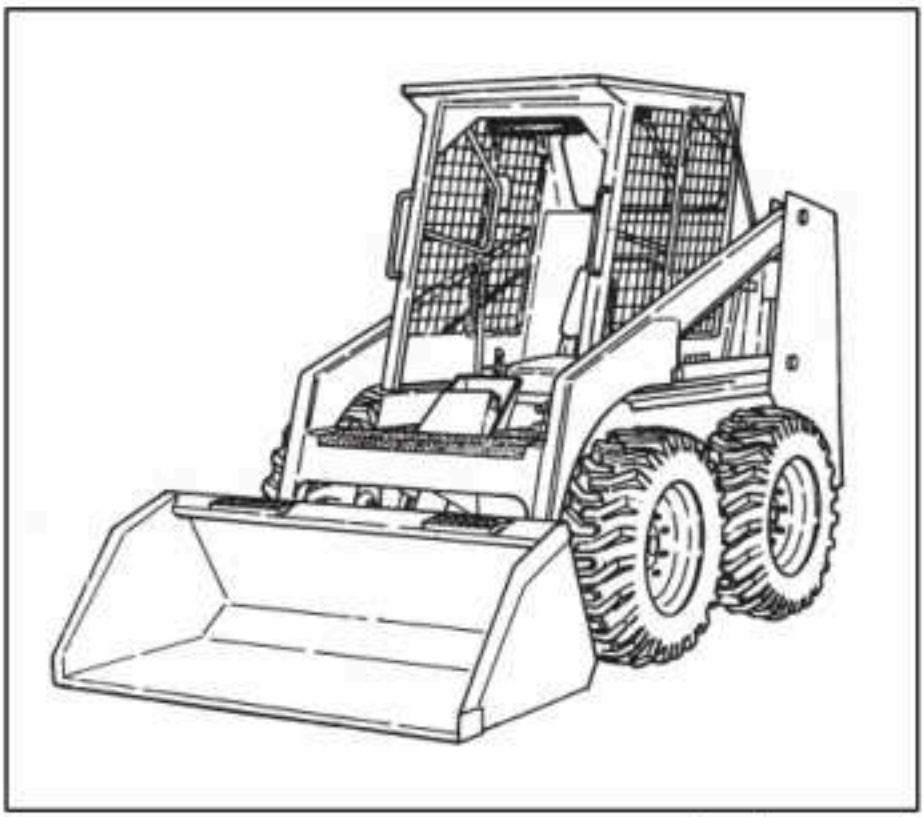
642B

Service Manual



MELROE
INGERSOLL-RAND

6570275(4-86) Printed in U.S.A.

bobcat

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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: _____

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REMOTE START SWITCH

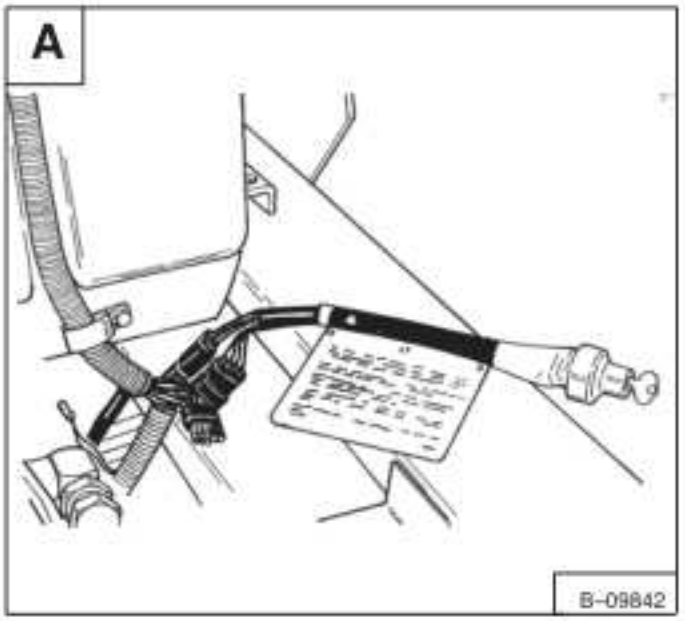
Procedure

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.



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CYLINDER HEAD (Cont'd)

Removal And Installation (Cont'd)

Installation:

Tighten the bolts to 25 ft.–lbs. (34 Nm) torque in the sequence shown **[A]**.

Tighten to 51–54 ft.–lbs. (69–73 Nm) torque in the sequence shown **[A]**.

Remove the cylinder head. Remove the cylinder head gasket.

Installation: Use a new cylinder head gasket and do not use sealant on the gasket.

