



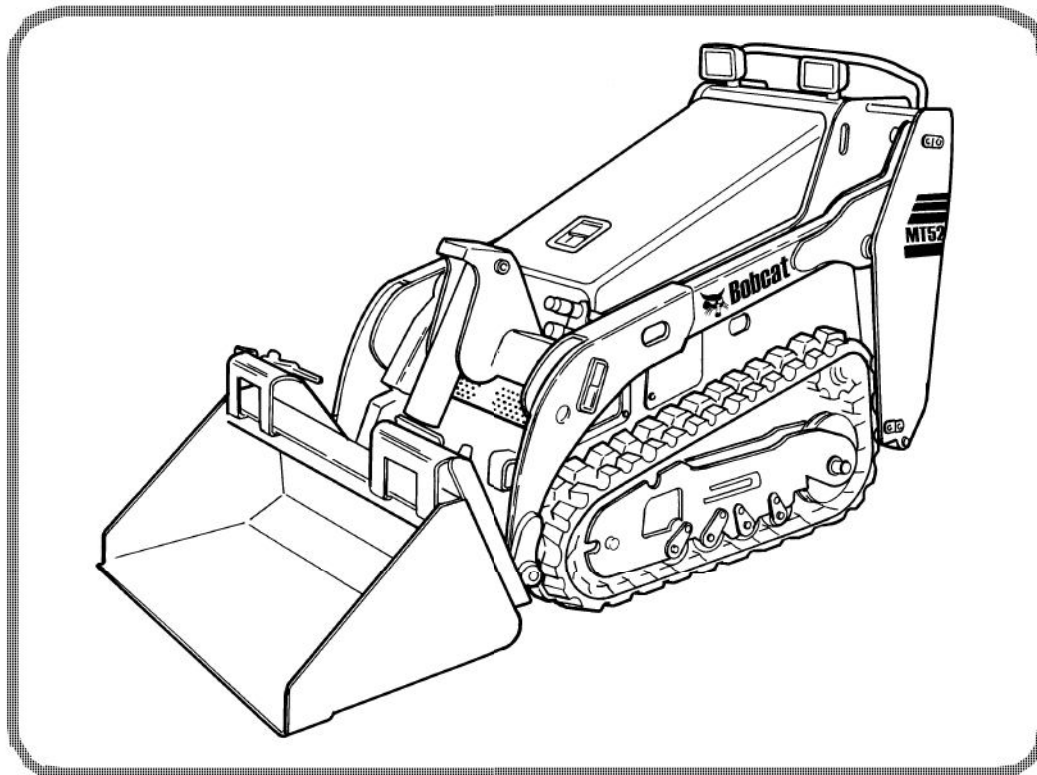
Bobcat®

Service Manual

MT52, MT55 Mini Track Loader

**MT52 - S/N A3WR11001 & Above, A3WS11001 & Above,
S/N B38R11001 & Above**

**MT55 - S/N A3WT11001 & Above, S/N A3WU11001 & Above,
S/N B38T11001 & Above, S/N B38U11001 & Above**



**EQUIPPED WITH
BOBCAT INTERLOCK
CONTROL SYSTEM (BICS™)**



MAINTENANCE SAFETY

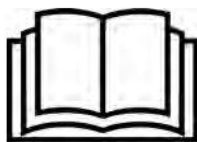


WARNING

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-2003-0807

CORRECT



P-90216

- ⚠ Never service the Bobcat Mini Track Loader 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.

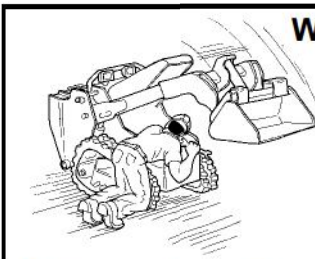
WRONG



B-23041

- ⚠ 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.

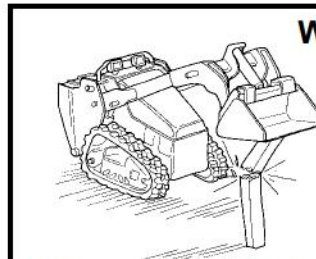
WRONG



B-23035

- ⚠ Disconnecting or loosening any hydraulic tubeline, hose, fitting, component or a part failure can cause lift arms to drop. Do not go under lift arms when raised unless supported by an approved lift arm support device. Replace it if damaged.

WRONG



B-23036

- ⚠ Never work on loader with lift arms up unless lift arms are held by an approved lift arm support device. Replace if damaged.
- ⚠ Never modify equipment or add attachments not approved by Bobcat Company.

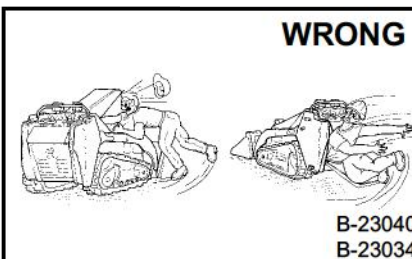
WRONG



B-23039

- ⚠ Stop, cool and clean engine of flammable materials before checking fluids.
- ⚠ Never service or adjust loader with the engine running unless instructed to do so in the manual.
- ⚠ Avoid contact with leaking hydraulic fluid or diesel fuel under pressure. It can penetrate the skin or eyes.
- ⚠ Never fill fuel tank with engine running, while smoking or when near open flame.

WRONG



B-23040
B-23034

- ⚠ 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.
- ⚠ Keep rear door closed except for service. Close and latch door before operating the loader.

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. The Service Safety Training Course is available from your Bobcat dealer.

MSW29-0409

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Hello dear friend!

Thank you very much for reading.

Enter the link into your browser.

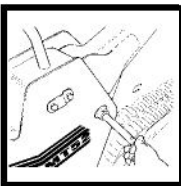


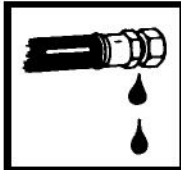



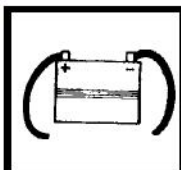

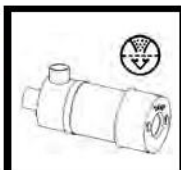
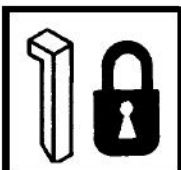
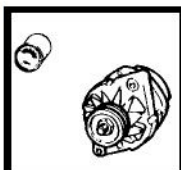
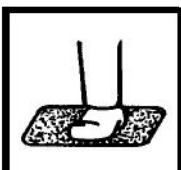
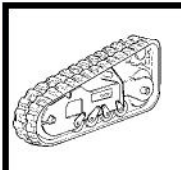


The full manual is available for immediate download.

