

Product: Bobcat 642B Skid Steer Loader Service Repair Workshop Manual
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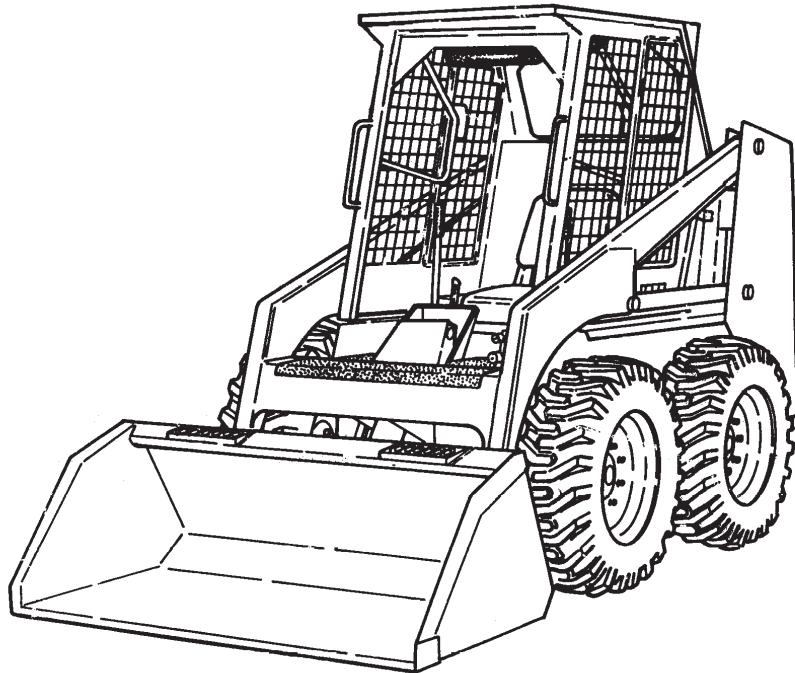
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4

2

B

Service Manual



Sample of manual. Download All 228 pages at:

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**MELROE
INGERSOLL-RAND**

6570275 (4-86)

Printed in U.S.A.

 **bobcat**
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MAINTENANCE SAFETY



WARNING

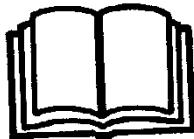
Instructions are necessary before operating or servicing machine. Read and understand the Operation & Maintenance Manual, Operator's Handbook and signs (decals) on machine. Follow warnings and instructions in the manuals when making repairs, adjustments or servicing. Check for correct function after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

W-2003-0903



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

CORRECT



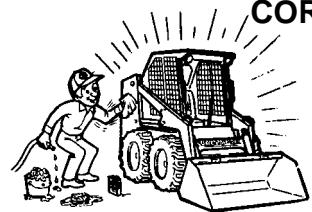
B-10731a

CORRECT



B-12365

CORRECT



B-7469

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

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.

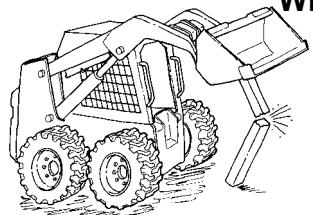
WRONG



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.

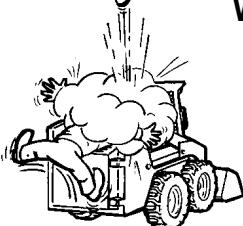
WRONG



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.

MSW01-0805



Bobcat®

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PREVENTIVE
MAINTENANCE

HYDRAULIC
SYSTEM

HYDROSTATIC
SYSTEM

DRIVE
SYSTEM

MAIN
FRAME

ELECTRICAL
SYSTEM

ENGINE
SERVICE

TECHNICAL
DATA

SPECIFICATIONS

**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.

REFERENCE INFORMATION

Write the correct information for Your Bobcat loader in the spaces below. Always use these numbers when referring to your Bobcat loader.

Loader Serial Number

Engine Serial Number

NOTES: _____

YOUR LOADER DEALER: _____
ADDRESS: _____
PHONE: _____

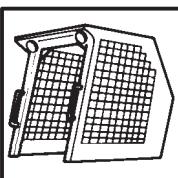


FOREWORD

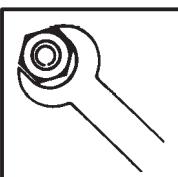
This manual is for the Bobcat loader mechanic. It provides necessary servicing and adjustment procedures for the Bobcat loader and its component parts and systems. Refer to the Operation & Maintenance Manual for operating instructions, starting procedure, daily checks, etc.

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

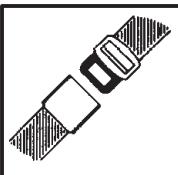
1. Check that the ROPS/FOPS (Including sidescreens) is in good condition and is not modified.



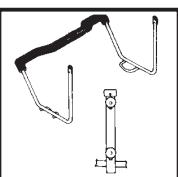
2. Check that ROPS mounting hardware is tightened and is Melroe approved.



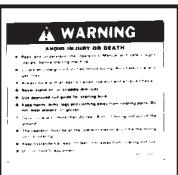
3. The seat belt must be correctly installed, functional and in good condition.



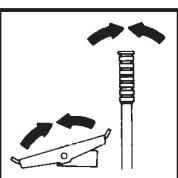
4. The seat bar and pedal interlocks must be correctly adjusted, clean and lubricated.



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.



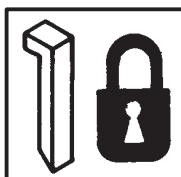
8. The parking brake must function correctly.



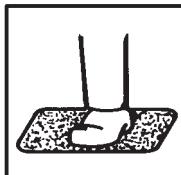
9. Enclosure door latches must open and close freely.



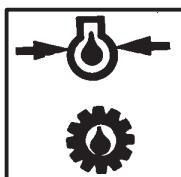
10. Bob-Tach wedges and linkages must function correctly and be in good condition.



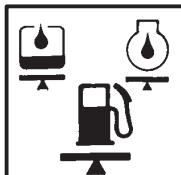
11. Safety treads must be in good condition.



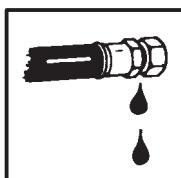
12. Check for correct function of indicator lamps (Optional on some models).



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



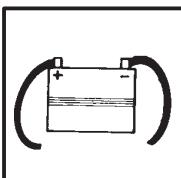
14. Inspect for fuel, oil or hydraulic fluid leaks.



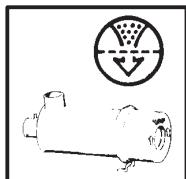
15. Lubricate the loader.



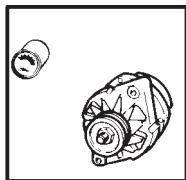
16. Check the condition of the battery and cables.



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



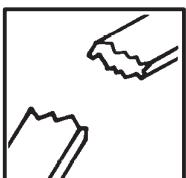
18. Check the electrical charging system.



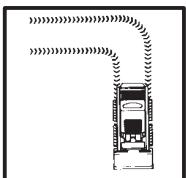
19. Check tires for wear and pressure.



