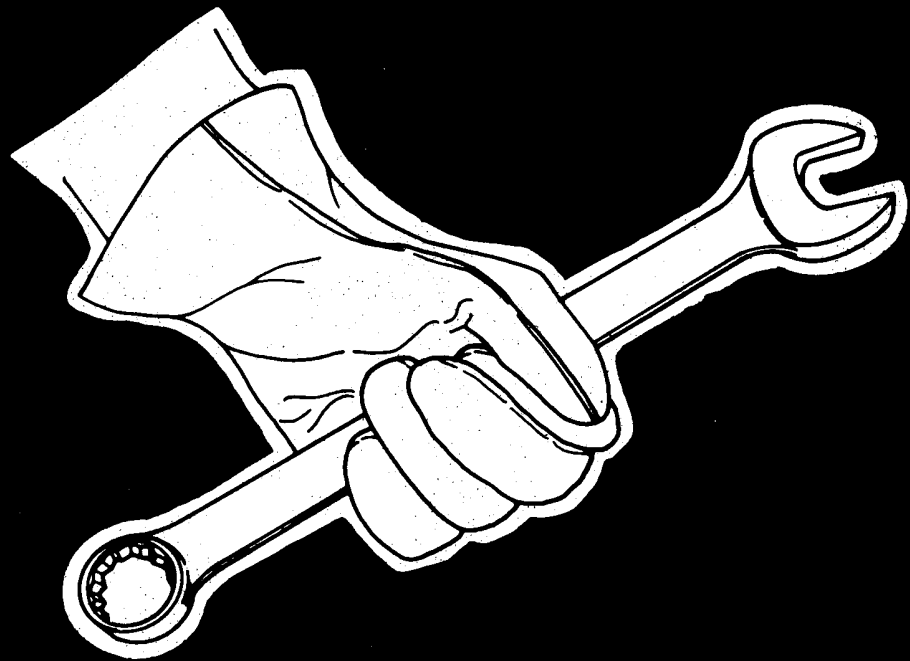




2000

RTF

# SERVICE MANUAL



**CLARK** Melroe  
Division



# MAINTENANCE SAFETY



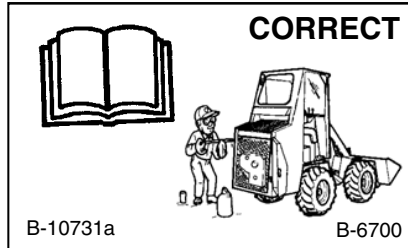
## WARNING

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.

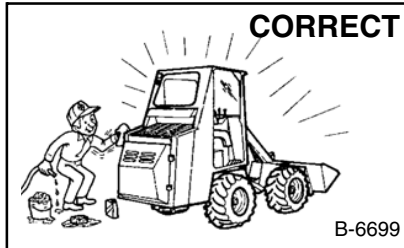
W-2003-0903



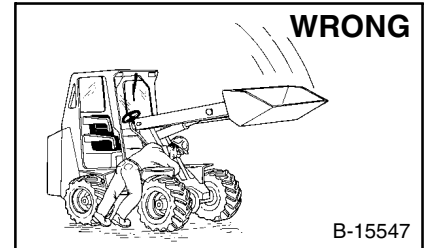
**Safety Alert Symbol:** This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



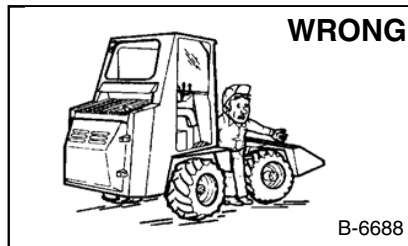
- ⚠ Never service the Bobcat Loader without instructions. See Service Manual.
- ⚠ Check engine and hydraulic fluids daily.
- ⚠ Use recommended fluids.



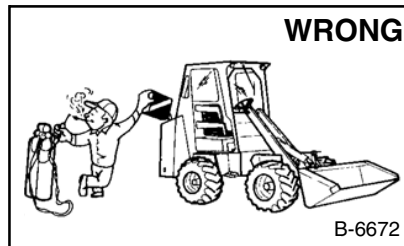
- ⚠ Cleaning and maintenance are required daily.



- ⚠ 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.



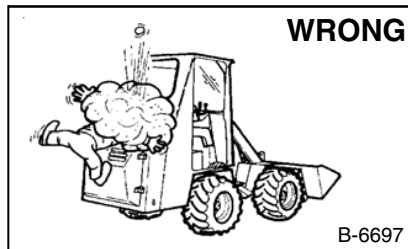
- ⚠ Always connect steering frame lock before working on the loader.



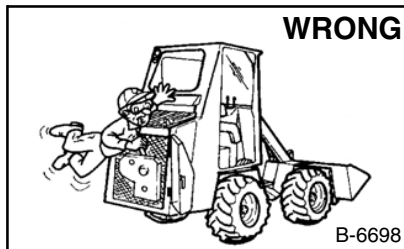
- ⚠ Do not fill the fuel tank with engine running, while smoking or when near an open flame.



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



- ⚠ 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.



- ⚠ 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.



- ⚠ 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.

MSW04-0805



**Bobcat®**

# SAFETY INSTRUCTIONS

## SAFETY IS YOUR RESPONSIBILITY

The Rough Terrain Forklift is a highly maneuverable and compact machine. In operation, it is rugged and useful under a wide variety of conditions. This presents an operator with hazards which are common for off-highway, rough-terrain applications but are not unique for use of the Bobcat Forklifts.

