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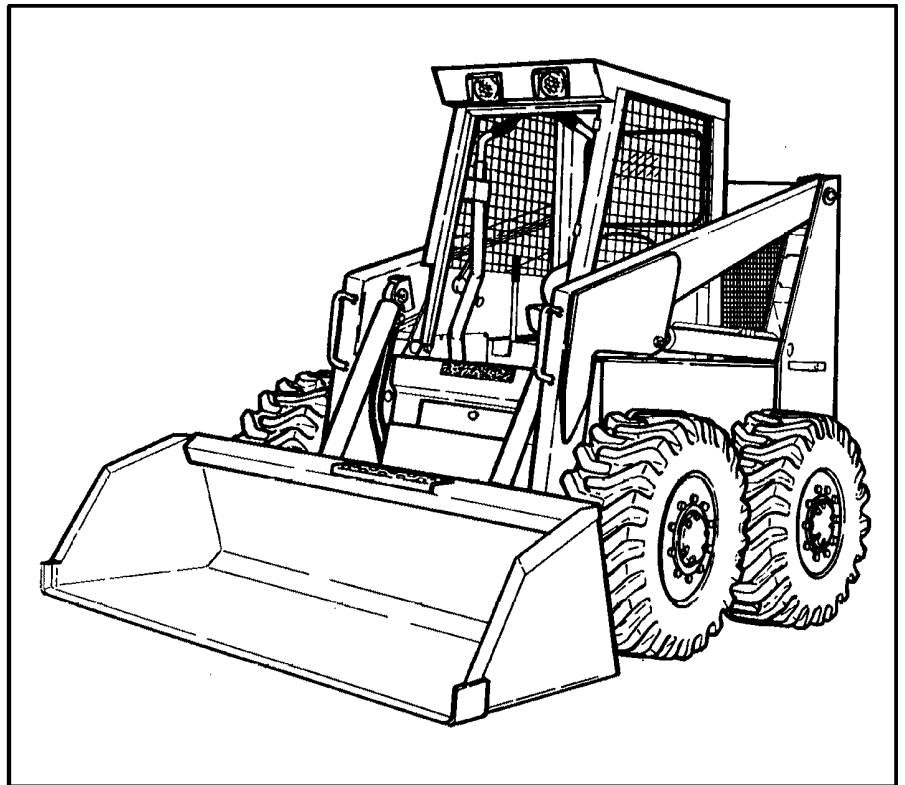


# Service Manual

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**MELROE**  
**INGERSOLL-RAND**

6556214 (11-85)

Printed in U.S.A.



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# MAINTENANCE SAFETY



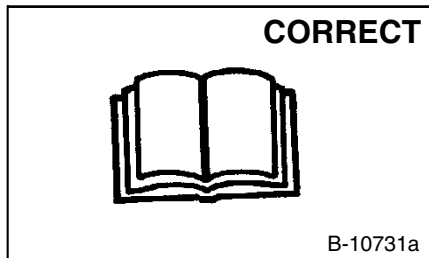
## WARNING

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.

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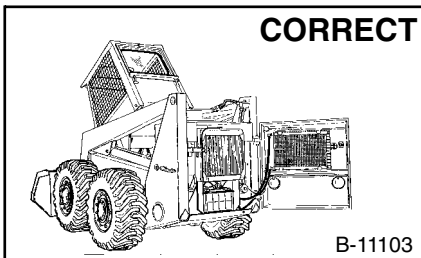


**Safety Alert Symbol:** This symbol with a warning statement, means: "Warning, be alert! Your safety is involved!" Carefully read the message that follows.



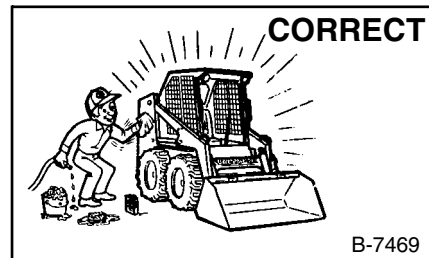
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⚠ Never service the Bobcat Skid-Steer Loader without instructions.



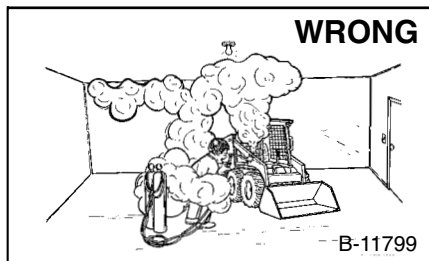
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⚠ Use the correct procedure to lift or lower operator cab.



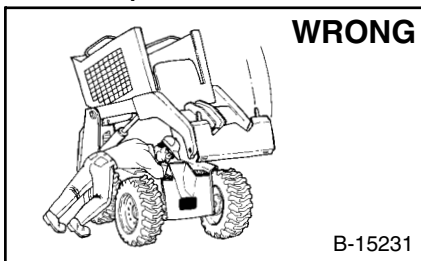
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⚠ Cleaning and maintenance are required daily.



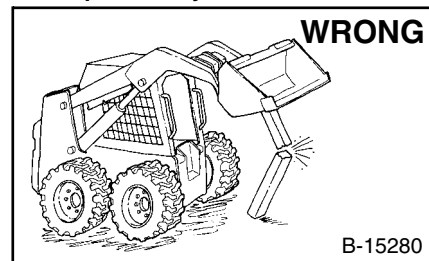
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- ⚠ Have good ventilation when welding or grinding painted parts.
- ⚠ Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.
- ⚠ Avoid exhaust fume leaks which can kill without warning. Exhaust system must be tightly sealed.



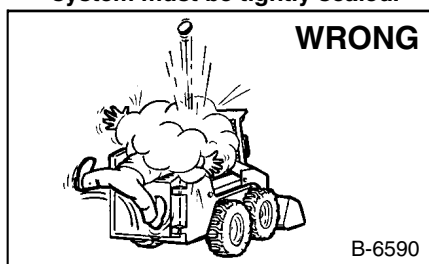
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- ⚠ Disconnecting or loosening any hydraulic tubeline, hose, fitting, component or a part failure can cause lift arms to drop. Do not go under lift arms when raised unless supported by an approved lift arm support device. Replace it if damaged.



