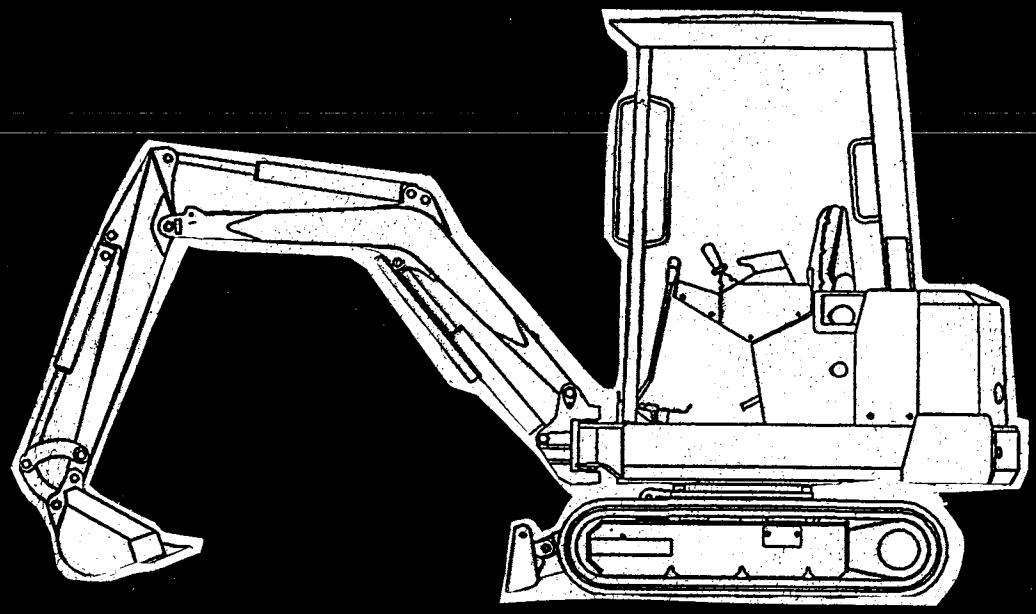
bobcat

220

S/N 15001 & Above

SERVICE MANUAL



MELROE COMPANY

bobcat®

6722345 (9-92)-7.50C

A BUSINESS UNIT OF CLARK EQUIPMENT COMPANY

Printed in U.S.A.

MAINTENANCE SAFETY

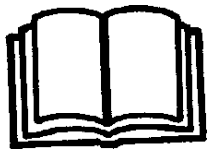
WARNING

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

W-2003-0903

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

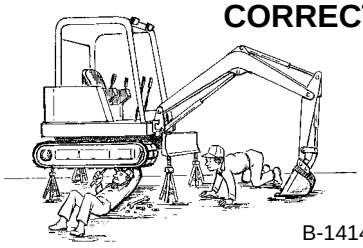
CORRECT



B-10731a

Never service the Bobcat Hydraulic Excavator without instructions.

CORRECT

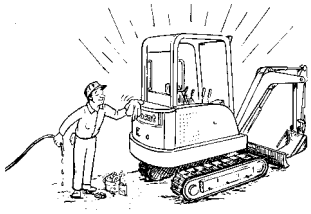


B-14148

Use the correct procedure to lift and support the excavator.

Always lift the blade fully before installing jackstands.

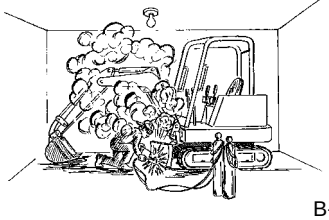
CORRECT



B-14142

Cleaning and maintenance are required daily.

WRONG

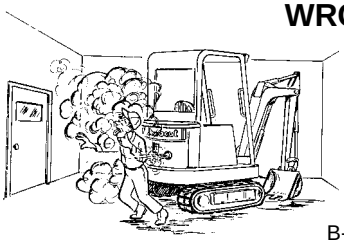


B-14147

Have good ventilation when welding or grinding painted parts.

Wear dust mask when grinding painted parts. Toxic dust and gas can be produced.

WRONG

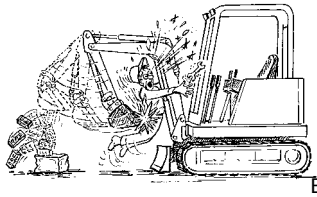


B-14141

Vent exhaust to outside when engine must be run for service.

Exhaust system must be tightly sealed. Exhaust Fumes can kill without warning.

WRONG

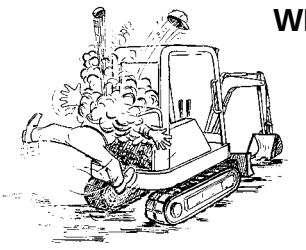


B-14145

Always lower the bucket and blade to the ground before doing any maintenance.

Never modify equipment or add attachments not approved by Bobcat Company.

WRONG



B-14146

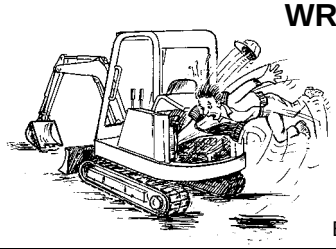
Stop, cool and clean engine of flammable materials before checking fluids.

Never service or adjust machine 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-14143

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 excavator.

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.

MSW20-0805

MELROE COMPANY

bobcat®

220—1
Revision Number

10 February 1995
Date

SERVICE MANUAL REVISION

AFFECTING:

Product EXCAVATOR

Model 220 (S/N 15001 & Above)

Manual No. 6722345 (9-92)

ROUTE TO ATTENTION

PARTS MANAGER	☐
SERVICE MANAGER	☑
SALES MANAGER	☐

NOTICE Insert This Sheet With The Appropriate Manual For Future Reference.

The following pages are a revision to the 220 (15001) Service Manual P/N 6720345 (9-92).
Take out the pages shown and put in the revised pages as follows:

TAKE OUT	PUT IN
Section 5 — Content Page	Section 5 — Content Page (Revised Feb. 95)
5—13	5—13 (Revised Feb. 95)
5-24	5-24 thru 5-37 (Added Feb. 95)

A BUSINESS UNIT OF CLARK EQUIPMENT COMPANY

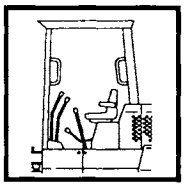
Printed in U.S.A.

FOREWORD

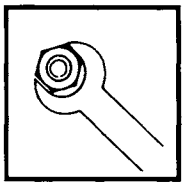
This manual is for the Bobcat hydraulic excavator mechanic. It provides necessary servicing and adjustment procedures for the hydraulic excavator and its component parts and systems. Refer to the Operation & Maintenance Manual for operating instructions, starting procedure, daily checks, etc.

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

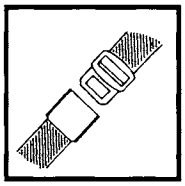
1. Check that the operator canopy is in good condition and is not modified.



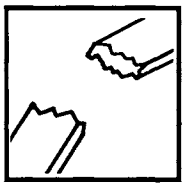
2. Check that operating canopy mounting hardware is tightened and is Melroe approved.



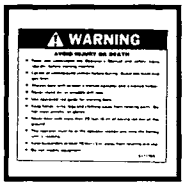
3. The seat belt must be correctly installed, functional and in good condition.



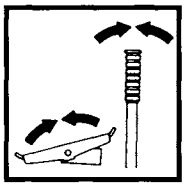
4. Inspect for loose or broken parts or connections.



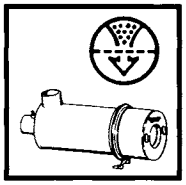
5. Machine signs must be legible and in the correct location.



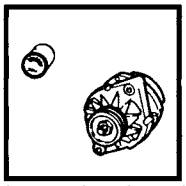
6. Steering levers, control levers and foot pedal must return to neutral.



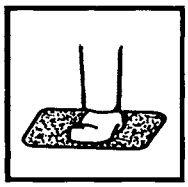
7. Inspect the air cleaner for damage or leaks. Check the condition of the element.



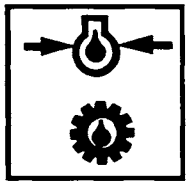
8. Check the electrical charging system.



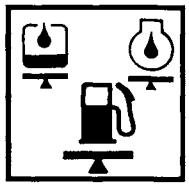
9. Safety treads must be in good condition.



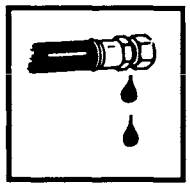
10. Check for correct function of indicator lamps.