The machine has an internal combustion engine with resultant heat and exhaust. All exhaust gases can kill so the machine must be used with adequate ventilation. The machine must not be used in space with explosive dusts or gases or so that the engine exhaust contacts flammable material. The machine has a spark arrestor muffler which is required for operation in certain areas.

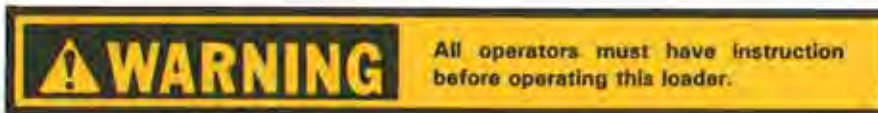
For machine applications, the dealer recommends the capabilities and restrictions of the machine and attachments for each application use. The dealer demonstrates the safe operation of the machine according to the manufacturer's instructional materials which are also available to all operators. The dealer can also identify unsafe modifications or use of unapproved attachments. The attachments and buckets are designed for rated capacity and secure fastening to the machine. For each model machine, the user must check with the dealer or manufacturer's literature to identify each bucket or attachment for safe loads of materials of specified densities.

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

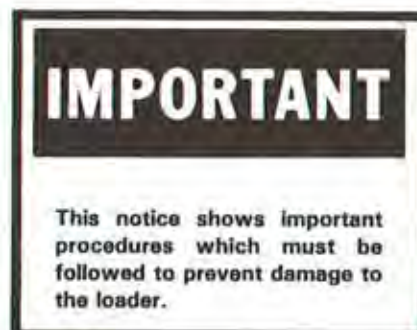
1. The Delivery Report is used to check whether complete instructions have been given to the new owner.
2. The Operator's Manual delivered with every machine gives operating information as well as routine maintenance and service.
3. Every machine has signs (decals) which instruct on the safe care and operation of the machine. The complete signs and their location are shown in the Operator's Manual. All signs are available from the dealer.
4. The Bobcat Forklift has a plastic Operator Handbook fastened by cable to the operator cab. It has brief operations always available to the operator. The handbook is available from the dealer in an English edition or a combination English, French, German, Spanish edition.
5. The Service Manual and Parts Book are optional manuals from the dealer for use by mechanics to do shop-type service and repair work.

The dealer and owner/operator review the recommended uses of the machine and attachments at the time of delivery of the machine. If change of the use of the machine occurs in the future, the owner/operator must remember to ask the dealer for recommendations on the new use of the machine.

## READ THIS MANUAL BEFORE YOU SERVICE THE BOBCAT ROUGH TERRAIN FORKLIFT (RTF)



This Service Manual was written to give the service personnel instructions on the safe service of the Bobcat Forklift. READ AND UNDERSTAND THIS SERVICE MANUAL BEFORE YOU SERVICE YOUR BOBCAT.



## **SAFE OPERATION NEEDS A QUALIFIED OPERATOR**

### **A QUALIFIED OPERATOR\* MUST DO THE FOLLOWING:**

#### **A. UNDERSTAND THE WRITTEN INSTRUCTIONS, RULES AND REGULATIONS**

1. The written instructions from the Clark Equipment Co., include the delivery report, loader operator's handbook and manual, attachment manual and machine signs (decals).
2. Check the rules and regulations at your location. The rules may include an employer's work safety requirements. Regulations may identify a hazard such as a utility supply line.

#### **B. HAVE TRAINING WITH ACTUAL OPERATION**

1. Operator training must consist of a demonstration and verbal instruction. This training is given by the Bobcat dealer before the loader is delivered.
2. The new operator should start in an area without bystanders and use all the controls until he can control the loader at full use under the conditions for his work area.

#### **C. KNOW THE WORK CONDITIONS**

1. For each material to be handled, the operator must know how to avoid exceeding the rated operating capacity of the loader. For example in handling certain loose materials with a given bucket, he must know whether he can safely take a full or part of a bucket load.
2. The operator must know any prohibited uses or work areas for the loader. For example, he needs to know about excessive slopes.

\*For an operator to be qualified, he must not use drugs or alcoholic drinks which change his alertness or coordination while working. An operator who is taking prescription drugs must get medical advice on whether or not he can safely operate a machine.

## FOREWORD

This manual gives instruction for correct servicing and adjustment of the Bobcat Forklift, and overhaul instructions of the drive system, machine hydraulic/hydrostatic system and general main frame parts.

Make reference to the Operator's Manual for operations instructions (Starting Procedure, Daily Checks, Vertical Mast Operations, etc.).

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

1. Check hydraulic fluid level, engine oil level and fuel supply.
2. Inspect for any sign of fuel, oil or hydraulic fluid leaks.
3. Lubricate the machine.
4. Check battery condition and cables.
5. Inspect air cleaner system for damage or leaks. Check element and make replacement, as needed.
6. Check electrical charging system.
7. Check the warning lights.
8. Check tires for wear and pressure.
9. Check the attachment for condition. Inspect the vertical mast for damage or wear.
10. Inspect safety items for condition (Operator Enclosure, Seat Belt, Safety Treads, Lights, Horn, Safety Signs [Decals], Brake, etc.).
11. Make an inspection for loose or broken parts or connections.
12. Operate the Bobcat Forklift, checking all functions.

Check the above items, if any are in need of repair tell the Owner/Operator.

