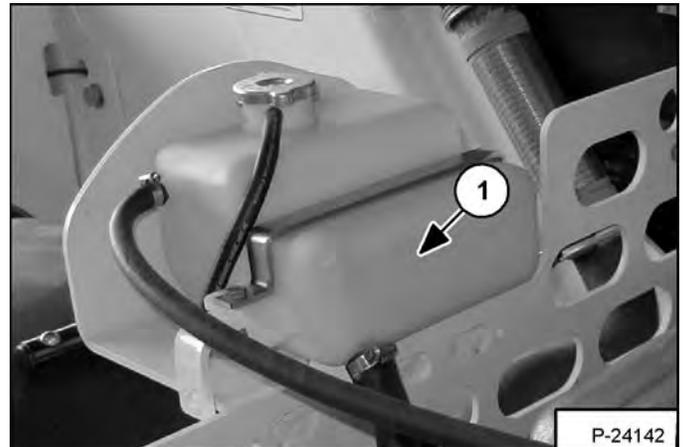
Check cooling system for leaks.

Checking The Coolant Level

Open the engine cover.

Check the coolant level in the coolant recovery tank.

Figure 10-70-3



The coolant level must be between the MIN and MAX marks (Item 1) [Figure 10-70-3] on the coolant recovery tank when the engine is cold.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to anti freeze. Too much antifreeze reduces cooling system efficiency and may cause serious premature engine damage.

Too little antifreeze reduces the additives which protect the internal engine components; reduces the boiling point and freeze protection of the system.

Always add a premixed solution. Adding full strength concentrated coolant can cause serious premature engine damage.

I-2124-0497

ENGINE COOLING SYSTEM (CONT'D)

Replacing The Coolant

! WARNING

Do not remove radiator cap when the engine is hot. You can be seriously burned.

W-2070-1285

IMPORTANT

AVOID ENGINE DAMAGE

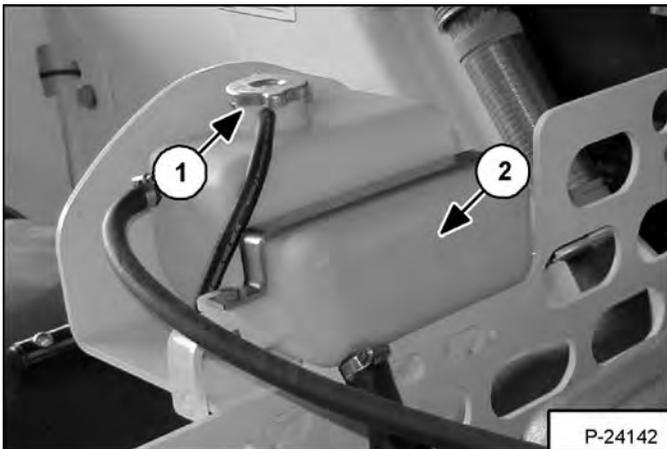
Always use the correct ratio of water to anti freeze. Too much antifreeze reduces cooling system efficiency and may cause serious premature engine damage.

Too little antifreeze reduces the additives which protect the internal engine components; reduces the boiling point and freeze protection of the system. Always add a premixed solution. Adding full strength concentrated coolant can cause serious premature engine damage.

I-2124-0497

Open the engine cover.