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

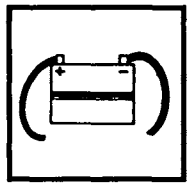


12. Inspect for fuel, oil or hydraulic fluid leaks.

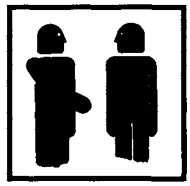


13. Lubricate the hydraulic excavator.

14. Check the condition of the battery and cables.



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



CONTENTS

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:

- 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.
- The Operation & Maintenance Manual delivered with the excavator gives operating information as well as routine maintenance and service procedures. It is a part of the excavator and must stay with the machine when it is sold. Replacement Operation & Maintenance Manuals can be ordered from your Bobcat excavator dealer.
- The excavator 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 Excavator dealer.
- The EMI Manual delivered with the excavator gives information for safe operating and standard signals.
- 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.

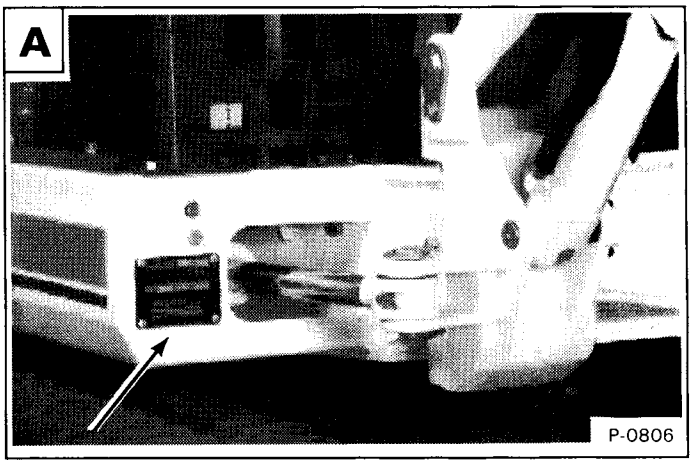
- Wear tight fitting clothing and any other required safety apparel when operating or servicing the excavator.
- Wear safety glasses when maintaining or servicing the excavator.
- Exhaust gases can kill, vent engine exhaust outdoors.
- Know where fire extinguishers and first aid kits are located and how to use them.
- Do not run the excavator 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.
- Do not use ether or starting fluids on an engine that has glow plugs. These starting aids can explode and injure you.
- Clean the excavator before doing any welding. Cover rubber hoses, battery and all other flammable parts. Keep a fire extinguisher near the excavator when welding.
- Have good ventilation when welding or grinding painted parts. Wear a dust mask when grinding painted parts. Toxic dust or gas can be produced.
- Stop the engine and let it cool before adding fuel. NO SMOKING!
- Use the procedure in this manual for installing, connecting and jump starting batteries.

SERIAL NUMBER LOCATIONS

Always use the serial number of the machine 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.

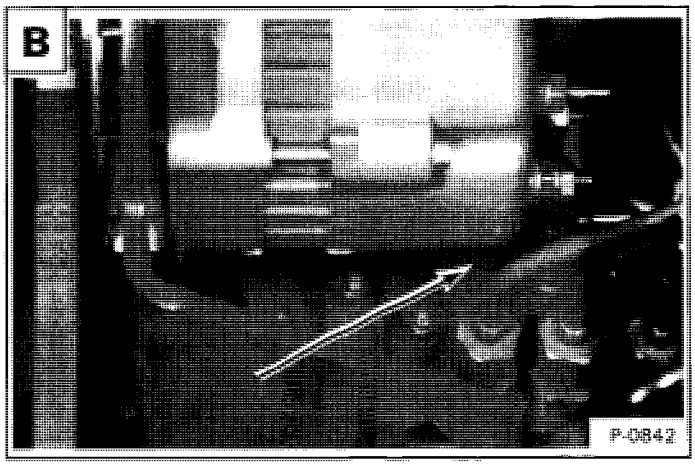
HYDRAULIC EXCAVATOR SERIAL NUMBER

The excavator serial number is on the right front side of the machine frame [A].