<https://www.ebooklibonline.com>

FOREWORD

This manual is for the Bobcat mini loader mechanic. It provides necessary servicing and adjustment procedures for the Bobcat mini loader 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 loader has had service or repair:

- | | | | |
|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
| 1. Check lift arm support device, replace if damaged. (Stored Position) |  | 9. Check hydraulic fluid level, engine oil level and fuel supply. |  |
| 2. Machine signs (decals) must be legible and in the correct location. |  | 10. Inspect for fuel, oil or hydraulic fluid leaks. |  |
| 3. Controls must return to neutral. |  | 11. Lubricate the mini loader. |  |
| 4. Check for correct function of the optional work lights. |  | 12. Check the condition of the battery and cables. |  |
| 5. The parking brake must function correctly. |  | 13. Inspect the air cleaner for damage or leaks. Check the condition of the element. |  |
| 6. Bob-Tach wedges and linkages must function correctly and be in good condition. |  | 14. Check the electrical charging system. |  |
| 7. Safety treads must be in good condition on the optional platform. |  | 15. Check tracks for wear and tension. Use only approved tracks. |  |
| 8. Check for correct function of indicator lamps. |  | 16. Inspect for loose or broken parts or connections. |  |

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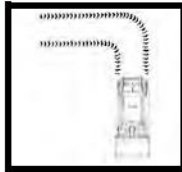
17. Check for any field modification not completed.



20. Check function or condition of all equipped options and accessories (examples: ride-on platform, shutdown kit, attachment control kit, light kit, etc.).



18. Operate the machine and check all functions.



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



19. Check for correct function of lift/tilt lockouts, neutral start interlocks and reverse stop panel.



**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.

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 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-2408-0801

IMPORTANT

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

I-2019-0284



DANGER

The signal word DANGER on the machine and in the manuals indicates a hazardous situation which, if not avoided, will result in death or serious injury.

D-1002-1107



WARNING

The signal word WARNING on the machine and in the manuals indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

W-2044-1107

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.
- The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop-type service and repair work.
- The Mini Loader Safety Video is available from your Bobcat dealer or at www.training.bobcat.com or www.bobcat.com.

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SI ML-0913 SM

FIRE PREVENTION



Maintenance

The machine and some attachments have components that are at high temperatures 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 can cause a fire hazard. Clean often to avoid this accumulation. Flammable debris in the engine compartment is a potential fire hazard.

The operator's area, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent fire hazards and overheating.

All fuels, most lubricants and some coolants mixtures are flammable. Flammable fluids that are leaking or spilled onto hot surfaces or onto electrical components can cause a fire.

Operation

Do not use the machine where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.

Electrical



Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part or wires that are loose or frayed.

Battery gas can explode and cause serious injury. Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting. Do not jump start or charge a frozen or damaged battery. Keep any open flames or sparks away from batteries. Do not smoke in battery charging area.

Hydraulic System

Check hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Hydraulic tubes and hoses must be properly routed and have adequate support and secure clamps. 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.

Fueling



Stop the engine and let it cool before adding fuel. No smoking! Do not refuel a machine near open flames or sparks. Fill the fuel tank outdoors.

Ultra Low Sulfur Diesel (ULSD) poses a greater static ignition hazard than earlier diesel formulations with higher Sulfur content. Avoid death or serious injury from fire or explosion. Consult with your fuel or fuel system supplier to ensure the delivery system is in compliance with fueling standards for proper grounding and bonding practices.

Starting

Do not use ether or starting fluids on any engine that has glow plugs. These starting aids can cause explosion and injure you or bystanders.

Use the procedure in the Operation & Maintenance Manual for connecting the battery and for jump starting.

Spark Arrester Exhaust System

The spark arrester exhaust system 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.

Check the spark arrester exhaust system regularly to make sure it is maintained and working properly. Use the procedure in the Operation & Maintenance Manual for cleaning the spark arrester muffler (if equipped).

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SI ML-0913 SM

FIRE PREVENTION (CONT'D)

Welding And Grinding

Always clean the machine and attachment, disconnect the battery, and disconnect the wiring from the Bobcat 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 dust mask when grinding painted parts. Toxic dust or gas can be produced.

Dust generated from repairing nonmetallic parts such as hoods, fenders or covers can be flammable or explosive. Repair such components in a well ventilated area away from open flames or sparks.

Fire Extinguishers



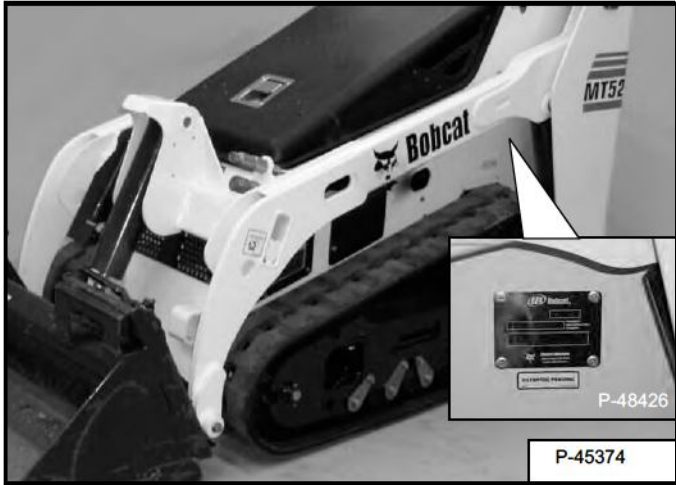
Know where fire extinguishers and first aid kits are located and how to use them. Inspect the fire extinguisher and service the fire extinguisher regularly. Obey the recommendations on the instructions plate.

SERIAL NUMBER LOCATION

Always use the serial number of the loader 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.

Loader Serial Number

Figure 1



The loader serial number plate is located on the loader frame as shown [Figure 1].

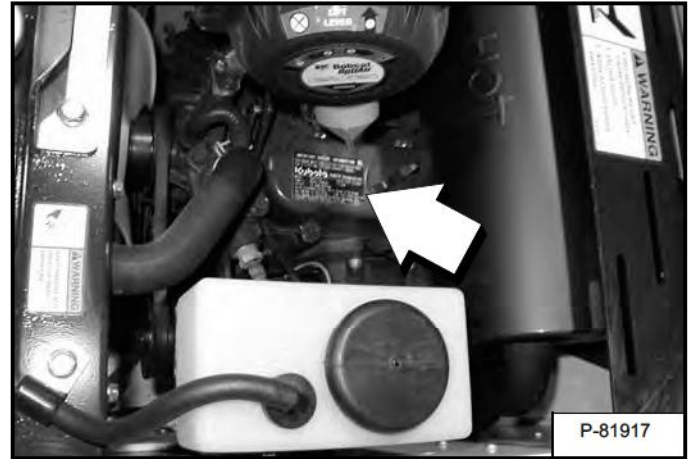
Explanation of loader Serial Number:

XXXX	XXXXX
Model 1.-Model / Engine Combination	Model 2.-Production Sequence (Series)

1. The four digit Model / Engine Combination Module number identifies the model number and engine combination.
2. The five digit Production Sequence Number identifies the order which the loader is produced.

Engine Serial Number

Figure 2



The engine serial number is located on the valve cover of the engine [Figure 2].

