

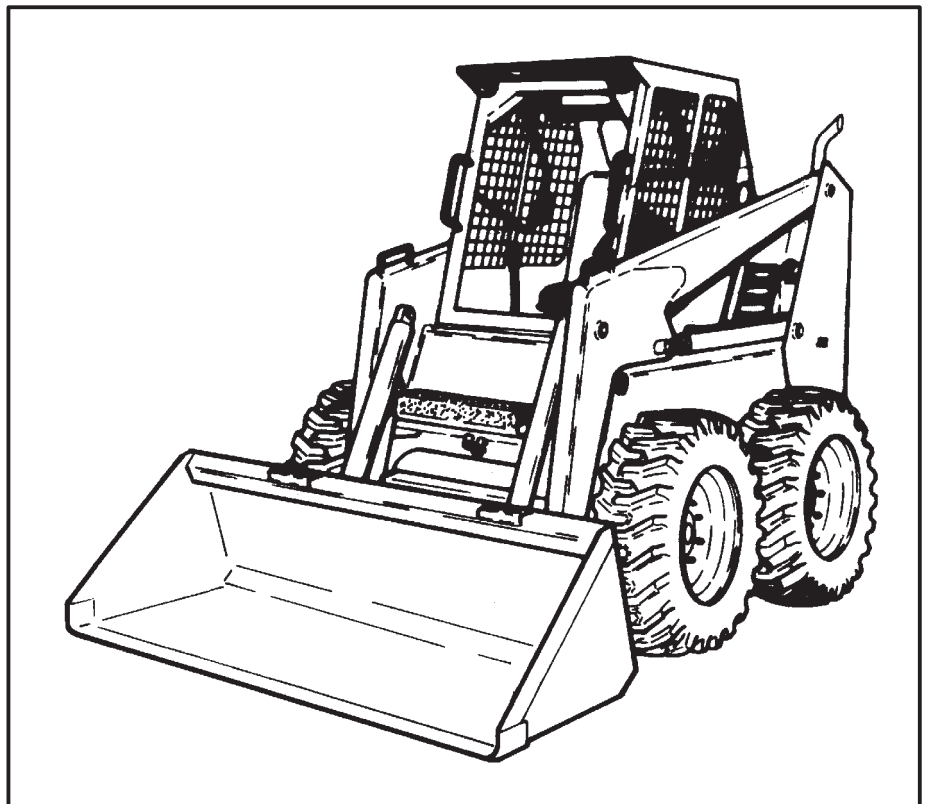
9

4

3



Service Manual



MELROE
INGERSOLL-RAND



Product: Bobcat 943 Skid Steer Loader Service Repair Workshop Manual
Full Download: <https://www.arepairmanual.com/downloads/bobcat-943-skid-steer-loader-service-repair-workshop-manual/>

Sample of manual. Download All 370 pages at:
<https://www.arepairmanual.com/downloads/bobcat-943-skid-steer-loader-service-repair-workshop-manual/>

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



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

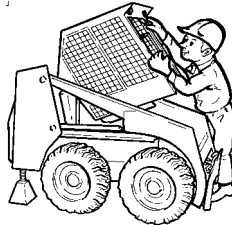
CORRECT



B-10731a

- Never service the Bobcat Skid-Steer Loader without instructions.

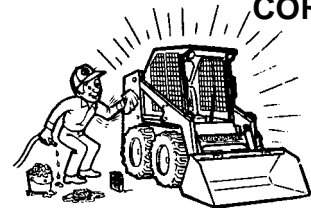
CORRECT



B-12365

- Use the correct procedure to lift or lower operator cab.

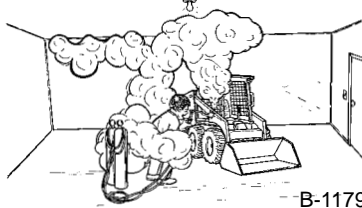
CORRECT



B-7469

- Cleaning and maintenance are required daily.

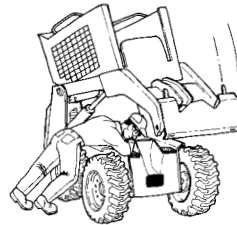
WRONG



B-11799

- 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.

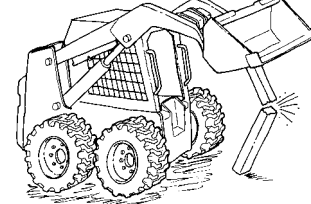
WRONG



B-15231

- 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.

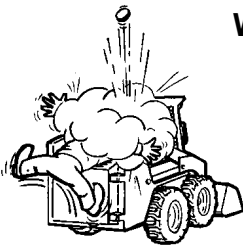
WRONG



B-15280

- 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.

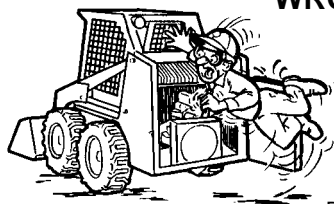
WRONG



B-6590

- 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-6580

- 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.



Bobcat®

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**PREVENTIVE
MAINTENANCE**

**HYDRAULIC
SYSTEM**

**HYDROSTATIC
DRIVE SYSTEM**

**DRIVE
SYSTEM**

**MAIN
FRAME**

**ELECTRICAL
SYSTEM**

**ENGINE
SERVICE**

**TECHNICAL
DATA**

**ALPHABETICAL
INDEX**

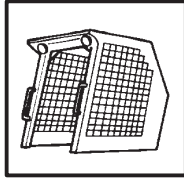


FOREWORD

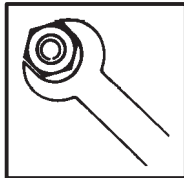
This manual is for the Bobcat loader mechanic. It provides necessary servicing and adjustment procedures for the loader and its component parts and systems. Refer to the Operation & Maintenance Manual for operating instructions, starting procedure, daily checks, etc.

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

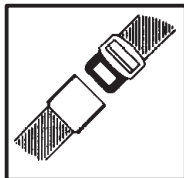
1. Check that the ROPS/FOPS (including sidescreens) is in good condition and is not modified.



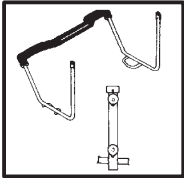
2. Check that ROPS mounting hardware is tightened and is Melroe approved.



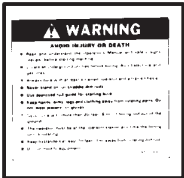
3. The seat belt must be correctly installed, functional and in good condition.



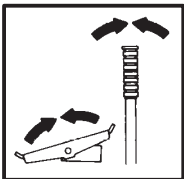
4. The seat bar and pedal interlocks must be correctly adjusted, clean and lubricated.



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



6. Steering levers, and foot pedals must return to neutral.



7. Check for correct function of the work lights and travel lights.



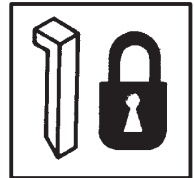
8. The parking brake must function correctly.



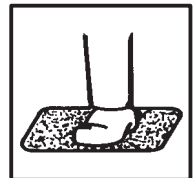
9. Enclosure door latches must open and close freely.



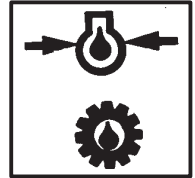
10. Bob-Tach wedges and linkages must function correctly and be in good condition.



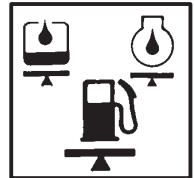
11. Safety treads must be in good condition.



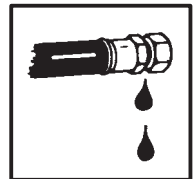
12. Check for correct function of indicator lamps (Optional on some models).



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



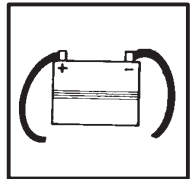
14. Inspect for fuel, oil or hydraulic fluid leaks.



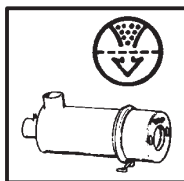
15. Lubricate the loader.



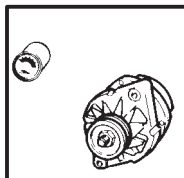
16. Check the condition of the battery and cables.



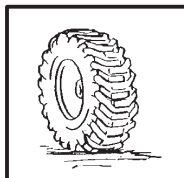
17. Inspect the air cleaner for damage or leaks. Check the condition of the element.



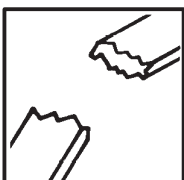
18. Check the electrical charging system.



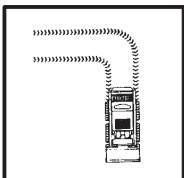
19. Check tires for wear and pressure.



20. Inspect for loose or broken parts or connections.



21. Operate the loader and check all functions.



22. Check for any field modifications not completed.



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



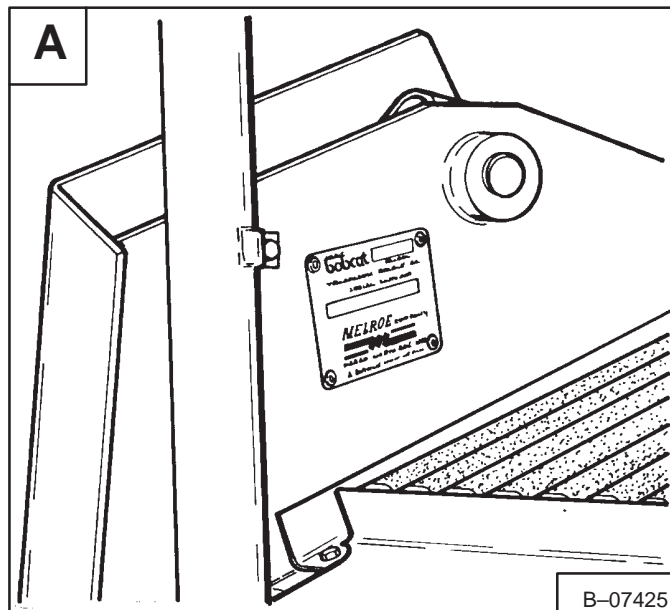
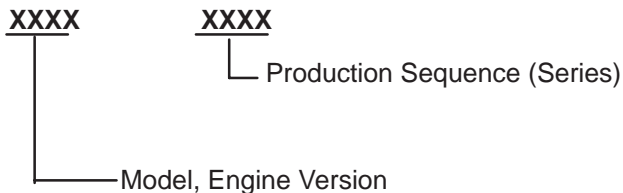
SERIAL NUMBER LOCATIONS

Always refer to the correct serial number when ordering parts or making repairs.