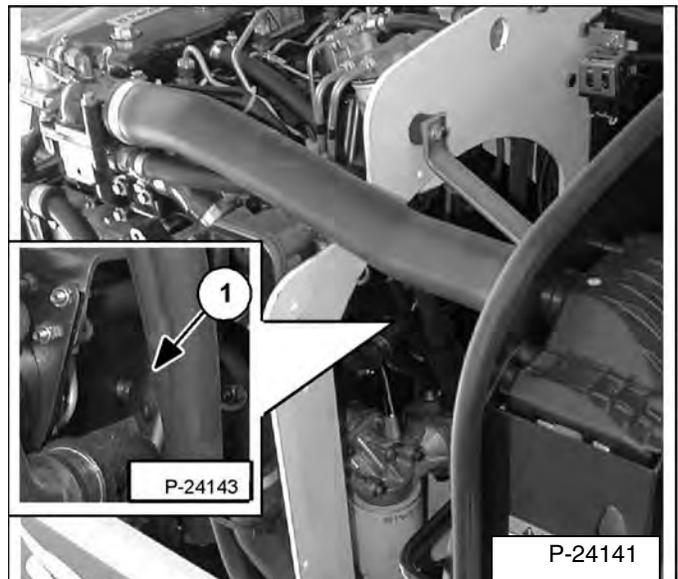
Figure 10-70-4



Remove the cap (Item 1) [Figure 10-70-4] from the coolant recovery tank.

Remove fan shield.

Figure 10-70-5



Remove the engine block drain plug (Item 1) [Figure 10-70-5].

Open the radiator drain valve located on the back side and bottom of the radiator and drain all of the coolant into a container. Dispose of used coolant in an environmentally safe manner.

Close the drain valve and install the engine drain plug.

Mix the coolant in a separate container.

NOTE: The loader is factory filled with propylene glycol coolant (purple color). DO NOT mix propylene glycol with ethylene glycol.

Add premixed coolant, 47% water and 53% propylene glycol to the recovery tank if the coolant level is low.

One gallon and one pint (4,3 L) of propylene glycol mixed with one gallon (3,8 L) of water is the correct mixture of coolant to provide a -34° F (-37° C) freeze protection.

Use a refractometer to check the condition of propylene glycol in your cooling system.

Fill the radiator with the premixed coolant. Install the radiator cap.

Add coolant to the recover tank. The coolant level must be between the MIN and MAX marks (Item 2) [Figure 10-70-4] on the coolant recovery tank.

Run the engine until it is at operating temperature.

Stop the engine.

Check the coolant level in the recovery tank when cool.

Add coolant to the recovery tank as needed.

FUEL SYSTEM

Fuel Specifications

Use only clean, high quality diesel fuel, Grade No. 2 or Grade No. 1.

The following is one suggested blending guideline which should prevent fuel gelling problems in cold temperatures:

TEMP. F° (C°)	NO. 2	NO. 1
+15° (9°)	100%	0%
Down to -20° (-29°)	50%	50%
Below -20° (-29°)	0%	100%

See your fuel supplier for local recommendations.

Filling The Fuel Tank

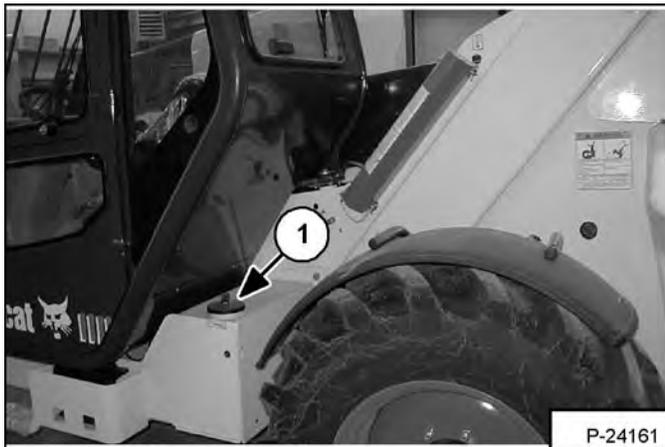


WARNING

Stop and cool the engine before adding fuel. **NO SMOKING!** Failure to obey warnings can cause an explosion or fire.

W-2063-0887

Figure 10-80-1



Remove the fuel fill cap (Item 1) [Figure 10-80-1].