DELIVERY REPORT

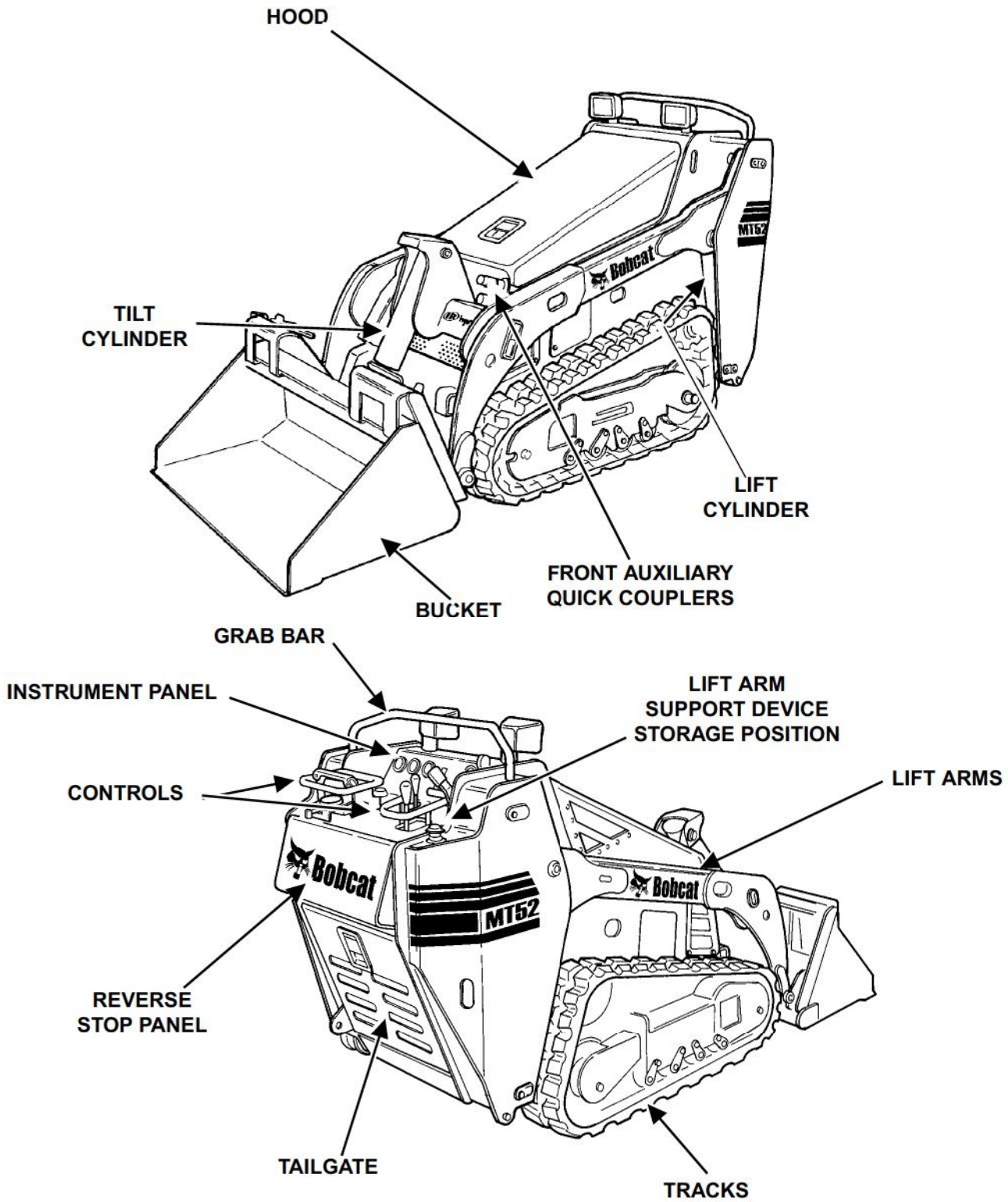
Figure 3

The delivery report [Figure 3] contains a list of items that must be explained or shown to the owner or operator by the dealer when the Bobcat mini loader is delivered.

The delivery report must be reviewed and signed by the owner or operator and the dealer.

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MINI LOADER IDENTIFICATION



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B-19984
B-23782

BUCKET - A bucket and other attachments are available for the Bobcat Mini Loader.

SAFETY AND MAINTENANCE

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LIFTING AND BLOCKING THE MINI LOADER

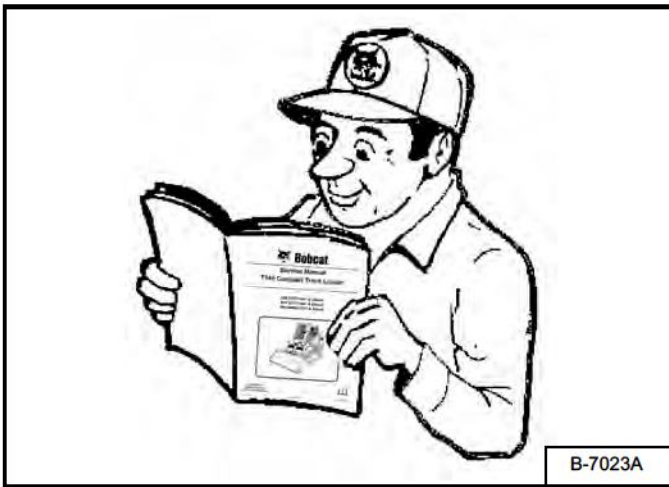
Procedure

! WARNING

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.

W-2408-0801

Figure 10-10-1



Read the Removal And Installation, Disassembly And Assembly, etc. completely to become familiar with the procedure before beginning [Figure 10-10-1].

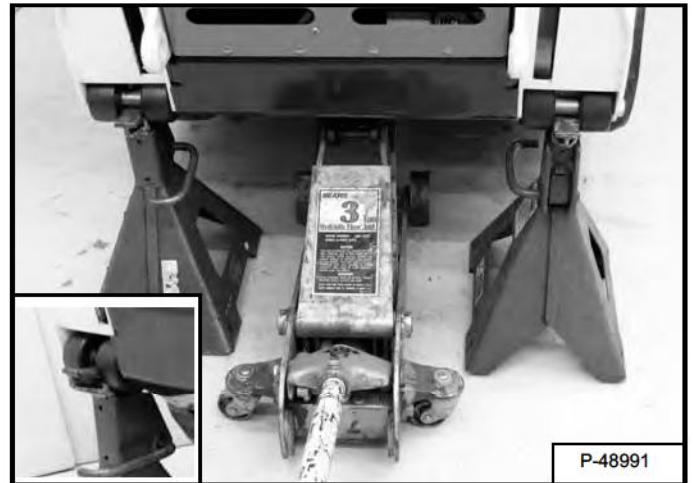
Always park the loader on a level surface.

! WARNING

When the engine is running during service, the steering control lever and hydraulic control levers must be in NEUTRAL and the parking engaged.

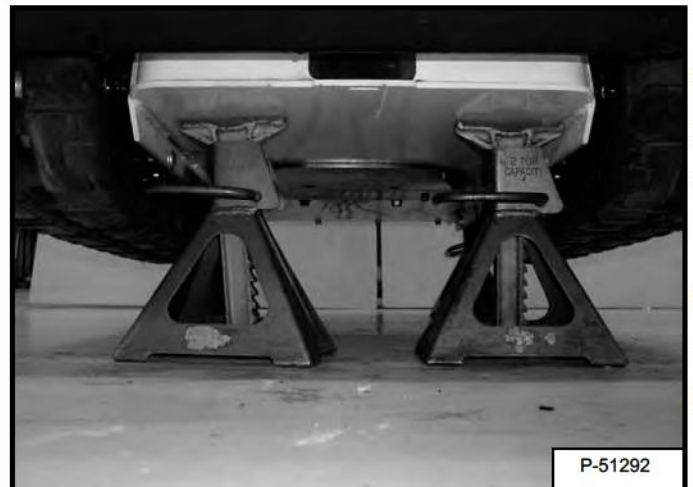
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Figure 10-10-2



Raise the rear of the machine and put jackstands under the rear roller wheels (Inset) [Figure 10-10-2]. Be sure the jackstands do not touch the tracks. Lower the machine to the jackstands.