LOADER SERIAL NUMBER

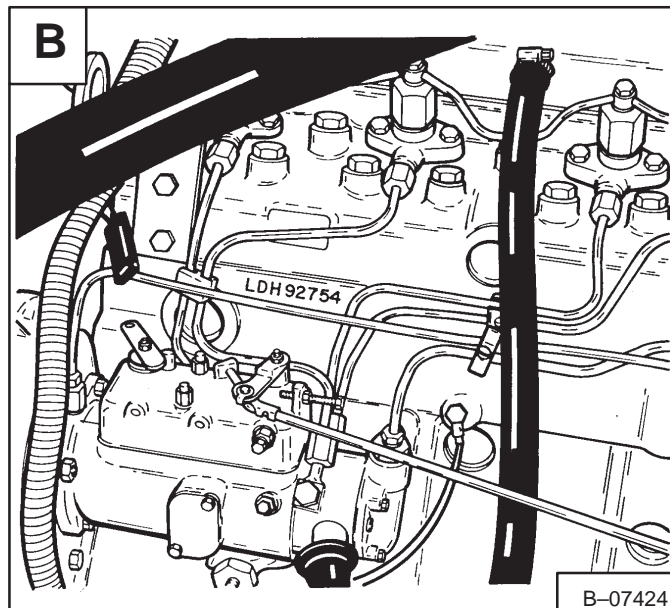
The loader serial number plate is located on the inside of the left upright, above the grill [A].

Explanation of loader Serial Number:



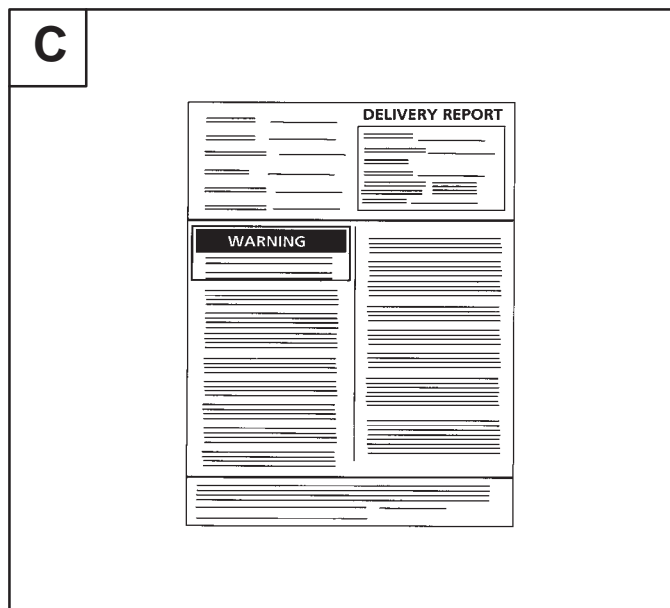
ENGINE SERIAL NUMBER

The engine serial number is on the engine block, above the fuel injection pump [B].

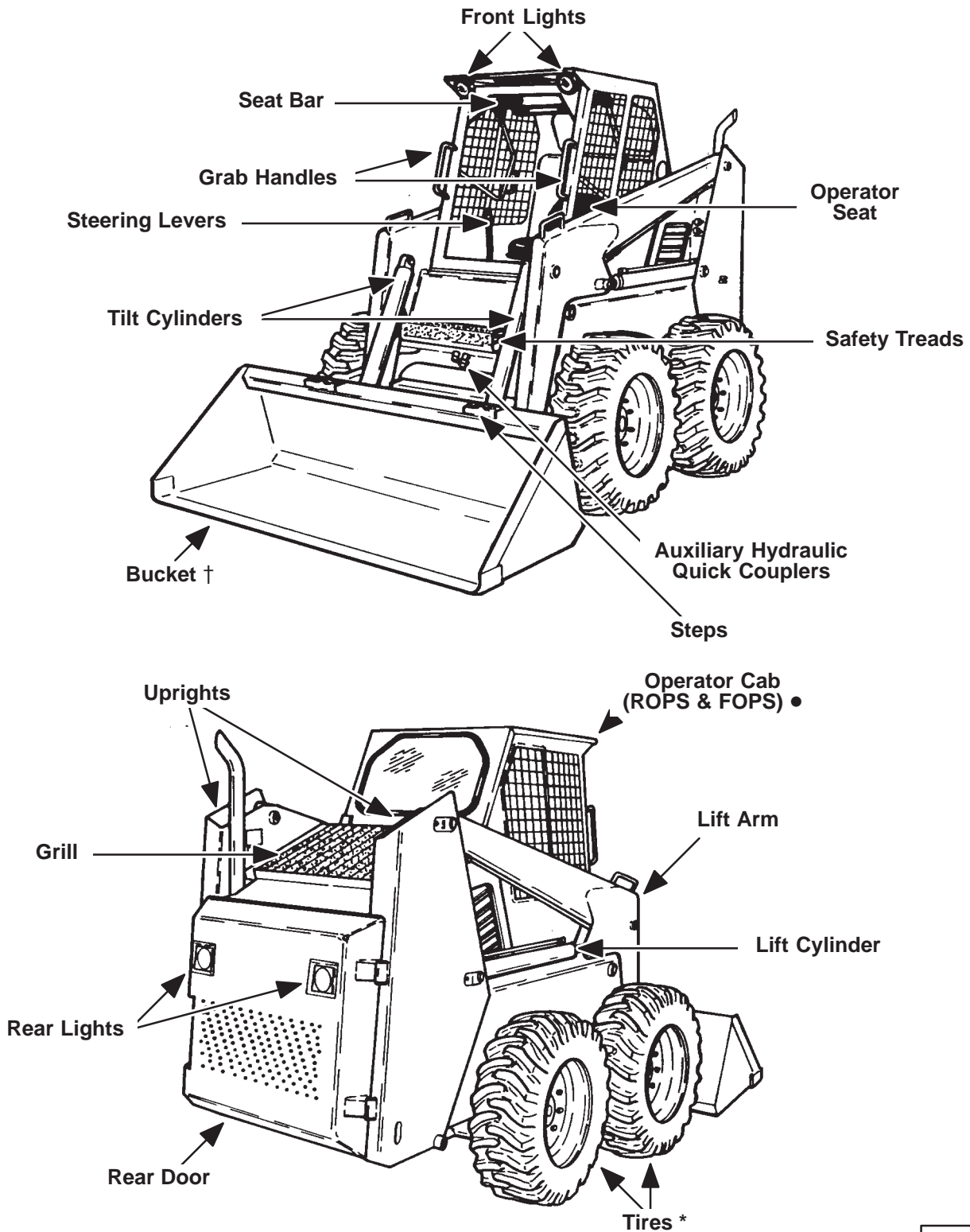


DELIVERY REPORT

The Delivery Report must be filled out by the dealer and signed by the owner or operator when the bobcat loader is delivered. An explanation of the form must be given to the owner. Be sure that it is filled out completely before you sign it [C].



BOBCAT LOADER IDENTIFICATION



B-11949
B-11957

* TIRES – Flotation tires are shown. The Bobcat loader is base-equipped with standard tires.

† BUCKET – Several different buckets are available for the Bobcat loader.

• ROPS, FOPS – Roll-Over Protective Structure, Falling Object Protective Structure, per SAE J1040 or SAE J1043. The Bobcat loader is base-equipped with a standard operator cab as shown.

PREVENTIVE MAINTENANCE

PREVENTIVE MAINTENANCE

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SERVICE SCHEDULE

This service schedule is a guide for correct maintenance of the Bobcat loader that must be done regularly. Always use these service intervals unless very hot, cold, dusty or corrosive operating conditions make it necessary to increase the frequency of service. Failure to do so can cause damage to the machine.



WARNING

Instructions are necessary before operating or servicing machine. Read Operation & Maintenance Manual, 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. Failure to follow instructions can cause injury or death.

W-2003-1089

SERVICE SCHEDULE		HOURS						
ITEM	SERVICE REQUIRED	8-10	50	100	150	250	500	1000
Engine Oil	Check the oil level & add oil as needed.							
Engine Air Cleaner	Check restriction indicator. See Page 1-10 for the correct procedure to service the air filter elements.							
Engine Coolant System	Clean debris from cooling fins & rear grill.							
Tires	Check for damaged tires & correct air pressure.							
Seat Belt, Seat Bar & Pedal Interlocks	Check the condition of seat belt. Check the seat bar & pedal interlocks for correct operation.							
Exhaust System	Check condition of system. See Page 1-6 for more information.							
Safety Signs (Decals) & Safety Treads	Check for damaged signs & safety treads. Replace the safety signs & safety treads if worn or damaged.							
Bob-Tach & Lower Tilt Cylinder Pivot	Add grease to the fittings until extra grease shows.							
Hydraulic/Hydrostatic Fluid	Check the fluid level in the reservoir & add fluid as needed.							
Engine Fuel Filter	Remove water from filter.							
Operator Cab	Check the fastening bolts, washers & nuts. Check the condition of the cab.							
Lift & Tilt Pedals Area	Remove clean-out caps. Remove dirt & debris from the pedal area.							
Wheel Nuts	★ Check for loose wheel nuts. Tighten to correct torque if loose.							
Hydraulic Fluid, Tubelines & Hoses	Check the fluid level & add as needed. Check for damage & leaks & replace as needed.							
Alternator Drive Belt	Check the tension & adjust as needed.							
Controls & Brakes	Check operation & adjust as needed.							
Loader Pivot Areas & Bob-Tach Wedges	Add grease to the fittings until extra grease shows.							
Spark Arrestor Muffler	Remove the plug & clean the spark chamber.							
Engine Oil & Filter	Replace the engine oil & the filter.							
Batteries	Check the water level. Check battery cables for corrosion. Check that the battery cables are tight. Check covers.							
Chaincase	Check fluid level & add as needed.							
Belt Drive Tightener	■ Check gap at rod nuts. Correct gap is 0.060-0.120" (1,5-3,0 mm).							
Seat Bar	Grease pivot as needed.							
Engine Fuel Filter	Replace the filter elements & in-line fuel filters.							
Hydraulic/Hydrostatic Filters	● Replace filter elements.							
Hydraulic/Hydrostatic Fluid Reservoir	Replace the breather cap.							
Chaincase	Replace the fluid.							
Hydraulic Fluid Reservoir	Replace the hydraulic/hydrostatic fluid.							