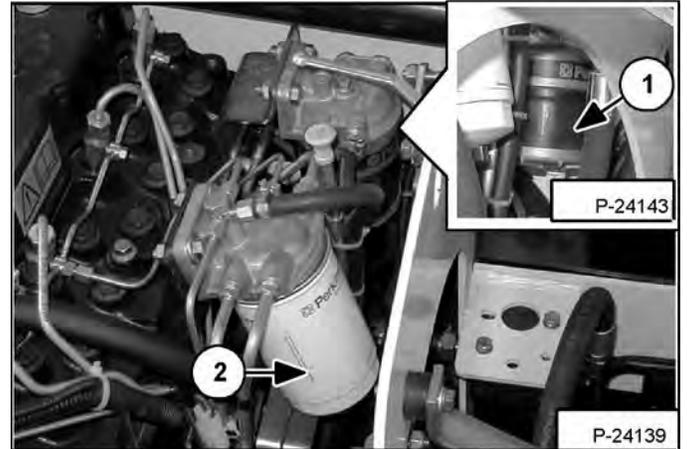
Use a clean, approved safety container to add fuel of the correct specifications. Add fuel only in an area that has free movement of air and no open flames or sparks. **NO SMOKING!**

Install and tighten the fuel fill cap [Figure 10-80-1].

Fuel Filter

See SERVICE SCHEDULE on Page 10-50-1 for the service interval when to clean the sediment bowl.

Figure 10-80-2



Remove and clean the sediment bowl (Item 1) [Figure 10-80-2]. Install and tighten the sediment bowl.

See SERVICE SCHEDULE on Page 10-50-1 for the service interval when to replace the fuel filter.

Remove the filter element (Item 2) [Figure 10-80-2].

Clean the area around the filter housing.

Put oil on the seal of the new filter element.

Install the fuel filter, and hand tighten.



WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W-2103-1285



Bobcat®

ENGINE LUBRICATION SYSTEM

Checking Engine Oil

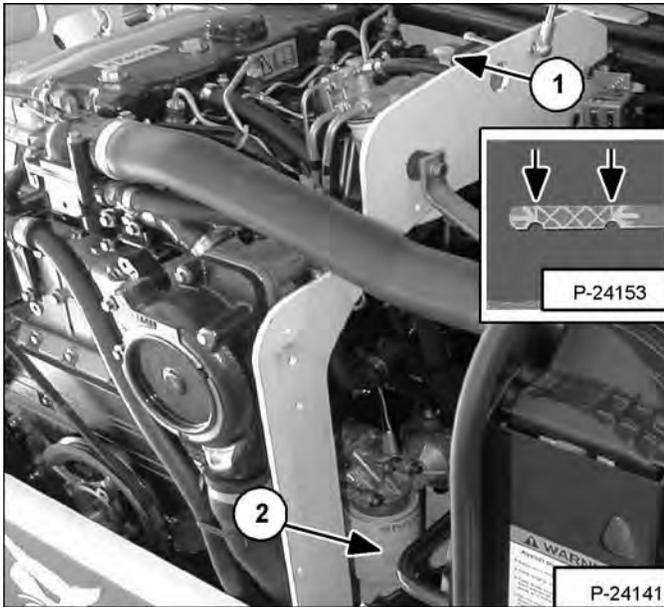


Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W-2103-1285

Check the engine oil level every day before starting the engine for the work shift.

Figure 10-90-1

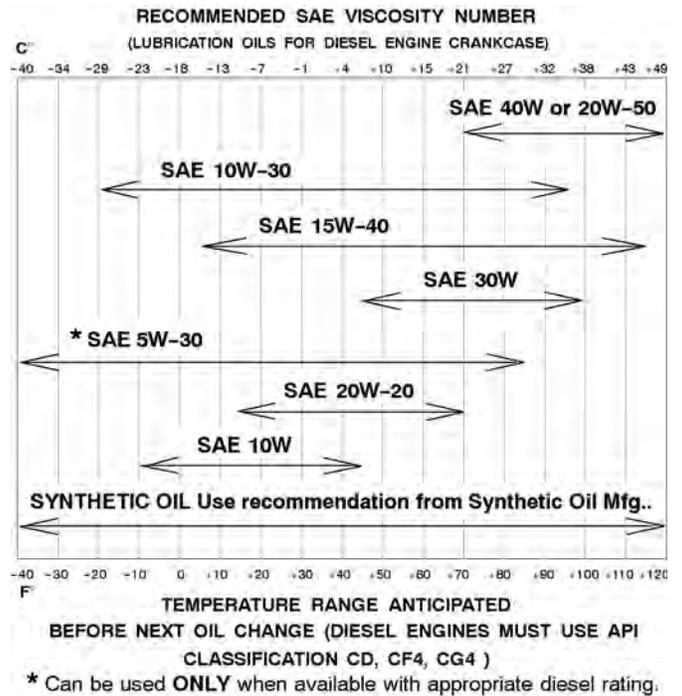


Open the engine cover and remove the dipstick (Item 1) [Figure 10-90-1].

