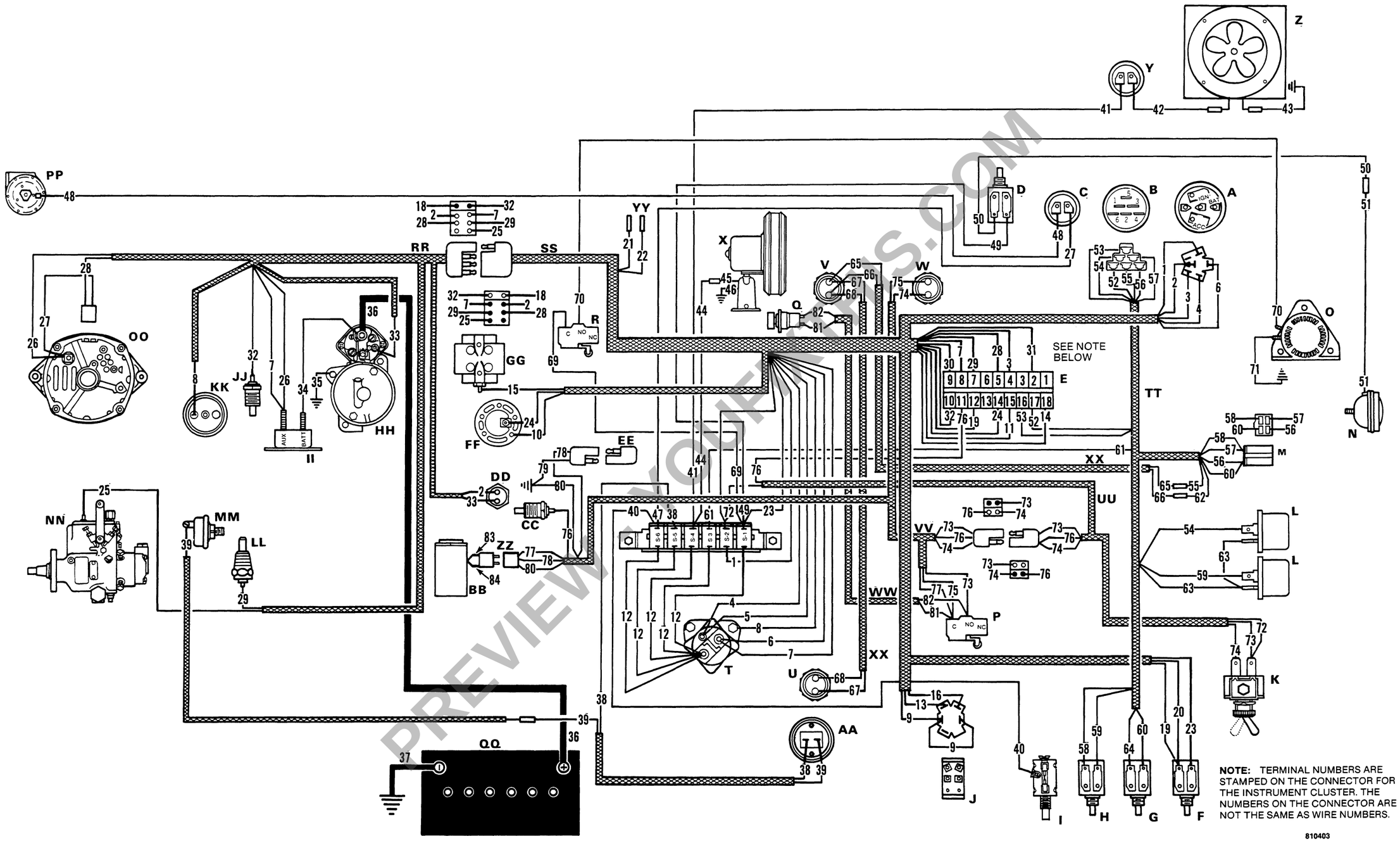

Figure 6 - Basic Wiring Diagram