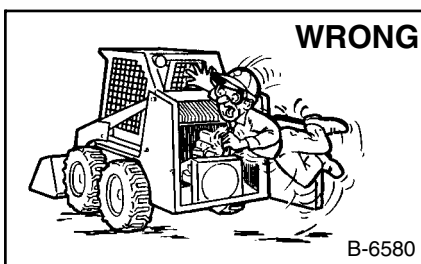
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- ⚠ Never work on loader with lift arms up unless lift arms are held by an approved lift arm support device. Replace if damaged.
- ⚠ Never modify equipment or add attachments not approved by Bobcat Company.



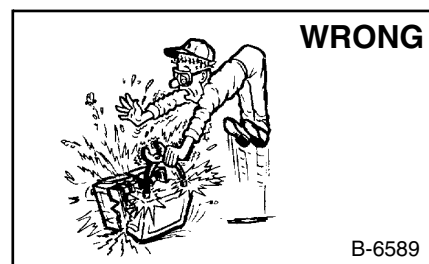
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- ⚠ Stop, cool and clean engine of flammable materials before checking fluids.
- ⚠ Never service or adjust loader with the engine running unless instructed to do so in the manual.
- ⚠ Avoid contact with leaking hydraulic fluid or diesel fuel under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



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.



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®**

# FOREWORD

This manual provides instruction for proper routine servicing and adjustment of the Bobcat, and detailed overhaul instructions of the power train, loader hydraulic/hydrostatic system and general mainframe components.

Refer to the Owner's Manual for general operating instructions (Starting Procedure, Daily Checks, Bucket Operation, Minor Maintenance, etc.).

A general inspection of the following items should be made whenever the machine has undergone 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. Inspect air cleaner system for damage or leaks. Check element and make replacement, if necessary.
6. Check alternator drive belt for condition and tension.
7. Check for loose drive chains.
8. Check tires for wear and pressure.
9. Check the Bob-Tach attachment for condition. Inspect the wedges for damage or wear.
10. Inspect safety items for condition (ROPS Guard, Seat Belt, Safety Treads, Lights, etc.).
11. Make a visual inspection for loose or broken parts or connections.
12. Operate the loader, checking all functions.

Advise the owner if any of the above items are in need of repair.

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PREVENTIVE  
MAINTENANCE

HYDRAULIC  
SYSTEM

HYDROSTATIC  
SYSTEM

MECHANICAL  
TRANSMISSION

MAIN FRAME

ELECTRICAL  
SYSTEM

ENGINE SERVICE  
(974 Perkins)

ENGINE SERVICE  
(975 John Deere)

TECHNICAL  
DATA

ALPHABETICAL  
INDEX



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## I. SAFETY INSTRUCTIONS

### A. SAFETY IS YOUR RESPONSIBILITY

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

The dealer recommends the capabilities and restrictions of the loader and attachments for each application. The dealer demonstrates the safe operation of the loader 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 loader. For each model loader, 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 loader 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 loader gives operating information as well as routine maintenance and service.
3. Every loader has machine signs (or decals) which instruct on the safe care and operation of the loader. The complete signs and their location are shown in the Operator's Manual. All signs are available from your Bobcat dealer.
4. The loader has a plastic Operator Handbook fastened to the operator cab. It has brief instructions always available to the operator. The handbook is available from your Bobcat dealer.
5. The Service Manual and Parts Manual are optional manuals from your Bobcat dealer for use by mechanics to do shop-type service and repair work.

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

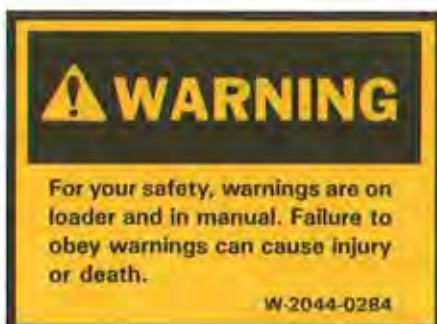
### B. BEFORE OPERATING THE BOBCAT LOADER



B-7023



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





## C. SAFE OPERATION NEEDS A QUALIFIED OPERATOR

A QUALIFIED OPERATOR \* MUST DO THE FOLLOWING:

1. UNDERSTAND THE WRITTEN INSTRUCTIONS, RULES AND REGULATIONS
  - a. The written instructions from Melroe Company include the delivery report, loader operator's handbook and manual, attachment manual and machine signs (decals).
  - b. 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 utility supply line.
2. HAVE TRAINING WITH ACTUAL OPERATION
  - a. Operator training must consist of a demonstration and verbal instruction. This training is given by the Bobcat dealer before the loader is delivered.
  - b. 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.
3. KNOW THE WORK CONDITIONS
  - a. For each material to be handled, the operator must know how to avoid exceeding the rated operating capacity of the loader. For example, he must know whether he can safely take a full load or just part of a bucket load when handling a certain loose material with a given bucket.
  - b. 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.

## II. FIRE PREVENTION

The loader has several components which are at high temperature under normal operating conditions. The primary source of high temperatures is the engine and exhaust system. The electrical system, if damaged or incorrectly maintained, can be a source of arcs or sparks. These conditions make it necessary to avoid applications where explosive dust or gases can be ignited by arcs, sparks or heat.

Flammable debris (leaves, straw, etc.) must be removed regularly. If flammable debris is allowed to accumulate, it will increase the condition for fire hazard. The loader must be cleaned as often as necessary to avoid this accumulation. This flammable debris in the engine compartment can be a fire hazard when the loader is parked with a hot engine.

The spark arrestor muffler is designed to control the emission of hot particles from the engine and exhaust system, but the muffler and the exhaust gases are still hot. This spark arrestor muffler does not change the need to avoid use of the loader in an atmosphere with explosive dust or gases or where the exhaust can contact flammable material.