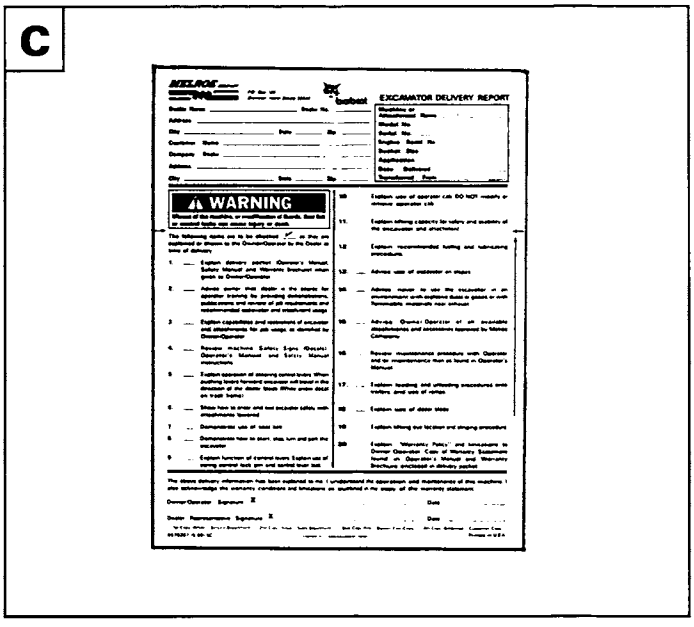
ENGINE SERIAL NUMBER

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

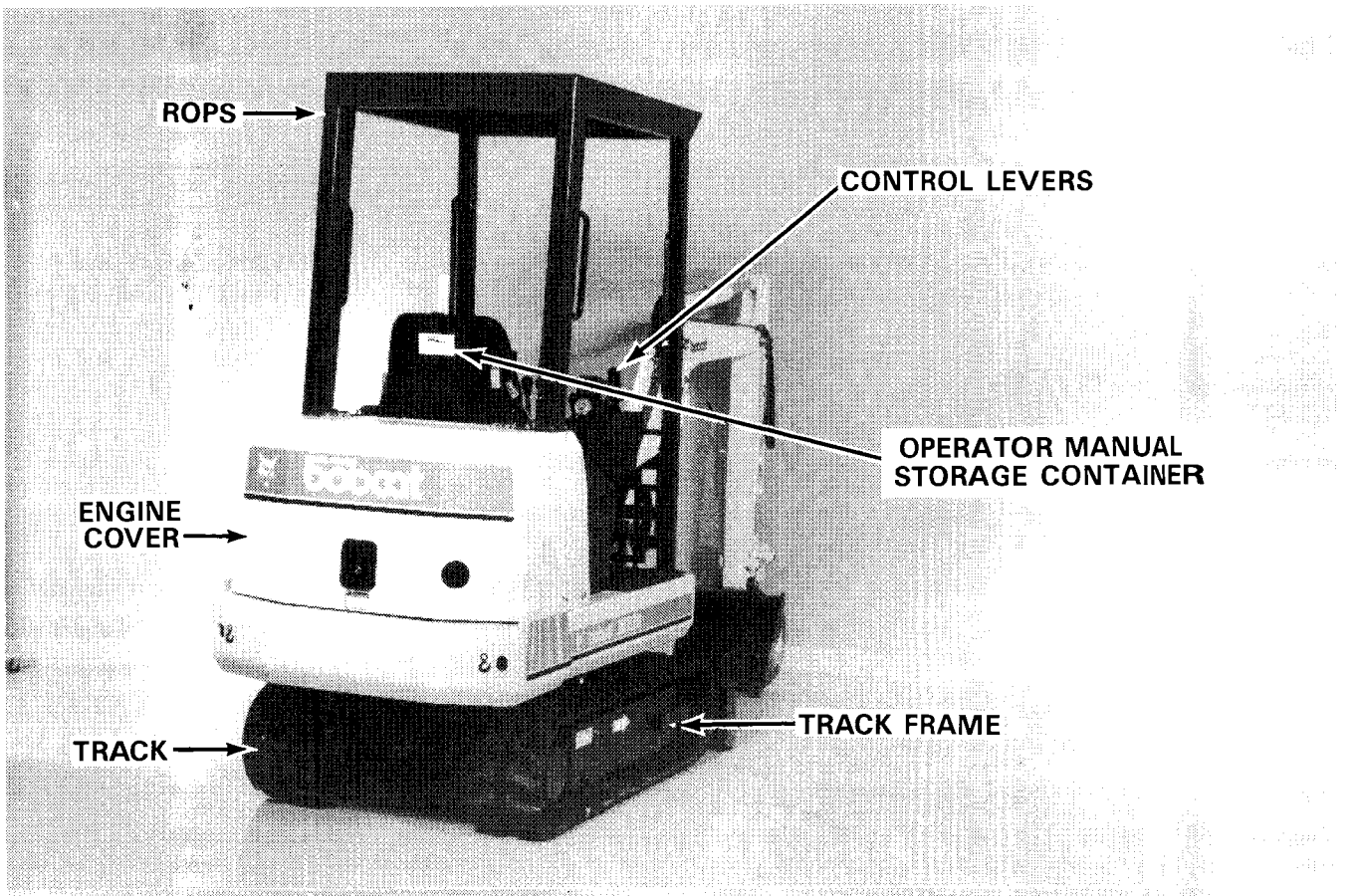


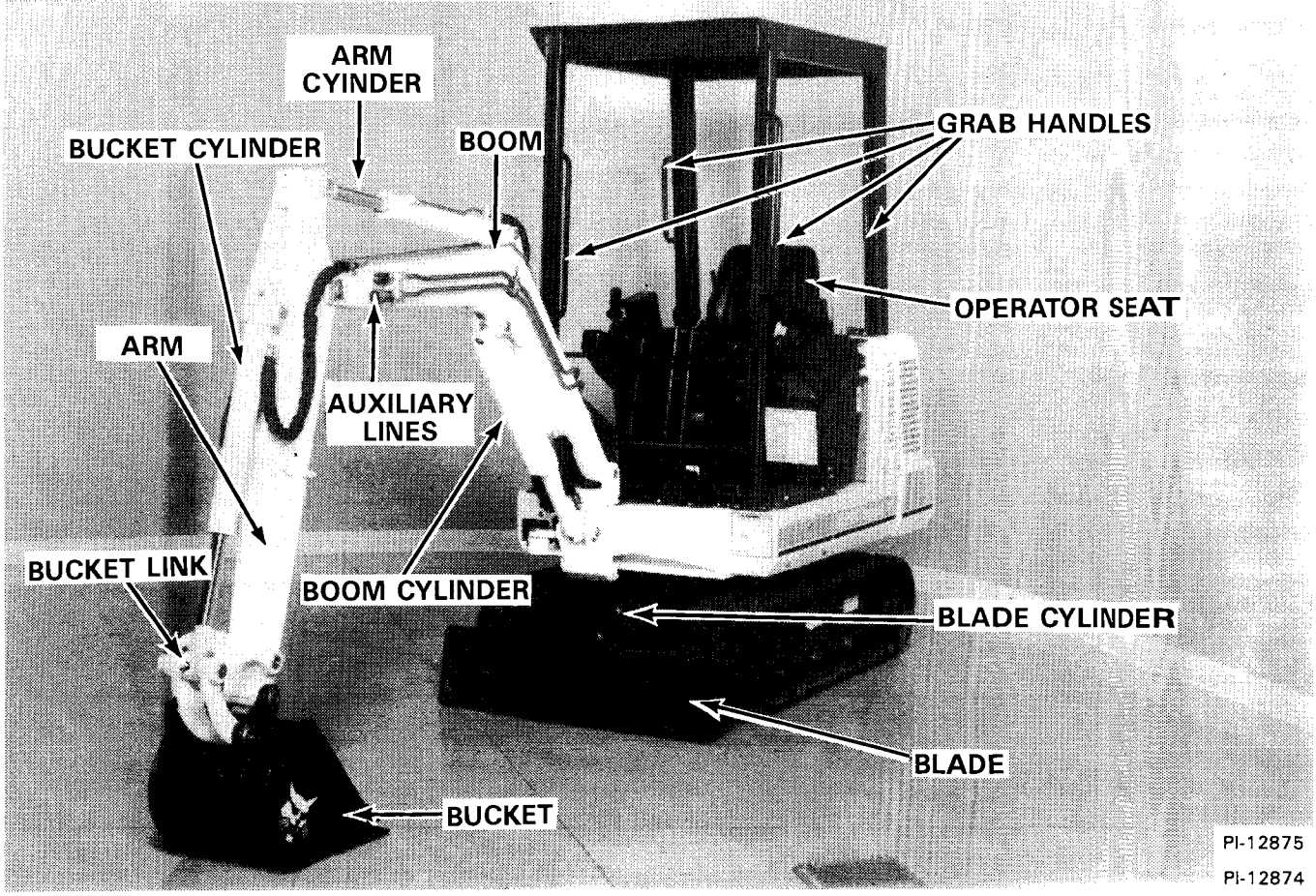
DELIVERY REPORT

All Delivery Report items must be explained to the owner/operator by the dealer. The dealer is to fill out the form and the owner/operator signs the form to indicate his understanding [C].



HYDRAULIC EXCAVATOR IDENTIFICATION



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SERVICE SCHEDULE

Maintenance work must be done at regular intervals. Failure to do so may result in excessive and early failures. The Service Schedule is a guide for correct maintenance of the Hydraulic Excavator.

⚠ WARNING

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

W-2003-1089

SERVICE SCHEDULE		HOURS					
ITEM	**SERVICE REQUIRED**	8-10	50	100	250	500	1000
Engine Air Cleaner	Check & empty dust cup as required.	■					
Engine Oil	Check the oil level and add oil as needed.	■					
Engine Coolant System	Check radiator coolant level.	■					
Indicator Lights	Check for correct operation.	■					
Operator Canopy	Check the fastening bolts, nuts & condition of cab.	■					
Seat Belt	Check the condition & that fasteners are tight.	■					
Safety Signs (Decals)	Check for damaged signs (decals) replace as needed.	■					
Tracks	Check & adjust tension.	■					
Hydraulic Reservoir	Check fluid level.	■					
All Machinery Pivot Points	Lubricate 22 grease fittings.	■					
Fuel Tank/Fuel Filter	Drain water and sediment from fuel tank/filter.		■				
Swing Circle	Lubricate two grease fittings.		■				
Swing Pinion	Lubricate one grease fitting.		■				
Engine Oil & Filter	Replace oil & filter element.			■			
Alternator Belt	Check & adjust tension.			■			
Hydraulic Filter	Replace filter element.				■		
Fuel Filter	Replace filter element.				■		
Battery	Check & clean cable ends & check electrolyte level.				■		
Air Cleaner	Replace the filter element.				■		
Cooling System	Clean the radiator fins.					■	
Alternator & Starter	Check the condition.					■	
Engine Valve Clearance	Check & adjust valve clearance.					■	
Cooling System	Drain, flush & add new coolant to the cooling system.						■
Hydraulic Tank	Change the fluid & clean fill neck strainer.						■
Case Drain Return Screen	Clean the screen with solvent.						■
Final Drive Case	Change the gear lube.						■

After the first 250 hours of machine operation do the following procedures:

- **Change oil in final drive case.**
- **Check and adjust engine valve clearance.**

ENGINE COVER

⚠ WARNING

AVOID INJURY OR DEATH

Never service or adjust the machine when the engine is running unless instructed to do so in this manual.

W-2012-1285

Keep the engine cover closed when operating the machine.

W-2141-0189

Open the engine cover to service the engine. Pull on the latch and lift the engine cover up until it is fully raised [A].

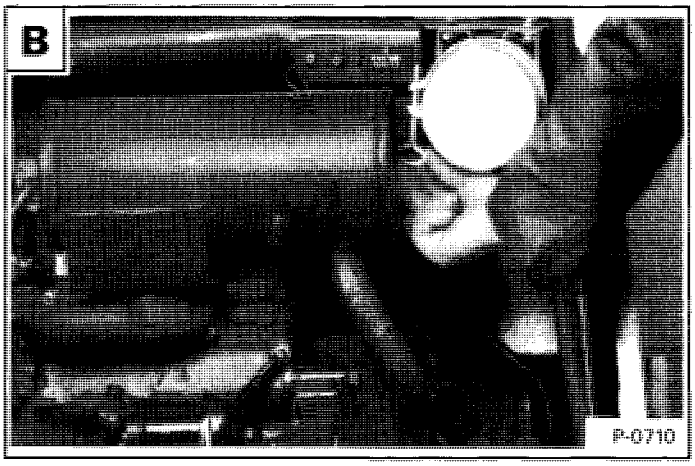
AIR CLEANER SERVICE

See the Service Schedule (Page 1—1) for the correct service interval.