for Chassis

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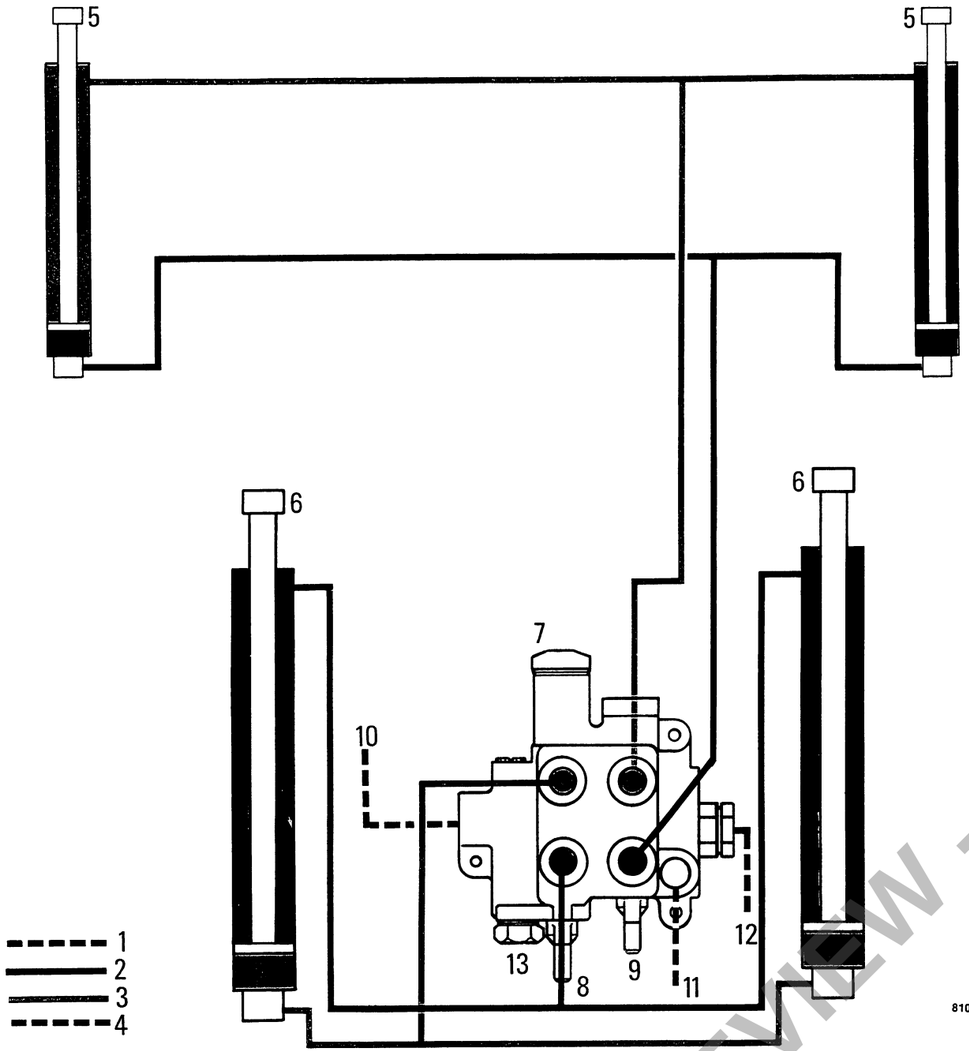
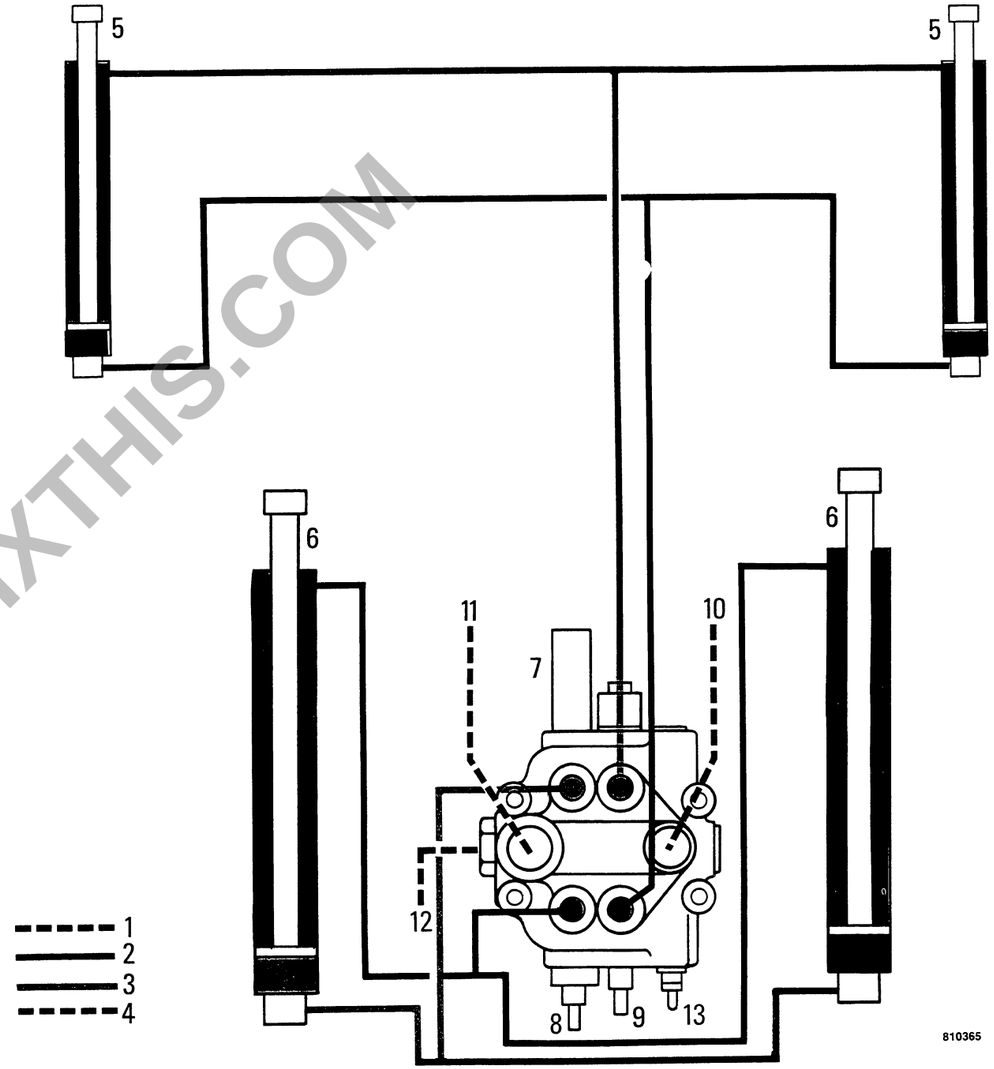