1. Do not use the Bobcat loader in applications where explosive dust or gases can be ignited by arcs, sparks, hot components or exhaust gases.
2. The operator cab, engine compartment and engine cooling system must be inspected every day and cleaned if necessary to prevent overheating. Remove all flammable material.
3. Check all electrical wiring and connections for damage. Keep the battery terminals clean and tight. Repair or replace any damaged part.
4. Check for damage and leakage at all the fuel, oil and hydraulic tubes, hoses and fittings. Tighten or replace any that show leakage. Always clean fluid spills.
5. Use ether or starting fluids only when approved by the engine manufacturer. Do not use ether or starting fluids on any engine which has glow plugs. These starting aids can cause an explosion and injure bystanders.
6. Always 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.
7. Stop the engine and let it cool before adding fuel. No smoking.
8. Use the procedure in Operator's Manual for connecting and charging batteries.
9. Use the procedure in Operator's Manual for servicing the spark arrestor muffler.



PREVENTIVE MAINTENANCE



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## 1-1 INTRODUCTION

### 1-1.1 Symbols

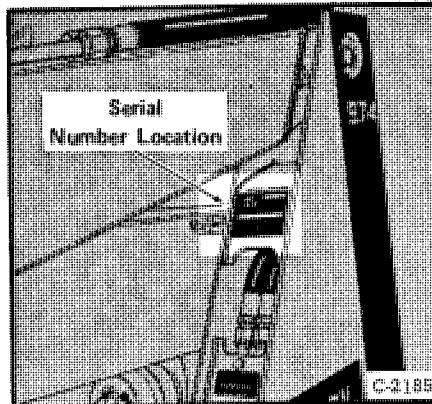


Fig. 1-1 974 & 975 Serial No. Location

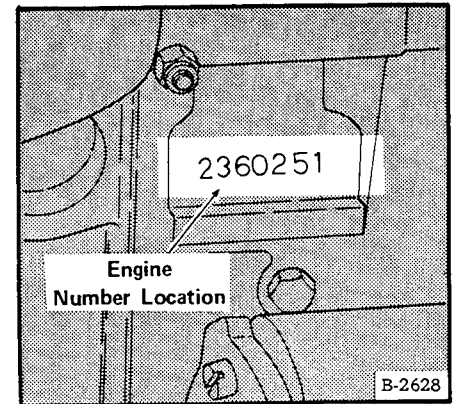
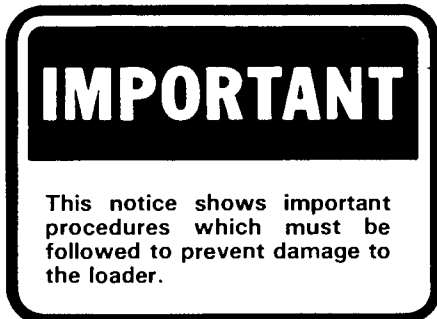


Fig. 1-2 974 Engine S/N Location (early)



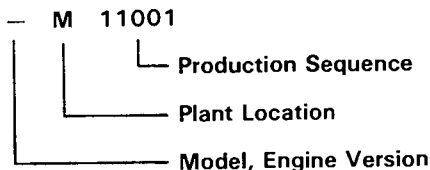
### 1-1.2 Serial Number Identification

It is important to make correct reference to the serial number of the loader when making repairs or ordering parts. Early or later made models (identification made by "Lot") sometimes use different parts, or it may be necessary to use a different procedure in doing a specific job:

### 1-1.3 Loader Serial Number

The loader serial number plate location is inside left upright (Fig. 1-1).

The serial number is made up as follows:



### 1-1.4 Engine Serial Number

For the location of the engine serial number, see figure 1-2, 1-3 or 1-4.

### 1-1.5 Pre-Delivery Inspection

The purpose of the pre-delivery inspection is to make sure that the loader is in correct operating condition when it comes to the dealer and before it is delivered to the customer.

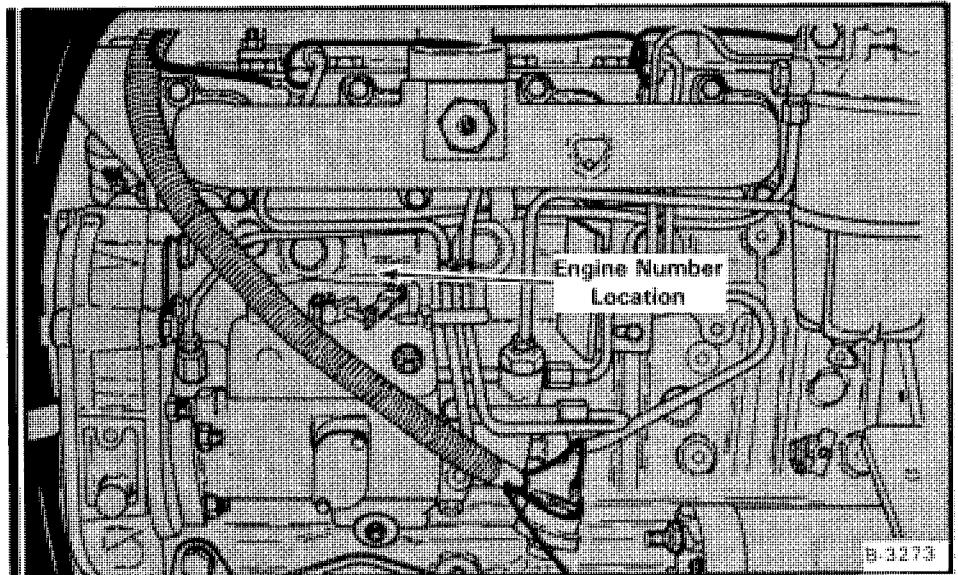


Fig. 1-3 974 Engine Serial Number Location (current)