## CONTENTS

<b>PREVENTIVE MAINTENANCE</b> .....	<b>1</b>
<b>HYDRAULIC SYSTEM</b> .....	<b>2</b>
<b>HYDROSTATIC SYSTEM</b> .....	<b>3</b>
<b>DRIVE SYSTEM</b> .....	<b>4</b>
<b>MAIN FRAME</b> .....	<b>5</b>
<b>ELECTRICAL SYSTEM</b> .....	<b>6</b>
<b>ENGINE SERVICE</b> .....	<b>7</b>
<b>TECHNICAL DATA</b> .....	<b>8</b>
<b>ALPHABETICAL INDEX</b> .....	<b>9</b>

**PREVENTIVE  
MAINTENANCE**

**HYDRAULIC  
SYSTEM**

**HYDROSTATIC  
SYSTEM**

**DRIVE  
SYSTEM**

**MAIN  
FRAME**

**ELECTRICAL  
SYSTEM**

**ENGINE  
SERVICE**

**TECHNICAL  
DATA**

**ALPHABETICAL  
INDEX**






## PREVENTIVE MAINTENANCE

## PREVENTIVE MAINTENANCE

	Paragraph Number	Page Number
ADJUSTING THE DOOR LATCH . . . . .	1-7	1-4
AIR CLEANER SERVICE . . . . .	1-8	1-4
ALTERNATOR BELT . . . . .	1-12	1-9
BACK-UP ALARM . . . . .	1-20	1-21
DELIVERY REPORT . . . . .	1-4	1-2
ELECTRICAL SYSTEM . . . . .	1-13	1-9
ENGINE COOLING SYSTEM . . . . .	1-11	1-9
ENGINE LUBRICATION SYSTEM . . . . .	1-10	1-7
ENGINE SERVICE . . . . .	1-6	1-4
FRAME LOCK . . . . .	1-1	1-1
FRONT & REAR AXLES . . . . .	1-15	1-17
FUEL SYSTEM . . . . .	1-9	1-5
HYDRAULIC/HYDROSTATIC SYSTEM . . . . .	1-14	1-14
LIFTING AND BLOCKING THE BOBCAT FORKLIFT . . . . .	1-2	1-1
LUBRICATION OF THE BOBCAT ROUGH TERRAIN FORKLIFT . . . . .	1-18	1-19
OPERATOR CAB . . . . .	1-22	1-21
SERIAL NUMBER LOCATIONS . . . . .	1-3	1-2
SERVICE SCHEDULE . . . . .	1-5	1-3
SPARK ARRESTOR MUFFLER . . . . .	1-19	1-20
TIRE MAINTENANCE . . . . .	1-17	1-17
U-JOINTS . . . . .	1-16	1-17
VERTICAL MAST . . . . .	1-21	1-21

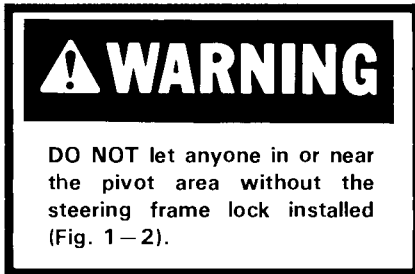
 <b style="font-size: 1.5em; margin-left: 10px;">WARNING</b>	<p>Instructions are necessary before doing service on forklift. See warnings and instructions both at beginning and throughout this manual. After doing service or making repair or adjustment, always check function of machine.</p> <p>Safety glasses or goggles are always needed for eye protection from electric arcs from shorts or welding, battery acid, compressed springs, fluids under pressure, and flying debris or loose material when engines are on or tools are used. Failure to obey warnings can cause injury or death.</p>
---	--



# 1 PREVENTIVE MAINTENANCE

## 1-1 FRAME LOCK

Before any service or repair work is done on the Bobcat Forklift, always install the steering frame lock (Fig. 1-1).



## 1-2 LIFTING AND BLOCKING THE BOBCAT FORKLIFT

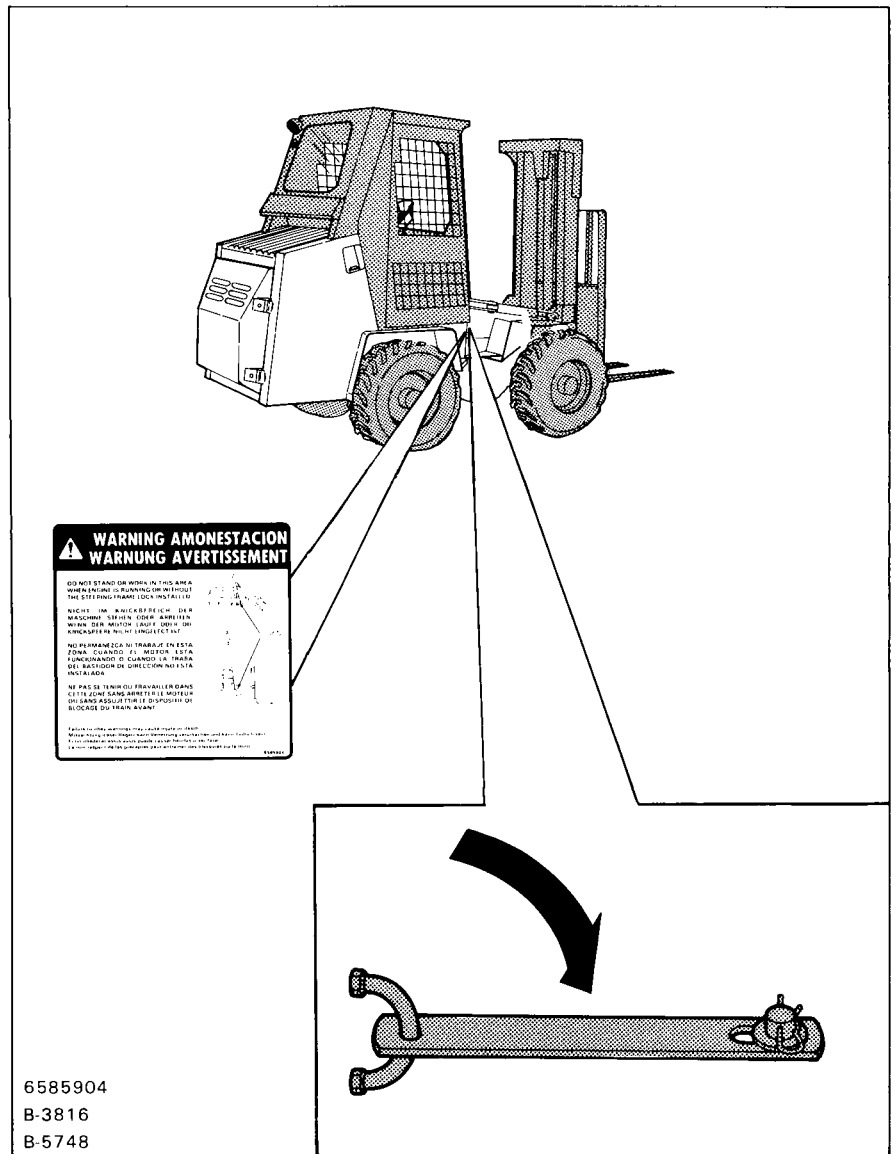
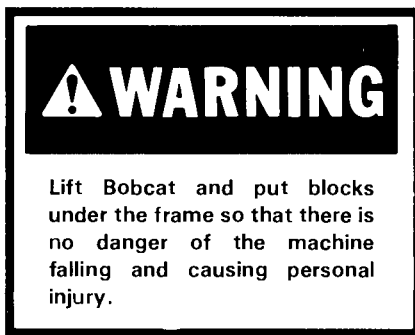