- ★ Check wheel nut torque every 8 hours for the first 24 hours of operation.
- Replace elements sooner if warning light comes ON.
- Check every 8 hours for the first 40 hours of operation.
- ◀ Or every 12 months.

PREVENTIVE MAINTENANCE



WARNING

Instructions are necessary before operating or servicing machine. Read Operation & Maintenance Manual, 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. Failure to follow instructions can cause injury or death [A].

W-2003-0797



WARNING

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

LIFTING AND BLOCKING THE BOBCAT LOADER

Procedure

Always park the loader on a level surface.



WARNING

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.

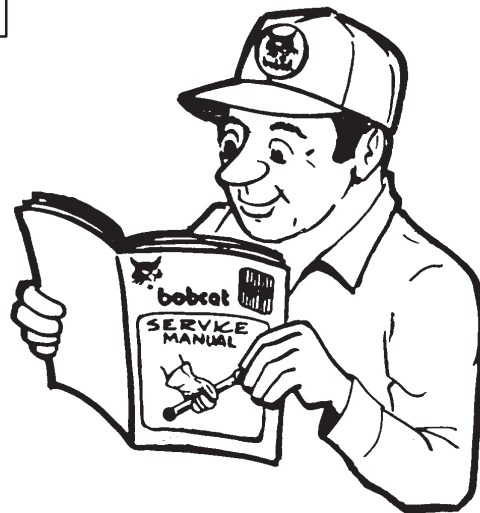
W-2017-0286

Lower the lift arms, stop the engine. Put the floor jack under the rear of the loader. Lift the rear of the loader and install jackstands [B].

Put the floor jack under the front of the loader. Lift the front of the loader and install jackstands under the axle tubes [C].

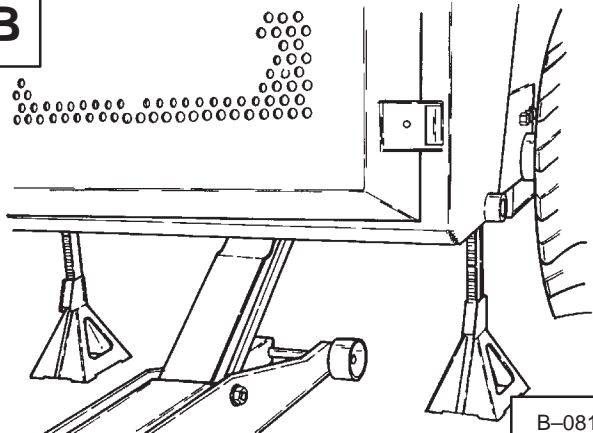
NOTE: Make sure the jackstands do not touch the tires.

A



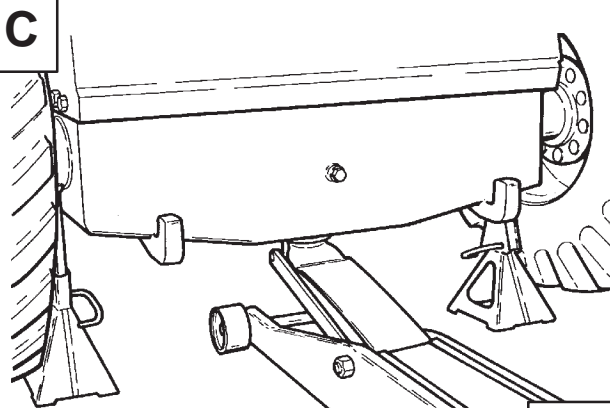
B-07023

B



B-08109

C



B-08108

TRANSPORTING THE BOBCAT LOADER

Procedure



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

A loader with an empty bucket or no attachment must be driven backward onto the transport vehicle [A].

Lower the lift arms and bucket onto the transport vehicle [B].

Stop the engine. Engage the parking brake.

To prevent the loader from moving during sudden stops or going up and down slopes, install tie-down chains as follows:

Fasten chains to the uprights as shown in figure [C].

Fasten chain to the front of the loader as shown in figure [D].

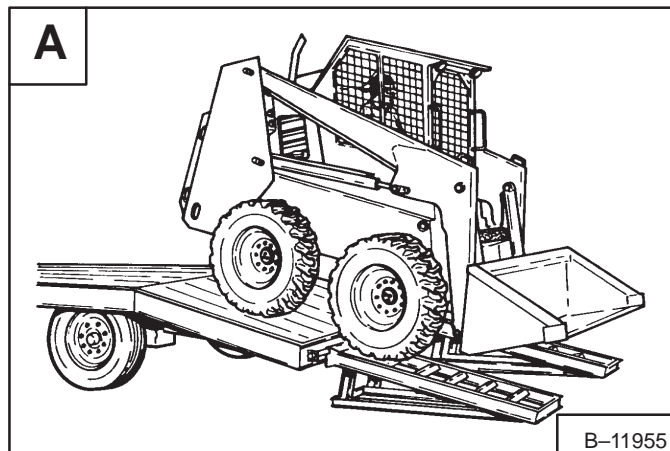
TOW VALVES

Procedure

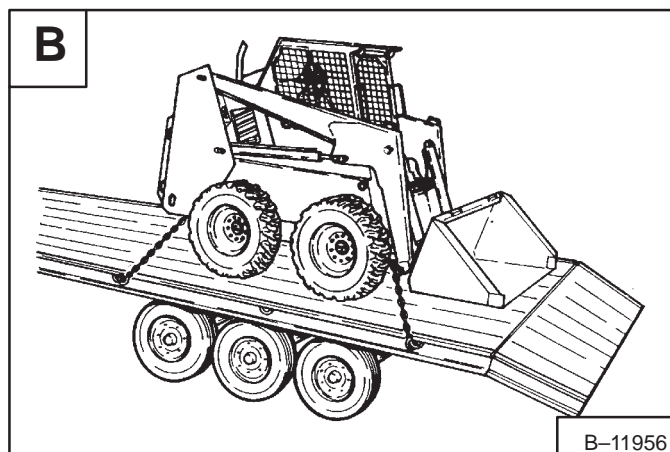
The loader can be moved for a short distance when the tow valves are open. (See Page 3-29, Fig. [C].)

Turn the two tow valves open one half turn.

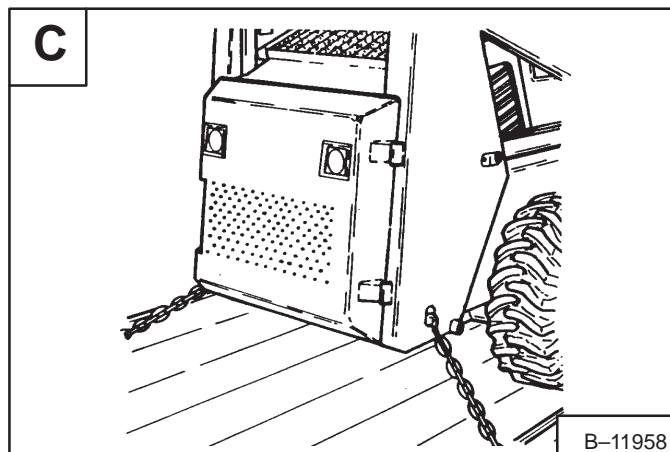
NOTE: After moving the loader with the tow valves open, make sure the tow valves are closed and tight because they have a direct effect on the operation of the loader drive system.



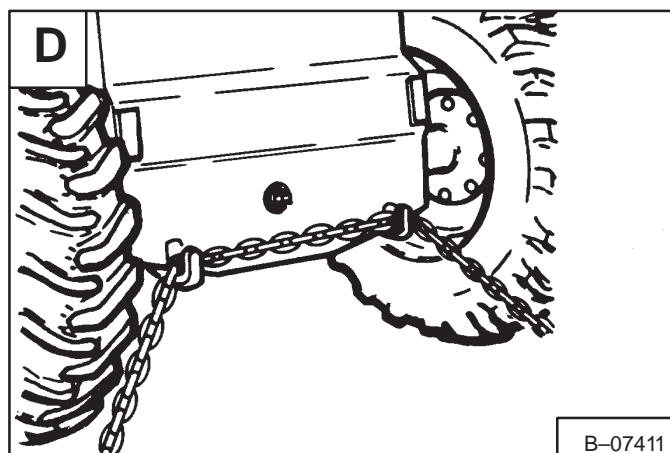
B-11955



B-11956



B-11958



B-07411

LIFT ARM SUPPORT DEVICE

Installing The Lift Arm Support Device

NOTE: Maintenance or service work can be done with the lift arms lowered. Put jackstands under the rear corners of the loader before raising the operator cab or lift arms.

One person must stay in the operator's seat, with the seat belt fastened and the seat bar lowered, while the second person installs the lift arm support device.

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

Have the second person install the lift arm support device **[A]**. The lift arm support device must be tight against the lift cylinder rod. Lower the lift arms slowly until the support device is held between the lift arm and the lift cylinder.