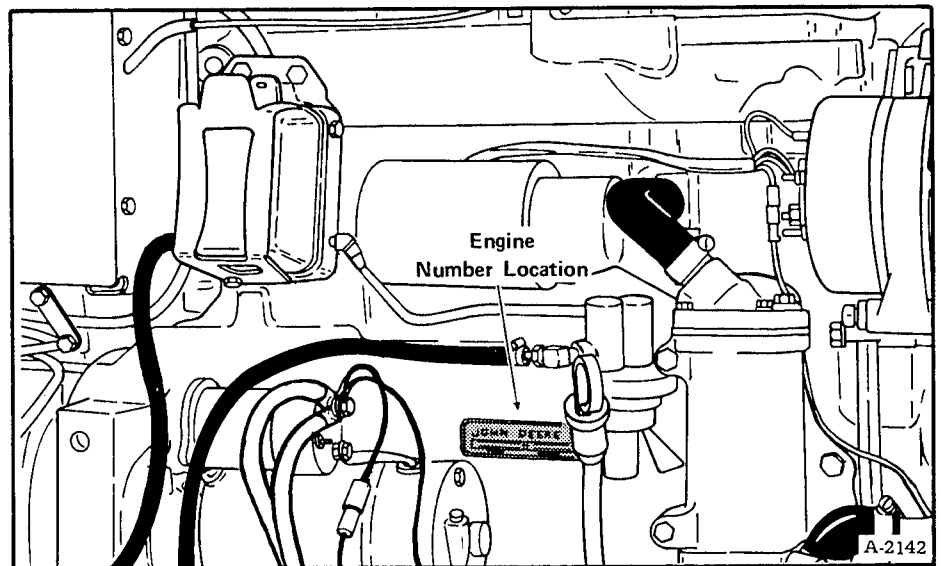


Fig. 1-4 975 Engine Serial Number Location

The pre-delivery inspection also lets the factory know when something is wrong with the loader so that action can be taken to prevent the problem from happening in the future.

All items on the inspection form (Fig. 1-5) must be completed according to specifications in this manual.

One copy of the completed form is to be mailed to the attention of Quality Control, Melroe Division.

Fig. 1-5 Pre-Delivery Inspection

**1-1.6 30 Hour Inspection**

The 30 hour inspection must be completed soon after the first 30 hours of loader operation.

The purpose of the 30 hour inspection is as follows:

- (1) For adjustment and inspection after first work period.
- (2) To correct wrong maintenance and operating methods.
- (3) For demonstration of correct service procedures to customer.

Fig. 1-6 30 Hour Inspection

All items on the 30 hour inspection form (Fig. 1-6) must be completed by the mechanic according to specifications in the manual.

When the 30 hour inspection has been completed, the form must be signed by the mechanic completing the inspection, the dealer and owner or operator.

One copy of the completed form is for the owner of the loader. Another copy is to be sent to the attention of Service Department, Melroe Division. The remainder copy is for the Dealer.

## SERVICE SCHEDULE

Maintenance work must be done regularly. Failure to do so will result in damage to the loader or engine. The service schedule is a guide for correct maintenance of the Bobcat loader. Do not change from this service schedule unless to increase frequency of intervals when the Bobcat loader is operated in very hot, cold, dusty or corrosive conditions.

### BOBCAT SERVICE SCHEDULE\*

ITEM	SERVICE REQUIRED	HOURS					
		10	50	100	250	600	1000
Engine Oil	Check and add oil as necessary.	■					
Engine Cooling System	Check coolant level in radiator. Add coolant when low. Remove any foreign material from radiator grill area.	■					
Air Cleaner Indicator	Replace element when red ring shows in window.	■					
Fuel Bowl	Check for sediment or water. Drain off water and sediment, if necessary.	■					
All Pivot Pins	Add lubricant to all fittings until extra grease shows.	■					
Tires	Check the air pressure, and any damage to tires.	■					
Hydraulic Reservoir Level	Add correct fluid as necessary.	■					
Wheel Nuts	Tighten loose nuts to correct torque.	■					
Hydraulic Hoses	Check for damage and leaks and replace.	■					
Fan and Alternator Belt	Check the belt tension and adjust as necessary.		■				
Battery	Check water level and inspect cables.		■				
Final Drive Chaincase	Check fluid level, when low add fluid by removing side cover and fill to check plug level.		■				
Engine Oil and Filter Element	Change engine oil and filter.		■				
Cylinder Head Nuts (974)	Tighten to correct torque. Adjust valves.		■				
Final Drive Chains	Check for correct tension and adjust as needed.			■			
Hoses and Clamps	Inspect and tighten as necessary.			■			
Primary (10 Micron) Hydraulic Filter	Replace element.			■			
Spark Arrestor Muffler	Clean spark chamber.			■			
Secondary Hyd. Filters	Replace elements.				■		
Fuel Filter(s)	Install new filter element(s) and vent air from system.					■	
Crankcase Vent Tube (PCV) Valve	Remove and clean.					■	
Fluid Level in Reduction Gear Housing	Check fluid level and add correct oil and fill to check plug level as needed.					■	
Hydraulic Oil Reservoir	Slide skid plate open. Remove drain plug and remove condensation.					■	
Engine Cooling System	Drain and flush cooling system. Refill with water and, for protection from freezing, add anti-freeze as needed.						■
Reduction Gear Housing	Drain the fluid, fill to check plug level with correct fluid.						■
Final Drive Chaincase	Drain the fluid and flush. Fill to check plug level with correct fluid.						■
Hydraulic Fluid	Drain the fluid and fill to check plug level with correct fluid.						■
Starter Wicks (975)	Add lubrication. Use 10W oil.						■

\*IMPORTANT NOTE: See "30 Hour Inspection" on page



### 1-3 REAR DOOR AND ENGINE COVER

The rear door is opened by pulling out on the handle and turning it (Fig. 1-7). Pull the door fully open. The rear door weight is 453 lbs. (205 kg).

The top engine cover is removed by releasing the two rubber fasteners at the cab end of the cover (Fig. 1-8 & 1-9) then slide it to the rear. The cover will slide to the rear so the ROPS can be tilted on model 975 loaders. The muffler must be removed to remove the engine cover. The engine cover weight is 73 lbs. (33 kg).

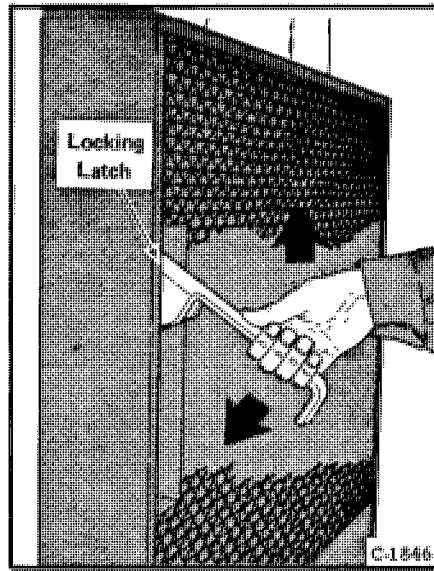


Fig. 1-7 Opening Rear Door

### 1-4 REMOVAL OF SIDE PANEL (FENDER)

Remove the two fastening nuts and bolts from the fender (one at a each end). Remove the fender. The fender weight is 35 lbs. (15 kg).