1. PUMP FLOW
2. OIL FLOW TO AND FROM A PORTS AND CYLINDERS
3. OIL FLOW TO AND FROM B PORTS AND CYLINDERS
4. RETURN OIL
5. BUCKET CYLINDERS
6. LIFT CYLINDERS
7. LOADER CONTROL VALVE
8. LIFT SPOOL
9. BUCKET SPOOL
10. FROM HYDRAULIC PUMP
11. TO HYDRAULIC RESERVOIR
12. TO BACKHOE CONTROL VALVE OR THREE POINT HITCH VALVE
13. MAIN RELIEF VALVE

Loader Hydraulic Circuit (Gresen Control Valve)



1. PUMP FLOW
2. OIL FLOW TO AND FROM A PORTS AND CYLINDERS
3. OIL FLOW TO AND FROM B PORTS AND CYLINDERS
4. RETURN OIL
5. BUCKET CYLINDERS
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8. LIFT SPOOL
9. BUCKET SPOOL
10. FROM HYDRAULIC PUMP
11. TO HYDRAULIC RESERVOIR
12. TO BACKHOE CONTROL VALVE OR THREE POINT HITCH VALVE
13. MAIN RELIEF VALVE

Loader Hydraulic Circuit (Parker Hannifin Control Valve)

Figure 7 - Loader Hydraulic Circuits

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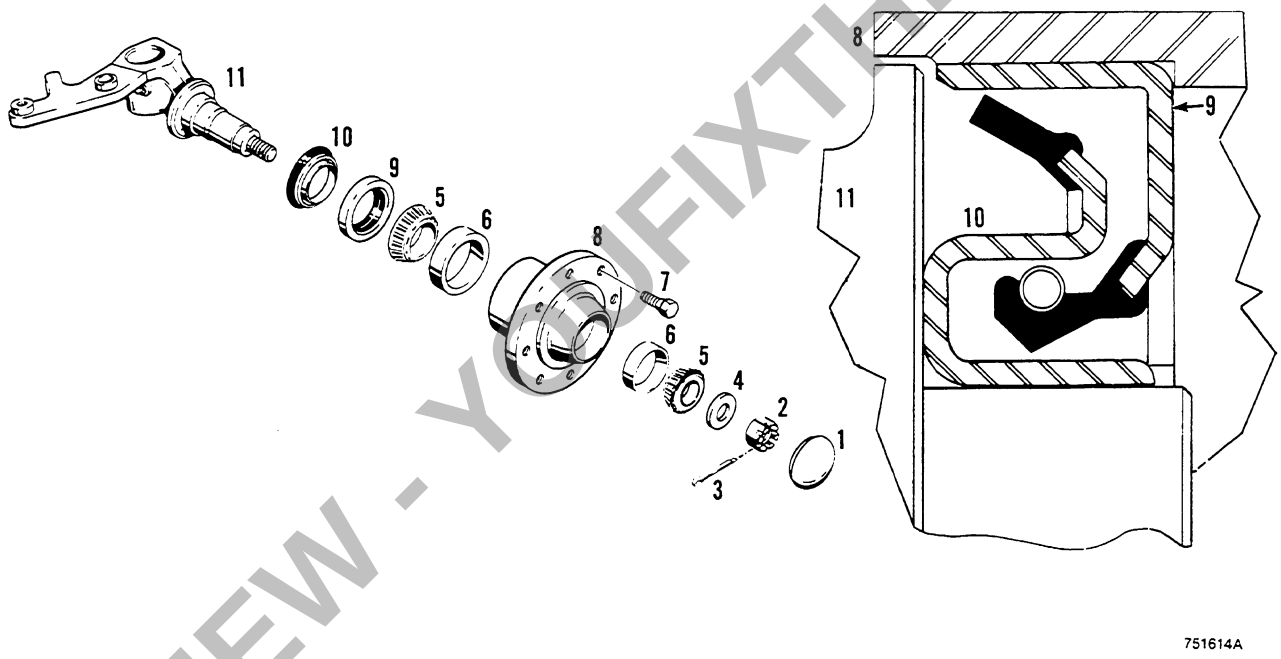
SPECIFICATIONS

Service

Toe in	1/8 - 3/8 inch (3 - 9 mm)
Clean and lubricate front wheel bearings	After every 500 hours of operation
Wheel bearing grease	Mobil No. 5 grease or equivalent (a short fiber, sodium soap grease)

Special Torques

Wheel bearing nut	75 - 85 pound-feet (101 - 115 N m) with wheel turning. Then loosen a maximum of 1/6 turn
Nuts for tie rod ball joints	100 - 120 pound-feet 135 - 162 N m)
Nut for steering cylinder ball joints	100 pound-feet (135 N m. Then tighten nut to next slot
Front wheel bolts	115 - 130 pound-feet (156 - 176 N m)



1. CAP
2. NUT
3. COTTER PIN
4. WASHER
5. WHEEL BEARING
6. BEARING CUP
7. WHEEL BOLT (8)
8. HUB
9. HUB SEAL
10. SPINDLE SEAL
11. SPINDLE