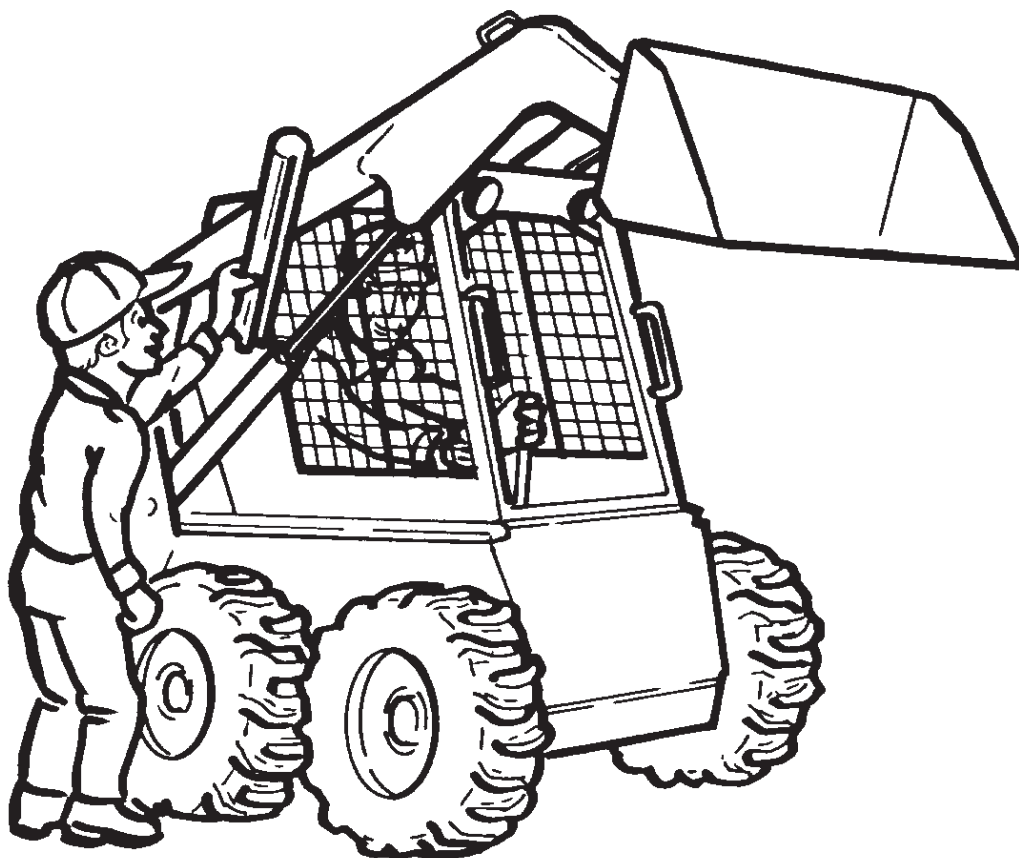


WARNING

Never work on a machine with the lift arms up unless the lift arms are secured by a 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-2059-0991

A



B-07437

OPERATOR CAB

Raising The Operator Cab

! WARNING

AVOID INJURY

Cylinders for raising and lowering operator cab have gas under pressure. Do not open cylinder. Only qualified service personnel can remove the cylinder.

W-2112-0987

Stop the loader on a level surface. Lower the lift arms fully. If the lift arms must be up while raising the operator cab, install a lift arm stop before raising the cab. (See Page 1-4.)

! WARNING

Before the cab or the lift arms are raised for service, jackstands must be put under the rear corners of the frame. Failure to use jackstands can allow the machine to tip backward causing injury or death.

W-2014-0895

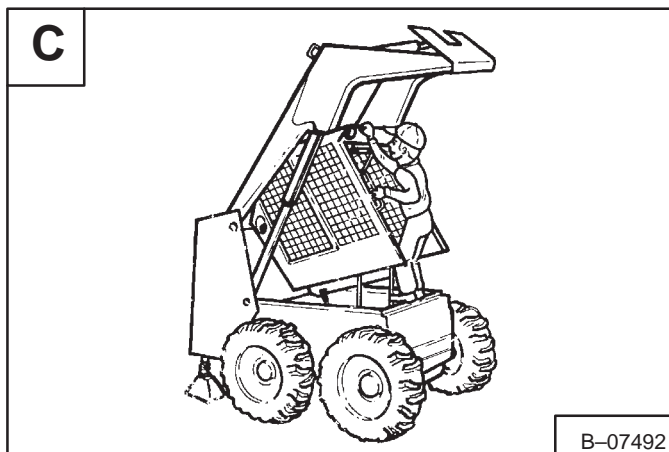
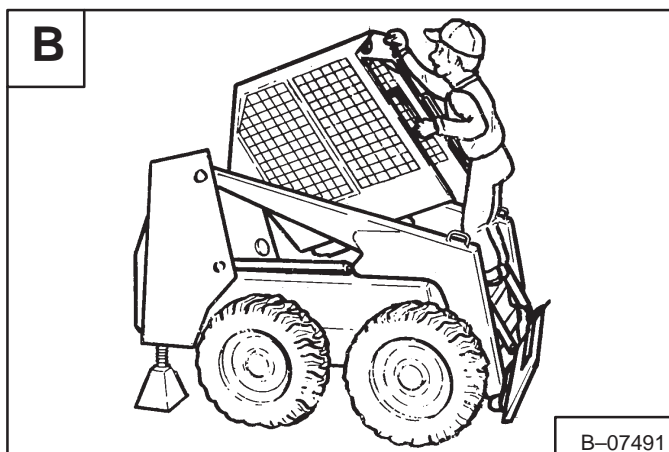
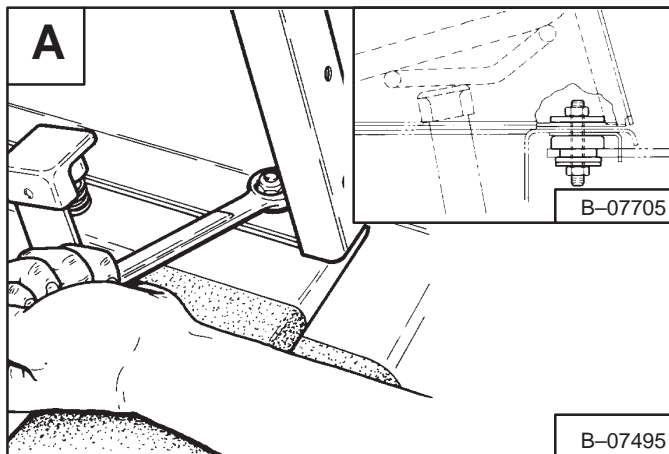
Remove the two front fasteners of the operator cab [A].

If the lift arms are down, stand on the lift arm cross member safety tread. Lift on the top of the operator cab and grab handle and then lift on the bottom of the operator cab, until it is all the way up [B].

If the lift arms are held up by a lift arm stop, stand on the loader frame safety treads. Lift on the top of the operator cab and the grab handle and then lift on the bottom of the operator cab, until it is all the way up [C].

Lowering The Operator Cab

Stand on the lift arm cross member or loader frame safety tread and slowly lower the operator cab by using the bottom of the cab and the grab handle [B] & [C].



! WARNING

Both sets of fasteners at the front of the operator cab (ROPS) must be assembled as shown in this manual. Failure to secure ROPS correctly can cause injury or death.

W-2005-1189

OPERATOR CAB (Cont'd)



WARNING

Never modify the operator cab or safety equipment or use attachments that are not approved by Melroe Company. Modifications or unapproved attachments can cause injury or death.

W-2035-1285

Operator Cab Air Seals (S/N 11999 & Below)

The rubber and foam seals between the engine compartment and the operator cab must be tight.

Higher temperatures and pressure in the engine compartment can force air into the cab if the seals are not tight.

Check for air leaks into the cab at the following locations:

1. Rubber boots around the lower end of the steering levers **[A]**.
2. Foam insulation under seat plate **[B]**.
3. Seals between operator cab and frame **[B]**.
4. Make sure clean out tubes are correctly installed.

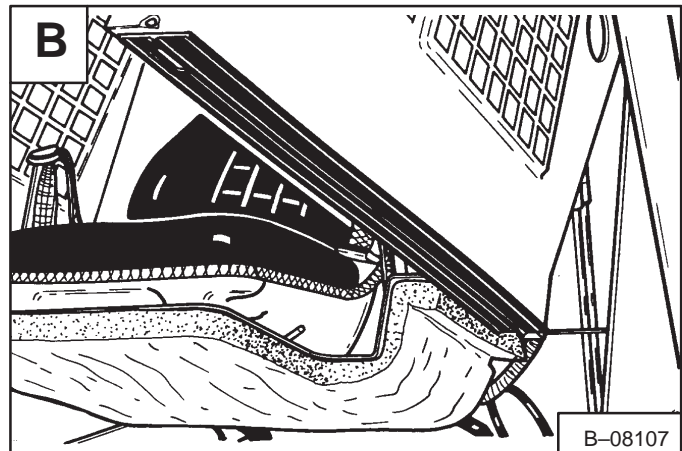
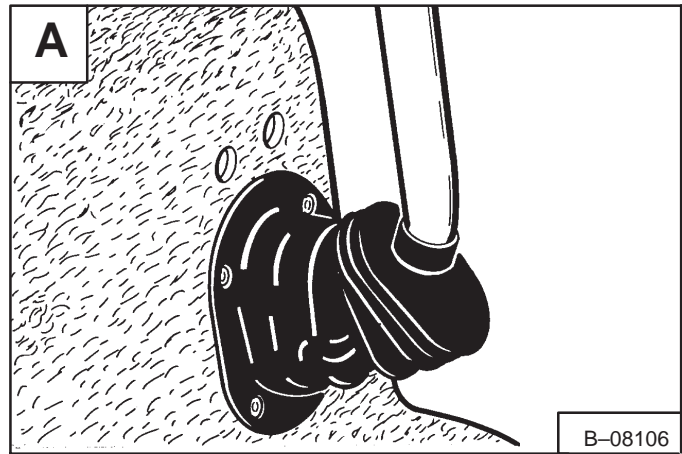
The exhaust system must be tight to avoid leaks of exhaust fumes into the engine compartment. Never use a loader with a defective exhaust system.



WARNING

When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless, invisible gases which can kill without warning.

W-2050-1285



OPERATOR CAB (Cont'd)

Cleaning Rear Window, Optional Front Door And Enclosure

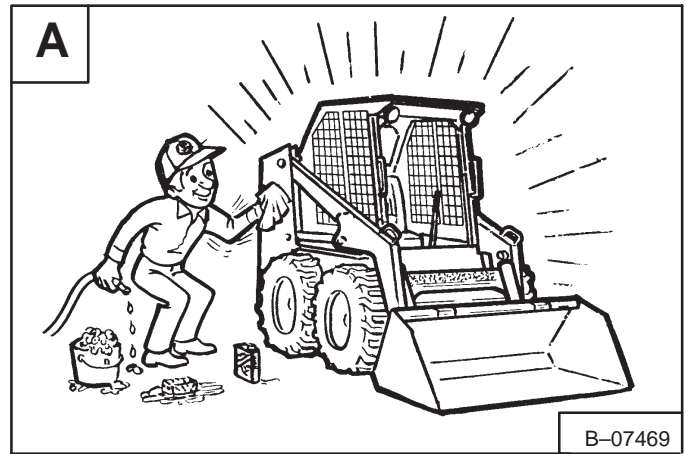
Use only approved cleaners on the windows of the loader [A].

Never use cleaners that have abrasive.

Do not let cleaning solutions dry on the window.

Cleaning solutions must be thoroughly rinsed with water.

Do not use razor blades or other sharp objects to scrape the window.