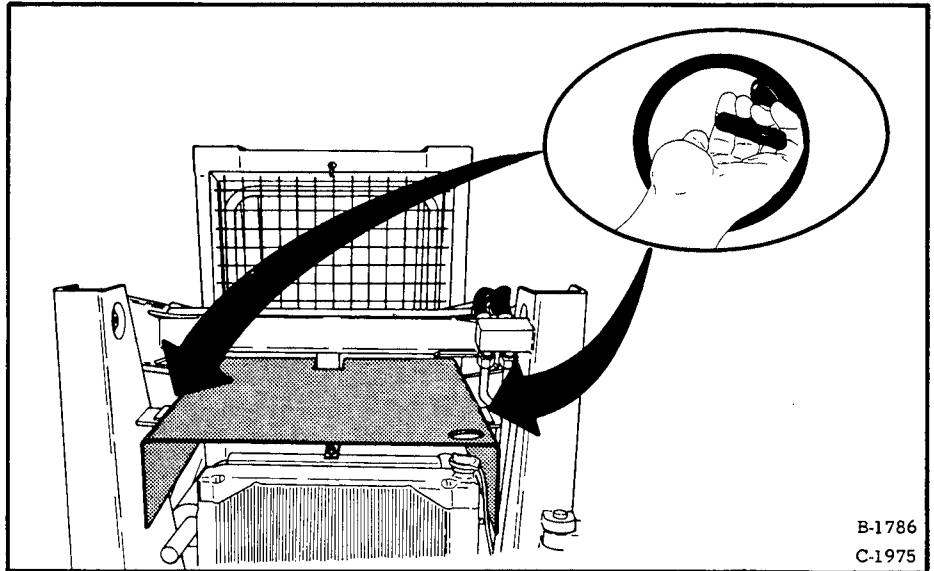


Fig. 1-8 Removing Engine Cover (974)

### 1-5 TILTING THE ROPS (Operator Enclosure) (Fig. 1-10)

The ROPS on the Bobcat Loader can be tilted to provide access when servicing.

#### 1-5.1 Tilting ROPS Forward

(1) Lower attachment to the ground. Slide operator's seat to the rear, and set throttle about 3 inches ahead of the left steering lever. Connect the seat belt together.

(2) Release rubber fasteners and slide top engine cover back several inches.

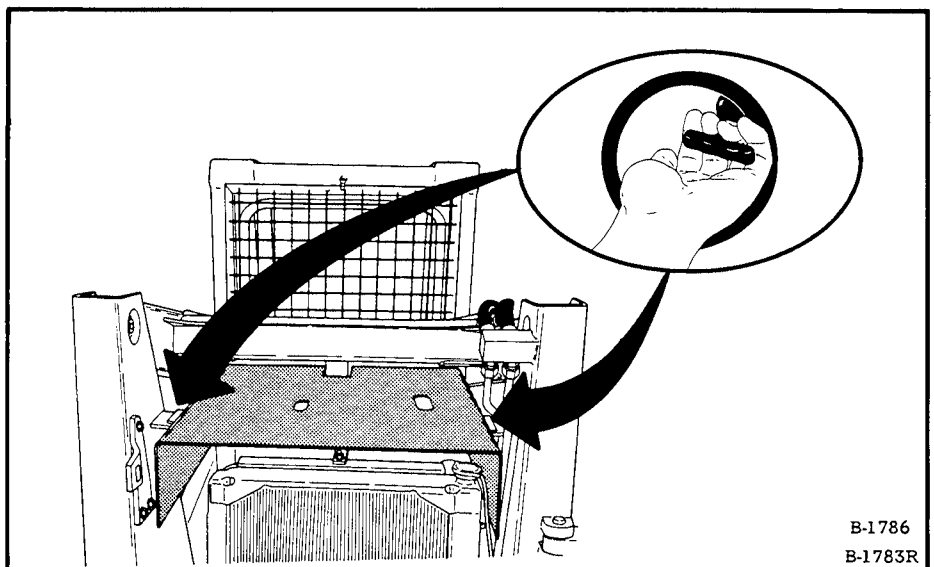


Fig. 1-9 Removing Engine Cover (975)

(3) Remove rear pins from both sides of enclosure. (Momentarily activate the cab tilt switch if pins are hard to remove.)

(4) Activate tilt switch and tilt the enclosure. Check control levers when tilting to make sure that they are clear.

(5) Lower safety leg above tilt cylinder until it is against the cylinder rod. Lower enclosure until its weight is supported by safety leg (Fig. 1-11).

#### 1-5.2 To Lower ROPS

(1) Tilt forward enough to remove weight from safety leg. Move leg up into storage position.

(2) Move throttle lever and directional control levers so that they do not hit enclosure as it is lowered, then activate switch to lower the enclosure.

(3) Replace mounting pins when enclosure is fully lowered. Secure pins with lock pins.

(4) Slide top engine cover forward and hold with rubber fasteners.

#### 1-6 CONTROL LEVER LOCK

A control lever lock keeps the operating levers in neutral position, so they can not be moved by accident while operating the engine during service.

To install the lock:

(1) Tilt the ROPS.

(2) Put the hook of the bolt through the tab on the floor (Fig. 1-12, Item 1).

(3) Lift the centering arm. Put the bolt through the hole in the centering arm (Fig. 1-12, Item 2).

(4) Install the wing nut on the bolt. The control lever lock must be installed if engine is to be operated during service.

#### 1-7 TO CLEAN ROPS AND SKID PLATE AREA

Clean ROPS and foot pedal area frequently to remove dirt and foreign material. Keep machine clean to prevent a fire from starting.