Inspection

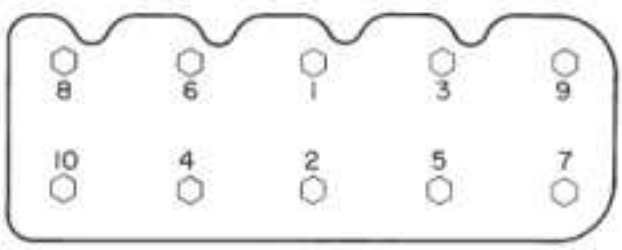
Clean the cylinder head of all carbon deposits. Remove the valves. (See Page 7B–32.)

Check the cylinder head surface by using a straight edge in the direction of A, B, etc. **[B]**.

Standard Dimension .... 0.002 inch (0,05 mm) or less
Service Limit ..... 0.004 inch (0,1 mm)

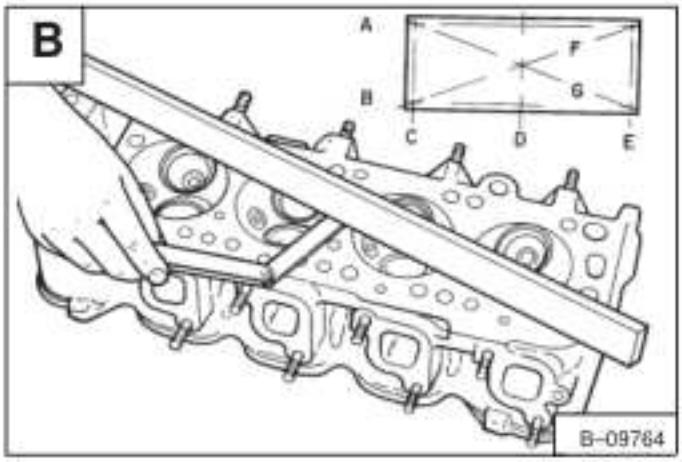
If the cylinder head surface exceeds the service limit, either replace or grind the cylinder head.

A Installing Head Bolt Sequence



B-09767

B



B-09764

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TORQUE FOR GENERAL METRIC BOLTS

Thread Size (Dia. x Pitch)	Material		
	Head Mark 4	Head Mark 7	Head Mark 10
M 5 x 0,8		3–4 ft.–lbs. (4–5 Nm)	
M 6 x 1,0		6–7 ft.–lbs. (8–9 Nm)	6–9 ft.–lbs. (8–12 Nm)
M 8 x 1,25	6–6 ft.–lbs. (8–12 Nm)	11–16 ft.–lbs. (15–22 Nm)	18–25 ft.–lbs. (24–34 Nm)
M 10 x 1,25	13–18 ft.–lbs. (18–24 Nm)	22–30 ft.–lbs. (30–41 Nm)	36–50 ft.lbs. 49–68 Nm)
M 12 x 1,25	22–30 ft.–lbs. (30–41 Nm)	40–54 ft.–lbs. (54–73 Nm)	69–87 ft.–lbs. (94–118 Nm)
M 14 x 1,5	36–50 ft.–lbs. (49–68 Nm)	58–80 ft.–lbs. (79–108 Nm)	116–137 ft.–lbs. (157–186 Nm)

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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.

⚠WARNING

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

W-2044-1285

IMPORTANT

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

I-2019-0284

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.J
- Use the procedure in the Operator's Manual for cleaning the spark arrestor muffler after each 100 hours of operation.

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FLUID FLOW EXPLANATION

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

The hydraulic pump ❺ is driven by a shaft through the hydrostatic pumps ❻ . The fluid goes from the hydraulic pump ❺ to the hydraulic control valve ㉘ .

The control valve ㉘ 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 ㉘ 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) ⓰ ⓱ . ALSO SEE OPTIONAL BUCKET POSITIONING SYSTEM OPERATION. As the fluid goes into one end of the cylinder(s) ⓰ ⓱ , the fluid from the other side of the cylinder flows back into the control valve ㉘ . When the cylinder(s) ⓰ ⓱ 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 ㉘ . Two sections of the control valve ㉘ 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 ㉙ to the center section of the hydrostatic pumps ❻ . This fluid is called ''charge supply fluid''. In the center section of the pumps ❻ the fluid is against two high pressure relief/replenishing valves ❾ , two replenishing valves ❼ and the charge relief valve ❽ . When the fluid gets to the pumps ❻ it activates the high pressure relief/replenishing valves ❾ and replenishing valve ❼ . The replenishing valves ❼ ❾ open and let fluid into the pumps ❻ for replenishing, lubrication and cooling. The pumps ❻ do not need the full volume of fluid flow so there is extra fluid. This extra fluid goes to the charge relief valve ❽ .

There are two hydrostatic pumps ❻ and hydrostatic motors ❹ . 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 ❻ and the motors ❹ are not working, but do have charge pressure. When the steering levers are moved, the swashplates in the pumps ❻ are angled and the fluid is forced out of the pressure side of the pumps ❻ and to the motors ❹ .