SEAT BAR SYSTEM

Description

The seat bar system has a pivoting seat bar with arm rests and has spring loaded interlocks for the lift and tilt control pedal [B]. The operator controls the use of the seat bar, the seat bar in the down position helps to keep the operator in the seat, also the interlocks require the operator to lower the seat bar in order to operate the foot pedal controls. When the seat bar is up, the lift and tilt pedals are locked when returned to the neutral position.

Inspection Of The Seat Bar System

Sit in the seat and fasten the seat belt. Engage the parking brake.

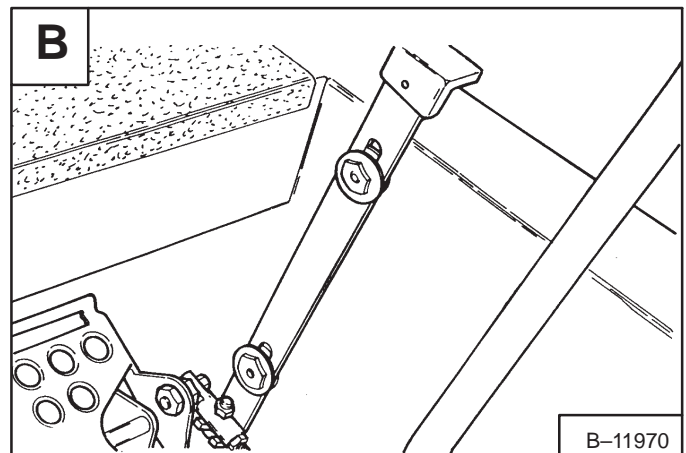
Pull the seat bar fully down. Start the engine.

Operate each foot pedal to check both the lift and tilt functions. Raise the lift arms until the bucket is about 2 feet (600 mm) off the ground.

Raise the seat bar. Try to move each foot pedal. Pedals must be firmly locked in neutral position. There must be no motion of the lift arms or tilt (bucket) when the pedals are pushed.

Pull the seat bar down, lower the lift arms and place the bucket flat on the ground.

Stop the engine. Raise the seat bar and operate the foot pedals to be sure that the pedals are firmly locked in the neutral position. Unbuckle the seat belt.



SEAT BAR SYSTEM (Cont'd)

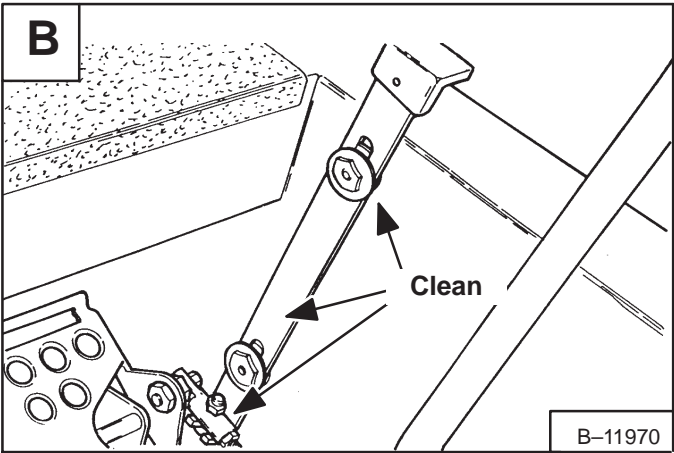
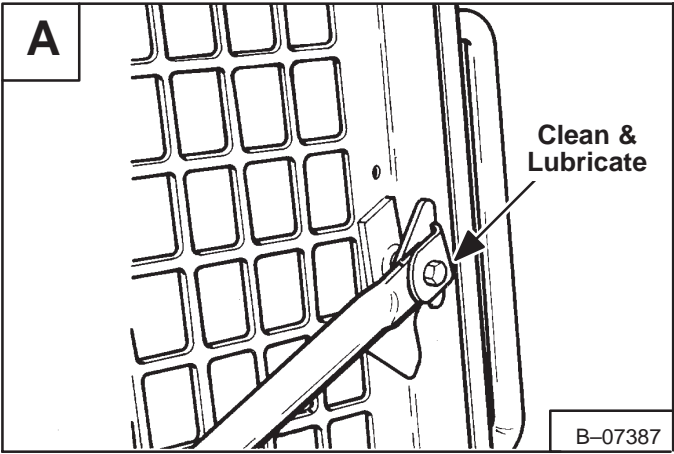
Servicing The Seat Bar System

See the *SERVICE SCHEDULE* Page 1-1 for the correct service intervals.

Clean any debris or dirt from moving parts [A] [B].

Apply general purpose grease to seat bar pivots at each side of the cab [A].

If seat bar system does not function correctly when inspected, check for free movement of each linkage part. Check for excessive wear. Adjust the pedal control linkage. Replace parts that are worn or damaged. Use only genuine Melroe replacement parts.



WARNING

AVOID INJURY OR DEATH

The seat bar system must lock the lift and tilt control pedals in neutral when the seat bar is up. Service the system if pedals do not lock correctly.

W-2105-1285

REAR DOOR

Opening Rear Door



WARNING

AVOID INJURY OR DEATH

Stop, cool and clean engine of flammable material. Never service or adjust loader with engine running unless instructed to do so in manual.

W-2061-0887

Pull up on the handle [A].

Turn the handle to release the latch and pull the rear door open [B].



WARNING

Keep the rear door closed when operating the machine. Failure to do so could seriously injure a bystander.

W-2020-1285

Adjusting The Door Latch

Loosen the set screw (inset) and nut (Item 1) [C].

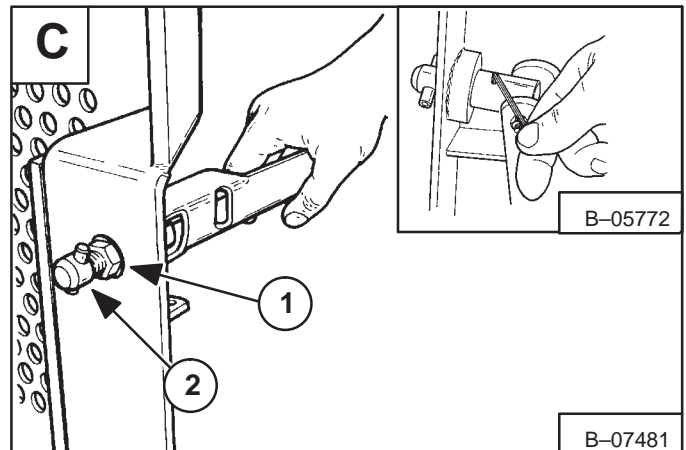
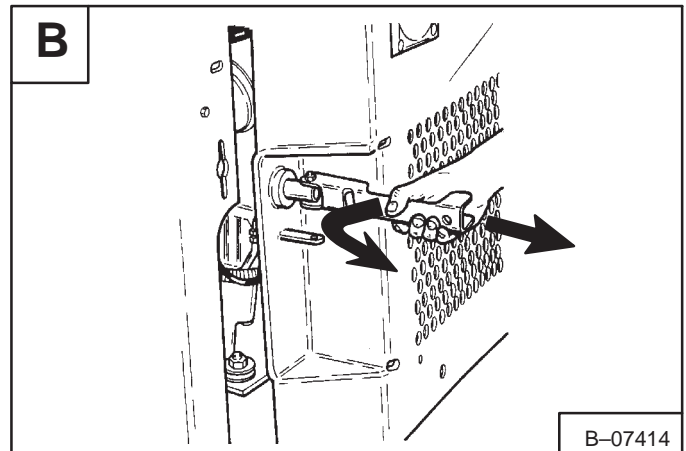
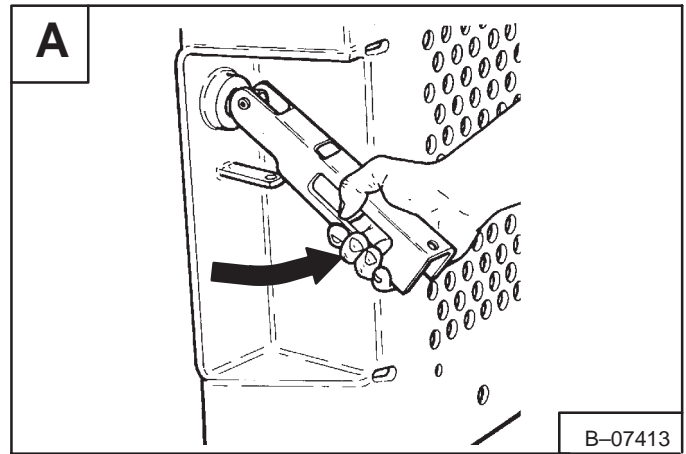
Adjust the bolt (Item 2) [C] so the top and bottom corners of the door touch the loader frame with the door closed and the handle in the latched position.

NOTE: When the latch is adjusted correctly, it will take approximately 50 lbs. (23 kg) to push the handle into the locked position.

Turn the bolt so that the roll pin is horizontal [C].

Tighten the set screw. Tighten the nut (Item 1) [C] to 65–70 ft. lbs. (88–95 Nm) torque.

Lubricate the wear surfaces of the latch.



REAR GRILL

Opening The Rear Grill

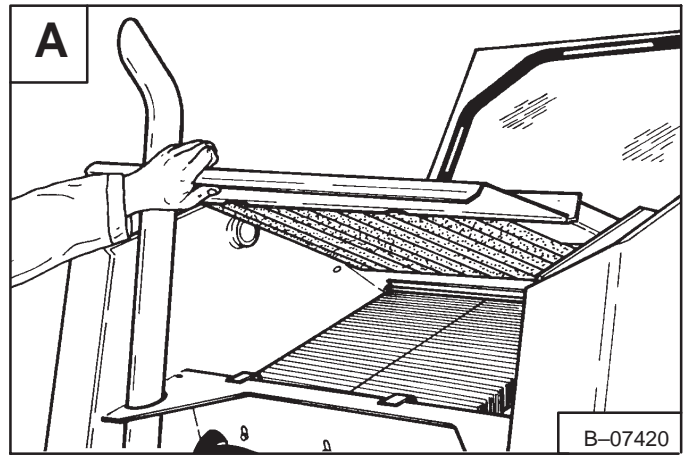


WARNING

AVOID INJURY OR DEATH

Stop, cool and clean engine of flammable material. Never service or adjust loader with engine running unless instructed to do so in manual.

W-2061-0887



Open the rear door and raise the rear grill [A]. The rear grill is held open by a gas cylinder.