20. Inspect for loose or broken parts or connections.



21. Operate the loader and check all functions.



22. Check for any field modification not completed.



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



SAFETY INSTRUCTIONS

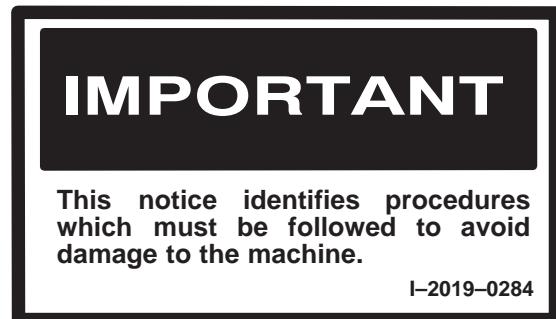
⚠ WARNING

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-2003-1289

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

1. 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.
2. The Operation & Maintenance Manual delivered with the loader gives operating information as well as routine maintenance and service procedures. It is a part of the loader and must stay with the machine when it is sold. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat loader dealer.
3. The loader has machine signs (decals) which instruct on the safe operation and care. The signs and their locations are shown in the Operation & Maintenance Manual. Replacement signs are available from your Bobcat loader dealer.
4. The FIEI Safety Manual delivered with the loader gives general safety information.
5. The Service Manual and Parts Manual are available from your dealer for use by mechanics to do shop-type service and repair work.



Safety Alert Symbol: This Safety Symbol is used for important safety messages. When you see this symbol follow the safety message to avoid personal injury or death.

- Wear tight fitting clothing and any other required safety apparel when operating or servicing the loader.
- Wear safety glasses when maintaining or servicing the loader.
- Exhaust gases can kill, vent engine exhaust outdoors.
- Know where fire extinguishers and first aid kits are located and how to use them.
- Do not run the Bobcat loader where exhaust, arcs, sparks or hot components can contact flammable material, explosive dust or gases.
- Check fuel and hydraulic tubes, hoses and fittings for damage and leakage. Never use open flame or bare skin to check for leaks. Tighten or replace any parts that show leakage. Always clean fluid spills. Do not use gasoline or diesel fuel for cleaning parts. Use commercial nonflammable solvents.
- Clean the loader before doing any welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the loader when welding
- Have good ventilation when welding or grinding painted parts. Wear a dust mask when grinding painted parts. Toxic dust and gas can be produced.
- Stop the engine and let it cool before adding fuel. No smoking.
- Use the procedure in this manual for connecting and charging batteries.
- Use the procedure in the Operator's Manual for cleaning the spark arrestor muffler after each 100 hours of operation.

SERIAL NUMBER LOCATIONS

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

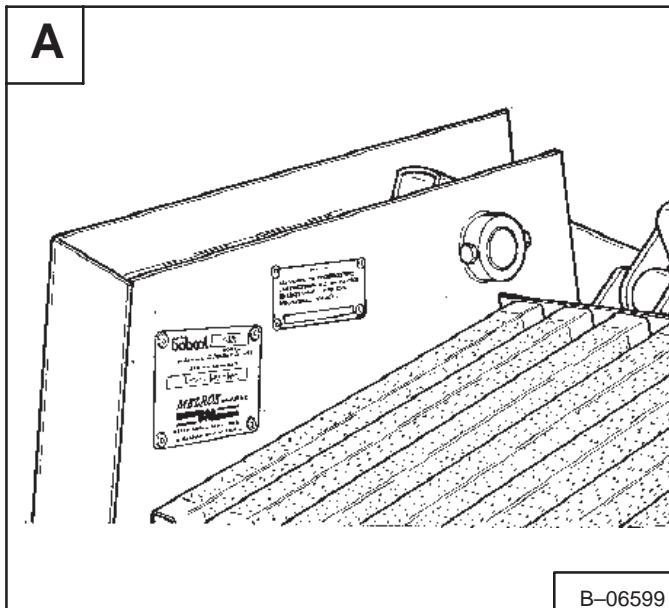
The loader serial number plate is located on the inside of the left upright, above the grill [A].

Explanation of loader Serial Number:

XXXX XXXX

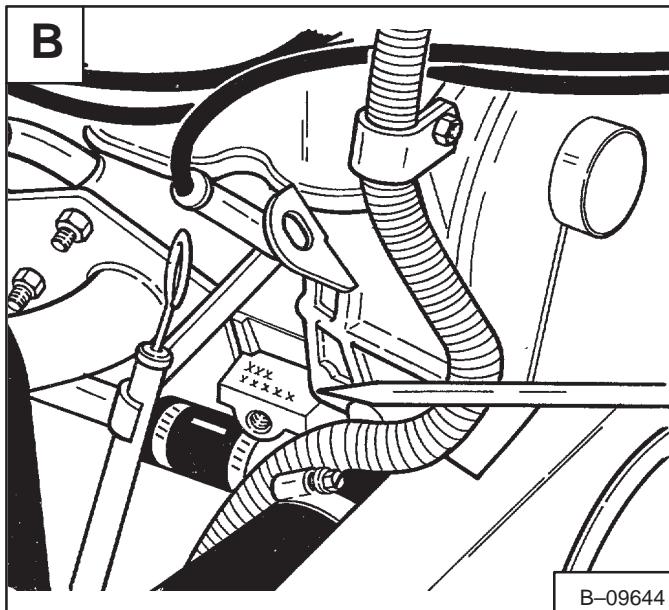
Production Sequence
(Series)