Keep the oil level between the marks on the dipstick (INSET) [Figure 10-90-1].

Use a good quality motor oil that meets API Service Classification of CD or better. (See *Oil Chart* below.)

Oil Chart



Replacing Oil And Filter

See SERVICE SCHEDULE on Page 10-50-1 for the service interval for replacing the engine oil and filter.

Run the engine until it is at operating temperature. Stop the engine.

Open the engine cover.

Remove the shield.

Remove the oil filter (Item 2) [Figure 10-90-1].

Clean the filter housing surface.

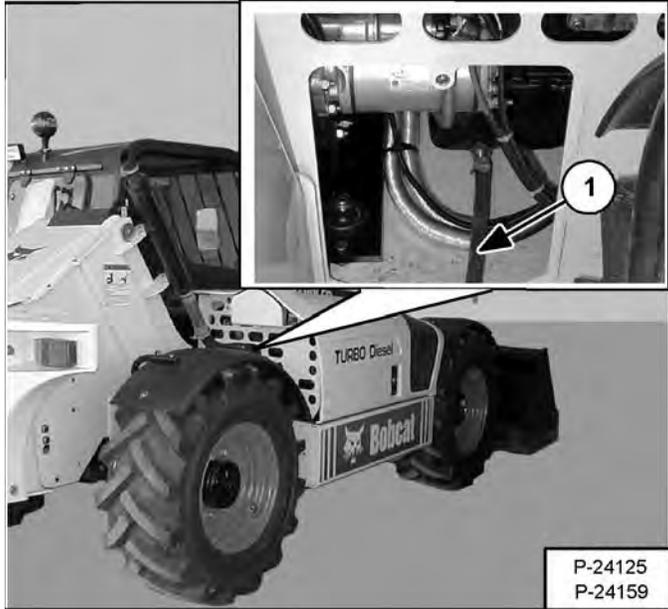
Put clean oil on the new oil filter gasket.

Install the filter and hand tighten.

ENGINE LUBRICATION SYSTEM (CONT'D)

Replacing Oil And Filter (Cont'd)

Figure 10-90-2



Remove the access panel at the rear of the engine compartment. Remove the cap and install the drain hose (Item 1) [Figure 10-90-2].

Drain the oil into a container and recycle or dispose of used oil in an environmentally safe manner.

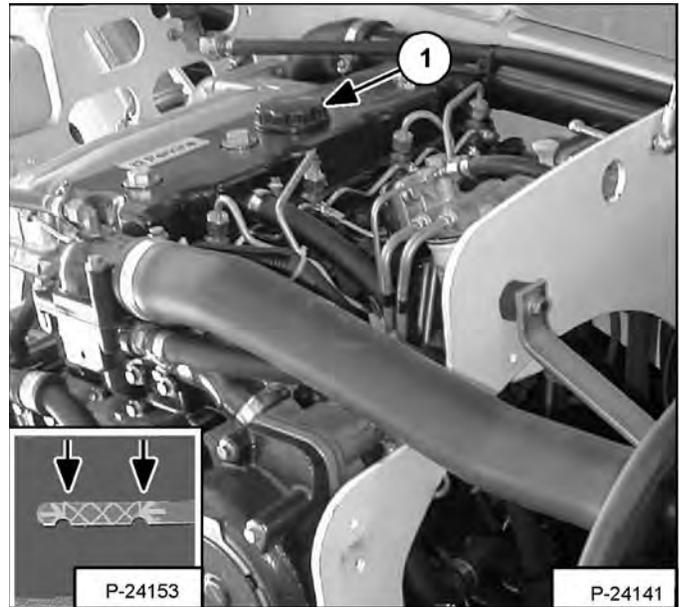
Remove drain hose and install cap.

WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W-2103-1285

Figure 10-90-3



Remove the filler cap (Item 1) [Figure 10-90-3].

Put oil in the engine. (See Capacities on Page SPEC-10-2 for Capacity).

Install fill cap.

Start the engine and let it run for several minutes.

Stop the engine.

Check for leaks at the oil filter and check the oil level.

Add oil as needed if it is not at the top mark [Figure 10-90-3] on the dipstick.

HYDRAULIC/HYDROSTATIC SYSTEM

Checking And Adding Fluid



Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in serious injury or death.

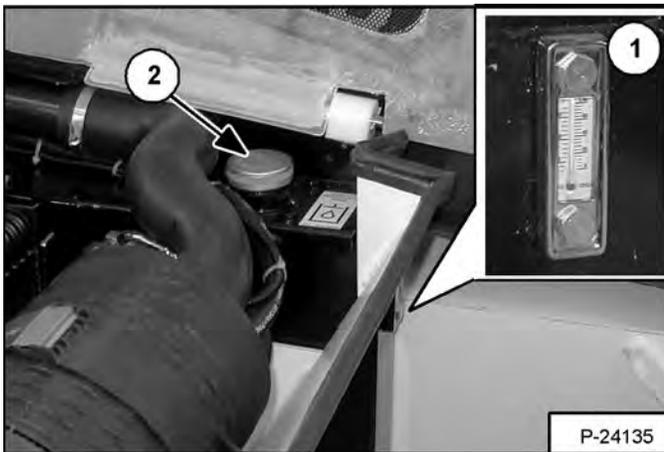
W-2103-1285

Use only recommended fluid in the hydraulic system. (See HYDRAULIC/HYDROSTATIC FLUID SPECIFICATIONS on Page SPEC-60-1.)

Stop the machine on a level surface. Lower the boom all the way.

Stop the engine.

Figure 10-100-1



Check the fluid level at the sight gauge (Item 1) [Figure 10-100-1].

Remove the fill cap (Item 2) [Figure 10-100-1].

Add the fluid as needed until visible in the center of the sight gauge [Figure 10-100-1].

Install the fill cap.

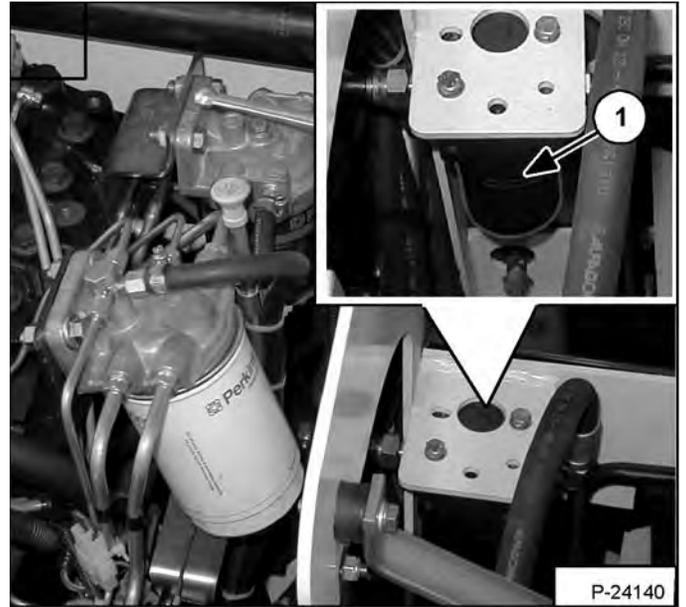
Replacing Hydraulic/Hydrostatic Filter

See SERVICE SCHEDULE on Page 10-50-1 for the correct service intervals.

Open the engine cover.

Remove the belt shield.

Figure 10-100-2



Remove the filter element (Item 1) [Figure 10-100-2].

Clean the surface of the filter housing where the seal contacts the housing.

Put clean oil on the seal of the new filter element.