Raise the rear grill to clean debris from the oil cooler and radiator. Raise the oil cooler for access to the radiator.

AIR CLEANER

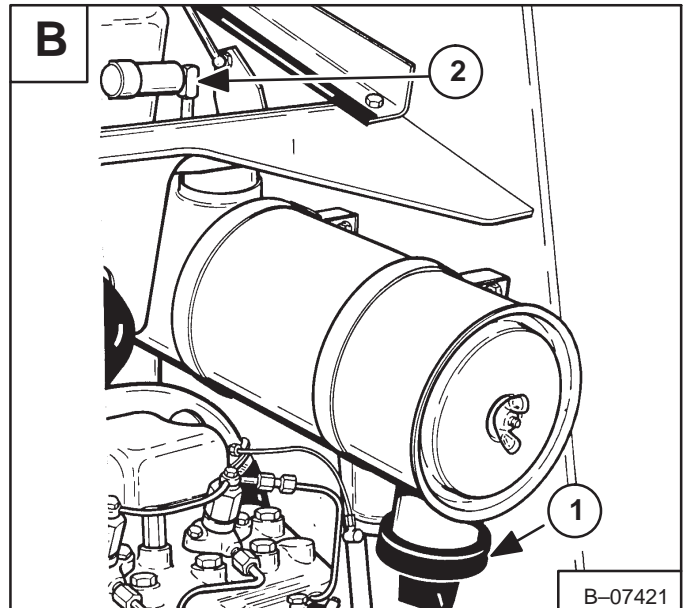
Replacement Of The Air Cleaner Element

NOTE: Before replacing the filter element, push the reset button at the restriction indicator. Start the engine and run at full RPM. If the reading is less than 22 in. H₂O, do not replace the filter element.

Clean the evacuator (Item 1) [B] every day.

Check all hoses and connections for leaks.

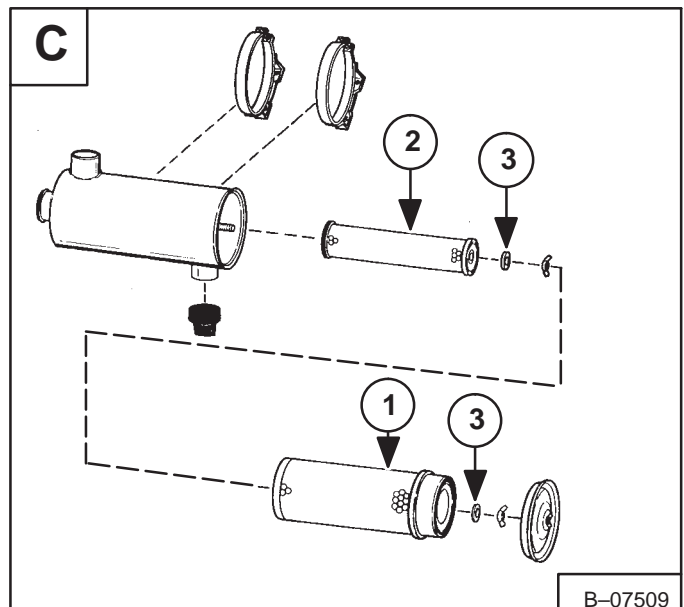
Start the engine and check the restriction indicator (Item 2) [B]. If the reading is more than 22 in. H₂O, replace the outer filter (Item 1) [C].



Replace the inner filter element (Item 2) [C] every third time the outer element is replaced or when the restriction indicator shows 15 in. H₂O after the outer element has been replaced.

NOTE: Make sure the seal washer (Item 3) [C] is under the wing nut when replacing the filter element.

Push the reset button at the restriction indicator.



FUEL SYSTEM

Filling The Fuel Tank

Use number 2 diesel fuel. During very cold temperatures, use number 1 fuel.

Remove the fuel fill cap (Item 1), add fuel as needed [A].



WARNING

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

W-2063-0887

Fill the fuel tank only in an area with good ventilation and no open flames or sparks [B].

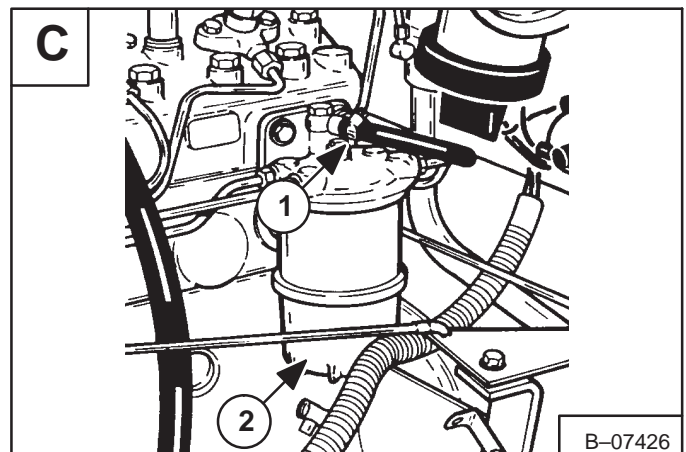
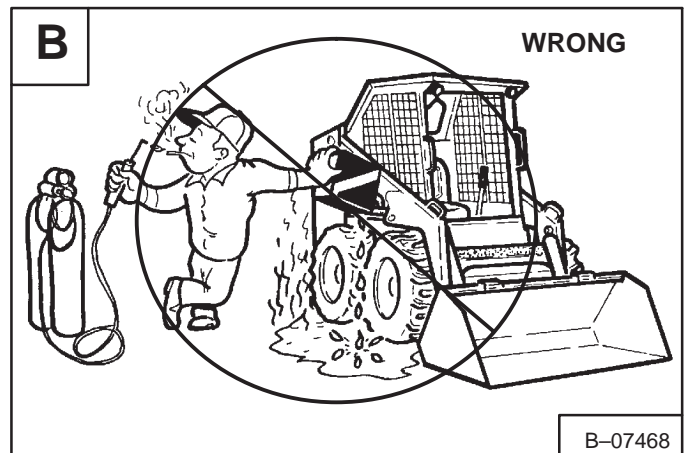
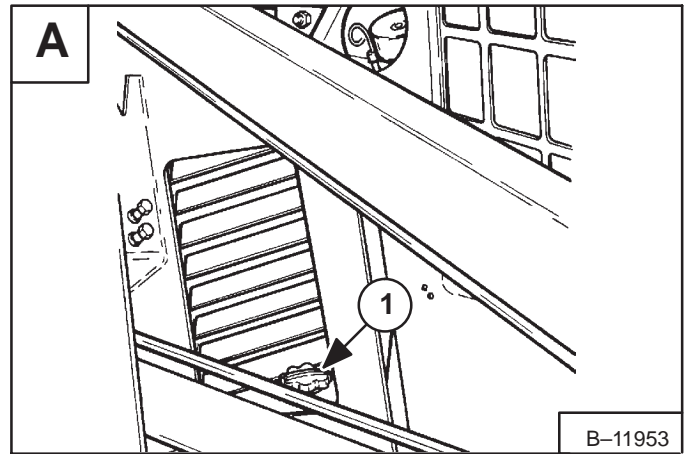
Always use clean fuel and container to add fuel to the fuel tank.

Removing Water From The Fuel Filter

Loosen the thumb screw (Item 1) [C] on the bottom of the filter.

Drain the water into a container. Tighten the thumb screw after the water has been removed from the filter.

See Section 7, for replacement of fuel filter elements and remove air from the fuel system.

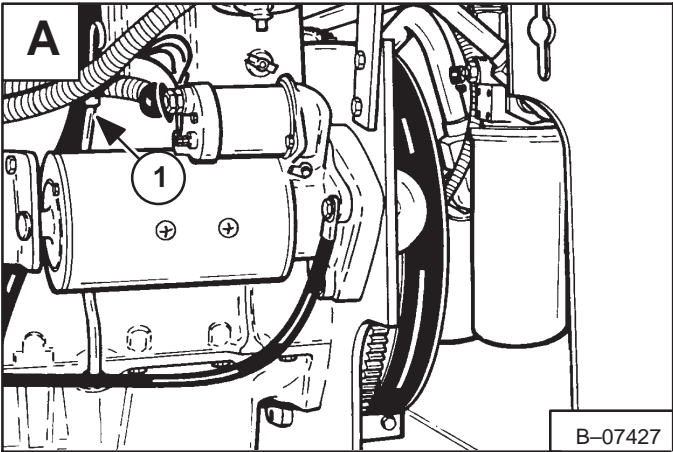


ENGINE OIL AND FILTER

Replacement Of Engine Oil And Filter

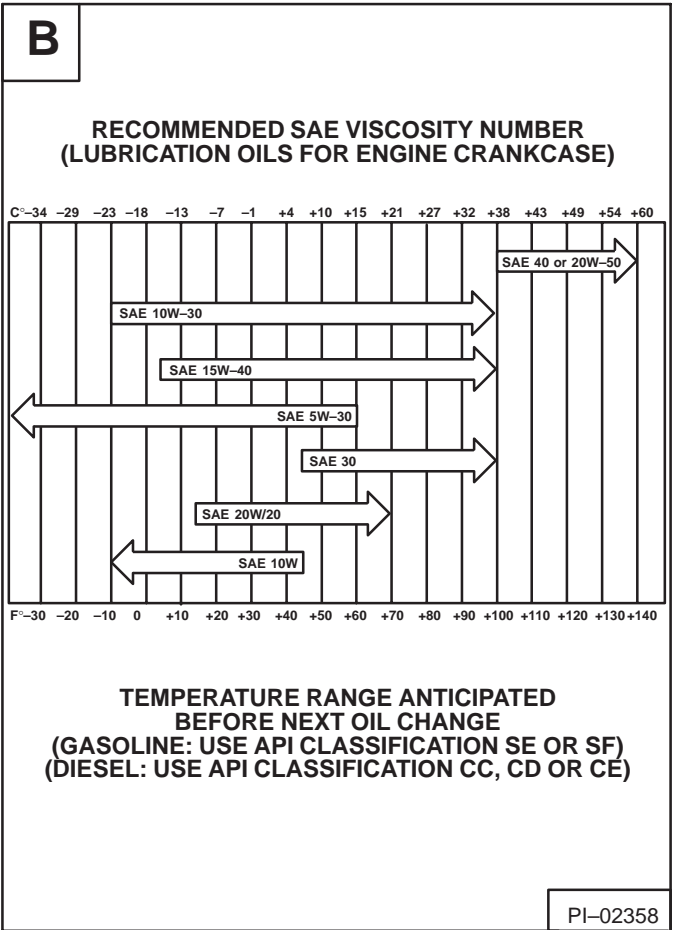
See the *SERVICE SCHEDULE* Page 1-1 for the correct service interval.