Model, Engine Version



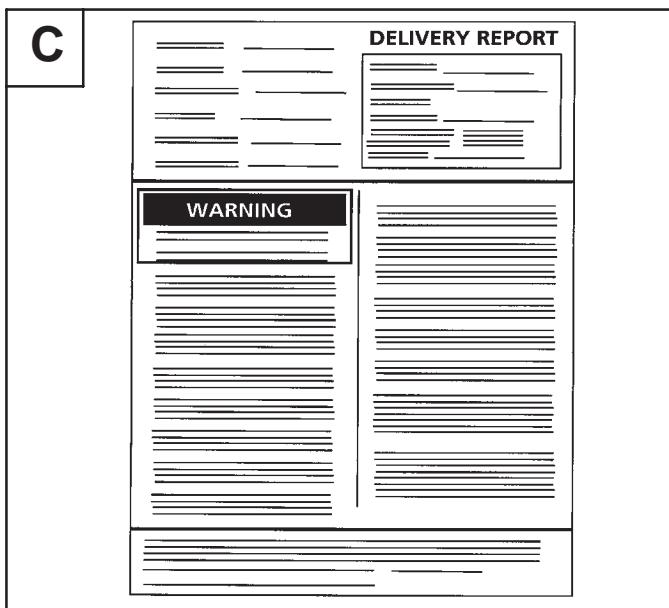
ENGINE SERIAL NUMBER

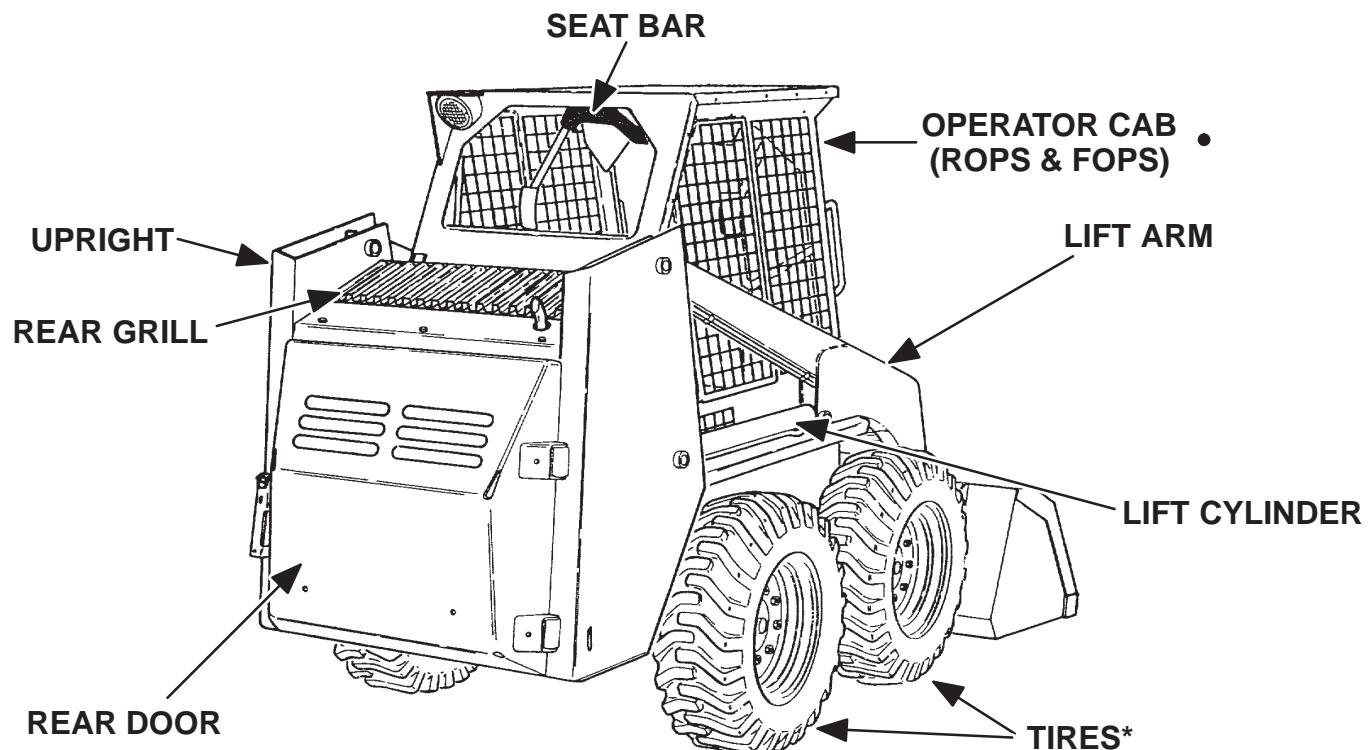
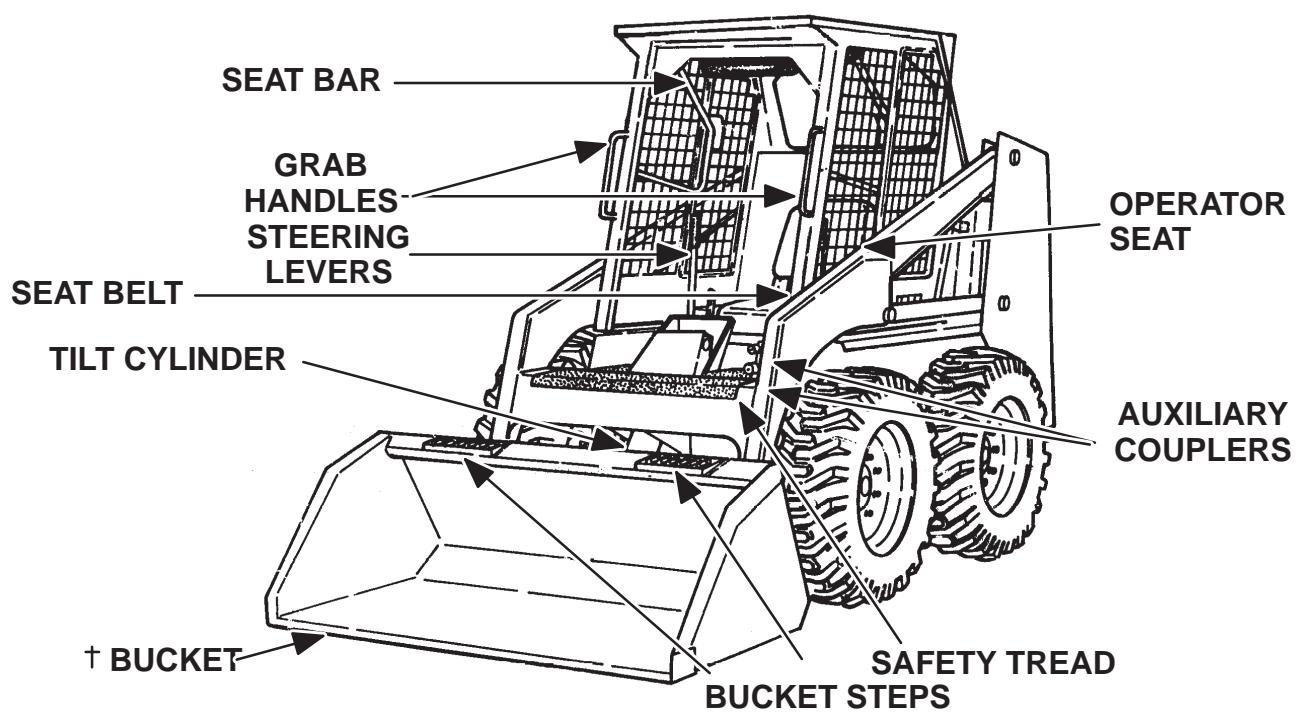
The serial number is near the fuel injection pump on the engine block [B].



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. Make sure it is filled out completely [C].





B-07377
B-02878

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

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

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



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SERVICE SCHEDULE

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 loader.