Figure 10-10-3



Raise the front of the machine and put jackstands under the front of the frame. [Figure 10-10-3]. Lower the machine to the jackstands.

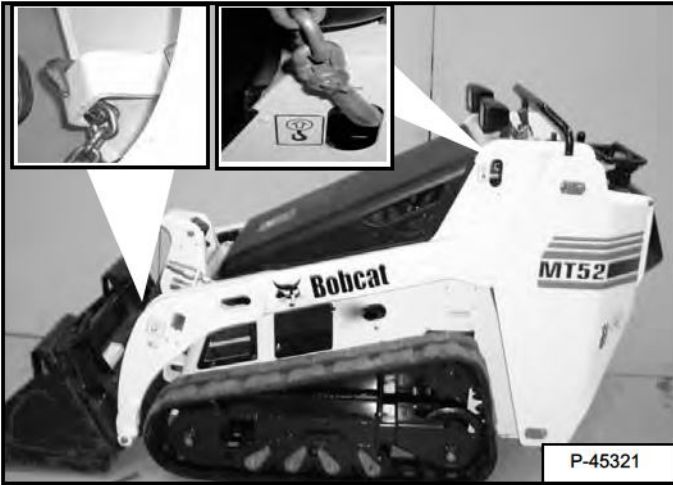
NOTE: Make sure the jackstands do not touch the tracks.

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LIFTING AND BLOCKING THE MINI LOADER (CONT'D)

Four Point Lift

Figure 10-10-4



The loader can be lifted using four attachment points; two at the lower front of the loader frame and two at the upper end of the uprights [Figure 10-10-4].

Be sure the lifting devices are of adequate strength to lift the loader. (See (MT52) MINI LOADER SPECIFICATIONS on Page SPEC-10-1.) **OR** (See (MT55) MINI LOADER SPECIFICATIONS on Page SPEC-11-1.)

LIFT ARM SUPPORT DEVICE

Installing

WARNING

Never work on a machine with the lift arms up unless the lift arms are secured by an approved lift arm support device. Failure to use an approved lift arm support device can allow the lift arms or attachment to fall and cause injury or death.

W-2059-0598

WARNING

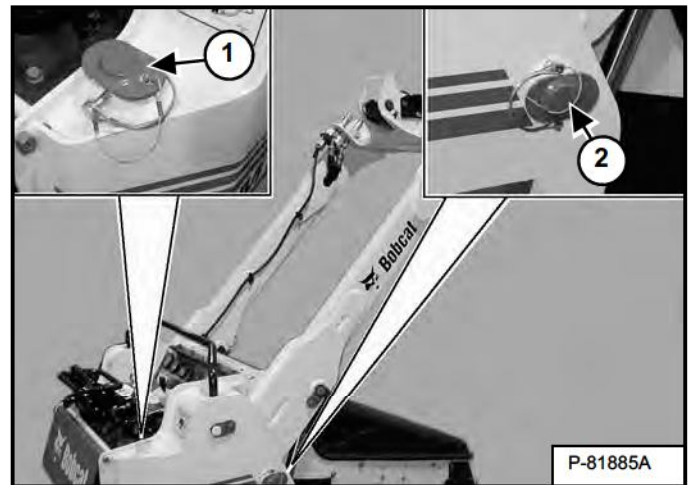
Repair the support device if damaged or if parts are missing. Using a damaged support device or with missing parts can cause lift arms or boom to fall causing serious injury or death.

W-2271-1007

Put the mini loader on a flat, level surface.

Remove any attachment from the mini loader.

Figure 10-20-1



Remove the retainer pin and remove the lift arm support device (Item 1) [Figure 10-20-1] from the storage position.

Start the engine, and raise the lift arms all the way up.

Install the lift arm support device (Item 2) [Figure 10-20-1] into the machine frame bushings and secure with retainer pin.

Slowly lower the lift arms until movement stops.

Stop the engine.

Removing

Start the engine and raise the lift arms off the lift arm support device.

Remove the retainer pin (Item 1) and remove the lift arm support device (Item 2) [Figure 10-20-1].

Lower the lift arms and stop the engine.

Return the lift arm support device to the storage location.

Install the retainer pin to secure the lift arm support device.

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TRANSPORTING THE MINI LOADER ON A TRAILER

Loading And Unloading



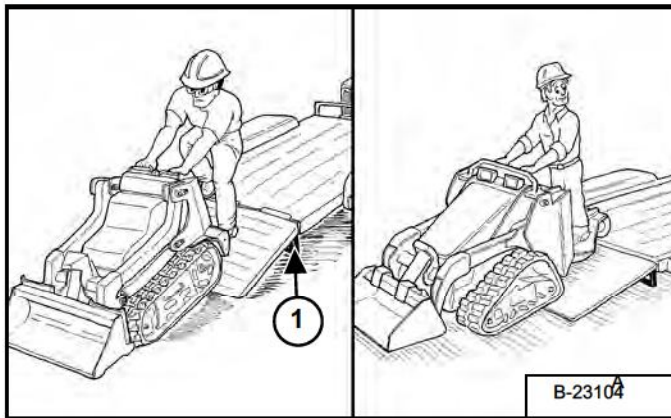
AVOID SERIOUS INJURY OR DEATH

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-2058-0807

Be sure the trailer or vehicle and ramps are of adequate size and capacity. (See Performance on Page SPEC-10-2.)

Figure 10-30-1



A mini loader with an empty bucket or no attachment must be loaded backward onto the transport vehicle [Figure 10-30-1].

Use a full width ramp when loading a machine with Ride-On Platform [Figure 10-30-1]. The platform will pivot as you move up the ramp.

NOTE: Do not load the machine on a trailer with the Ride-On Platform installed unless you have a full width ramp. Remove the platform if a full with ramp is not available.

When using adjustable ramps, be sure the ramp width and spacing adequately covers the tread width. Do not attempt to mount ramps that are spaced too wide or too narrow.

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

Fastening

Figure 10-30-2



Fasten the mini loader to the transport vehicle to prevent the it from moving during sudden stops or when going up or down slopes [Figure 10-30-2].

- Lower the bucket or attachment fully.
- Stop the engine.
- Install chains at the front and rear tie down positions [Figure 10-30-2]. (Both sides)
- Fasten each end of the chain to the transport vehicle.
- Use load binders to tighten the chains.

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TOWING THE MINI LOADER

Procedure

Because of the design of the mini loader, there is not a recommended towing procedure.

- The mini loader can be lifted onto a transport vehicle.
- The mini loader can be skidded a short distance to move for service (EXAMPLE: Move onto a transport vehicle.) without damage to the hydrostatic system. (The tracks will not turn.) There might be slight wear to the tracks when the mini loader is skidded.

The towing chain (or cable) must be rated at 1.5 times the weight of the mini loader. (See Performance on Page SPEC-10-2.)

SERVICE SCHEDULE

Maintenance Intervals

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 mini loader.