Check the oil level every 8-10 hours of operation (Item 1) [A].



Use the recommended engine oil [B].

Run the engine until warm. Stop the engine.



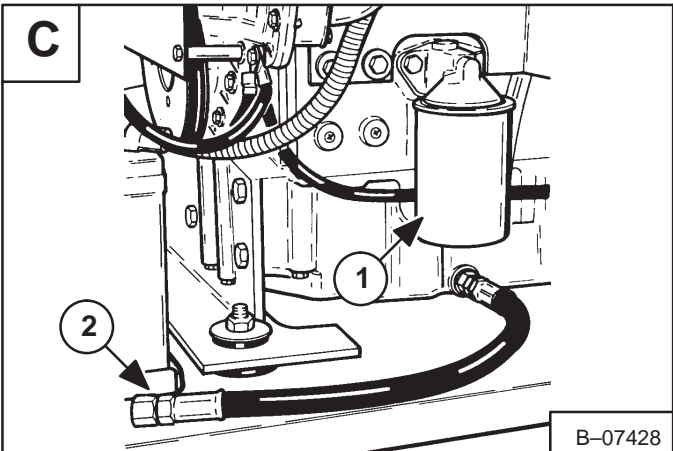
Remove the filter (Item 1) [C] and drain hose cap (Item 2) [C].

Clean the contact surface of the filter housing. Put clean oil on the gasket of the new filter. Install the oil filter and hand tighten only.

Install the drain hose cap. Fill the engine to the correct capacity (See Specification Section for the correct capacity).

Start the engine. Check for leaks at the oil filter. Stop the engine.

Check the oil level, add oil as needed to bring the oil level to the top mark on the dipstick.



COOLING SYSTEM

Checking Coolant Level

Check the coolant level in the recovery tank when the engine is cool.

Coolant must be at the full mark on the recovery tank (Item 1) [A].

Lift the oil cooler and use air or water pressure to remove debris from the top of the radiator.

Removing The Coolant From The Cooling System



WARNING

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

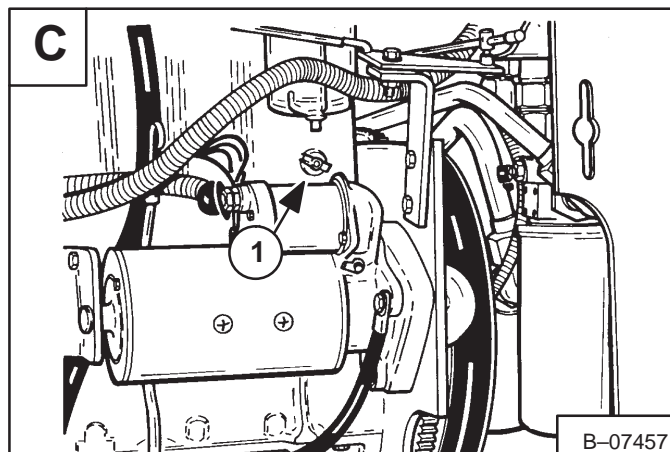
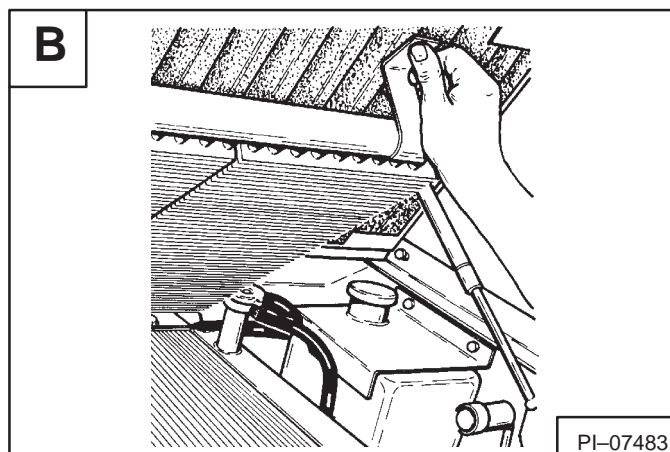
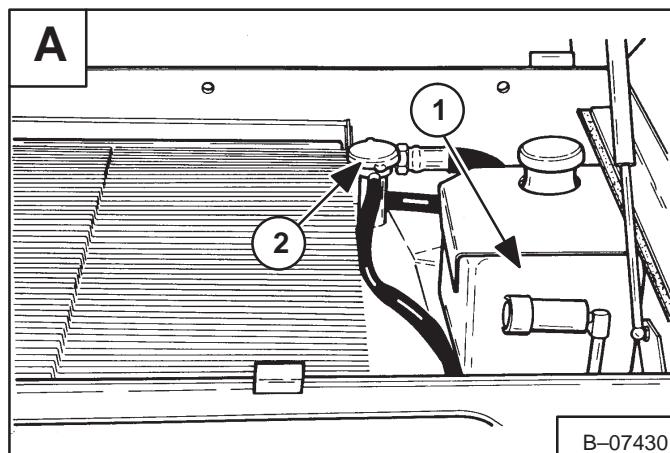
W-2070-1285

Raise the rear grill and remove the radiator cap (Item 2) [A].

Open the drain valve (Item 1) [C] at the engine block. Use a hose to direct the coolant into a container. Do not let coolant flow into the engine compartment.

Close the valve after all the coolant is removed from the cooling system.

Pre-mix ethylene glycol anti-freeze (50%) and water (50%). Fill the radiator with the coolant mixture. Install the radiator cap. Add coolant mixture to the *FULL* mark on the recovery tank.



ELECTRICAL SYSTEM

Description

The Bobcat loader has a 12-volt, negative ground charging system.

There are two fuses (Item 1) **[A]** in the instrument panel to protect the electrical system.

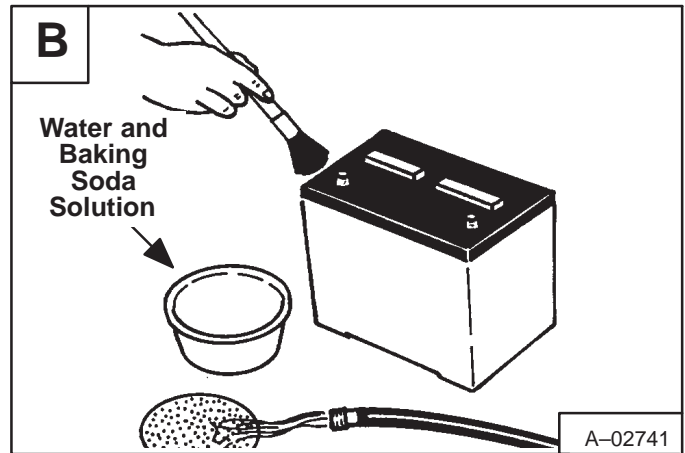
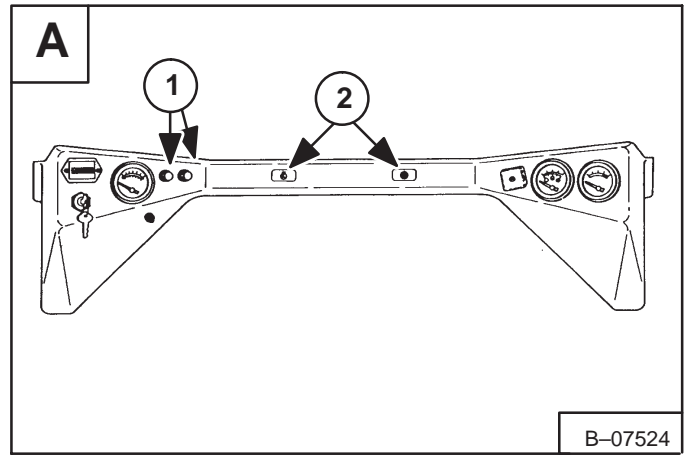
A blown fuse indicates a system overload. Check for a broken wire or a short in the electrical system before starting the engine.

The engine and hydraulic/hydrostatic warning lights (Item 2) **[A]** will come ON when the key switch is turned ON. When the engine is started, the lights must go OFF. Stop the engine and correct the problem, if the lights do not go OFF.

Electrical System Maintenance

Check the condition of the battery terminals and cable ends. Use a sodium bicarbonate (baking soda) and water solution to remove any acid or corrosion from the terminals or battery cable ends. Put grease on the cable ends to prevent corrosion.

Check the condition of all the electrical wires.



ELECTRICAL SYSTEM (Cont'd)

Using An Extra Battery (Jump Start)

If it is necessary to use an extra battery to start the engine, **BE CAREFUL!** There must be one person in the operator's seat and one person to connect and disconnect the battery cables. The extra battery must be the same voltage as the loader battery.

1. Turn the ignition to the OFF position.
2. Connect the first jumper cable (Item 1) [A] to the positive (+) terminal of the extra battery and to the solenoid terminal (Item 2) [A] of the starter.

NOTE: Never connect the negative (–) cable to the negative (–) terminal of the battery.

3. Connect the second jumper cable (Item 3) [A] to the negative (–) terminal of the extra battery and to the engine mounting frame (Item 4) [A].
4. Keep the jumper cables away from moving parts.
5. Start the engine (Also See *COLD TEMPERATURE STARTING*, Page 1–16).
6. Immediately remove the negative (–) cable (Item 4) [A] from the engine frame.
7. Remove the positive (+) cable from the starter.

IMPORTANT

Damage to the alternator can occur if:

- Engine is operated with battery cables disconnected.
- Battery cables are connected when using a fast charger or when welding on the loader. (Remove both cables from the battery.)
- Extra battery cables (booster cables) are connected wrong.