! 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 manual 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-2003-1289

SERVICE SCHEDULE		HOURS					
ITEM	SERVICE REQUIRED	8-10	50	100	250	500	1000
Engine Air Cleaner	Clean the dust cup & replace the filter element as needed.						
Engine Oil	Check oil level & add oil as needed.						
Engine Cooling System	Check recovery tank level and clean grill as needed.						
Tires	Check air pressure & for damage to the tires.						
Indicator Lights	Check for correct operation of all the indicators & lights.						
Seat Belt & Seat Bar	Check the condition of seat belt. Check seat bar for correct operation to lock foot pedals.						
Safety Signs (Decals) & Safety Tread	Check for damaged safety signs (decals) and safety tread. Replace as needed.						
All Loader Pivot Points	Add grease to the fittings until the extra grease shows.						
Hydraulic Fluid	Check the fluid level in the reservoir & add fluid as needed.						
Engine Oil & Filter	Replace oil & filter.						
Battery	Check cables & water level.						
Control Pedals & Steering	Check operation. Make repairs & adjustment as needed.						
Wheel Nuts	Check for loose wheel nuts & tighten to 105–115 ft.-lbs. (142–156) torque. Check for loose nuts every 8 hours for the first 24 hours.						
Operator Cab	Check for loose cab mounts, tighten as needed.						
Parking Brake	Check operation. Make adjustment as needed.						
Alternator Belt	Check tension, make adjustment as needed.						
Spark Arrestor Muffler	Clean the spark chamber.						
Governor Oil Level	Check level, if low, add oil.						
Steering Levers	Lubricate the grease fittings.						
Engine Ignition System	Check points & timing. Replace the spark plugs.						
U-Joint	Lubricate the three fittings.						
Hydraulic Filter	* Replace filter element						
Fuel Filter	Replace the filter element.						
Hydraulic Reservoir Breather Cap	Replace the breather cap.						
Engine Timing Belt	Check and adjust as needed.						
Final Drive Transmission (Chaincase)	Replace the fluid.						
Hydraulic/Hydrostatic Reservoir	Replace the fluid.						

* Also replace the filter element when transmission warning light stays on for five (5) minutes after the hydrostatic fluid is at operating temperature.



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

A



B-07023

LIFTING AND BLOCKING THE BOBCAT LOADER

Procedure

Always park the loader on a level surface.

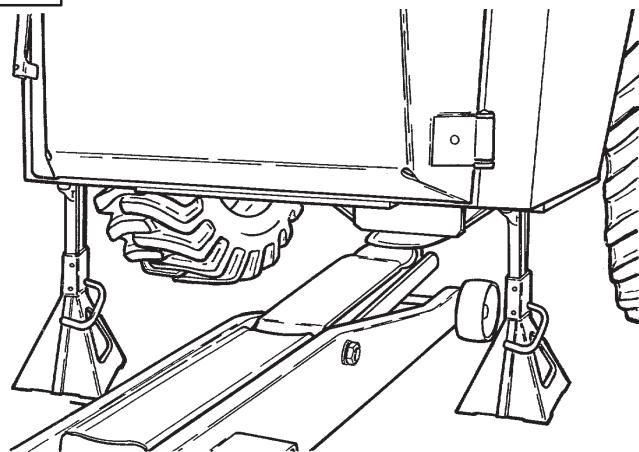


WARNING

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

B



B-09931

Put floor jack under the rear of the loader.

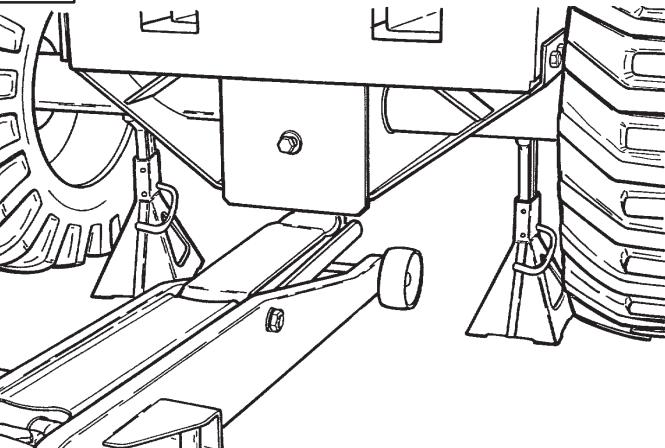
Lift the rear of the loader and install jackstands [B].

Put floor jack under the front of the loader.

Lift the front of the loader and put jackstands under the axle tubes [C].

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

C



B-09843

TRANSPORTING THE BOBCAT LOADER

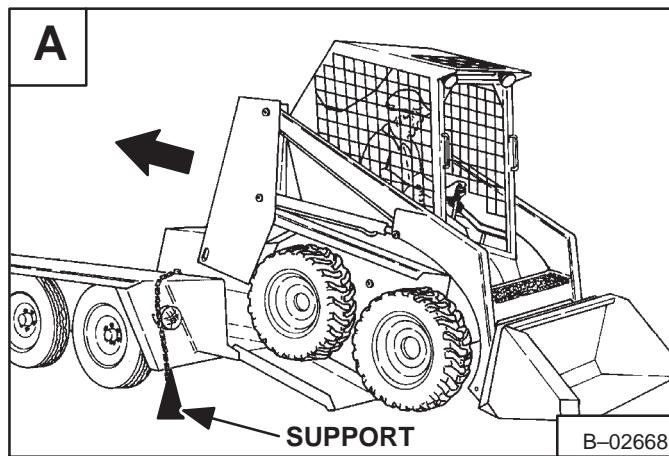
Procedure



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 empty bucket or no attachment must be driven backwards onto the transport vehicle [A].

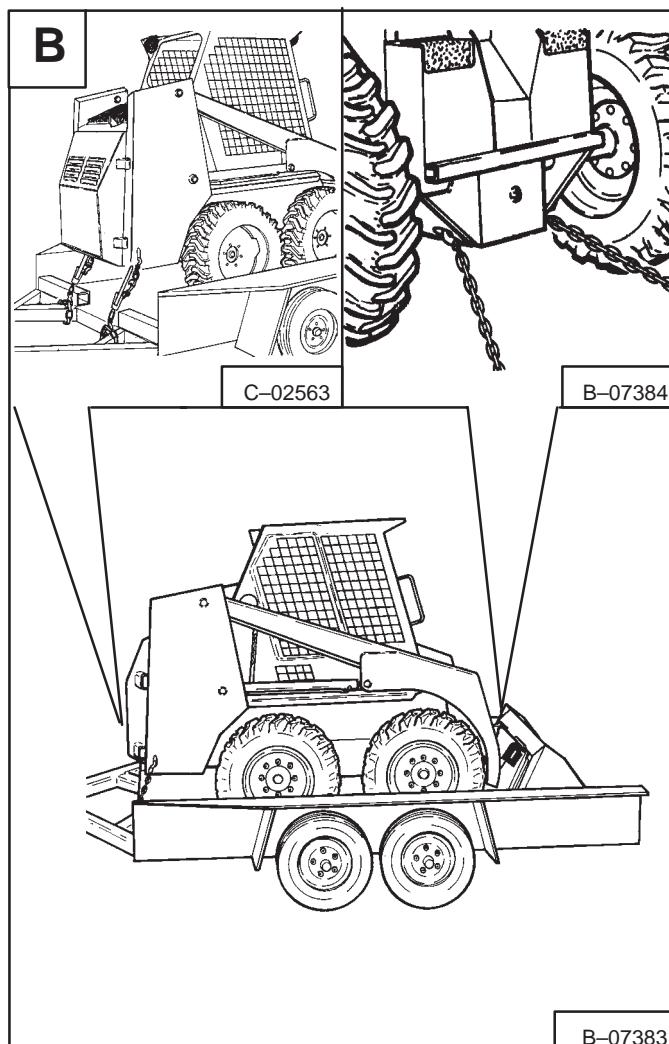
The rear of the trailer must be blocked or supported [A] when loading or unloading the loader to prevent the front end of the trailer from raising up.