Install and hand tighten the filter element.

Close the engine cover before operating.



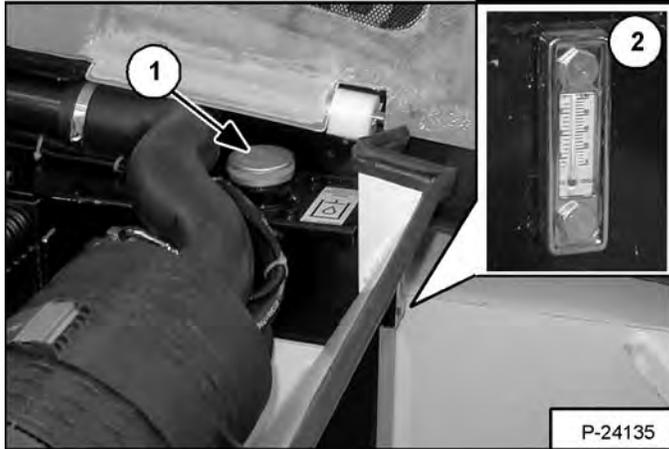
Diesel fuel or hydraulic fluid under pressure can penetrate skin or eyes, causing serious injury or death. Fluid leaks under pressure may not be visible. Use a piece of cardboard or wood to find leaks. Do not use your bare hand. Wear safety goggles. If fluid enters skin or eyes, get immediate medical attention from a physician familiar with this injury.

W-2072-0496

HYDRAULIC/HYDROSTATIC SYSTEM (CONT'D)

Replacing Hydraulic Fluid

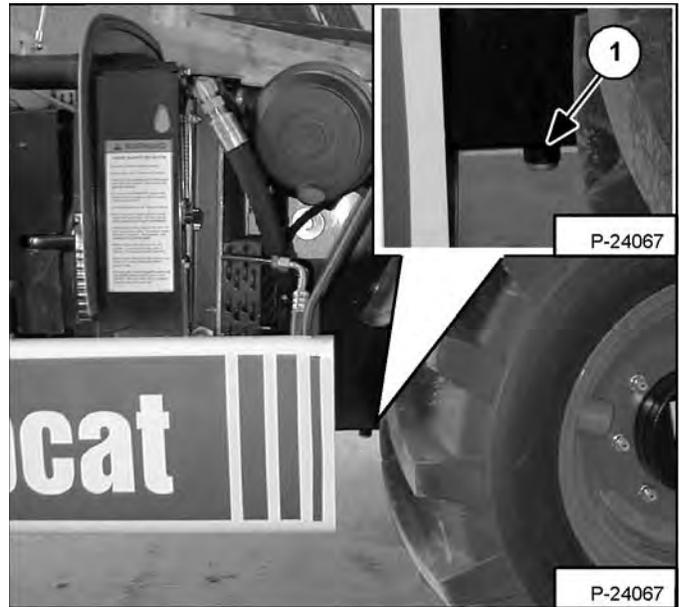
Figure 10-100-3



Open the engine cover.

Remove the fill cap (Item 1) [Figure 10-100-3].

Figure 10-100-4



Remove the reservoir drain plug (Item 1) [Figure 10-100-4] behind the right front wheel and drain the fluid into a container. Recycle or dispose of the fluid in an environmentally safe manner.

Add fluid until it is visible in the center of the sight gauge (Item 2) [Figure 10-100-3].

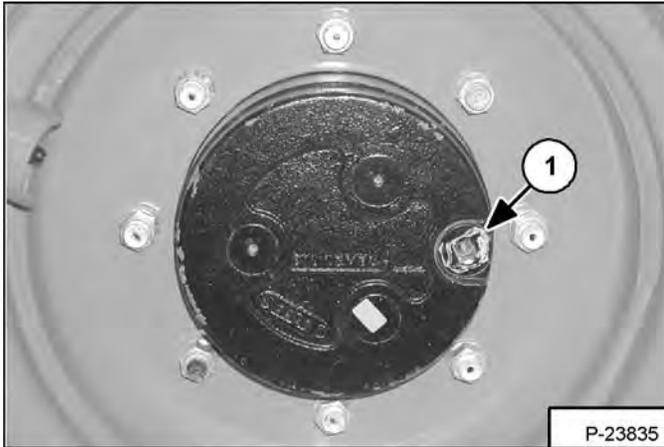
Install the fill cap.