Fig. 1-1 Installing Steering Frame Lock

Before doing maintenance on the Bobcat Forklift, you must lift it up and block it as follows:

- (1) Lower the vertical mast. Stop the engine and install the framelock.
- (2) Put a floor jack under the rear of the machine.
- (3) After the rear of the Bobcat Forklift is lifted, put a jackstand under each rear corner. Make sure the machine is level.
- (4) Put the floor jack under the center of the front axle.
- (5) After the front of the machine is lifted, place jackstands under each side of the front axle. Make sure the machine is level.

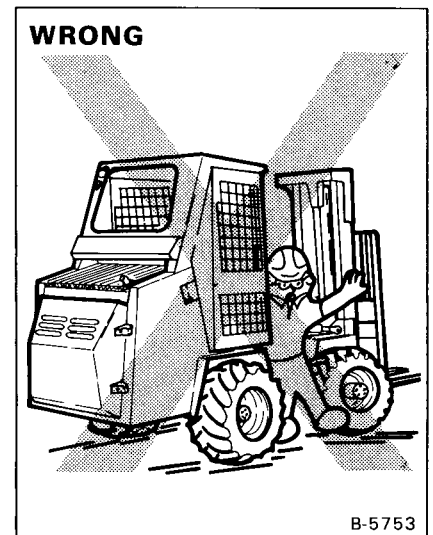
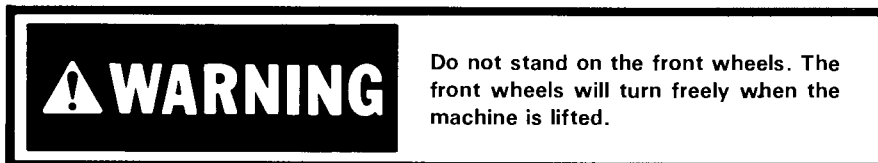


Fig. 1-2 Pivot Area Warning

### 1-3 SERIAL NUMBER LOCATIONS

It is important to make correct reference to the Serial Number of the Bobcat Forklift, the vertical mast and/or engine when making repairs or ordering parts. It is possible that the present machines do not use all of the same parts as earlier machines or it is possible that different procedures are used for service or repair.

Always have these numbers available when ordering parts or working on the Bobcat Forklift.

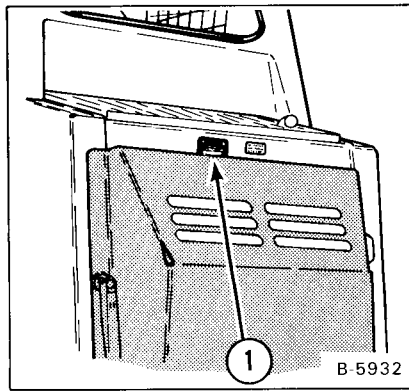


Fig. 1-3 Forklift Serial Number

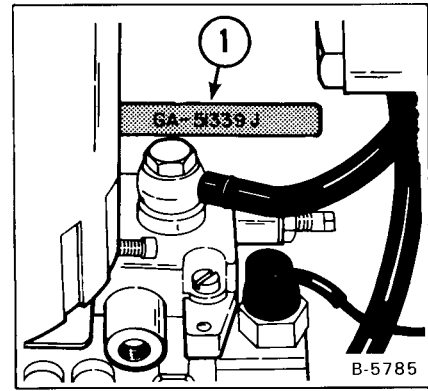
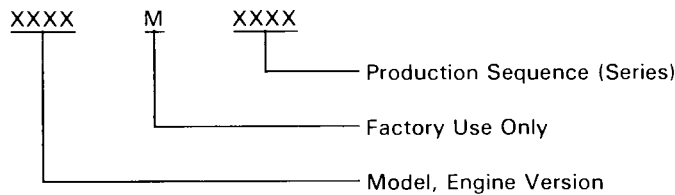


Fig. 1-4 Engine Serial Number

#### 1-3.1 Machine Serial Number

The Bobcat Forklift serial number is located at the rear of the machine over the rear door (Fig. 1-3, Item 1).