Use the following procedure to fasten the Bobcat loader to the transport vehicle [B].

Lower the bucket or attachment to the floor and stop the engine.

Engage the parking brake.

Install chains at the front as shown and to the rear to prevent the loader from moving during sudden stops or when going up or down slopes.



LIFT ARM STOP

Procedure

One person must stay in the operator cab with the seat belt fastened and the seat bar lowered, while the second person installs a Melroe approved stop over the rod of one lift cylinder **[A]**.

Start the engine and raise the lift arms.

Have a second person install the lift arm stop over the rod of one lift cylinder.

The lift arm stop must be tight against the cylinder rod.

Lower the lift arms slowly until the stop is held between the lift arm and the lift cylinder.



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

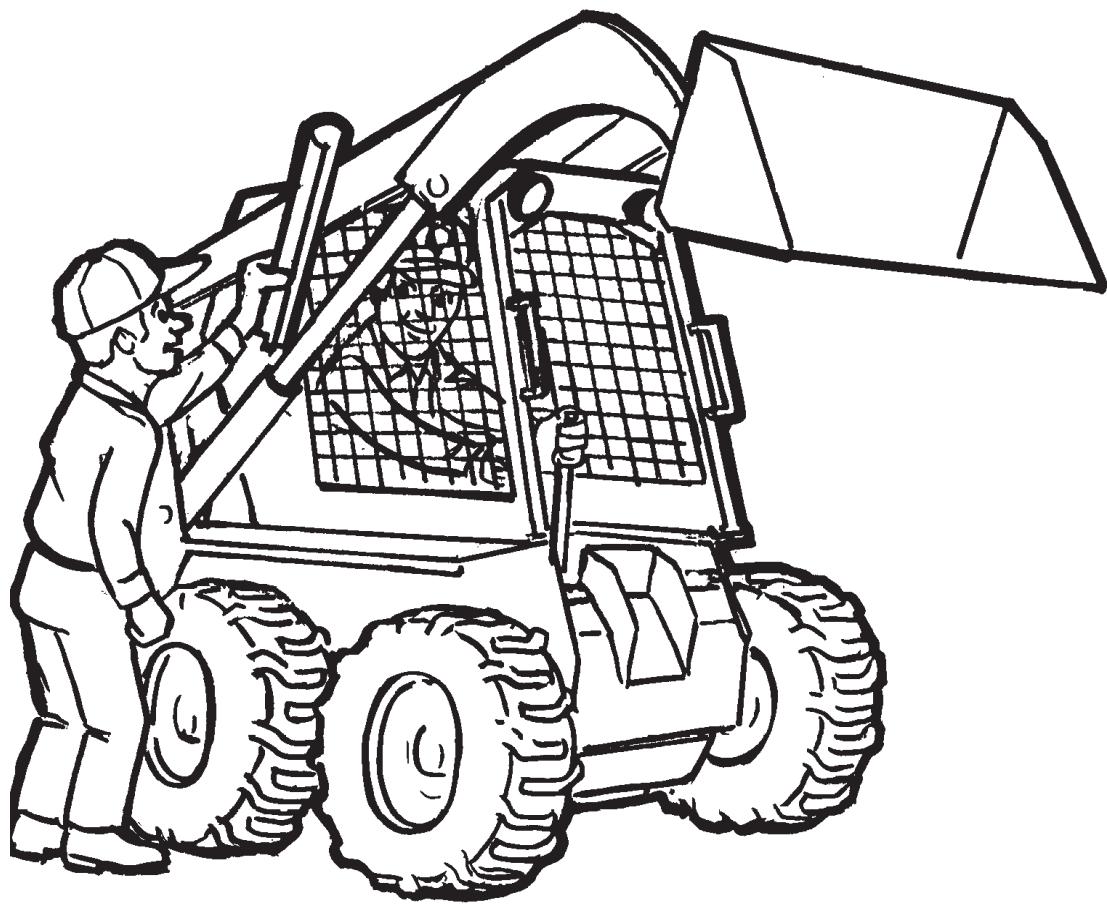


WARNING

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

A



B-06581

OPERATORS CAB

The Bobcat loader has operator cab (ROPS and FOPS) as standard equipment to protect the operator from rollover and falling objects.

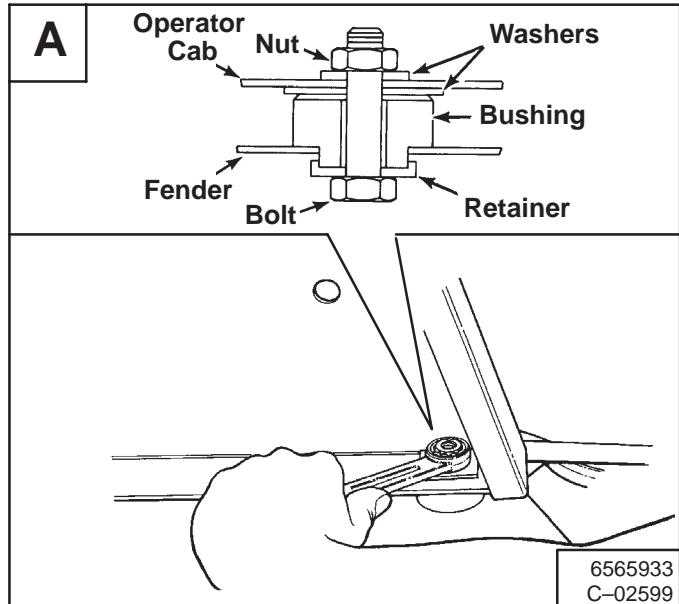
Check with your dealer if the operator cab has been damaged.



WARNING

Never modify operator cab by welding, grinding, drilling holes or adding attachments unless instructed to do so by Melroe Company. Changes to the cab can cause loss of operator protection from rollover and falling objects, and result in injury or death.

W-2069-1285



The operator cab fastening bolts and nuts must be tight [A].

Installation: Tighten the bolts & nuts to 65–70 ft.-lbs. (89–94 Nm) torque.



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

Raising the Operator Cab

Stop the loader on a level surface. Put the lift arms all the way down.

If the lift arms are up while raising the cab, install a lift arm stop. (See Page 1–4.)