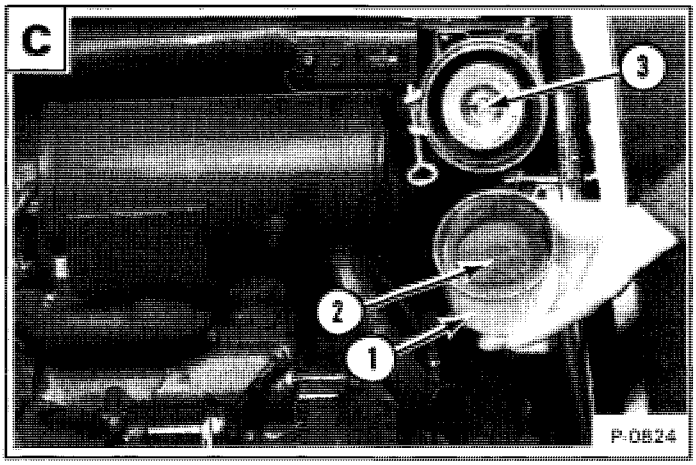
Service the air cleaner as follows:

Daily Check:

1. Loosen the clamp on the air cleaner [B].



2. Remove the cover (Item 1) and the dust cup (Item 2) [C]. Empty the dust cup. Visually inspect the filter element. Do Not remove the element unless plugged and replacement is necessary.



Filter Replacement:

3. Remove the wing nut (Item 3) [C].

4. Remove the filter element [D].

5. Check the air cleaner housing for damage.

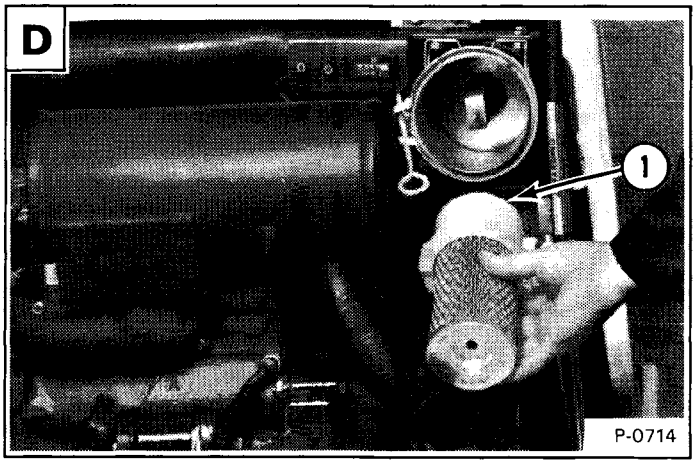
6. Wipe the canister clean with a clean cloth. Do Not use compressed air.

7. Check the seal (Item 1) [D].

8. Install a new air filter element. Install and tighten the wing nut.

9. Install the dust cup and cover so the arrow points up.

10. Check that all the air cleaner hose clamps are tight.



FUEL SYSTEM

Use Number 2 diesel fuel in the engine. When the temperature goes below 14°F (-10C), Number 1 fuel can be used.

⚠ WARNING

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

W-2063-0887

Fuel System Service

The fuel level in the tank is indicated by the fuel gauge (Item 1) when the ignition key is in the "ON" position [A].

NOTE: **When the fuel level reaches the 1/8 fuel setting, the low fuel light (Item 2) will come "ON" to alert the operator of this condition [A].**

Use the key to un-lock the fuel fill cap [B].

Turn the fill cap to remove it [B].

Use a clean, approved safety container to add fuel to the tank.

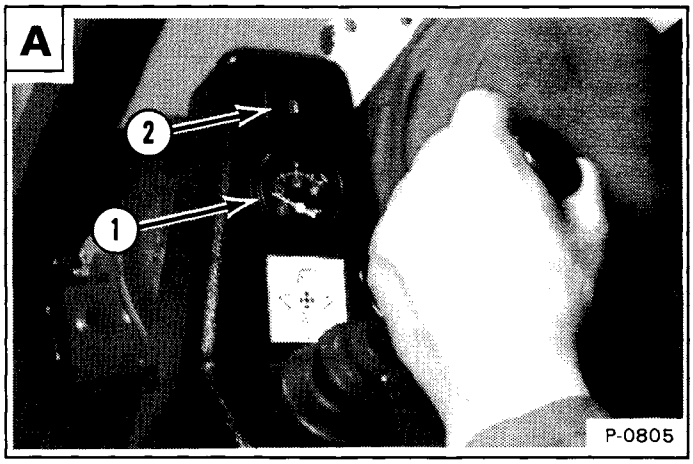
Add fuel only in an area that has a free movement of air and no open flames or sparks. NO SMOKING!

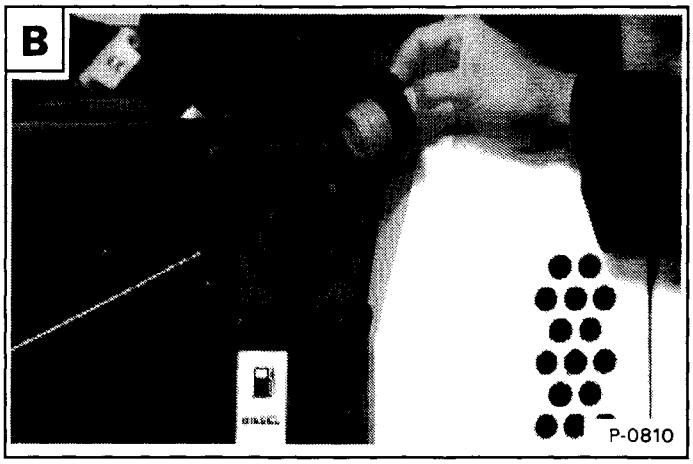
After the tank is full, install and tighten the fuel fill cap.

⚠ WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

W-2103-1285

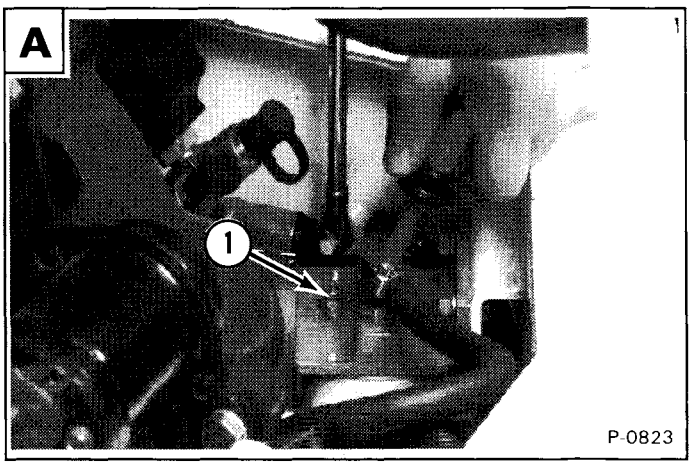




FUEL SYSTEM (Cont'd)

To remove the water and sediment from the fuel tank, remove the fuel hose at the fuel filter inlet elbow [A]. Insert the end of the hose into an approved container and drain.

NOTE: **If fuel will not drain, squeeze the primer bulb to start the fuel to flow.**



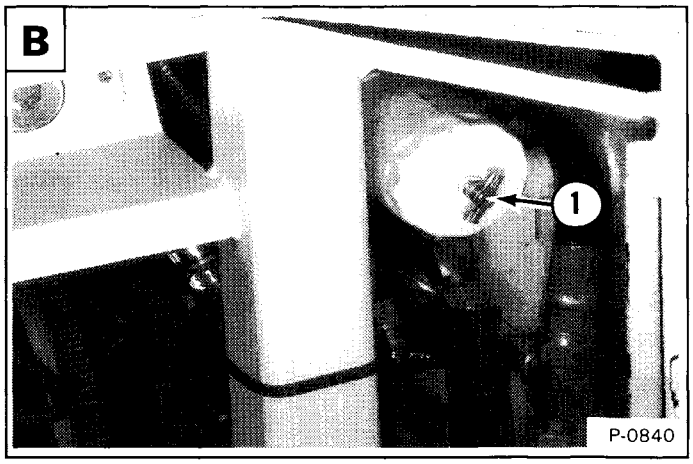
Fuel Filter

See the Service Schedule (Page 1—1) for the correct service interval.

To remove water from filter, open drain valve (Item 1) at the bottom of the fuel filter [B].