##### 1-7.1 To Open the Skid Plate

(1) Remove bolt from the hole of retaining bar at the rear of the skid plate.

(2) Install the removal tool (fastened inside the rear grill) on the skid plate (Fig. 1-13).

(3) Fasten a chain to the tool and fasten other end to a tree or post.

(4) Slowly move the machine forward until the skid plate is fully open against the stop.

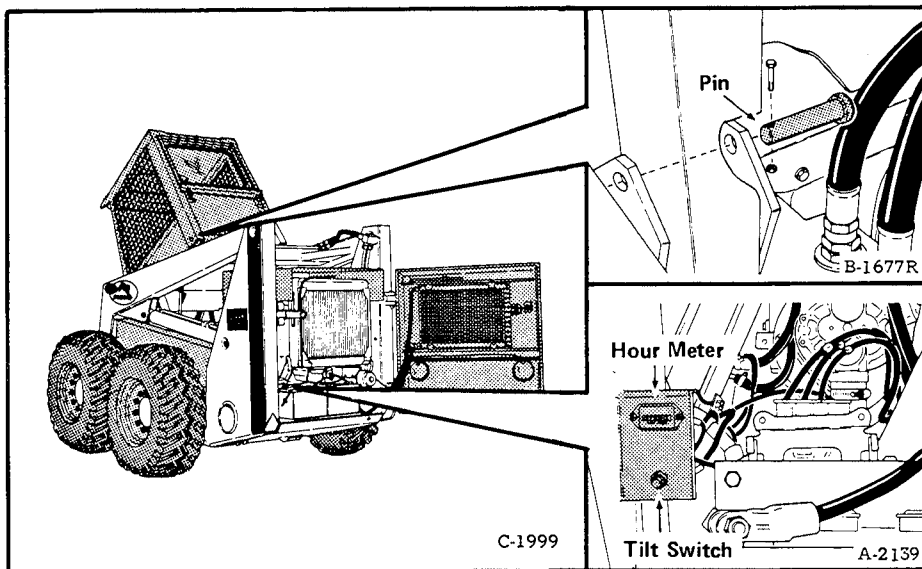


Fig. 1-10 Tilting ROPS Enclosure

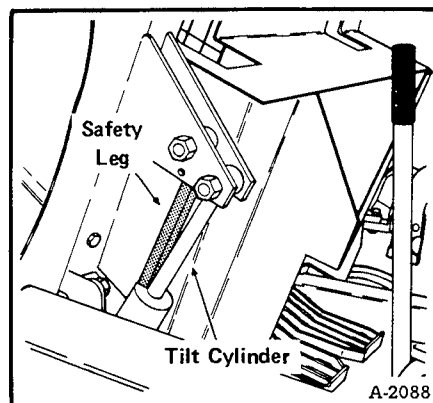


Fig. 1-11 Safety Leg

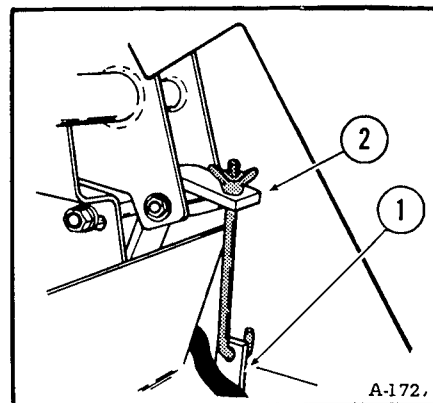


Fig. 1-12 Control Lever Lock

(5) Remove all foreign material from the machine.

**1-7.2 To Close the Skid Plate**

(1) Turn the Bobcat around, fasten the chain to the tool and slowly move the machine backward until the plate is closed.

(2) Remove the tool and install retaining bolt.

**NOTE:** Always install the rear pins after ROPS is lowered and before operating Bobcat.

**1-8 ENGINE MAINTENANCE (General)**

**1-8.1 Starting the Engine**

- (1) Put throttle lever in full open position.
- (2) Operate starter switch.

For cold weather starting see 7-22.10 "Cold Weather Starting Aid".

**1-8.2 Engine Oil Check**

- (1) Check oil level every eight hours of operation.
- (2) Oil level on new Bobcats should be checked every 2 to 4 hours during the first 50 hours of operation.
- (3) Oil level must always be kept between the "Full" and "Low" marks on the dipstick (Fig. 1-14).