Close the engine cover.

AXLES (FRONT AND REAR)

Checking Oil Level (Planetary Carrier)

Figure 10-110-1



Put the machine on a level surface with the plug positioned as shown (Item 1) [Figure 10-110-1].

Remove the plug (Item 1) [Figure 10-110-1]. The oil level should be at the bottom edge of the plug hole.

Add gear lube through the hole if the oil level is below the hole. (See Capacities on Page SPEC-10-2 for capacity and type.)

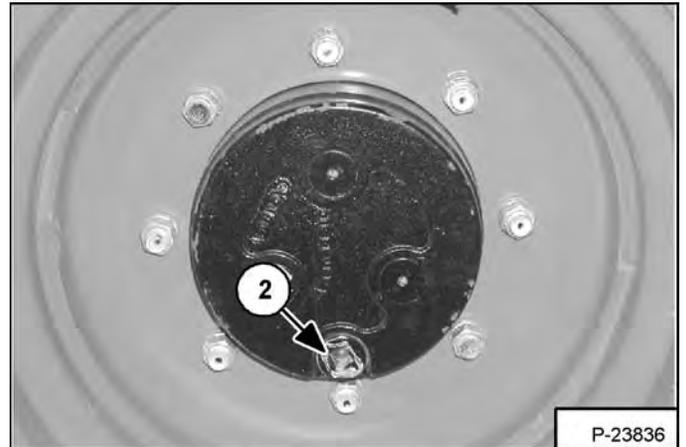
Install and tighten the plug.

Repeat the procedure for the other side.

Draining Oil (Planetary Carrier)

See SERVICE SCHEDULE on Page 10-50-1 for the correct service interval.

Figure 10-110-2



Put the machine on a level surface with the plug positioned as shown (Item 1) [Figure 10-110-2].

Remove the plug (Item 1) [Figure 10-110-2] and drain into a container. Recycle or dispose of the used lubricant in an environmentally safe manner.

Reposition the plug hole and add gear lube until the lube level is at the bottom edge of the plug hole (Item 1) [Figure 10-110-1]. (See Capacities on Page SPEC-10-2 for capacity and type.)

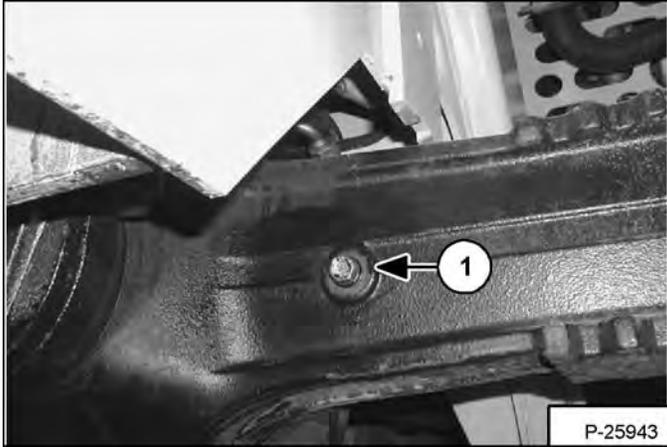
Install and tighten the plug.

Repeat the procedure for the other side.

AXLES (FRONT AND REAR) (CONT'D)

Checking Oil Level (Rear Differential)

Figure 10-110-3



With the machine on a level surface, remove the plug (Item 1) [Figure 10-110-3]. The oil level should be at the bottom edge of the plug hole.