Use a filter wrench to remove the final fuel filter [B].

Replace the element and hand tighten only.



Removing Air From the Fuel System

After replacing the fuel filter(s) or after running out of fuel, air must be removed from the fuel system.

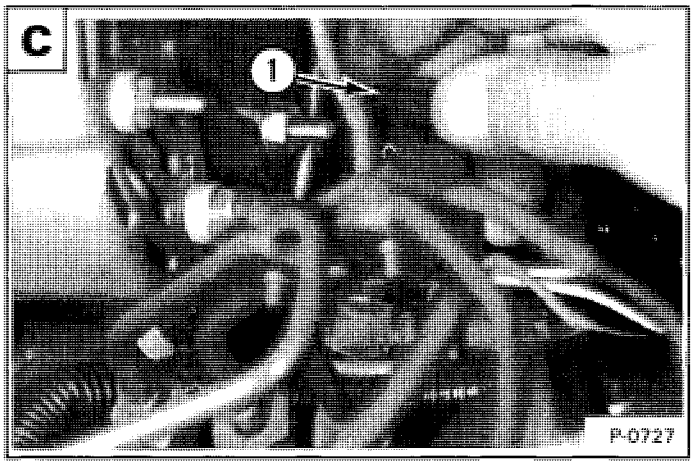
Open the vent screw (Item 1) on the injection pump [C].

Open the bleed screw on the top of the fuel filter housing (Item 1) [A].

Squeeze the primer bulb to fill the filter [D].

When fuel, free of air bubbles emerges from the filter housing, close the bleed screw.

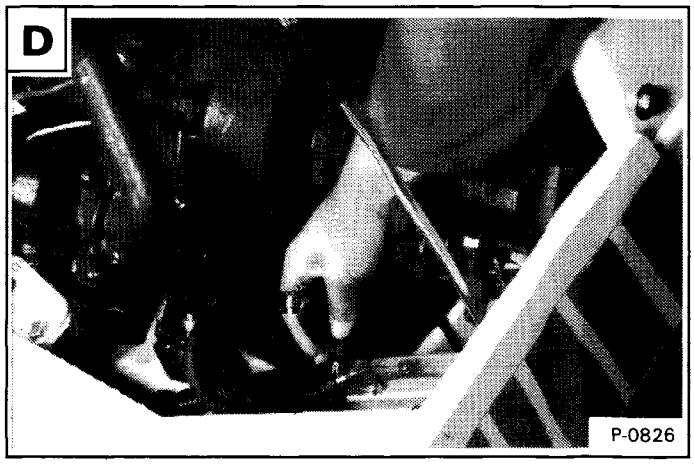
Leave the vent on the injection pump open slightly.



Start the engine. When the engine runs smoothly, close the vent screw on the injection pump.

NOTE: **If engine fails to start after the above procedure is performed, it will be necessary to bleed the injector lines; do the following:**

1. **Loosen the three (3) injector line locknuts, one turn.**
2. **While cranking the engine and fuel emerges from the injector lines, slowly tighten the injector line lock nuts.**



ENGINE LUBRICATION SYSTEM

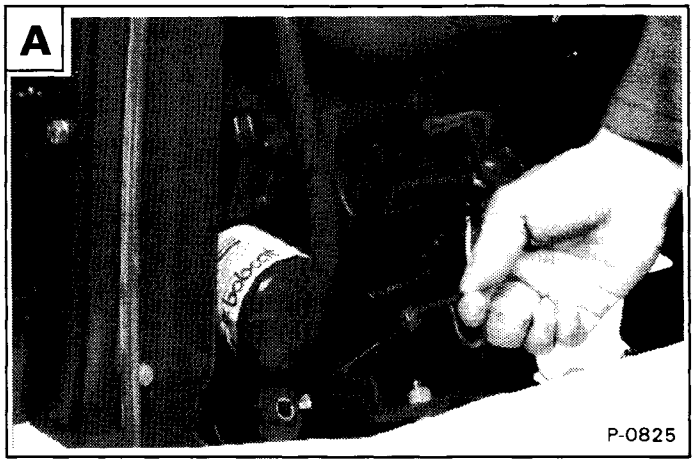
Check the engine oil every day.

Stop the engine. Open the engine cover.

Remove the dipstick [A].

Keep the oil level between the marks on the dipstick.

Use a good quality motor oil that meets API Service Classification of CC-CE or CD (See Fuel, Coolant and Lubricants Chart, Page 8—10).

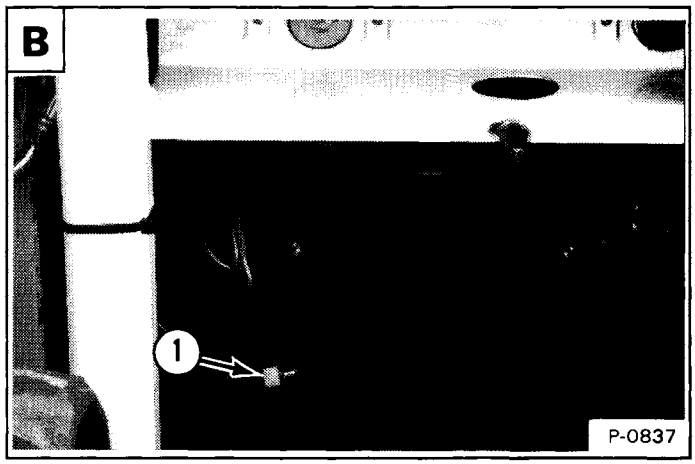


Engine Oil and Filter Replacement

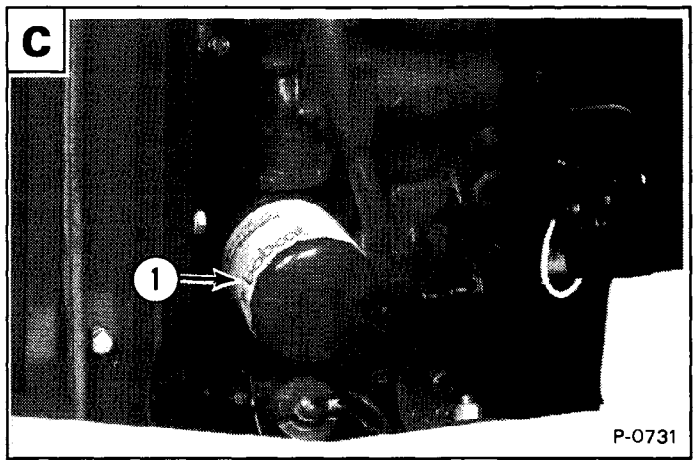
See the Service Schedule (Page 1—1) for the correct service interval.

Use the following procedure to change the oil and filter:

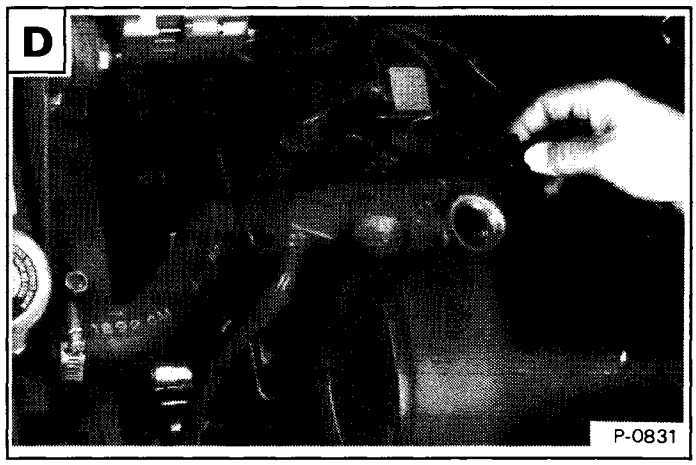
1. Run the engine until it is at operating temperature.
2. Turn the upper works so there is clearance for the engine oil drain plug. Stop the engine.
3. Remove the drain plug (Item 1) [B]. Drain the oil into a container.



4. Remove the oil filter (Item 1), using a filter wrench [C].
5. Clean the filter housing surface. Put clean oil on the filter gasket. Install the new filter and hand tighten only.
6. Install and tighten the oil drain plug.



7. Remove the oil fill cap [D]. Put 4.5 quarts (4,3 L) of oil into the engine (See Fuel, Coolant and Lubricants Chart, Page 8—10).
8. Start the engine and let it run for several minutes. Stop the engine. Check for leaks at the oil filter.
9. Check the oil level and add oil as needed to bring it to the "top" mark on the dipstick.