Figure 1

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SPECIFICATIONS

Pump output	24 gpm at 1800 psi at 2000 rpm (91 L/min at 12 410 kPa at 2000 r/min)
Pressure Settings of Relief Valves	
Main relief valve	2150 - 2250 psi (14 824 - 15 513 kPa)
Pump protection valve	2550 - 2650 psi (17 582 - 18 271 kPa)
Three point hitch	1750 - 1850 psi (12 066 - 12 755 kPa)
Secondary Relief Valves	Hand Pump
Backhoe bucket A and B ports	2250 - 2500 psi (15 513 - 17 237 kPa)
Swing A and B ports	1325 - 1475 psi (9136 - 10 170 kPa)
Dipper A and B ports	2250 - 2500 psi (15 513 - 17 237 kPa)
Boom A port	825 - 975 psi (5688 - 6722 kPa)
Boom B port	2250 - 2500 psi (15 513 - 17 237 kPa)
Three point hitch lift, A port	1850 - 1950 psi (12 755 - 13 445 kPa)
Oil temperature for hand pump tests	70 - 80° F (21 - 27° C)
Hydraulic reservoir capacity	11 U.S. gallons (41 litres)
Hydraulic system capacity	
Loader	13.5 U.S. gallons (51 litres)
Backhoe (with extendable dipper)	20 U.S. gallons (75.7 litres)
Backhoe (without extendable dipper)	18.3 U.S. gallons (69.3 litres)
Hydraulic oil	Case TCH Fluid
Alternate oil	Engine oil SC, Class C Above 32° F (0° C) use SAE 20 Below 32° F (0° C) use SAE 10W **NOTE:** Do not mix engine oil and TCH Fluid.
Oil change interval	After every 1000 hours of operation.
Filter change interval	After every 500 hours of operation.

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TROUBLESHOOTING CHART

PROBLEM	POSSIBLE CAUSE	CORRECTION
External oil leakage	Cap screws that fasten the adapter to the shuttle housing are loose.	Remove the power shuttle. Remove the adapter and check the gasket. Install a new gasket if necessary. Install the adapter and tighten the cap screws.
	Oil line connections loose.	Tighten the connections.
	O-ring on control valve spool is damaged.	Remove the control valve spool. Replace the O-ring.
	Cap screws that fasten the cover plate for the control valve are loose.	Remove the cover plate. Replace the gasket and install the cover plate again.
	Rear seal is damaged.	Replace the rear seal.
	Cap screws on the rear bearing retainer are loose.	Remove the rear bearing retainer. Replace the gasket. Install the rear bearing retainer.
Control lever does not stay in the correct position	Detent spring is broken.	Replace the spring.
	Detent ball will not move freely.	Clean and lubricate the detent ball and bore in the valve cover.
Oil temperature in the torque converter is too hot	Low oil level.	Check the oil level and add oil as necessary.
	Operating the machine in the wrong gear.	See the operators manual.
	Oil cooler filled with dirt.	Clean the dirt from the fins in the radiator. Do Test No. 2 on page 6202-14 to learn if the inside of the oil cooler is filled with dirt.
Machine will not move in either forward or reverse	Damaged torque converter.	Replace the torque converter.
	Damaged pressure regulator piston in the control valve spool.	Remove control valve spool and check pressure regulator piston.
	Broken spring for pressure regulator piston.	Remove control valve spool and check the spring.
	Low oil level.	Check the oil level and add oil as necessary.
	Worn charging pump.	Remove shuttle and replace the charging pump assembly.

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FLUIDS AND LUBRICANTS

COMPONENT	CAPACITY		SPECIFICATIONS
	U.S.	Metric	
Fuel tank	23.5 gallons	89 litres	See Operators Manual
Engine crankcase			
Without filter change	6 quarts	5.7 litres	Case HDM Oil
With filter change	7 quarts	6.6 litres	API Classification CD Above 32° F (0° C) .....SAE 30 10 - 50° F (-12° - 10° C) .....SAE 20W20 Below 32° F (0° C) .....SAE 10W
Hydraulic reservoir	11 gallons	41 litres	Case TCH Fluid Alternate oil: Engine oil SC, service class C Above 32° F (0° C) .....SAE 20 Below 32° F (0° C) .....SAE 10W **NOTE:** Do not mix engine oil and TCH Fluid.
Power shuttle transmission	8 quarts	7.6 litres	Case TCH Fluid
Transaxle	20 quarts	18.9 litres	Case FDL Final Drive Lube Alternate oil: Gear Lubricant (API-GL-4) Above 0° F (-18° C) .....SAE 90 Below 0° F (-18° C) .....SAE 80
Engine cooling system			
With heater	18 quarts	17 litres	Mix an ethylene glycol coolant with water for the lowest outside temperature that is expected. The mixture must be at least 50%50.
Without heater	14 quarts	13.2 litres	
Battery	As required		Add drinking water or distilled water.
Grease fittings	As required		No. 2 Molydisulfide grease
Wheel bearings	As required		Wheel bearing grease
Brake master cylinder (See Note)	As required		Case TCH Fluid Alternate oil: Automatic transmission fluid (ATF) such as Dexron II.
Parking brake cable	As required		Lubriplate 105 grease.