WARNING

AVOID INJURY OR DEATH

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W-2003-0807

Every 10 Hours (Before Starting The Mini Loader)

- **Engine Oil** - Check level and add as needed.
- **Engine Air Filters and Air System** - Check air filter condition indicator. Service filters only when required. Check for leaks and damaged components.
- **Engine Cooling System** - Clean debris from radiator and oil cooler areas. Check coolant level COLD and add premixed coolant as needed.
- **Fuel Filter** - Drain water and sediment from filter.
- **Hydraulic Fluid** - Check fluid level and add as needed. Do not over fill.
- **Lift Arms, Cylinders, Bob-Tach, Pivot Pins, Wedges, Rollers And Idlers** - Lubricate with multipurpose lithium based grease.
- **Reverse Stop Panel, Neutral Start Interlocks, and Lift / Tilt Lockouts Systems** - Check for correct function. Clean dirt and debris from moving parts.
- **Parking Brake** - Check for proper function.
- **Indicators and Lights** - Check for function. Clean or repair as needed.
- **Safety Signs** - Check for damaged signs (decals). Replace any signs that are damaged.
- **Continuous Flow Shutoff Lever** - Check for proper function.

Every 50 Hours

- **Hydraulic Hoses and Tubelines** - Check for damage and leaks. Repair or replace as needed.
- **Controls** - Check for correct operation. Adjust, repair or replace as needed.
- **Undercarriage** - Check for loose bolts and nuts.
- **Track Tension** - Check every 8 - 10 hours for the first 50 hours, then as scheduled. Check tension and adjust as needed.

Every 100 Hours

- **Engine Oil and Filter** - Service at first 50 hours, then as scheduled. Replace oil and filter.
- **Battery** - Check battery for damage. Check hoedowns, cables, connections, and electrolyte level; add distilled water as needed.
- **Drive Belts (Alternator / Water Pump / Fan Drive)** - Check condition. Replace as needed.
- **Spark Arrestor Muffler** - Clean spark chamber.

Every 250 Hours Or Every 12 Months

- **Fuel Filter** - Replace filter.
- **Lift Arm Lockout** - Check function of manual bypass control.

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SERVICE SCHEDULE (CONT'D)

Maintenance Intervals (Cont'd)

Every 500 Hours Or Every 12 Months

- **Hydraulic Filter and Hydraulic Reservoir Breather Cap** - Service filter at first 50 hours, then as scheduled. Replace the hydraulic filter and the reservoir breather cap.
- **Drive Belt (Hydrostatic)** - Check condition. Adjust or replace as needed.
- **Alternator and Starter** - Service at first 50 hours, then as scheduled. Check connections.

Every 1000 Hours Or Every 12 Months

- **Engine Valves** - Service at first 500 hours, then as scheduled. Adjust the engine valve clearance.
- **Hydraulic Fluid and Filters** - Replace hydraulic fluid and filters.

Every 24 Months

- **Coolant** - Replace the coolant.

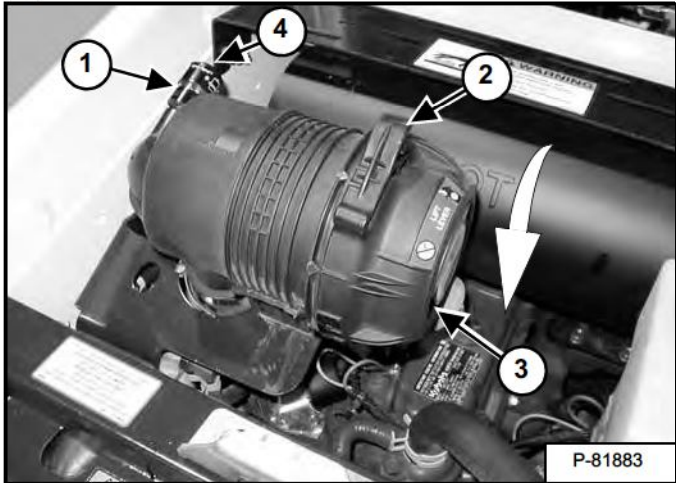
AIR CLEANER SERVICE

Replacing Filter Elements

It is important to change the air filter element at regular intervals.

For the correct interval (See SERVICE SCHEDULE on Page 10-50-1.)

Figure 10-60-1



Replace the Outer Filter only when the red ring shows in the condition indicator window (Item 1) [Figure 10-60-1].

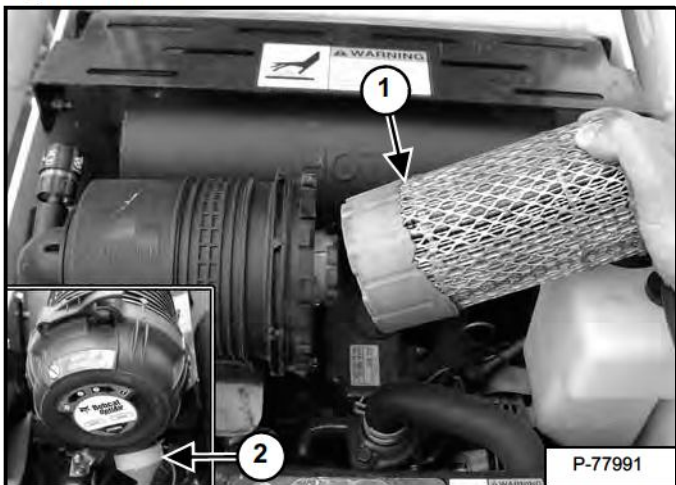
Replace the inner filter every third time the outer filter is replaced or as indicated below.

Outer Filter

Pull up on the locking lever (Item 2) [Figure 10-60-1] and hold while turning the dust cover (Item 3) [Figure 10-60-1] counterclockwise.

Remove and clean the dust cover.

Figure 10-60-2



Remove the outer filter element (Item 1) [Figure 10-60-2].

NOTE: Make sure all sealing surfaces are free of dirt and debris. Do not use air pressure to clean.

Install a new outer filter element.

Install the dust cover. Be sure the air cleaner valve (Item 2) [Figure 10-60-2] is down. Turn the dust cover clockwise and engage the locking lever.

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

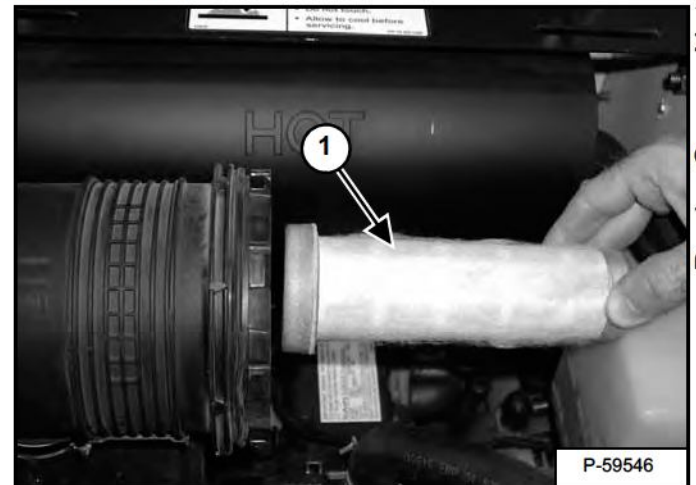
Press the button (Item 4) [Figure 10-60-1] to remove the red ring on the condition indicator.

Inner Filter

Only replace the inner filter under the following conditions:

- Replace the inner filter every *third* time the outer filter is replaced.
- After the outer filter has been replaced, press the button (Item 4) [Figure 10-60-1] on the top of the condition indicator and start the engine. Run at full rpm, then reduce engine speed and stop the engine. If the red ring shows in the condition indicator, replace the inner filter.