COOLING SYSTEM

Coolant Level

When the engine is cool, remove the radiator cap [A].

The coolant level must be 3/4''-1'' (19-25 mm) below the filler neck at the radiator.

If the coolant level is low, add pre-mixed coolant (50% water and 50% ethylene glycol) to the radiator.

Coolant Replacement

⚠ WARNING

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

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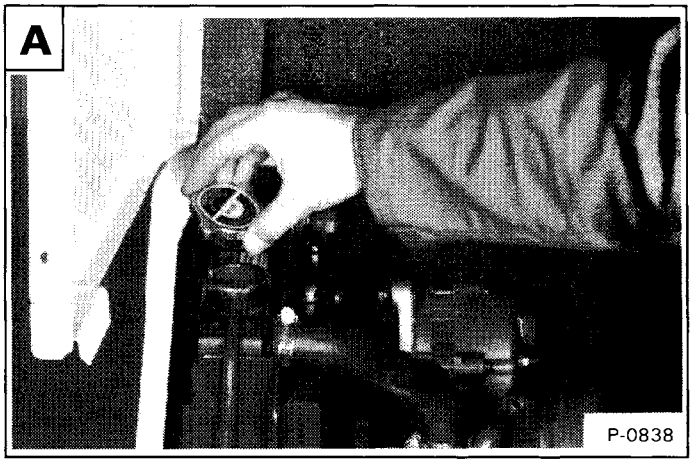
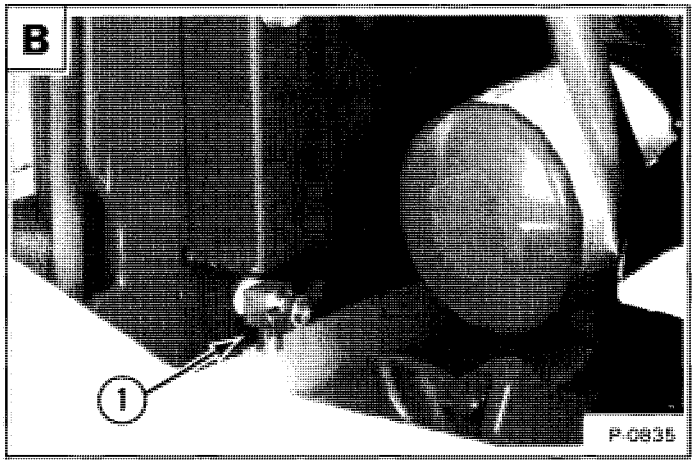
1. Turn the upper works so there is access to the engine and radiator from underneath. Stop the engine.
2. Loosen and remove the radiator cap [A].
3. Open the radiator drain valve (Item 1) [B].
4. Drain all the coolant from the system.
5. When all the coolant is removed, close the drain valve.
6. Pre-mix 50% water and 50% ethylene glycol in a separate container. Fill the radiator with the pre-mixed coolant until it is full.
7. Run the engine at idle speed for about 5-10 minutes to remove the air from the cooling system (leave the radiator cap off during this operation).
8. Stop the engine. Check the coolant level and add as needed to bring it 3/4''-1'' (19-25 mm) below the filler neck. Install the radiator cap and tighten.





⚠ WARNING

Wear safety glasses to prevent eye injury when any of the following conditions exist:

- **When fluids are under pressure.**
- **Flying debris or loose material is present.**
- **Engine is running.**
- **Tools are being used.**

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HYDRAULIC SYSTEM

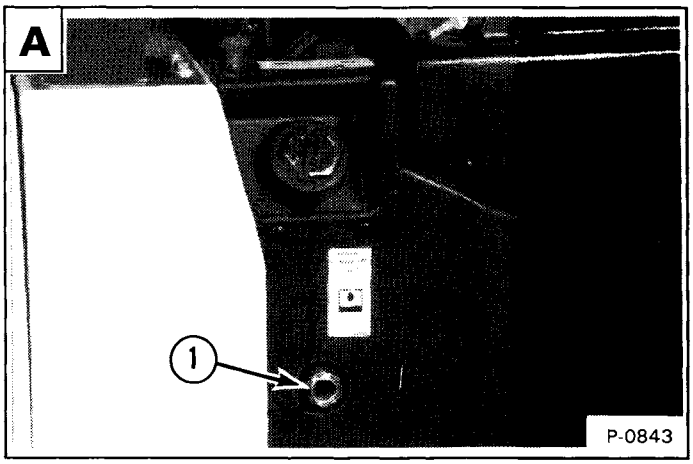
Checking and Adding Fluid

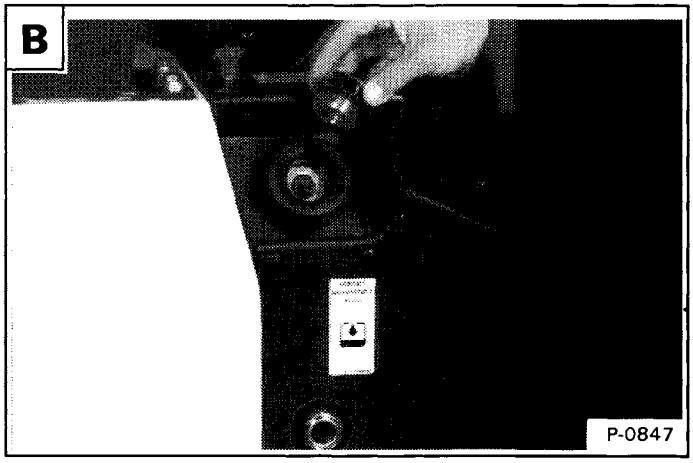
To check and add hydraulic fluid to the reservoir, use the following procedure:

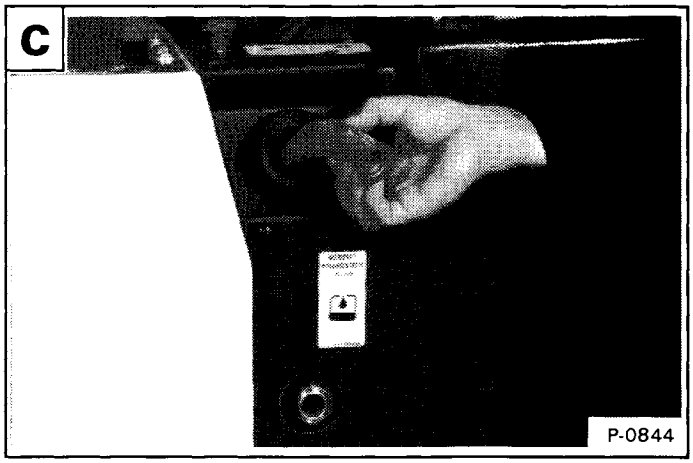
IMPORTANT

Prior to checking the hydraulic fluid level, retract the dipperarm and bucket cylinder. Put the bucket on the ground and raise the blade.

1. Put the machine on a flat level surface.
2. Retract the dipperarm and bucket cylinders, put the bucket on the ground and raise the blade. Stop the engine.
3. The hydraulic fluid level must be visible in the sight gauge (Item 1) [A].
4. If fluid level is not correct, remove the hydraulic cap [B].
5. Remove the screen from the fill neck and replace it if damaged [C].
6. Add the correct fluid to the reservoir until it is visible in the center of the sight gauge [A]. (See Fuel, Coolant and Lubricants Chart, Page 8-10).
7. Install the reservoir cap.





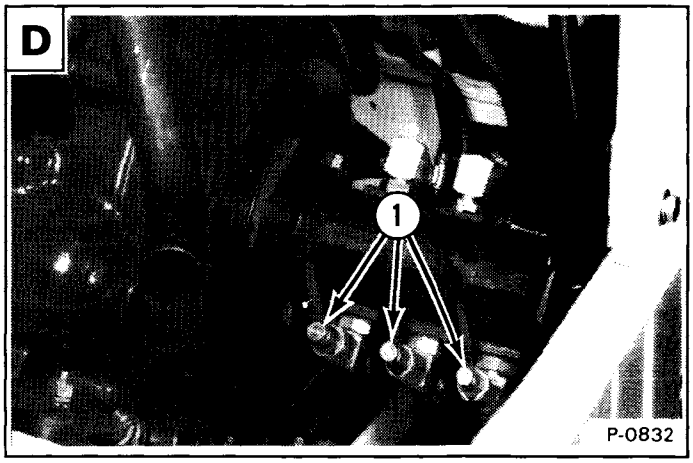


Diagnostic Couplers

Diagnostic couplers are located at each hydraulic pump (Item 1) [D].