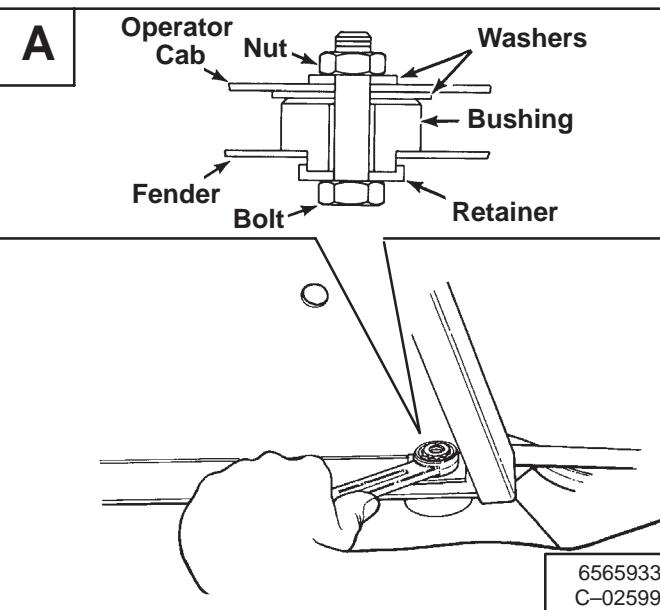
WARNING

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

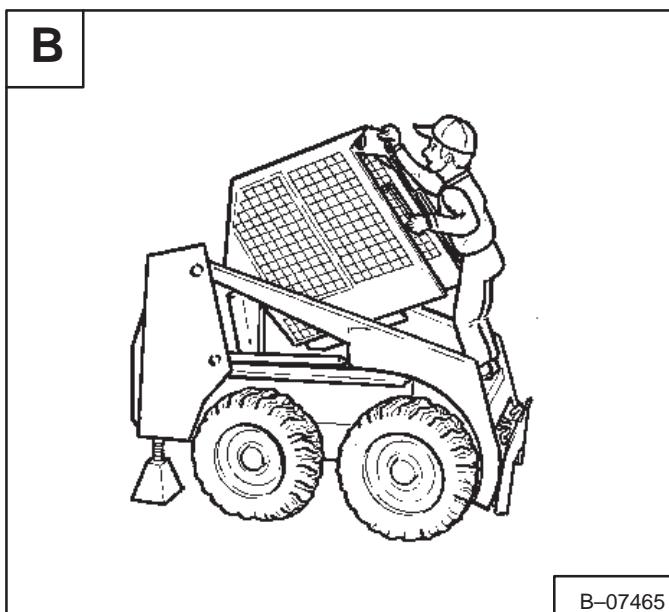
OPERATOR CAB (Cont'd)

Remove the two fasteners (including the washers or plates) at the front corners of the operator cab [A].



If the lift arms are down, stand on the safety tread (lift arm crossmember) and lift on the top of the operator cab and the grab handle. Slowly lift until the operator cab is all the way up [B].

If the lift arms are held up by a lift arm stop, stand in front of the loader. Lift on the grab handle and the bottom of the operator cab slowly until the operator cab is all the way up [C].

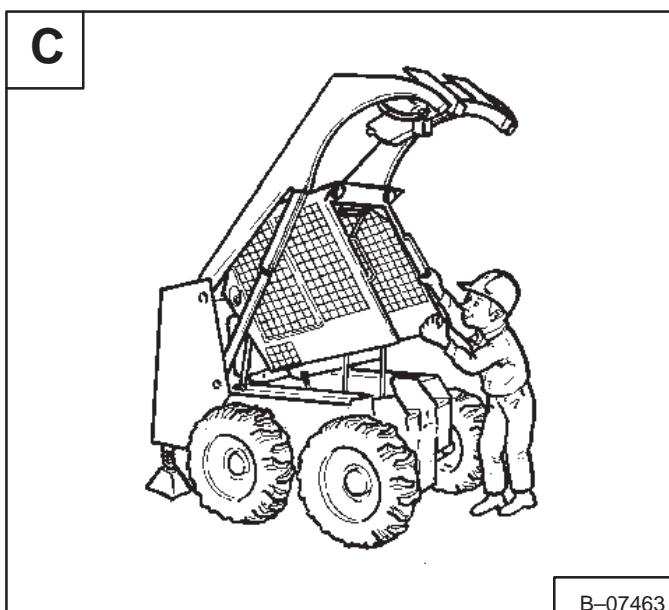


Lowering the Operator Cab

If the lift arms are down, stand on the safety tread (lift arm crossmember). Pull down on the bottom of the operator cab and use the grab handles and the operator cab top until the operator cab is all the way down [B].

If the lift arms are held up by a lift arm stop, stand in front of the loader. Pull down on the bottom of the operator cab and use the grab handle until the cab is all the way down [C].

Install the two fasteners, (including the washers or plates) and tighten the nuts [A]. Tighten the bolts and nuts to 65–70 ft.–lbs. (89–94 Nm) torque.



SEAT BAR SYSTEM

Seat Bar Description

The seat bar system has a pivoting seat bar with arm rests and has spring loaded latches for the lift and tilt control pedals. The operator controls the use of the seat bar. The seat bar in the down position helps to keep the operator in the seat and unlocks the foot pedals. When the seat bar is up, the lift and tilt pedals are locked in neutral position.

Seat Bar Inspection

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

Pull the seat bar all the way down and start the engine.

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

Raise the seat bar. Try to move each foot pedal. Pedals must be firmly locked in the 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 fully 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. Unfasten the seat belt.

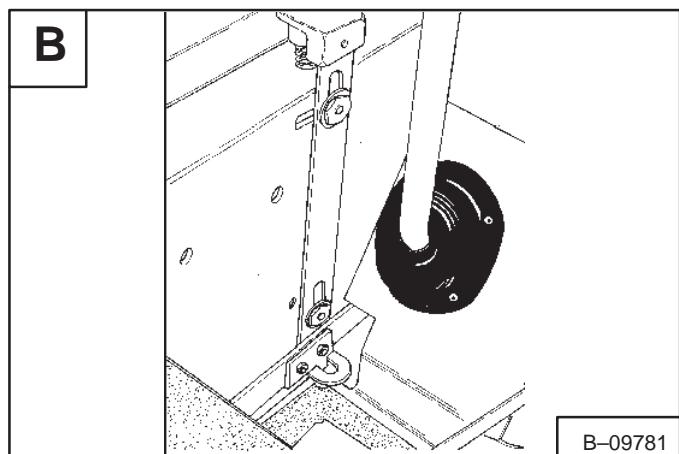
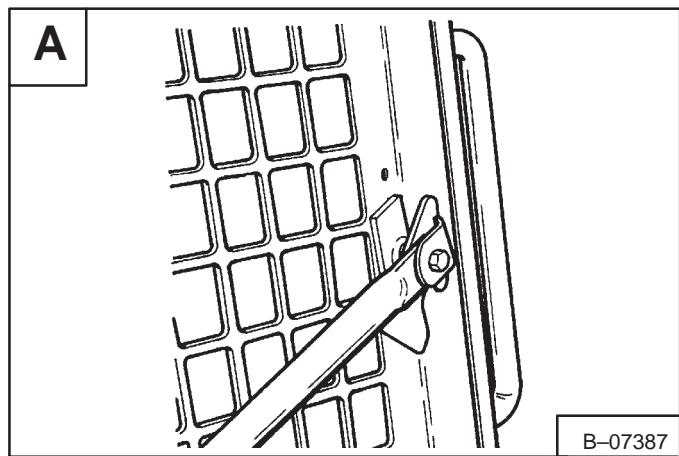
Seat Bar Maintenance

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

Inspect the linkage bolts and nuts for tightness 25–28 ft.–lbs. (34–38 Nm) torque.