NOTE: DO NOT use brake fluid in the brake system of this machine. Use the oil shown under Specifications only. Brake fluid will cause damage to the brake system.

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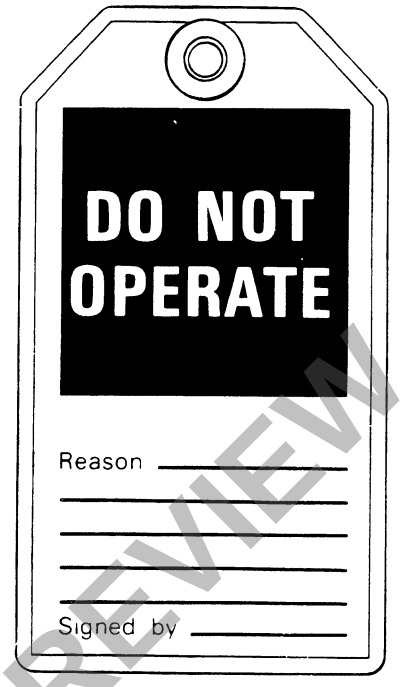
SAFETY RULES

This Symbol Shows Important Information About Safety In This Manual. When You See This Symbol, Carefully Read The Information That Follows and Understand The Possible Causes of Injury Or Death. 1-1-A

IMPORTANT: To prevent personal injury on job, follow the Warning, Caution, and Danger notes in this section and other sections throughout this manual. Follow the instructions carefully.

The procedures recommended and shown in this manual are good, effective service methods. However, all possible procedures and service hazards may not be covered. Therefore, if you use a tool or procedure not recommended, you must make sure that the method you select is a safe method.

Put the warning tag shown below on the key for the key switch when you are servicing or repairing this machine. One warning tag is on every new machine. You can buy additional warning tags, part number 331-4614, from Service Parts Supply.



780449

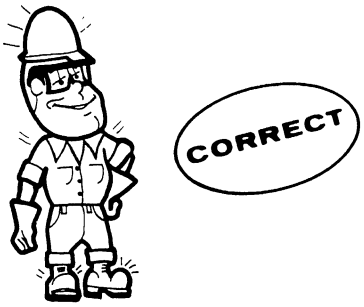
WARNING: *Read operator's manual to familiarize yourself with control lever functions.* 46-27

DANGER: *Before you move the backhoe boom to either side, make sure that all persons are out of the way. A swinging boom can crush.* 48-54

WARNING: *Operate tractor and equipment controls from the seat position only. Any other method could result in serious injury.* 48-55

WARNING: *This is a one man machine, no riders allowed.* 35-8

WARNING: *If you wear clothing that is too loose or do not use the correct safety equipment for your job, you can be injured. Always wear clothing that will not catch on objects. Extra safety equipment that can be required includes hard hat, safety shoes, ear protection, eye or face protection, heavy gloves and reflector clothing.* 45-3-A



DANGER: *Engine exhaust fumes can cause death. If it is necessary to start the engine in a closed place, remove the exhaust fumes from the area with an exhaust pipe extension. If you do not have an exhaust pipe extension, open the doors and get outside air into the area.* 48-56

WARNING: *When working in the area of the fan belt with the engine running, avoid loose clothing if possible, and use extreme caution.* 35-4