The couplers can be used to check circuit pressures.

Refer to Page 2—1 for test procedure and tools needed for testing.



IMPORTANT

Prior to checking the hydraulic fluid level, retract the dipperarm and bucket cylinder. Put the bucket on the ground and raise the blade.

Replacement of the Hydraulic Filter

See the Service Schedule (Page 1—1) for the correct service interval.

1. Open the engine cover.
2. Use a filter wrench and remove the filter element (Item 1) [A].
3. Clean the housing where the filter gasket makes contact.
4. Put clean hydraulic fluid on the gasket. Install the new filter element and hand tighten only.
5. Start the engine. Run the machine through the hydraulic functions. Stop the engine. Check the fluid level at the reservoir and add as needed. Check the filter area for leaks.

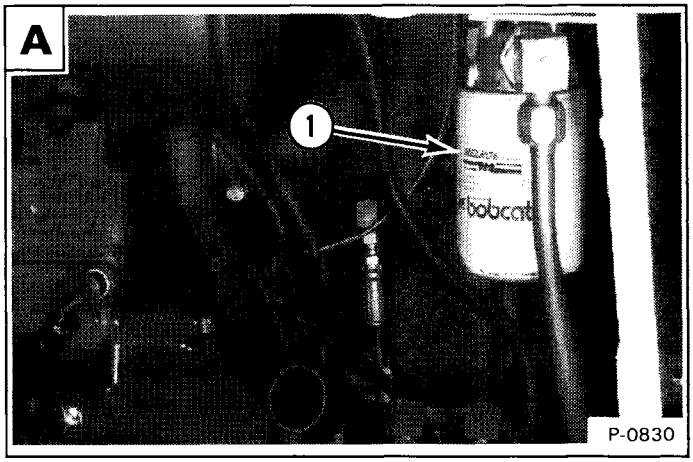
Hydraulic Reservoir

Replacement of the Hydraulic Fluid

See the Service Schedule (Page 1—1) for the correct service interval.

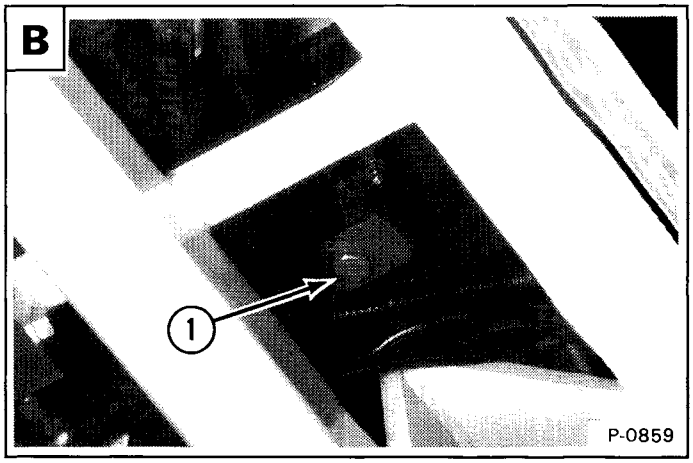
1. Move the upper works so there is clearance for the reservoir at the track frame.
2. Retract the dipperarm and bucket cylinder, lower the bucket to the ground. Stop the engine.
3. Remove the hydraulic filter element [A].
4. Remove the drain plug (Item 1) from the bottom of the reservoir [B].
5. Drain the fluid into a container.
6. Install the drain plug.
7. Install a new hydraulic filter.
8. Add the correct fluid to the reservoir until it is visible in the sight gauge (approximately 3.75 gals. (14,2 L.) to fill only the reservoir), (See Fuel, Coolant and Lubricants Chart, Page 8—10).
9. Run the machine through the hydraulic functions. Stop the engine. Check the fluid level and add as needed.

A



P-0830

B



P-0859

⚠ WARNING

Always clean up spilled fuel or oil. Keep heat, flames, sparks or lighted tobacco away from fuel and oil. Failure to use care around combustibles can cause explosion or fire which can result in injury or death.

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USING A BOOSTER BATTERY (JUMP STARTING)

Procedure

If it is necessary to use a booster battery to start the engine, BE CAREFUL! Make sure the swing lock pin is in the engaged position.

The key switch must be in the "OFF" position.

The booster battery must be 12 volt.

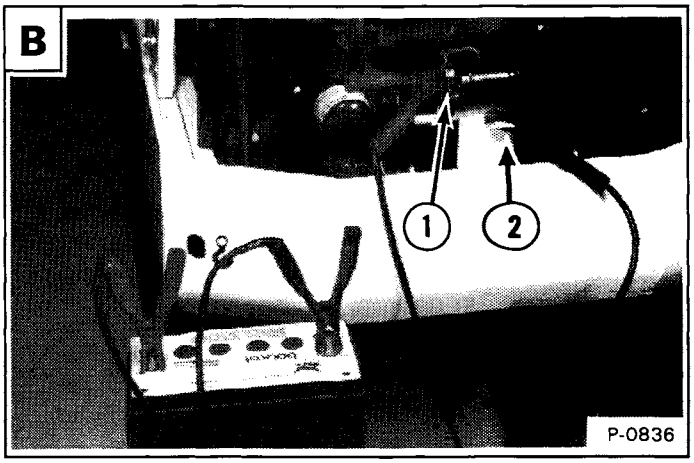
Open the engine cover [A].

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 (+) battery cable terminal (Item 1) [B].

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 machine frame (Item 2) [B].

NOTE: **Also see "Cold Starting Procedure, in Operation & Maintenance Manual.**

Start the engine. After the engine is running, remove the cable (Item 2) connected to the frame first. Disconnect the cable from the starter terminal (Item 1) [B].



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 machine (Remove both cables from the battery).**
- **Extra battery cables (booster cables) are connected wrong.**

I-2023-1285

⚠ WARNING

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

Do not jump start or charge a frozen battery. Warm battery to 60°F. (16°C.) before connecting to a charger. Un-plug charger before connecting or disconnecting cables to battery.

Battery gas can explode and cause serious injury.

W-2066-1285

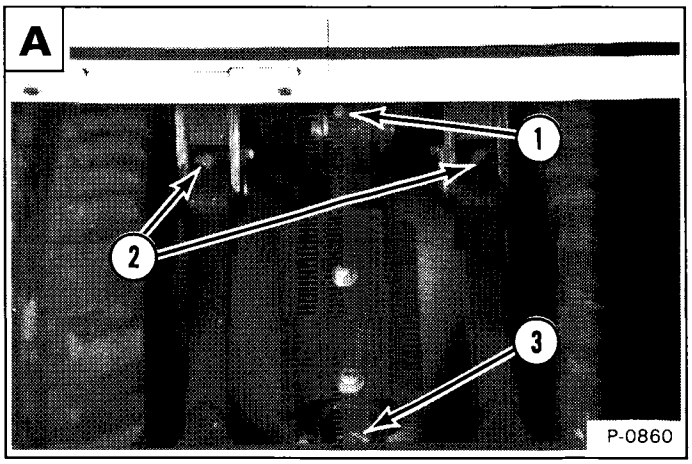
LUBRICATION OF THE HYDRAULIC EXCAVATOR

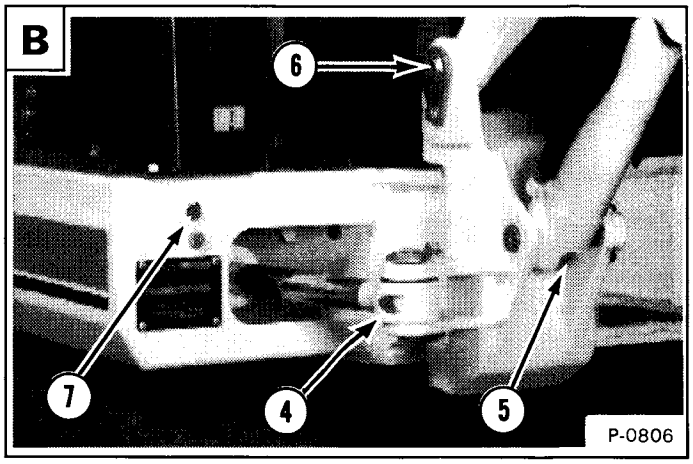
Procedure

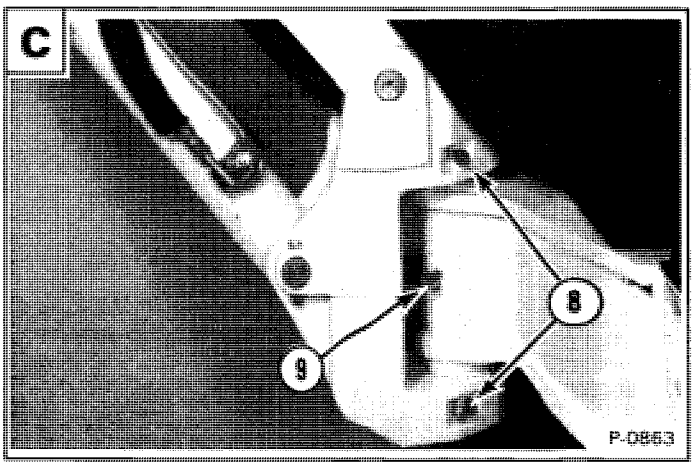
Lubricate the Hydraulic Excavator as specified in the Service Schedule (Page 1—1) for the best performance of the machine.