**1-8.3 Specifications**

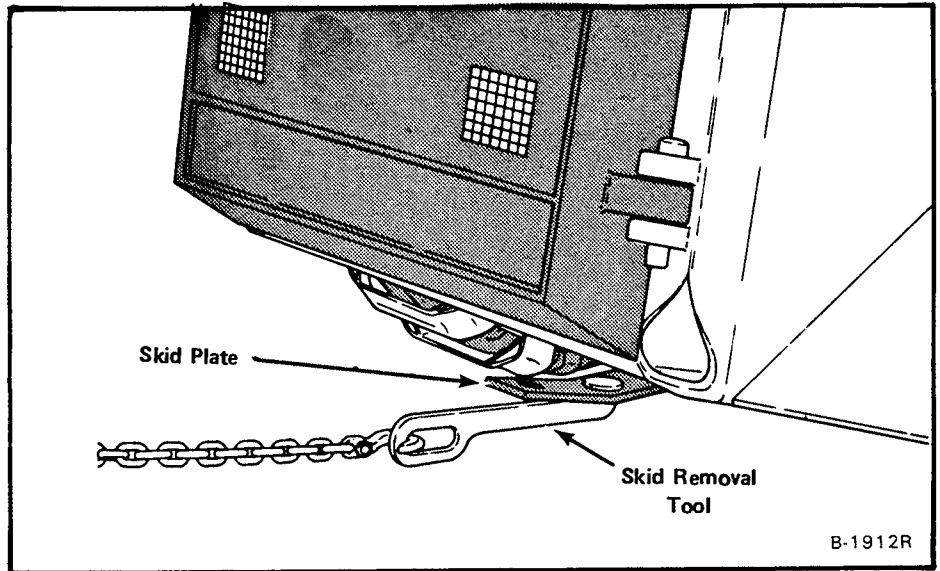


Fig. 1-13 Removing Skid Plate

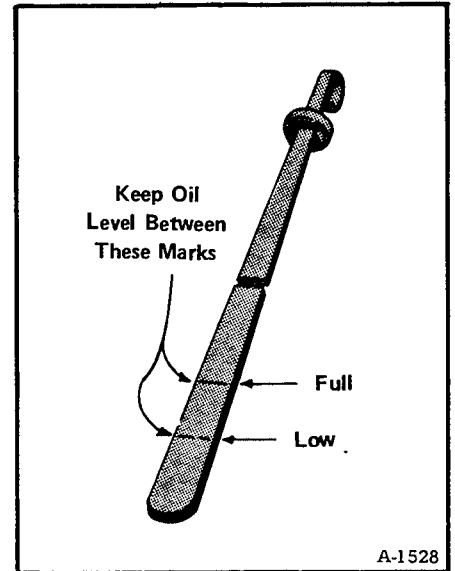
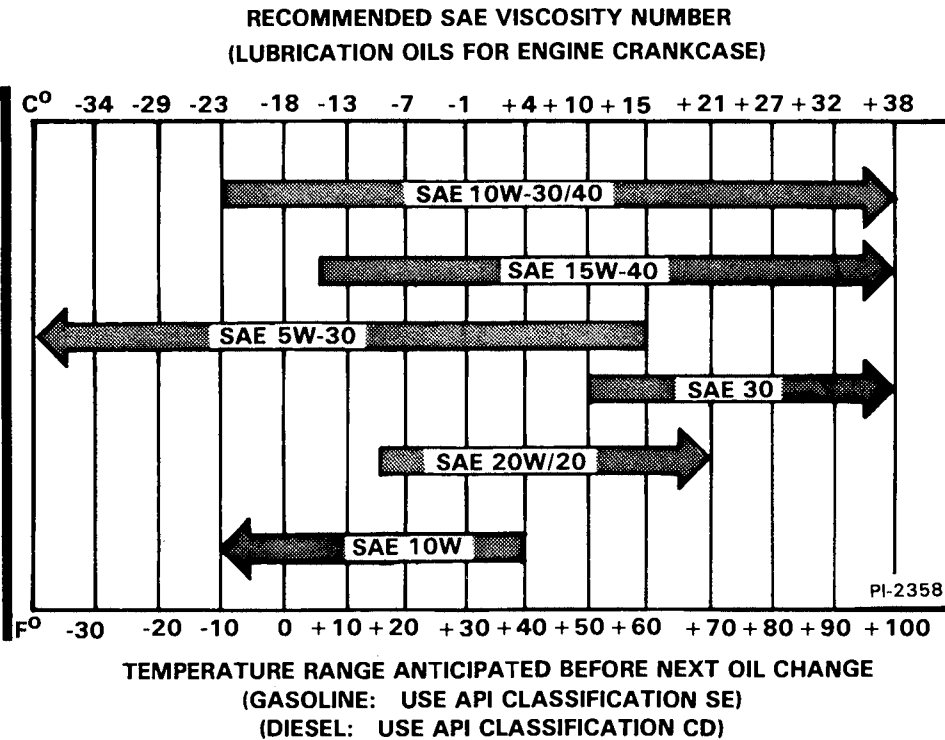


Fig. 1-14 Engine Oil Dipstick



PI-2358

## 1-9 CRANKCASE VENT TUBE

The crankcase vent tube must be cleaned every 50 hours of operation.

Remove tube and clean with solvent. A brush and air pressure can be used to aid in cleaning.

## 1-10 REPLACEMENT OF ENGINE OIL AND FILTER

Engine oil and filter require replacement every 100 hours of operation. In extremely hot, cold, dirty or corrosive conditions, make oil and filter replacement more frequently.

Start engine and allow it to reach operating temperature before making replacement of oil.

Replacement of engine oil and filter:

- (1) Remove crankcase drain plug (located at the end of crankcase drain hose)(Fig. 1-15).
- (2) Remove engine oil filter cartridge.
- (3) Clean filter sealing surface.
- (4) Apply small amount of new oil to sealing surface of filter and install on engine.
- (5) Allow oil to flow from crankcase for about five minutes, then replace drain plug.
- (6) Fill to "Full" mark on dipstick (Fig. 1-14). Do not overfill. Capacity is 8 quarts (7,5 litres) with filter replacement.
- (7) Start engine and run for about five minutes. Check for leaks around filter.
- (8) Stop engine. Check oil level and add oil as necessary.

**NOTE:** Do not overfill, as this will cause oil foaming, oil consumption, high engine temperature, and oil leaks at the engine seals.

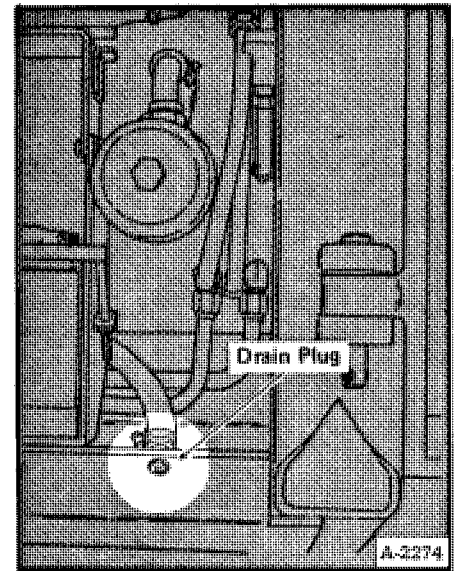


Fig. 1-15 Engine Oil Drain

## 1-11 ENGINE AIR INLET SYSTEM (Air Cleaner)

Correct maintenance of air inlet system is necessary for long engine life. A small leak in the system can destroy an engine within minutes. Do not overservice! Service only when red ring appears in condition indicator window.

### 1-11.1 Air Cleaner Service (Fig. 1-16)

- (1) Remove element by loosening retainer bar. Wipe filter can clean with a soft cloth.