Use general purpose grease to lubricate the seat bar pivot points at each side of the cab **[A]**.

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

USING EXTRA BATTERY (JUMP START)

Procedure

If it is necessary to use 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.



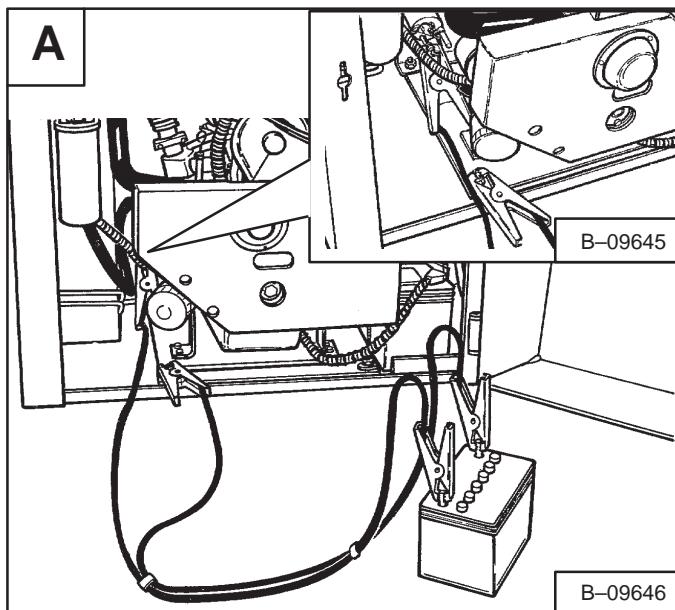
WARNING

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



WARNING

Keep arcs, sparks, flames and lighted tobacco away from batteries. When *jumping* from booster battery make final connection (negative) at engine frame.

Do not jump start or charge a frozen or damaged battery. Warm battery to 60°F. (16°C.) before connecting to a charger. Unplug charger before connecting or disconnecting cables to battery. Never lean over battery while boosting, testing or charging.

Battery gas can explode and cause serious injury.

W-2066-1296

The ignition switch must be in the OFF position.

The battery to be used must be of the same voltage.

Connect the end of the first cable to the positive (+) terminal of the booster battery. Connect the other end of the same cable to the starter positive (+) terminal [A].

Connect the end of the second cable to the negative (-) terminal of the booster battery. Connect the other end of the same cable to the engine for ground [A].

Keep the cables away from moving parts.

Start the engine.

After the engine has started, remove the cable connection at the engine ground (-) first.

Remove the cable connected to the positive (+) terminal of 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

REMOTE START SWITCH

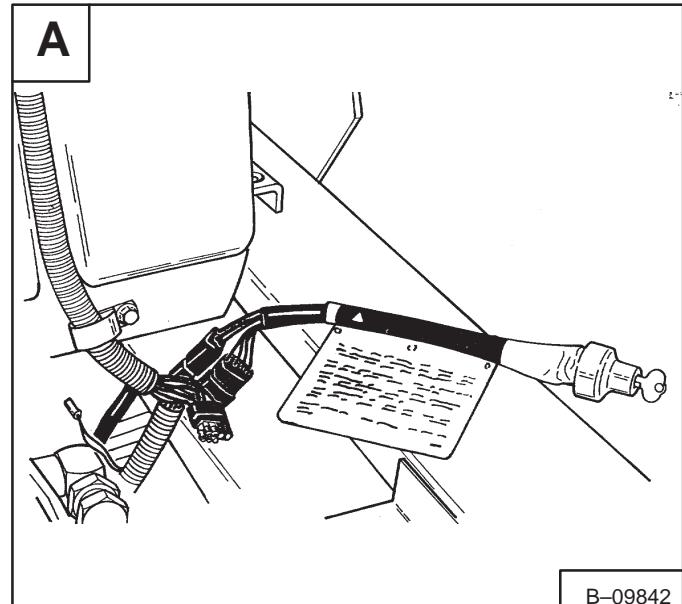
Procedure

The tools listed will be needed to do the following procedure:

MEL1138A – Remote Start Switch

The short wire harness assembly is required when the operator cab is in the raised position for service and the serviceman needs to start the engine. The wire harness connectors must be separated at the operator cab and engine wiring harness connectors **[A]**.

This remote start switch is required when the serviceman is adjusting the steering linkage, checking the hydraulic/hydrostatic system.





HYDRAULIC SYSTEM

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**HYDRAULIC
SYSTEM**



HYDRAULIC / HYDROSTATIC FLOW CHART

For Models

642B, 643

(With 3-Spool Melroe Control Valve)

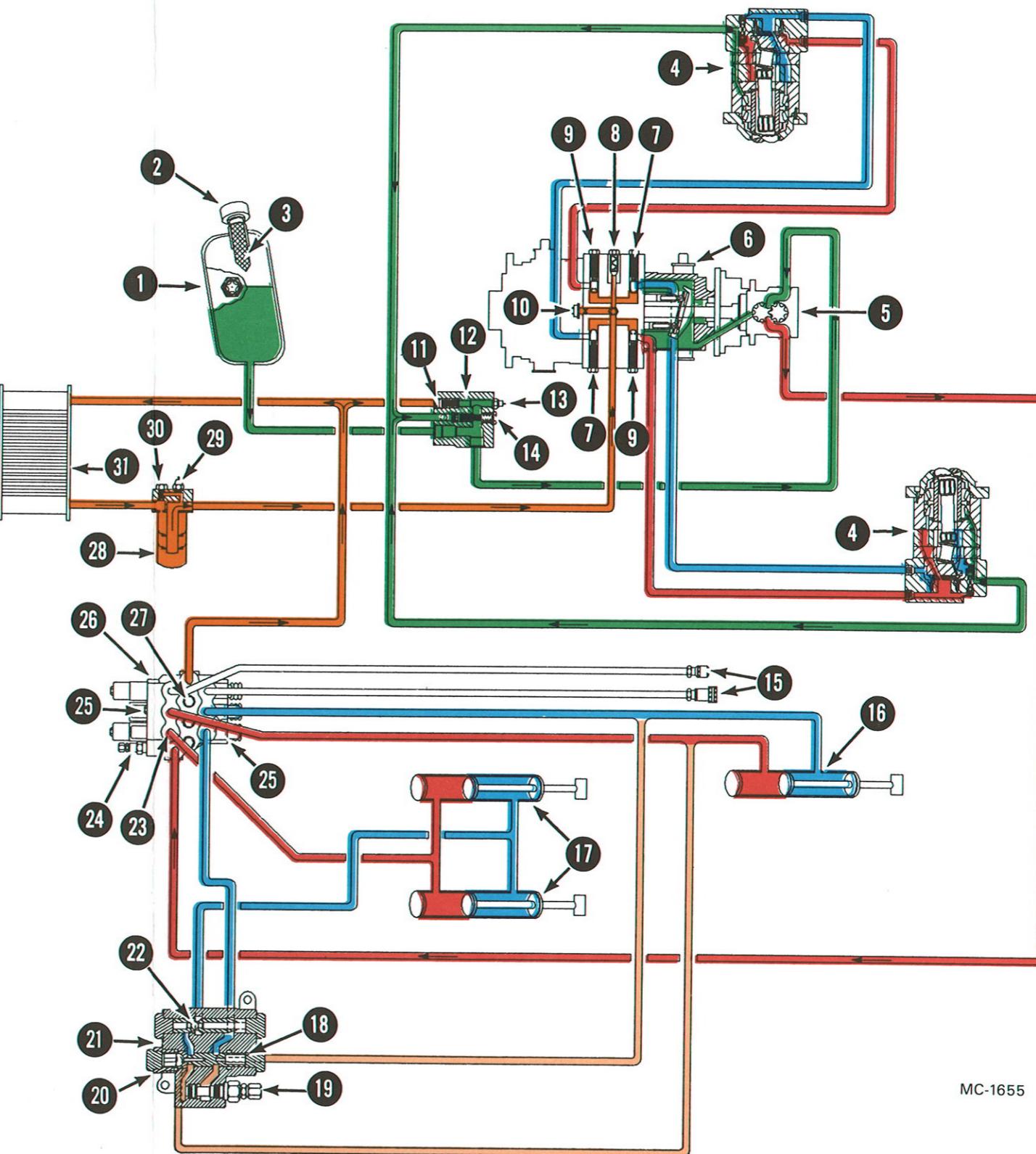
Chart # 6722238 (Printed August 1992)