Figure 10-60-3



Remove the dust cover, outer filter and inner filter.

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

Install the new inner filter (Item 1) [Figure 10-60-3].

Install the outer filter.

Install the dust cover. Be sure the air cleaner valve (Item 2) [Figure 10-60-2] is down. Turn cover clockwise 1/8 turn to engage the latch.

Press the button (Item 4) [Figure 10-60-1] on the condition indicator to remove the red ring.

ENGINE COOLING SYSTEM

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

Cleaning

Open the hood [Figure 10-70-2].

Figure 10-70-1



Remove screen covers (Item 1) [Figure 10-70-1] from both sides of the machine.

Use low air pressure or water pressure to clean the radiator through the side screens.

Install screen covers.

Close and latch the hood.

WARNING

AVOID INJURY OR DEATH

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.

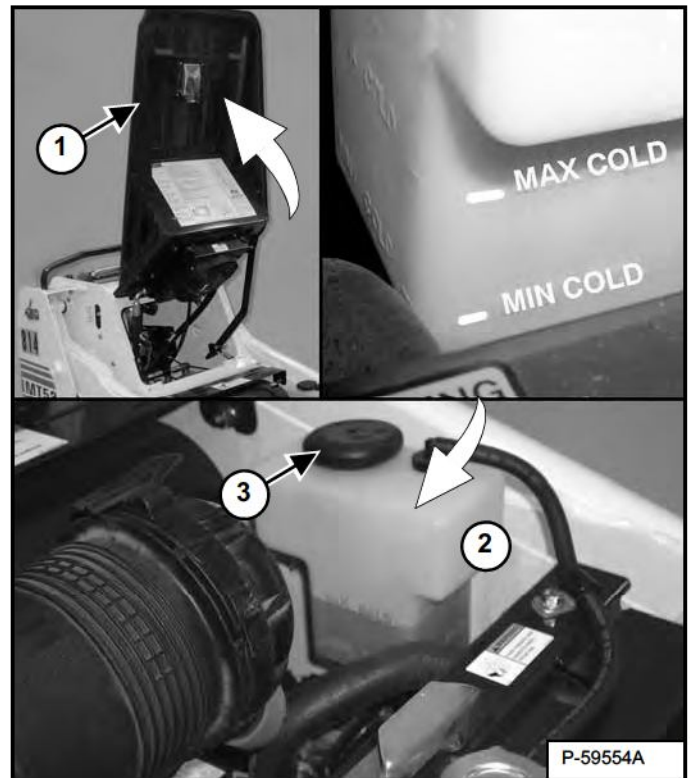
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Checking Level

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

Make sure the engine is cool.

Figure 10-70-2



Raise the hood (Item 1) [Figure 10-70-2].

Check coolant level in the recovery tank (Item 2) [Figure 10-70-2].

Remove the cap (Item 3) [Figure 10-70-2] from the recovery tank.

Add premixed coolant to the recovery tank until it is at the MAX level.

IMPORTANT

AVOID ENGINE DAMAGE

Always use the correct ratio of water to antifreeze.

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.

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ENGINE COOLING SYSTEM (CONT'D)

Removing And Replacing Coolant

Raise the hood.

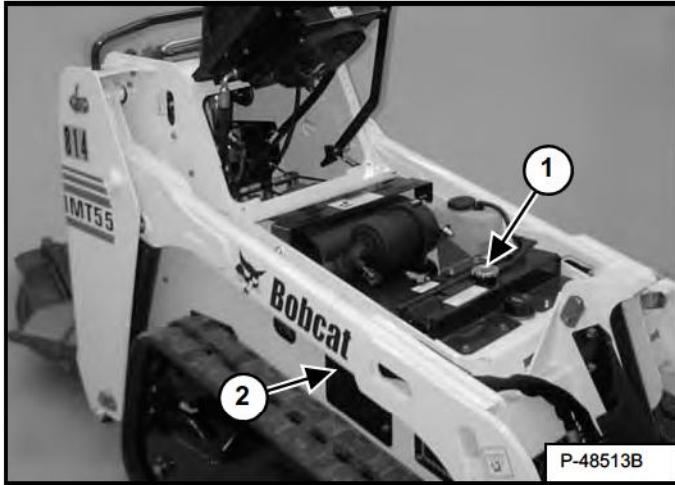
WARNING

AVOID BURNS

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

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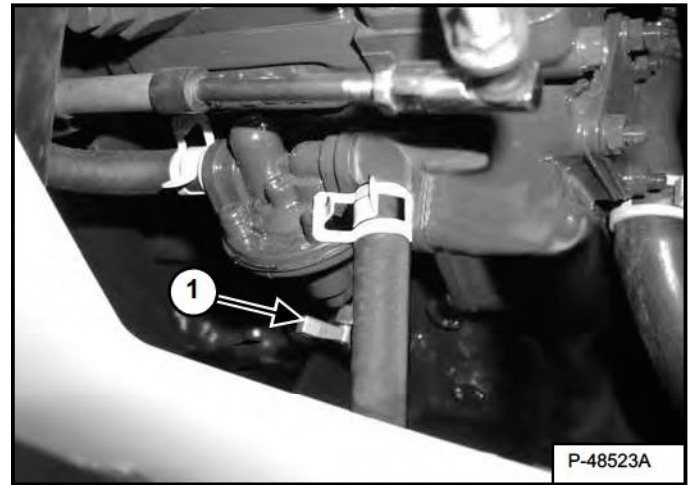
Figure 10-70-3



Remove the radiator cap (Item 1) [Figure 10-70-3] when the engine is cool.

Loosen the thumb nut and turn the access cover (Item 2) [Figure 10-70-3] open.

Figure 10-70-4



Connect a hose to the engine block drain valve (Item 1) [Figure 10-70-4] on the right side of the engine.

Open the valve and drain the coolant into a container. After the coolant is removed, close the drain valve and remove the hose.

Recycle or dispose of coolant in an environmentally safe manner.

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

Mix new coolant in a separate container. (See Capacities on Page SPEC-10-3.)

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 (47% water and 53% propylene glycol) to provide a -37° C (-34° F) freeze protection.

Add premixed coolant, to the radiator. Install the radiator cap.

Add premixed coolant to the coolant recovery tank. (See Checking Level on Page 10-70-1.) and read **IMPORTANT**.

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

Run the engine until it is at operating temperature. Stop the engine. Check the coolant level when cool. Add coolant as needed.

Close the hood.

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 during cold temperatures:

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

At a minimum, low sulfur diesel fuel must be used in this machine. Low sulfur is defined as 500 mg/kg (500 ppm) sulfur maximum.

The following fuels may also be used in this machine:

- Ultra low sulfur diesel fuel. Ultra low sulfur is defined as 15 mg/kg (15 ppm) sulfur maximum.
- Biodiesel Blend Fuel - Must contain no more than five percent biodiesel mixed with low sulfur or ultra low sulfur petroleum based diesel. This is commonly marketed as B5 blended diesel fuel. B5 blended diesel fuel must meet ASTM D975 (US Standard) or EN590 (EU Standard) specifications.