I-2023-1285



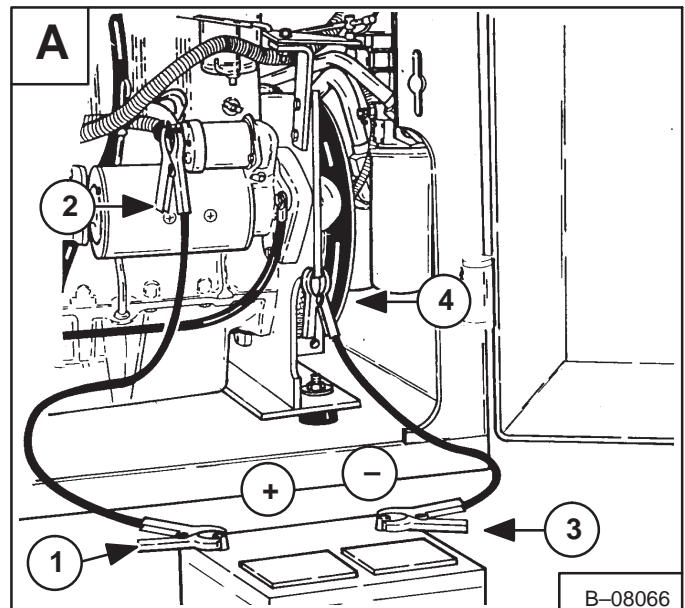
WARNING

Batteries contain acid which burns eyes and skin on contact. Wear goggles, protective clothing and rubber gloves to keep acid off body.

In case of acid contact, wash immediately with water. In case of eye contact get prompt medical attention and wash eye with clean, cool water for at least 15 minutes.

If electrolyte is taken internally drink large quantities of water or milk! **DO NOT** induce vomiting. Get prompt medical attention.

W-2065-1296



COLD TEMPERATURE STARTING

Starting Procedure

To make starting easier if the temperature is below 32°F. (0°C.), use the following procedure:

1. Replace the engine oil with the correct type and viscosity for the anticipated starting temperature. (See Page 1–12.)
2. Make sure the battery is at full charge.
3. Install a coolant heater on the engine.

To start the engine, use the following procedure:

Turn the key switch to the *START* position, and start to turn the engine.

Push the quick-start button. This will fill the fluid dispenser [A].

Release the button. This dispenses the starting fluid into the engine intake manifold. The sound of the engine should change.

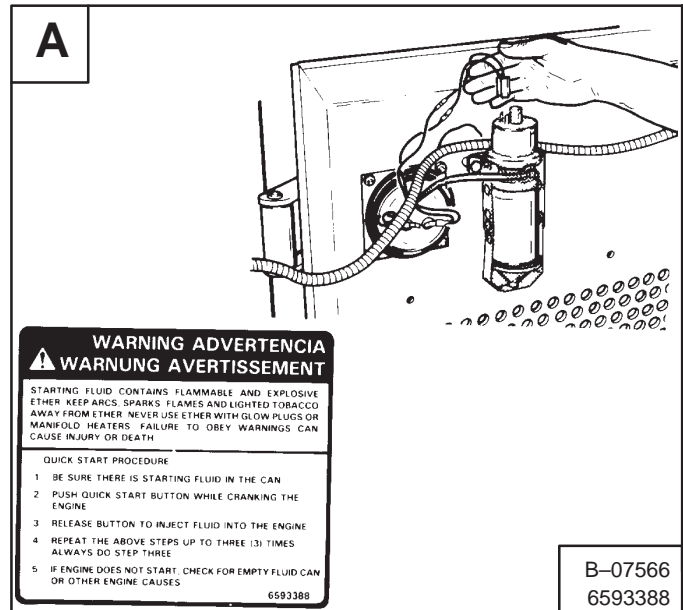
Keep cranking the engine for a few seconds. This either starts the engine or uses the starting fluid so that it does not accumulate in the engine.

Repeat the above steps. Always keep cranking the engine for a few seconds to avoid too much starting fluid in the engine.

If the engine does not start after repeating the above steps three times, correct deficiencies such as: empty starting fluid can, wrong fuel, too heavy viscosity oil, low charge at battery, etc.

NOTE: The starting fluid contains ether which is a flammable and explosive gas. Arcs, sparks, flames and lighted tobacco must be kept away from the ether to avoid explosions and fire.

Let the engine run for a few minutes to warm the engine and hydrostatic fluid before operating the loader. During very cold temperatures (0°F. –23°C. and below), let the engine run for at least five minutes.



IMPORTANT

When the temperature is below –20°F (–30°C), hydrostatic oil must be warmed before starting. The hydrostatic system will not get enough oil at low temperatures and will be damaged. Park the machine in an area where the temperature will be above 0°F (–18°C) if possible.

I-2007-1285

HYDRAULIC AND HYDROSTATIC SYSTEM

See Section 2 and 3 for the complete description of the Hydraulic and Hydrostatic System and Flow Charts.



WARNING

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

Checking And Adding Fluid

The loader must be level, lift arms all the way down and Bob-Tach rolled all the way back.

Check the fluid level [B].

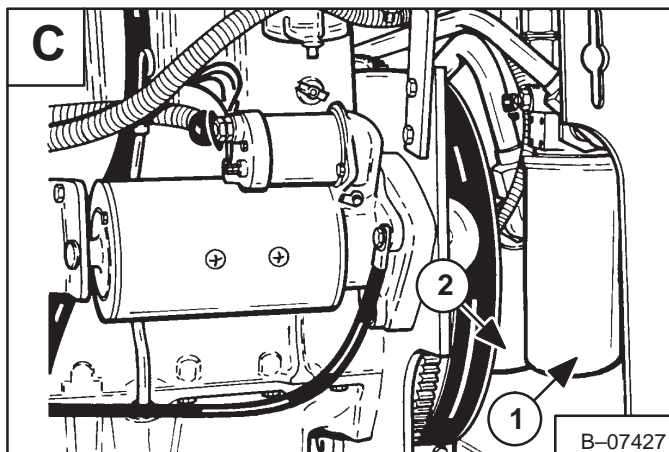
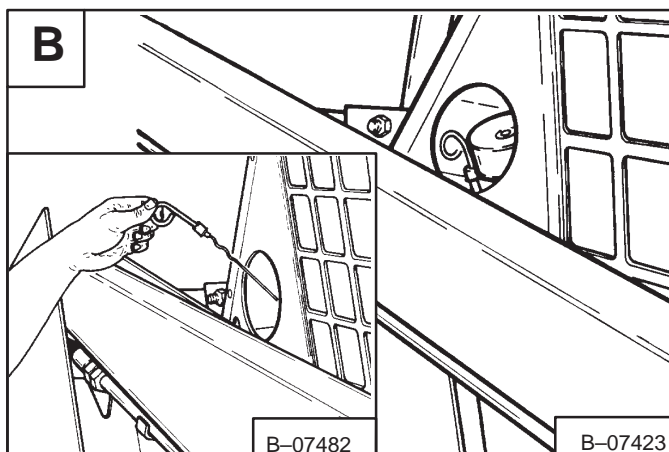
Add fluid as necessary (See Section 8 for correct specification for the hydraulic fluid).

Replacing The Hydraulic/Hydrostatic Filters

See the *SERVICE SCHEDULE* Page 1-1 for correct service procedure or replace the filters if the warning lights come ON during operation.

Remove the hydraulic filter (Item 1) [C] and hydrostatic filter (Item 2) [C].

Clean the contact surfaces of the filter heads. Put grease on the filter gaskets. Install the new filters.



SPARK ARRESTOR MUFFLER

The exhaust system must be tight so that exhaust fumes do not leak into the engine compartment. Higher air pressure in the engine compartment can force exhaust fumes into the operator cab. (See *Operator Cab Air Seals*, Page 1–6.)

Do not use a loader which has a defective exhaust system.

Stop the engine and open the rear door.

Remove the plug at the bottom of the muffler (Item 1) [A].

Engage the parking brake.

Start the engine. Wear safety goggles. Hold a piece of wood over the outlet of the muffler for about 10 seconds.

Stop the engine. Install and tighten the plug.
Close the rear door.

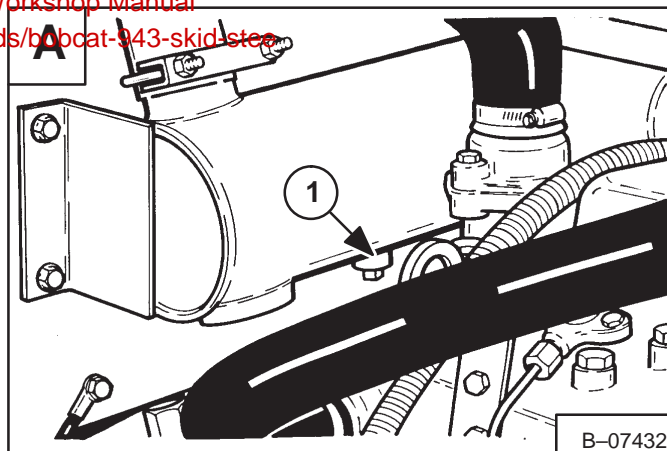
Cleaning Exhaust Purifier

For hard carbon deposits, use the following procedure:

1. Dry-brush the inlet face of the catalyst.
2. Use air pressure through outlet face of catalyst.
3. Repeat step 1 & 2 until inlet face of catalyst is clean.
4. Completely soak the catalyst in kerosene or any carbon solvent for one hour.
5. Use solvent/air pressure through outlet face of catalyst for about 10 minutes.
6. Use air pressure through outlet face.
7. Repeat step 5 & 6 until purifier is as clean as possible.
8. Use high pressure water to wash through the outlet face of purifier. Use air pressure to dry. Maximum pressure 50 PSI (345 kPa).

NOTE: Make sure to thoroughly dry after cleaning before using, because any solvent left inside will damage the purifier.

9. Install the purifier so that the exhaust gas flows in the same direction as before cleaning.



⚠ WARNING

Stop engine and allow the muffler to cool before cleaning the spark chamber. Wear safety goggles. Failure to obey can cause serious injury.

W-2011-1285

When an engine is running in an enclosed area, fresh air must be added to avoid concentration of exhaust fumes. If the engine is stationary, vent the exhaust outside. Exhaust fumes contain odorless, invisible gases which can kill without warning.

W-2050-1285

IMPORTANT

This loader is factory equipped with a U.S.D.A. Forestry Service approved spark arrestor muffler. It is necessary to do maintenance on this spark arrestor muffler to keep it in working condition. The spark arrestor muffler must be serviced by dumping the spark chamber every 100 hours of operation.

If this machine is operated on flammable forest, brush or grass covered land, it must be equipped with a spark arrestor attached to the exhaust system and maintained in working order. Failure to do so will be in violation of California State Law, Section 4442 PRC.

Make reference to local laws and regulations for spark arrestor requirements.

I-2022-0595