WARNING: *Operate controls from the operator's seat only.*

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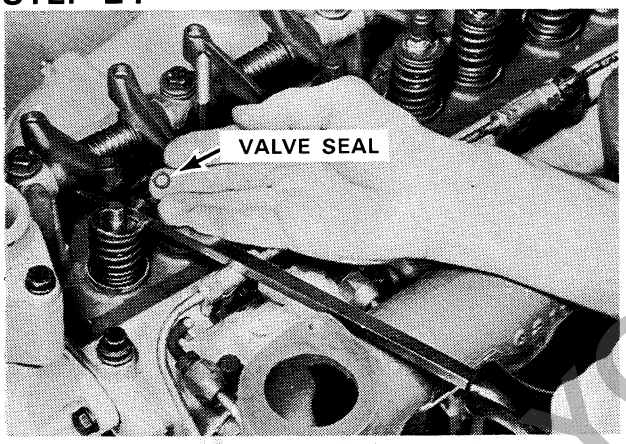
STEP 23



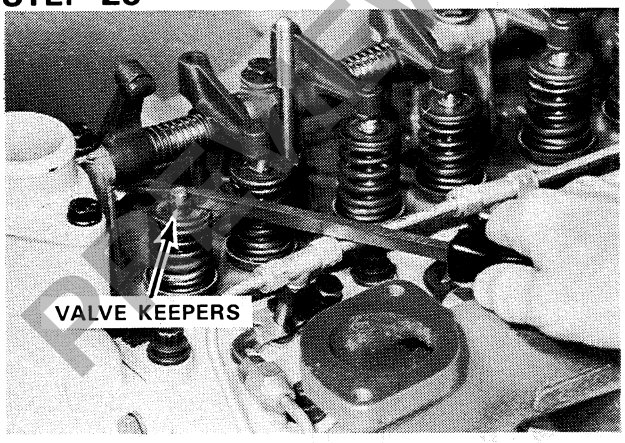
Install the spring retainer.

STEP 24



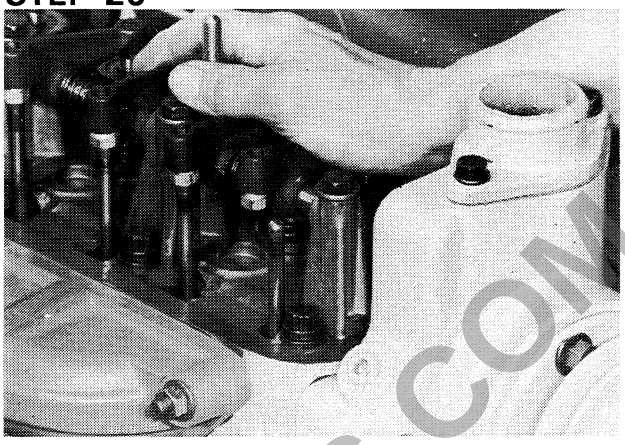
Compress valve spring using a screwdriver and install a new valve stem seal in the lower groove.

STEP 25



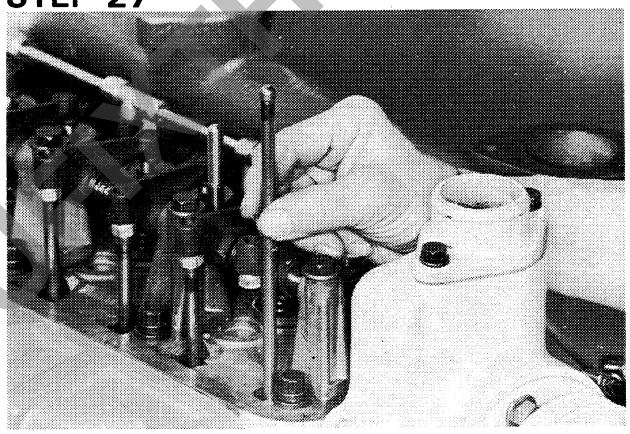
Keeping the valve spring compressed, install the valve keepers in the upper valve stem groove. Remove screwdriver and tap end of valve stem to seat keepers.

STEP 26



Push back the rocker arm assembly.

STEP 27



Install the push rod.

STEP 28



Release rocker arm assembly and position push rod beneath rocker arm adjusting screw.