RED - - - - -	High Pressure
BLUE - - - - -	Low Pressure
GREEN - - - - -	Case Drain & Reservoir
ORANGE - - - - -	Charge Pressure
L.T. ORANGE - - - - -	Bucket Positioning Fluid

NOTE

Chart shows oil flow in Forward Drive Position and with Hydraulic Cylinders Partially Extended. For Hydraulic/Hydrostatic System Operation, refer to Sheet 2 of this publication.



MC-1655



HYDRAULIC / HYDROSTATIC SYSTEM OPERATION

To Be Used With

HYDRAULIC / HYDROSTATIC FLOW CHART

For Models

642B, 643

(With 3-Spool Melroe Control Valve)

Chart # 6722238 (Printed August 1992)

CHART LEGEND

- 1 RESERVOIR..... 3.5 Gals. (13.2 L)
- 2 FILL CAP
- 3 SCREEN..... 60 Mesh
- 4 HYDROSTATIC MOTOR
- 5 HYDRAULIC PUMP, Rated @ 2600 RPM
642B (S/N 31104 & Above);
643 (S/N 24946 & Above)
Gear Type... 10.8 GPM (45.8 L/min.)
642B (S/N 13103 & Below);
643 (S/N 24945 & Below)
Vane Type... 10.8 GPM (45.8 L/min)
- 6 HYDROSTATIC PUMPS
- 7 REPLENISHING VALVES (2)
- 8 CHARGE RELIEF VALVE... 95-115 PSI
(655-793 kPa)
- 9 HIGH PRESSURE RELIEF/REPLENISHING
VALVES (2):. 3000 PSI (20685 kPa)
- 10 CHARGE PRESSURE SWITCH
17-23 PSI (117-159 kPa)
- 11 OIL COOLER BY-PASS... 177-227 PSI
(1220-1565 kPa)
- 12 PORT BLOCK
- 13 TEMPERATURE SWITCH. 225-232°F
(106-112°C)
- 14 CASE DRAIN RELIEF VALVE
45-55 PSI (310-379 kPa)
- 15 AUXILIARY QUICK COUPLERS (OPT.)
- 16 TILT CYLINDER
- 17 LIFT CYLINDERS
- 18 FLOW RETURN SPOOL
- 19 RELIEF VALVE..... 500-600 PSI
(3448-4136 kPa)
- 20 CHECK POPPET VALVE
- 21 BUCKET POSITIONING VALVE (OPT.)
- 22 FLOW DIVIDER SPOOL
- 23 RESTRICTOR (ONE WAY)
0.125" (3.2 mm) Dia. Orifice
- 24 MAIN RELIEF VALVE, 1850-1950 PSI
(12756-13445 kPa)
- 25 ANTI-CAVITATION VALVE (2)
- 26 HYDRAULIC CONTROL VALVE
- 27 LOAD CHECK VALVES (3)
- 28 HYDRAULIC/HYDROSTATIC FILTER
#3 Element
- 29 DIFFERENTIAL PRESSURE SWITCH
40 PSI (276 kPa)
- 30 FILTER BY-PASS VALVE..... 50 PSI
(345 kPa)
- 31 OIL COOLER

The fluid flows by gravity from the reservoir 1 to the port block 12 which is located inside the right fender. Return fluid from the oil cooler by-pass valve 12 joins with the fluid from the oil cooler 32 and hydrostatic pump 6 through the bearing of the pump 6 and supplies fluid to the hydraulic pump 5.

The hydraulic pump 5 is driven by a shaft through the hydrostatic pumps 6. The fluid goes from the hydraulic pump 5 to the hydraulic control valve 26.

The control valve 26 has an adjustable relief valve 24. When all three spools of the control valve are in the neutral position, the fluid goes through the control valve 26 and to the oil cooler 31. If one of the spools is activated, the fluid goes out the respective port and to either the base end, or the rod end of the cylinder(s) 16 17. ALSO SEE OPTIONAL BUCKET POSITIONING SYSTEM OPERATION. As the fluid goes into one end of the cylinder(s) 16 17, the fluid from the other side of the cylinder flows back into the control valve 26. When the cylinder(s) 16 17 reach the end of the stroke, the fluid pressure reaches the setting of the relief valve 24, it will open and let the fluid by-pass the hydraulic circuit (internally) and go back to the oil cooler 31. When the spool goes back to neutral position, then there is fluid available for the other sections of the control valve 26. Two sections of the control valve 26 can be used at the same time if the main relief valve 24 is not open.

The fluid flows from the oil cooler 31 through the filter 28 to the center section of the hydrostatic pumps 6. This fluid is called "charge supply fluid". In the center section of the pumps 6 the fluid is against two high pressure relief/replenishing valves 9, two replenishing valves 7 and the charge relief valve 8. When the fluid gets to the pumps 6 it activates the high pressure relief/replenishing valves 9 and replenishing valve 7. The replenishing valves 7 9 open and let fluid into the pumps 6 for replenishing, lubrication and cooling. The pumps 6 do not need the full volume of fluid flow so there is extra fluid. This extra fluid goes to the charge relief valve 8.

There are two hydrostatic pumps 6 and hydrostatic motors 4. One pump and one motor work together as a pair to drive on one side of the loader. The other pump and motor work as a pair to drive the opposite side of the loader.

When the steering levers are in neutral, the pumps 6 and the motors 4 are not working, but do have charge pressure. When the steering levers are moved, the swashplates in the pumps 6 are angled and the fluid is forced out of the pressure side of the pumps 6 and to the motors 4.

This flow of fluid is called "drive pressure fluid". Drive pressure is much higher than charge pressure causing the replenishing valves 7 9 to close, allowing the flow of fluid to go to the motors 4. There are four replenishing valves 7 9, two for each pump 6. One