Explanation of the Serial Number:



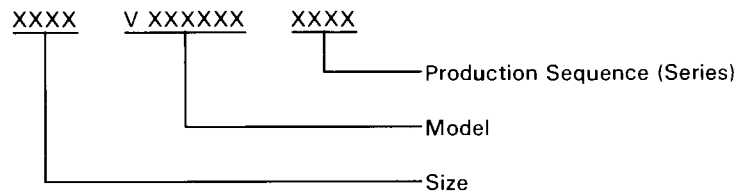
#### 1-3.2 Engine Serial Number

The engine serial number is on the right side of the engine, above the injection pump (on the cylinder block) (Fig. 1-4, Item 1).

#### 1-3.3 Vertical Mast Serial Number

The vertical mast model/serial number is located on the right side of the outside rail (Fig. 1-5).

Explanation of the Model/Serial Number:



#### 1-3.4 Axle Serial Numbers

All axles have identification numbers and letters on them. The front axle serial number is located on the left hand tube near the cover, 45° up from the bottom center of the tube. The rear axle serial number is located on the right hand tube near the cover, 45° up from the bottom center of the tube.

### 1-4 DELIVERY REPORT (Fig. 1-6)

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

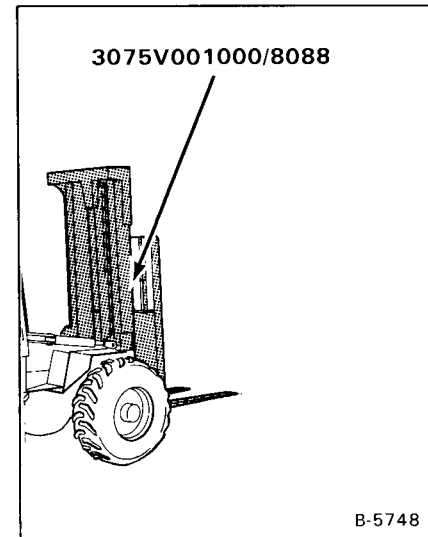


Fig. 1-5 Vertical Mast Model/Serial Number

Fig. 1-6 Delivery Report

## 1—5 SERVICE SCHEDULE

You must do maintenance work at regular intervals. Failure to do so will result in damage to the Forklift or the engine. The service schedule is a guide for correct maintenance of the Bobcat Forklift. Follow this service schedule as explained below unless it is to increase the frequency of intervals when the Bobcat Forklift is used in very hot, cold, dusty or corrosive conditions.

SERVICE SCHEDULE		HOURS					
ITEM	SERVICE REQUIRED	8-10	50	100	200	500	1000
Engine Oil	Check the oil and add as needed.	■					
Engine Air Cleaner	Check the condition indicator. Inspect the air cleaner system. Replace the outer element when the red ring shows in the indicator window.	■					
Tires	Check tires for damage and correct air pressure.	■					
Seat Belt	Check function and condition of the seat belt. Replace if necessary.	■					
Safety Signs (Decals)	Check for damaged decals. Replace any decals that are not in the correct location.	■					
All Pivot Points	Add lubricant to all fittings (See Page 1—19).	■					
Hydraulic Fluid	Check the fluid level and add the recommended fluid as needed.	■					
Engine Coolant System	Check coolant level and add as needed. Remove any debris from the grill area.	■					
Wheel Nuts	▲Tighten wheel nuts to 115 ft.-lbs. (155 Nm) torque.	■					
Fuel Filter Water Trap	Remove any trapped water from the filter.	■					
Batteries	Check the battery cables and the water level of the batteries.		■				
*Cylinder Heads	Tighten cylinder head bolts to the correct torque.		■				
Hydraulic Control Lever	Check for correct operation. Make repairs and adjustments as needed.		■				
Pallet Fork Lock Levers	Check the locking levers for condition and correct operation.		■				
Brakes	Check the brake for correct operation. Make adjustment as necessary.		■				
Alternator Drive Belt	Check condition and tension of the belt.		■				
Engine Oil & Filter	Replace oil and filter.		■				
Carriage Chains	Check for wear and correct tension. Put oil on chains.			■			
Spark Arrestor Muffler	Empty spark chamber.			■			
Hydraulic Filter	Replace the right hand filter.			■			
U-Joints (Drive Shaft)	Lubricate with a good quality grease.			■			
Final Fuel Filter	Replace the filter element.				■		
Front & Rear Axle	Check oil level and add oil as needed.				■		
U-Joint (Engine to Hydrostatic Pump)	Add grease to fittings (3).				■		
Bronze Filter (40 Micron)	Change the 40 micron filter in the hydrostatic port block.					■	
Hydraulic/Hydrostatic System	Replace the fluid and filters. Clean the cap and vent.						■

\* Dealer Service Only (This procedure is required only once, after the first 50 hours of operation).

▲ Check the wheel nut torque every 8 hours for the first 24 hours of operation.