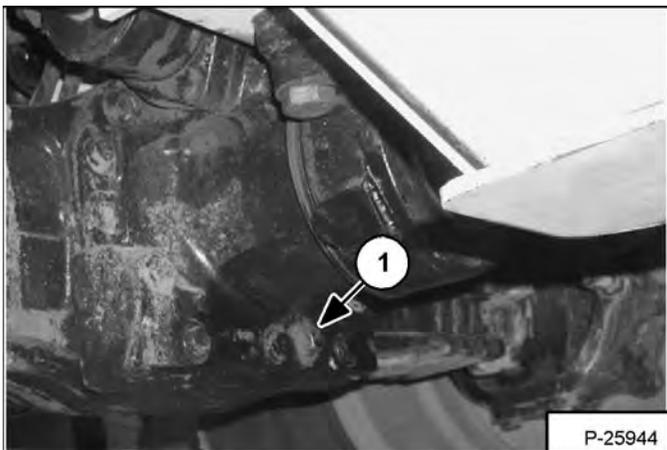
Add oil through the hole if the oil level is below the hole. (See Capacities on Page SPEC-10-2 for capacity and type.)

Install and tighten the plug.

Draining Oil (Rear Differential)

See SERVICE SCHEDULE on Page 10-50-1 for the correct service interval.

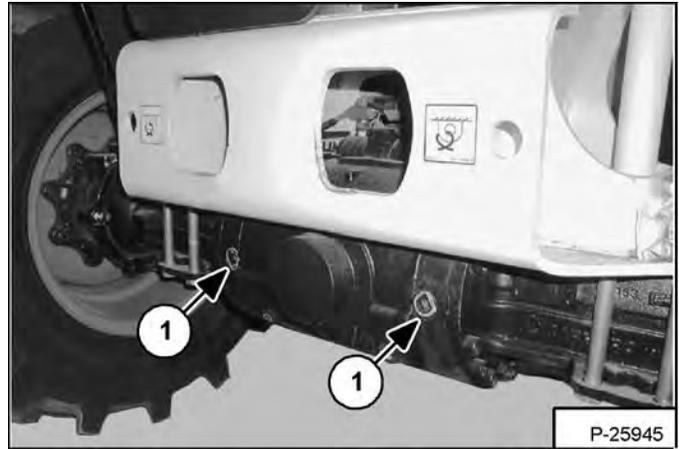
Figure 10-110-4



With the machine on a level surface remove the plug (Item 1) [Figure 10-110-4] and drain into a container. Recycle or dispose of the used lubricant in an environmentally safe manner.

Checking Oil Level (Front Differential)

Figure 10-110-5



Put the machine on a level surface with the plugs positioned as shown (Item 1) [Figure 10-110-5].

Remove the plugs (Item 1) [Figure 10-110-5]. The oil level should be at the bottom edge of the plug hole.

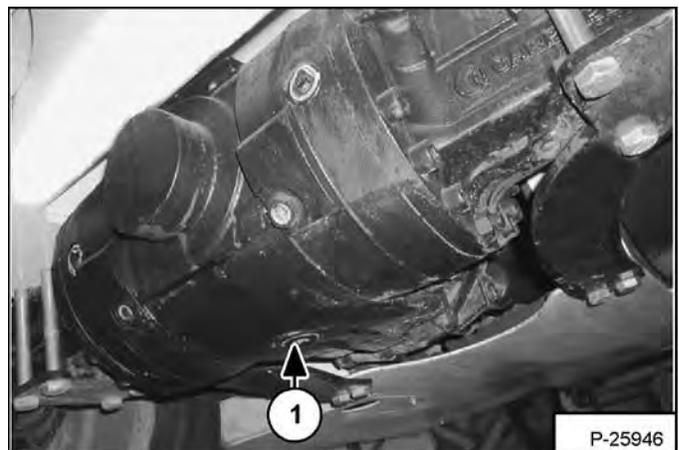
Add oil through the hole if the oil level is below the hole. (See Capacities on Page SPEC-10-2 for capacity and type.)

Install and tighten the plug.

Draining Oil (Front Differential)

See SERVICE SCHEDULE on Page 10-50-1 for the correct service interval.

Figure 10-110-6



With the machine on a level surface, remove the plug (Item 1) [Figure 10-110-6] and drain into a container. Recycle or dispose of the used lubricant in an environmentally safe manner.

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