Biodiesel Blend Fuel

Biodiesel blend fuel has unique qualities that should be considered before using in this machine:

- Cold weather conditions can lead to plugged fuel system components and hard starting.
- Biodiesel blend fuel is an excellent medium for microbial growth and contamination which can cause corrosion and plugging of fuel system components.
- Use of biodiesel blend fuel may result in premature failure of fuel system components, such as plugged fuel filters and deteriorated fuel lines.
- Shorter maintenance intervals may be required, such as cleaning the fuel system and replacing fuel filters and fuel lines.
- Using biodiesel blended fuels containing more than five percent biodiesel can affect engine life and cause deterioration of hoses, tubelines, injectors, injector pump and seals.

Apply the following guidelines if biodiesel blend fuel is used:

- Ensure the fuel tank is as full as possible at all times to prevent moisture from collecting in the fuel tank.
- Ensure that the fuel tank cap is securely tightened.
- Biodiesel blend fuel can damage painted surfaces, remove all spilled fuel from painted surfaces immediately.
- Drain all water from the fuel filter daily before operating the machine.
- Do not exceed engine oil change interval. Extended oil change intervals can cause engine damage.
- Before vehicle storage; drain the fuel tank, refill with 100% petroleum diesel fuel, add fuel stabilizer and run the engine for at least 30 minutes.

NOTE: Biodiesel blend fuel does not have long term stability and should not be stored for more than three months.

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FUEL SYSTEM (CONT'D)

Filling The Fuel Tank

⚠ WARNING

AVOID INJURY OR DEATH

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.

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⚠ WARNING

AVOID INJURY OR DEATH

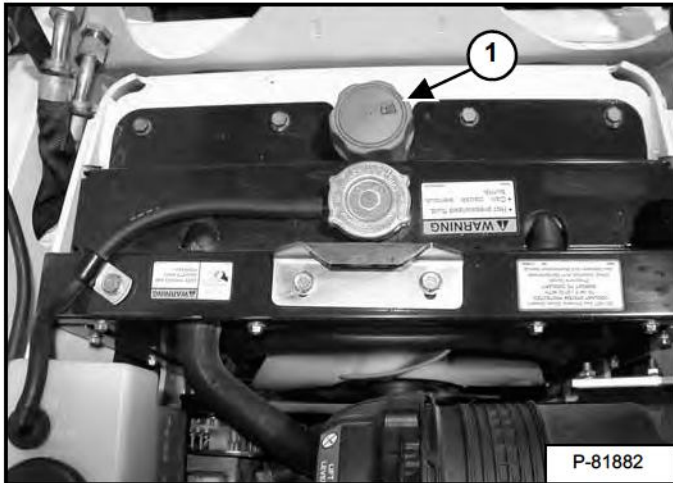
Stop and cool the engine before adding fuel. **NO SMOKING!** Failure to obey warnings can cause an explosion or fire.

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Be sure engine is cool, then open the hood.

NOTE: Lift arms must be lowered, or fully raised with lift arm support device installed before opening the hood.

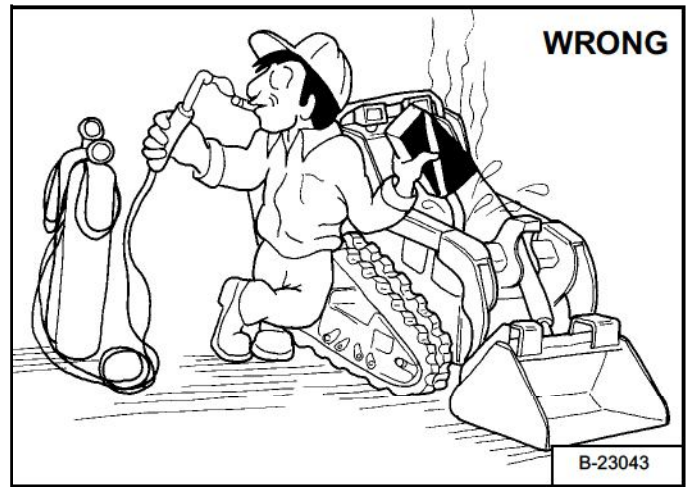
Figure 10-80-1



Open the hood.

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

Figure 10-80-2



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!** [Figure 10-80-2].

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

Close and latch hood.

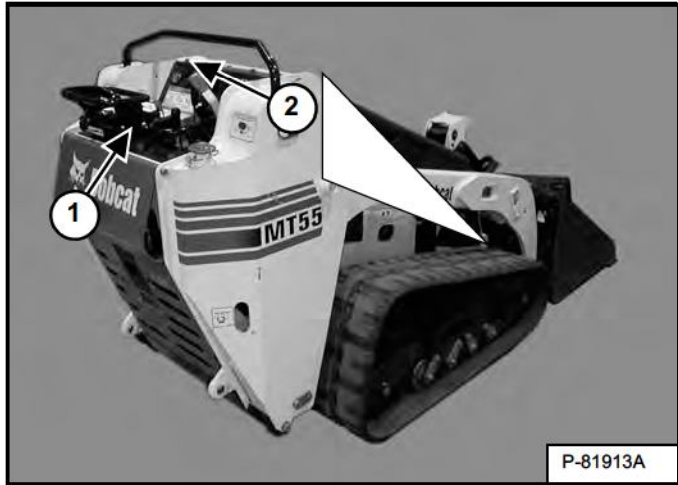
FUEL SYSTEM (CONT'D)

Fuel Filter

For the service interval for removing water from, or replacing the fuel filter. (See SERVICE SCHEDULE on Page 10-50-1.)

Removing Water

Figure 10-80-3



Loosen the thumb nut and open the access cover on the right side of the machine [Figure 10-80-3].

Loosen the drain (Item 1) [Figure 10-80-3] at the bottom of the filter to remove water from the filter. Tighten the drain.

Replacing Element

Remove the filter element (Item 2) [Figure 10-80-3].

Clean the area around the filter housing. Put clean oil on the seal of the new filter element. Install the fuel filter element and hand tighten.

Remove the air from the fuel system.

Removing Air From The Fuel System

After replacing the filter or when the fuel tank has run out of fuel, the air must be removed from the fuel system before starting the engine.

! WARNING

AVOID INJURY OR DEATH

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-2072-0807

Engine and muffler must be cool before beginning.

Figure 10-80-4



Loosen the thumb nut and open the access cover on the right side of the machine [Figure 10-80-4].

Operate the hand pump (priming bulb) (Inset) [Figure 10-80-4] until the hand pump feels solid.

Start the engine. It may be necessary to operate the hand pump again to get the engine started.

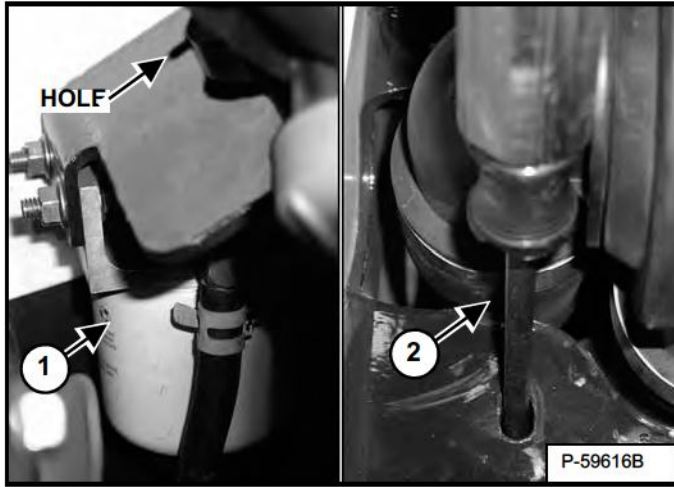
If the engine still fails to start, you might need to loosen the vent on the top of the fuel filter while cranking the engine.