This flow of fluid is called ''drive pressure fluid''. Drive pressure is much higher than charge pressure causing the replenishing valves ❼ ❾ to close, allowing the flow of fluid to go to the motors ❹ . There are four replenishing valves ❼ ❾ , two for each pump ❻ . One

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HYDRAULIC / HYDROSTATIC FLOW CHART

For Model

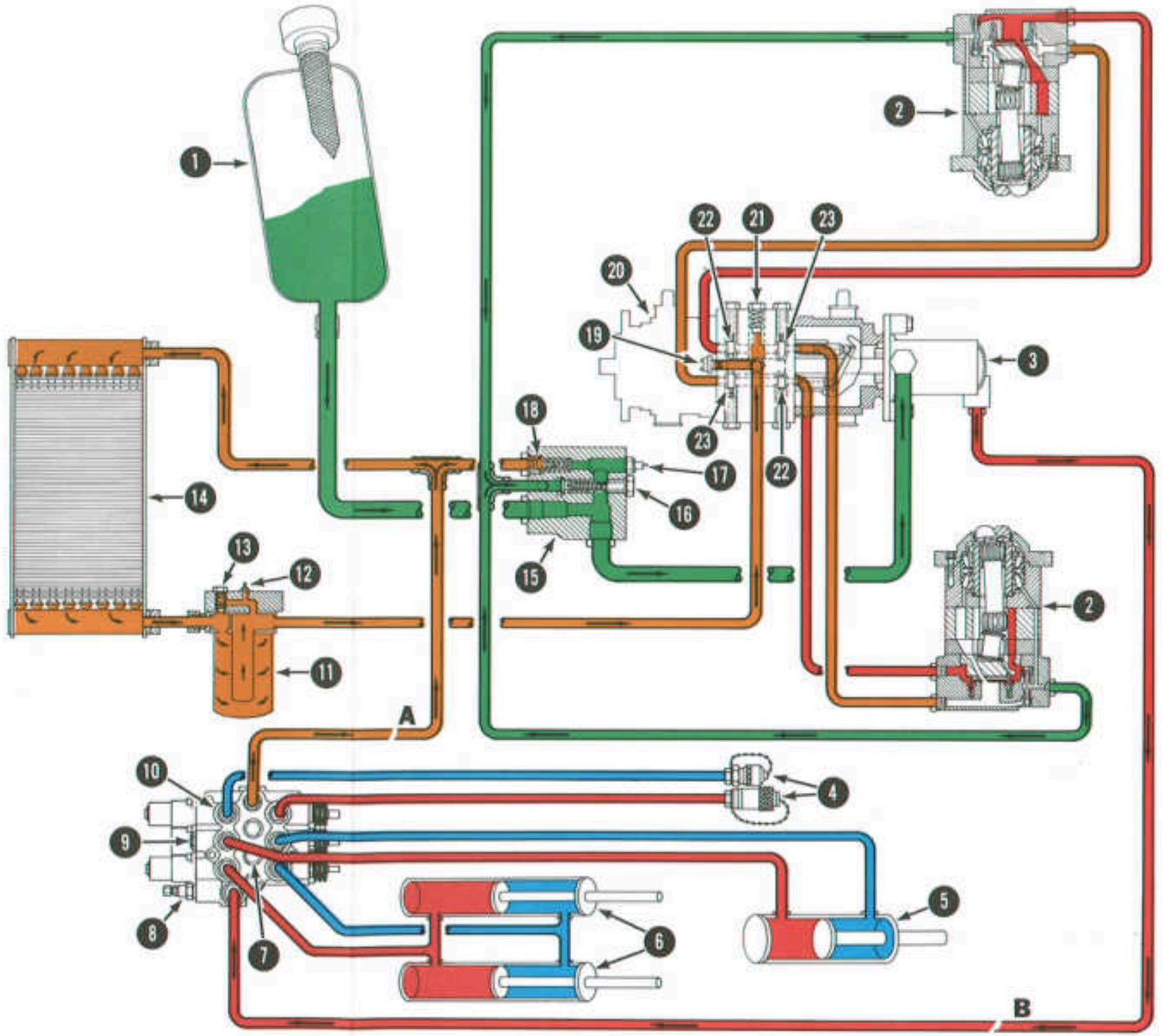
641 (Starting With S/N 13209)
642 (Starting With S/N 13524)
642B (Starting With S/N 25000)
643 (Starting With S/N 13406)

Chart # 6570266 (Printed April 1989)

RED - - - - - - - - High Pressure
BLUE - - - - - - - - Low Pressure
GREEN - - - - - - Case Drain & Reservoir
ORANGE - - - - - Charge Pressure

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.

NOTE
Refer to Chart #6570287 for machines equipped with optional Bucket Positioning Valve. Reference "A" and "B" indicate location of hydraulic circuitry connection.



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