**NOTE:** Do not use air pressure; dirt can be forced into the engine.

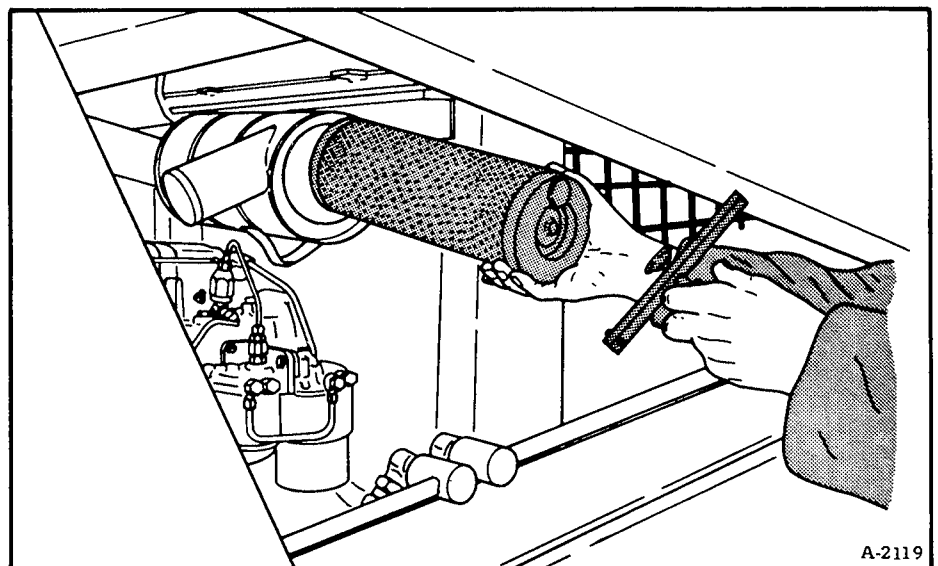


Fig. 1-16 Removing Air Cleaner Element

(2) Install new element carefully and reassemble.

(3) Press in button, located at bottom of condition indicator, to retract red ring from sight window (Fig. 1-17).

### 1-11.2 Air Inlet System Service

When servicing air cleaner, carefully inspect all of the air inlet system as follows:

- (1) Check all connections for tightness.
- (2) If the air cleaner body has been dented, check for separations in seams and/or holes.
- (3) Check hoses for cracks.
- (4) Inspect intake manifold for cracks and manifold gasket for damage or looseness.
- (5) If adjustment does not correct the problem, make replacement of necessary parts immediately.

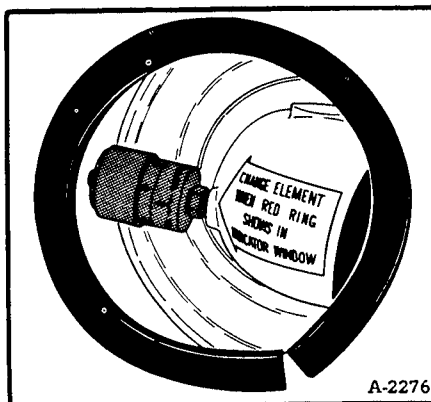


Fig. 1-17 Filter Condition Indicator

### 1-12 ENGINE COOLING SYSTEM

Keep the coolant at the correct level or engine overheating can result.

⚠ WARNING

Remove the radiator filler cap only when the coolant temperature is below boiling point. Then loosen the cap slightly to the stop to relieve pressure before completely removing cap.

Put the Bobcat on a level surface. Carefully remove radiator cap and check coolant level. If coolant level is below midway between core and filler neck, add clean water or anti-freeze as necessary to maintain protection of the cooling system. The capacity of the cooling system is 19 U.S. quarts (18 litres).

The cooling system is pressurized (6-1/4 to 7-1/2 PSI [43 to 52 kPa]) so all components and connections must be in good condition for correct operation. Loss of pressure will result in overheating and loss of coolant.

The radiator grill area must be kept clear for good cooling. Use air or water pressure on the outside of radiator to force debris out of core.

⚠ WARNING

When using air pressure wear eye protection to prevent injury from debris. Do not use water on a hot engine or in any fertilizer application.

### 1-13 FLUSHING THE COOLING SYSTEM

At least one time each year, the complete cooling system must be flushed and filled again with clean coolant and conditioner.

Use flushing procedure on next page: (Fig. 1-18)

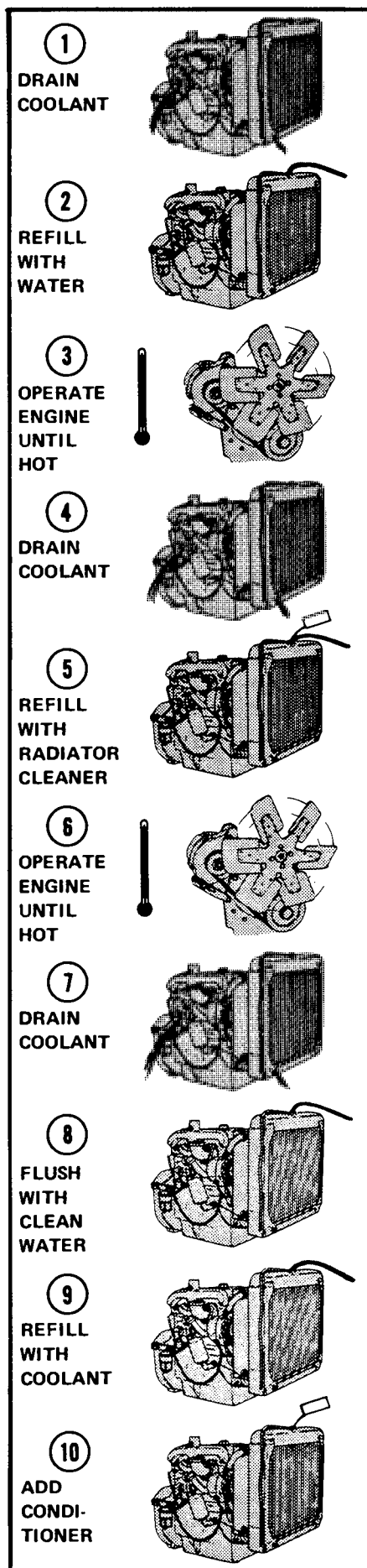


Fig. 1-18 Flushing Cooling System



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