## 1-6 ENGINE SERVICE

### **⚠ WARNING**

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

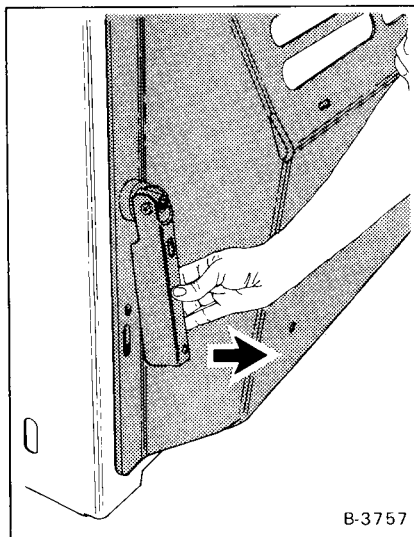


Fig. 1-7 Releasing Rear Door

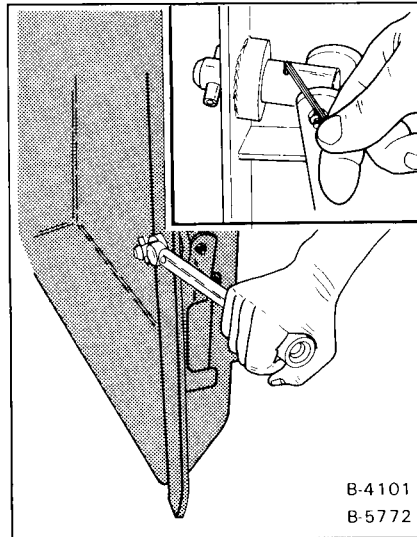


Fig. 1-8 Adjusting the Latch

Open the rear door to service the engine. Pull the door latch up and to the left to release the door latch (Fig. 1-7). The door can then be fully opened to get to the engine.

## 1-7 ADJUSTING THE DOOR LATCH

Loosen the set screw (Fig. 1-8, Inset). Turn the nut on the end of the latch pin (Fig. 1-8). The door must contact the machine at the bottom (Fig. 1-9, Item 1) and the top with the lever in the position shown in figure 1-9. It will take approximately 50 lbs. of force to push the latch down. When the latch is adjusted correctly, tighten the set screw. The set screw must be aligned with the flat surface of the bolt.

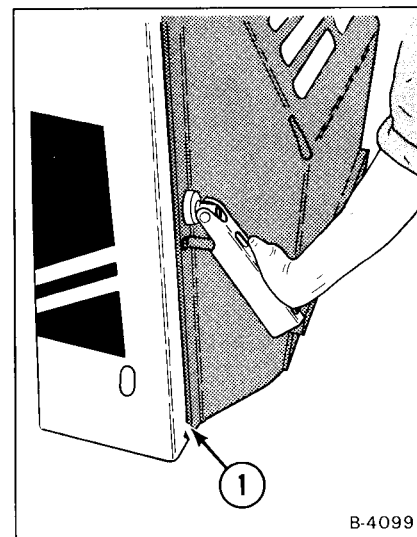


Fig. 1-9 Closing the Door

### **⚠ WARNING**

Keep the rear door closed except for service. Make sure you close the door and fasten the latch tightly before operating the Bobcat Forklift.

## 1-8 AIR CLEANER SERVICE

It is important to check the air cleaner condition indicator at regular intervals for good engine performance and long service life. Do not service the air cleaner until the red condition indicator ring shows.

**NOTE:** Before changing the air cleaner, push the button on the condition indicator (Fig. 1-10, Item 1), start the engine and if the red ring still shows, do the following service procedure.

The large air cleaner element (outer) must be replaced when the red ring shows in the window of the condition indicator (Fig. 1-10, Item 1). DO NOT remove the inner filter. Service the air cleaner as follows:

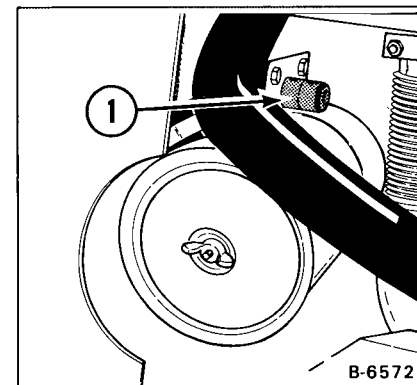


Fig. 1-10 Condition Indicator

(1) Remove the wing nut (Fig. 1-10, Item 2) and remove the air cleaner cover. Remove the filter element (Fig. 1-11, Item 1).

(2) Clean the inside of the filter housing (Fig. 1-11, Item 2) so that the element has a smooth surface to contact at the seal. Make sure the air cleaner housing is free of corrosion, especially if the Bobcat Forklift is used under corrosive conditions.

(3) Install the outer filter element. DO NOT replace the inner filter element (Fig. 1-12, Item 3) unless the red ring still shows (after the engine is running) in the condition indicator window after replacing the outer element.

(4) Install the air cleaner cover (Fig. 1-11, Item 4).

(5) Push the button at the condition indicator, to remove the red ring in the window.

(6) Check that the hoses and the clamps are tight.

### 1-9 FUEL SYSTEM

Use number 2 diesel fuel in the engine. During very cold temperature conditions, use number 1 fuel.

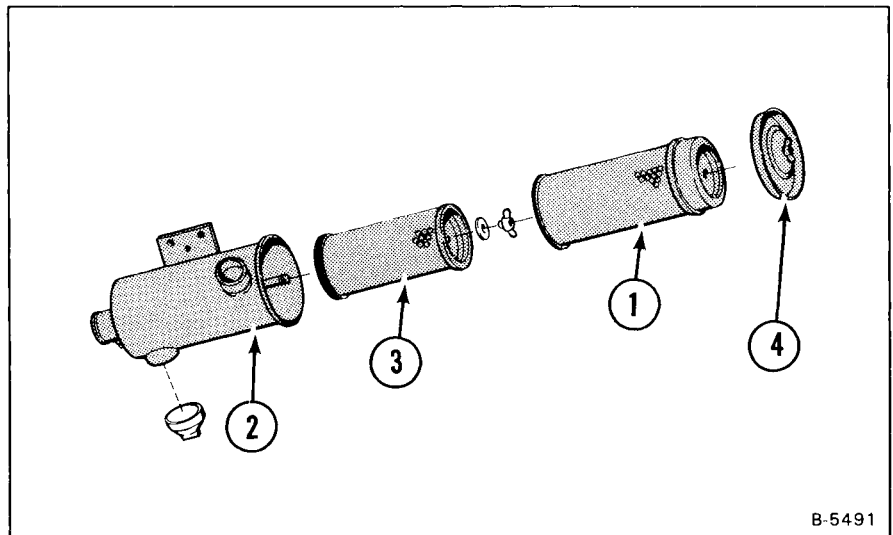
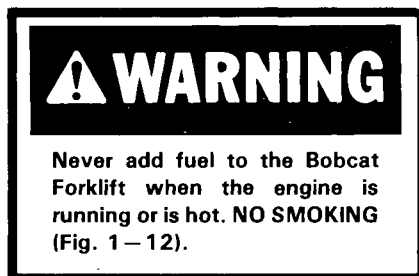