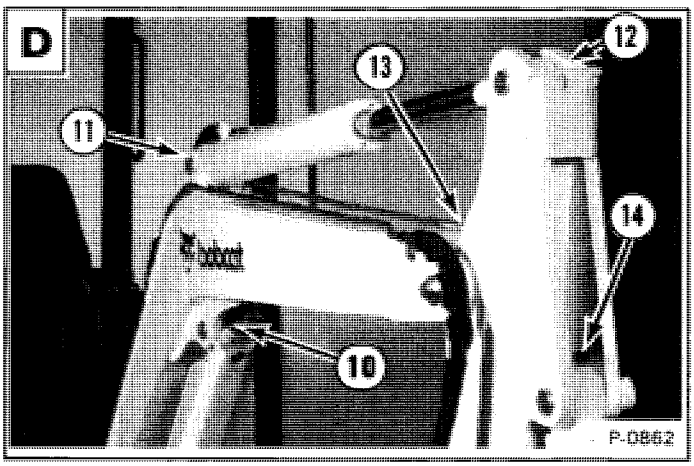
Always use a good quality lithium based multi-purpose grease when lubricating the machine. Apply the lubricant until extra grease shows.

Ref.	Description (# of Fittings)
1.	Blade Cylinder Rod End, every 8-10 hours (1) [A].
2.	Blade Pivots, every 8-10 hours (2) [A].
3.	Blade Cylinder Base End, every 8-10 hours (1) [A].
4.	Boom Swing Cylinder Rod End, every 8-10 hours (1) [B].
5.	Boom Cylinder Base End, every 8-10 hours (1) [B].
6.	Boom Base Pivot, every 8-10 hours (1) [B].
7.	Swing Circle Pinion, every 50 hours (1) [B]. Install 4 pumps of grease from a grease gun into the grease fitting. Rotate the upperstructure 180° and install 4 more pumps of grease into the grease fitting.
8.	Boom Swing Bracket Pivot, every 8-10 hours (2) [C].
9.	Frame Swing Bracket Pivot, every 8-10 hours (1) [C].
10.	Boom Cylinder Rod End, every 8-10 hours (1) [D].
11.	Arm Cylinder Base End, every 8-10 hours (1) [D].
12.	Arm Cylinder Rod End, every 8-10 hours (1) [D].
13.	Arm Base Pivot, every 8-10 hours (1) [D].
14.	Bucket Cylinder Base End, every 8-10 hours (1) [D].



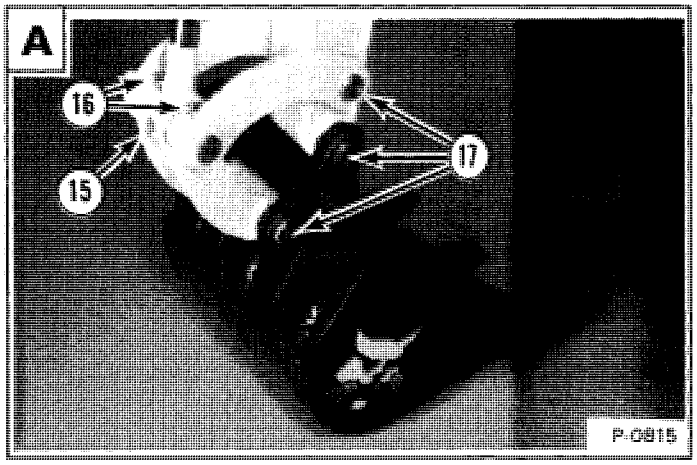




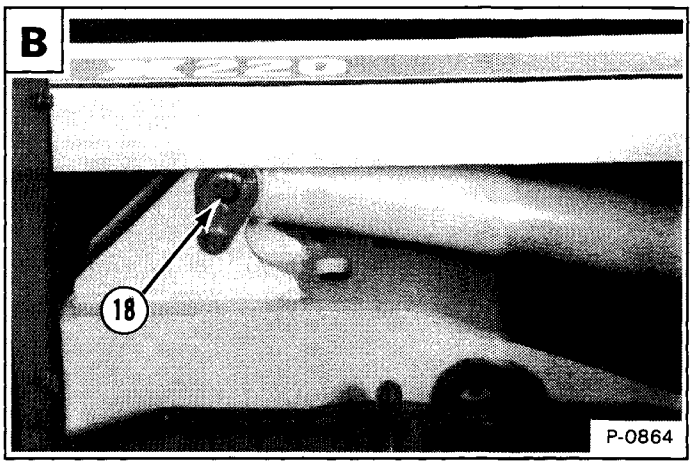


LUBRICATION OF THE HYDRAULIC EXCAVATOR (Cont'd)

Ref.	Description (# of Fittings)
15.	Bucket Cylinder Rod End, every 8-10 hours (1) [A].
16.	Bucket Link Pivots, every 8-10 hours (2) [A].
17.	Bucket Pivots, every 8-10 hours (3) [A].

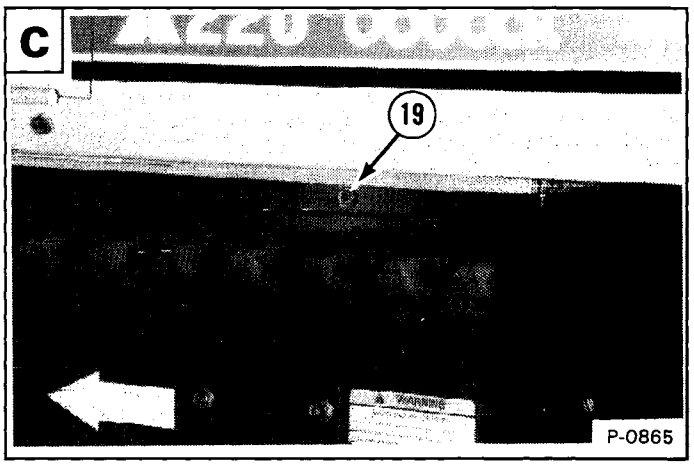


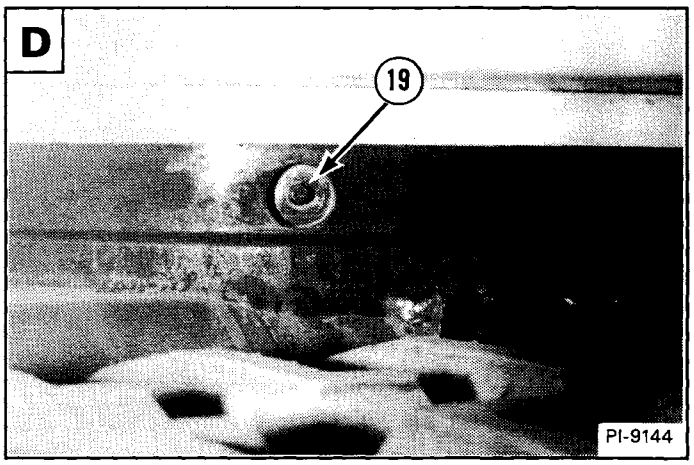
18. Boom Swing Cylinder Base End, every 8-10 hours (1) [B].



19. Swing Circle Ball Bearing, every 50 hours (2) [C].

NOTE: Do Not overgrease the swing circle or damage to the seal could result. Install 4 to 5 pumps of grease gun in to each of the 2 grease fittings. Rotate the upperstructure 90° and install 4 to 5 pumps of grease into each of the 2 grease fittings.






bobcat


bobcat