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FUEL SYSTEM (CONT'D)

Removing Air From The Fuel System (Cont'd)

Figure 10-80-5



Open the hood.

The fuel filter (Item 1) [Figure 10-80-5] is located under the air cleaner mounting bracket.

Use a screwdriver (Item 2) [Figure 10-80-5] through the hole in the bracket to loosen the vent.

Crank the engine until it starts.

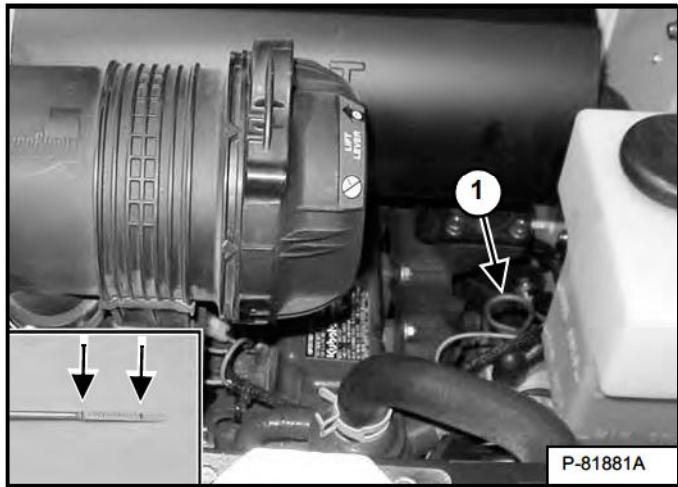
Tighten the vent and close the hood.

ENGINE LUBRICATION SYSTEM

Checking And Adding Engine Oil

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

Figure 10-90-1



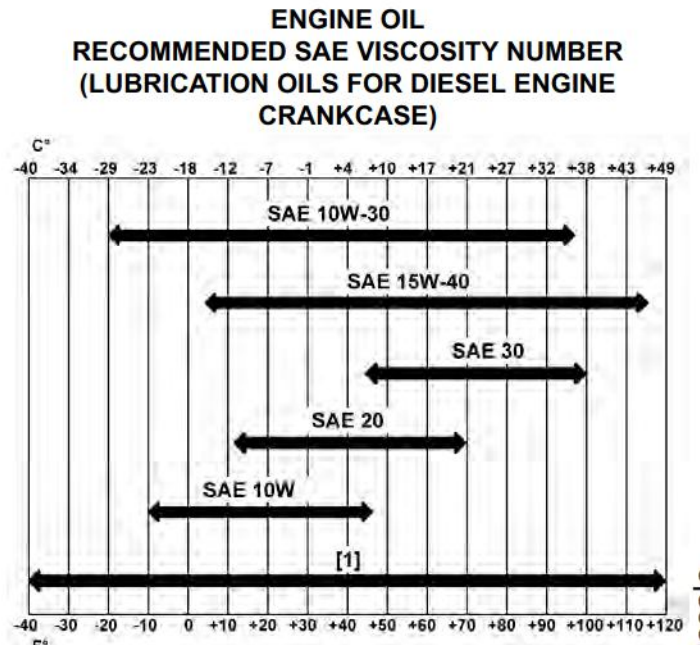
Open the engine cover and remove the dipstick (Item 1) [Figure 10-90-1].

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

Engine Oil Chart

Install the dipstick and close the hood.

Figure 10-90-2



**TEMPERATURE RANGE ANTICIPATED BEFORE
NEXT OIL CHANGE (DIESEL ENGINES MUST USE API
CLASSIFICATION CI-4 OR BETTER)**

[1] Synthetic Oil - Use recommendation from Synthetic Oil Manufacturer.

Use good quality engine oil that meets API Service Classification of CI-4 or better [Figure 10-90-2].

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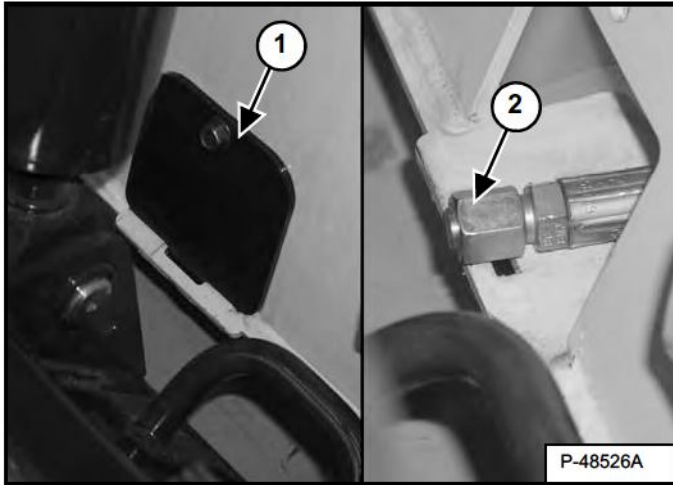
Thank you so much for reading

ENGINE LUBRICATION SYSTEM (CONT'D)

Removing And Replacing Oil And Filter

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

Figure 10-90-3



Remove the access cover (Item 1) [Figure 10-90-3] and route the oil drain hose to a container at the front of the machine.

Remove the cap from the drain hose (Item 2) [Figure 10-90-3] and drain the oil. Dispose of the used oil in an environmentally safe manner.

Install cap on the drain hose and push the hose back into the machine.

Install the access cover.

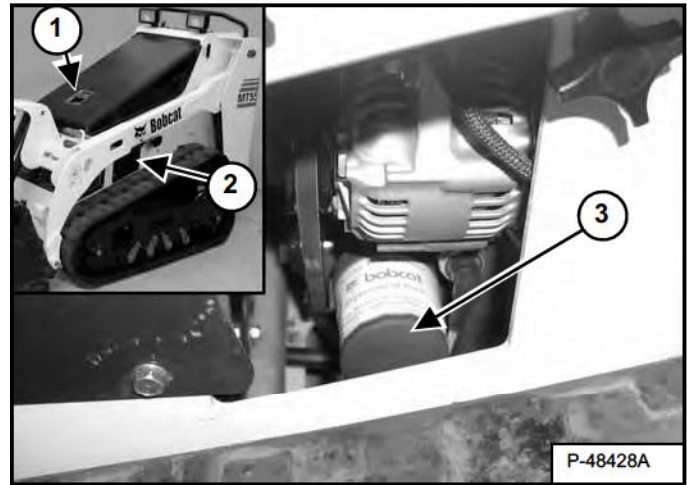
WARNING

AVOID INJURY OR DEATH

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.

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Figure 10-90-4



Open the hood (Item 1). Loosen the thumb nut and open the access cover (Item 2) [Figure 10-90-4] on the left side of the machine.

Remove the oil filter (Item 3) [Figure 10-90-4] (located under the alternator) and clean the filter housing surface.

Put clean oil on the oil filter gasket. Install the filter and hand tighten.

WARNING

AVOID INJURY OR DEATH

Never service or adjust the machine when the engine is running unless instructed to do so in the manual.

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