Fig. 1-11 Air Cleaner Assembly



### 1-9.1 Fuel System Service

Remove the filler cap to service the fuel tank as follows (Fig. 1-13, Item 1):

(1) Use a clean, approved safety container to add fuel.

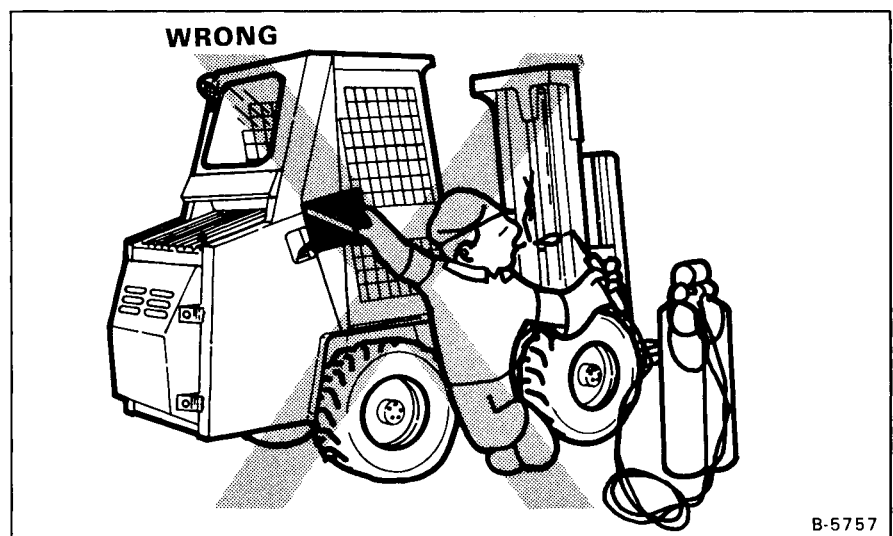


Fig. 1-12 Fuel Fill Warning

- (2) The key switch must be in the "OFF" position and the engine cool.
- (3) Add fuel only in an area that has a free movement of air or no open flames or sparks. NO SMOKING (Fig. 1–12).
- (4) Use only clean fuel of the correct specifications (See Section 8 for specifications).
- (5) Tighten the cap on the fuel tank on the right side of the machine (Fig. 1–13, Item 1).

### 1–9.2 Fuel Filter

The fuel filter is installed at the front left of the engine. Replace the filter element (Fig. 1–14) every 200 hours of machine operation.

Check the water trap every 50 hours of machine operation. If there is water in the water trap at the bottom of the filter, loosen the thumb screw (Fig. 1–14, Item 1). When fuel flows from the drain with no water, tighten the thumb screw.

To replace the fuel filter element:

- (1) Clean the area around the fuel filter. Put a clamp on the fuel supply hose from the fuel tank.
- (2) Remove the thumb screw at the bottom of the filter, drain the fuel from the filter.
- (3) Remove the filter by removing the small bolt at the top of the filter head (Fig. 14, Item 2) while holding the nut below the filter bowl. Remove the filter bowl.
- (4) Check the condition of the seals. Replace as needed.
- (5) Install the filter, bowl, nut and thumb screw. Tighten the thumb screw finger tight only. Remove the clamp from the fuel line.
- (6) Remove the air from the fuel system.
- (7) After the engine is running, check for leaks.

### 1–9.3 Removing Air From The Fuel System

After replacement of the fuel filter element or when the fuel tank has run out of fuel, the air must be removed from the fuel system before starting the engine. To remove the air from the fuel system:

- (1) Open the rear door of the machine.
- (2) Open the vent plug on the top of the fuel filter (Fig. 1–14, Item 3).
- (3) Operate the hand pump (Fig. 14, Item 4) until the fuel flows from the vent plug on the top of the fuel filter (Fig. 1–14, Item 3).

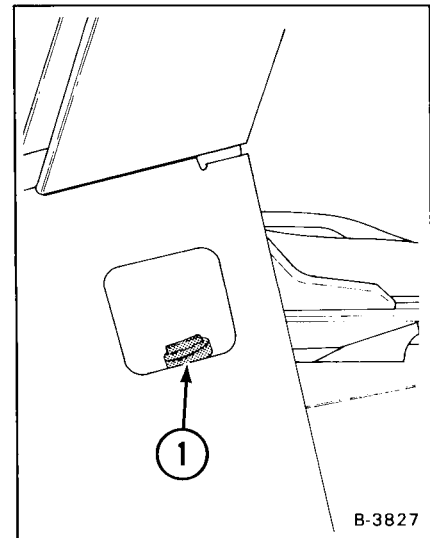


Fig. 1–13 Fuel Fill Location

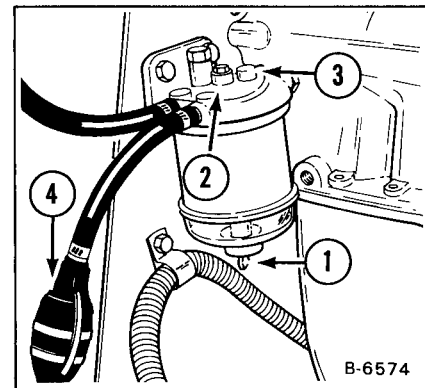
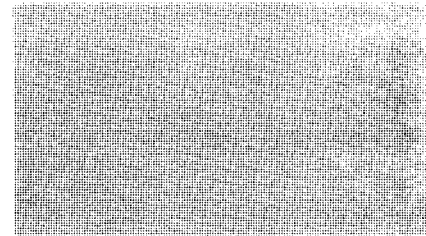
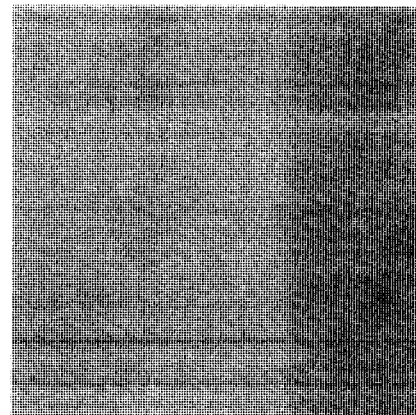


Fig. 1–14 Fuel Filter





- (4) Close the vent plug on the top of the fuel filter.
- (5) Again operate the hand pump until the hand pump feels solid.
- (6) Loosen the vent pump on the fuel injection pump (Fig. 1 – 15, Item 1).
- (7) Operate the hand pump (Fig. 1 – 14, Item 3) until fuel flows from the vent plug with no air bubbles.
- (8) Close the vent plug on the injection pump before releasing the hand pump.
- (9) Loosen the high pressure tubelines at the fuel injectors (Fig. 1 – 16).
- (10) Move the throttle to the half open position. Turn the engine with the starter until clear fuel shows at the fittings of the injectors.

**NOTE:** Turn the engine for 30 seconds only with 60 seconds between starts.

- (11) Tighten the fittings of the high pressure tubelines to 15 ft.-lbs. (20 Nm) torque.

IMPORTANT	When removing the high pressure tubelines from the injectors. <b>DO NOT</b> bend them.
-----------	--

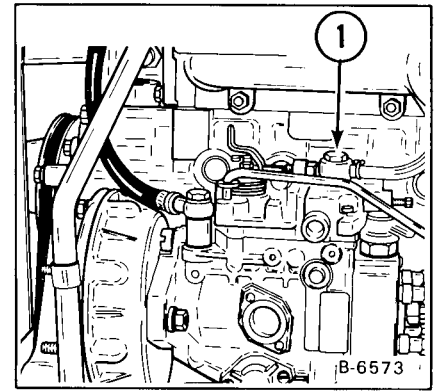
- (12) Close the rear door.

## 1 – 10 ENGINE LUBRICATION SYSTEM

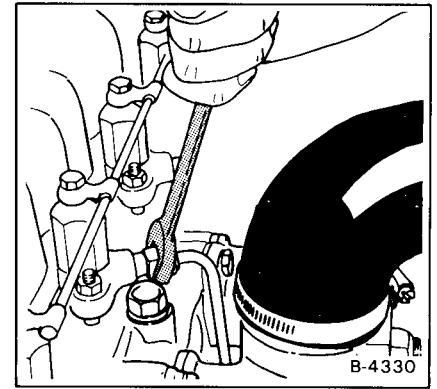
Check the oil level each day.

To check the oil level, stop the engine, open the rear door and remove the dipstick (Fig. 1 – 17).

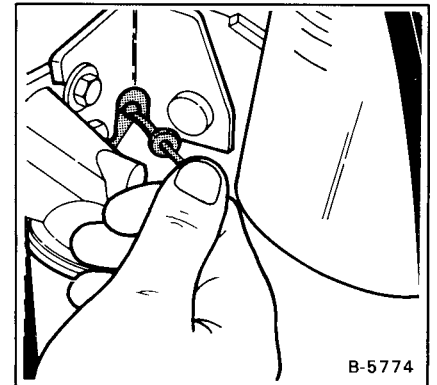
Keep the oil level between the marks on the dipstick (Fig. 1 – 18). Do not fill above the top mark. Use a good quality motor oil that meets API Service Classification of CC or CD (See the Chart).



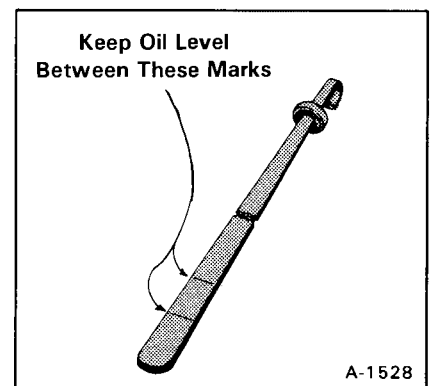
**Fig. 1 – 15** Fuel Injection Pump



**Fig. 1 – 16** Fuel Injectors



**Fig. 1 – 17** Oil Dipstick



**Fig. 1 – 18** Engine Dipstick

**Dear**

**Thanks very much for your visiting and  
patience.**

**Want to get more information,**

**Please click here, Go back to the page.**

**After your payment, you will have instant access to  
your download.**

**The Download Link will also be sent to your e-mail.**

**You will get the complete manual**

**Have any questions**

**please write to me**

**[admin@servicemanualperfect.com](mailto:admin@servicemanualperfect.com)**