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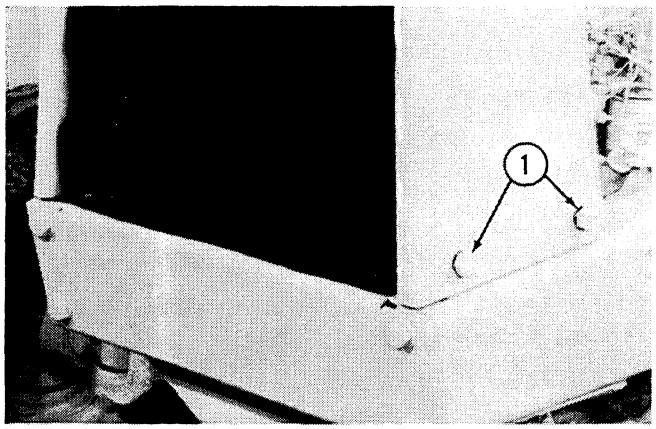
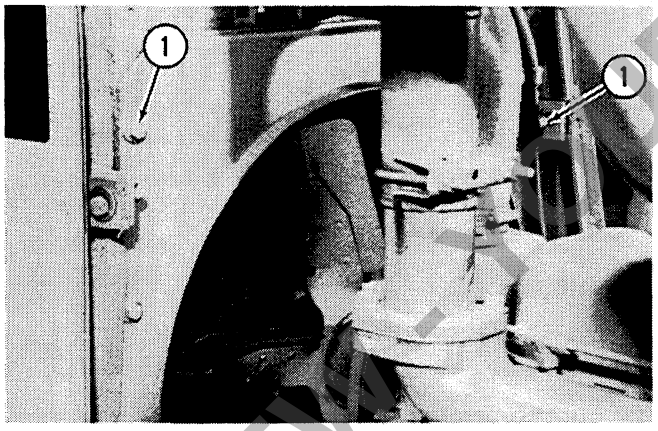
13. Loosen and remove the bolts and nuts that fasten the shroud to the frame.



1. Bolts

Figure 19

14. Loosen and remove the self-locking nuts from the bolts that fasten the top of the radiator to the shroud. Remove the bolts and flat washers.



1. Bolts and Flat Washers

Figure 20

15. Fasten a chain hoist to the shroud. Remove the shroud from the machine.

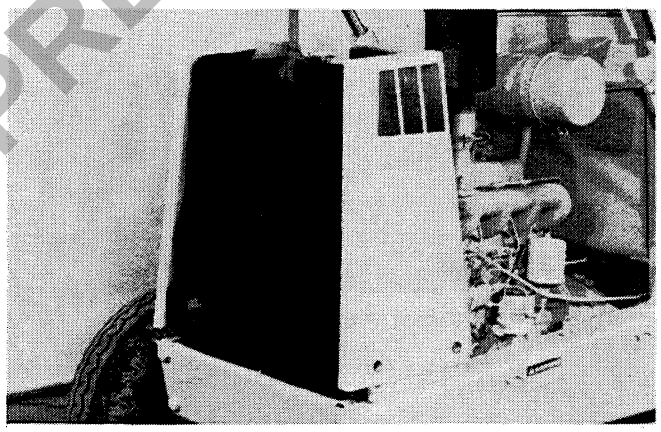
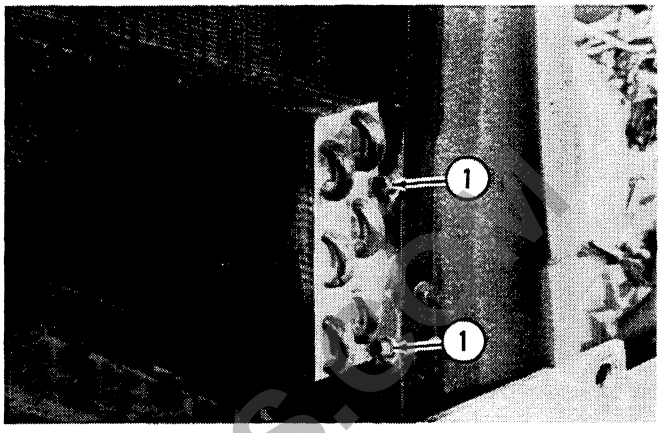


Figure 21

16. Loosen and remove the hardware that fastens the oil cooler to the radiator.



1. Hardware

Figure 22

17. Lower the oil cooler until the oil cooler is in the position shown in Figure 23.

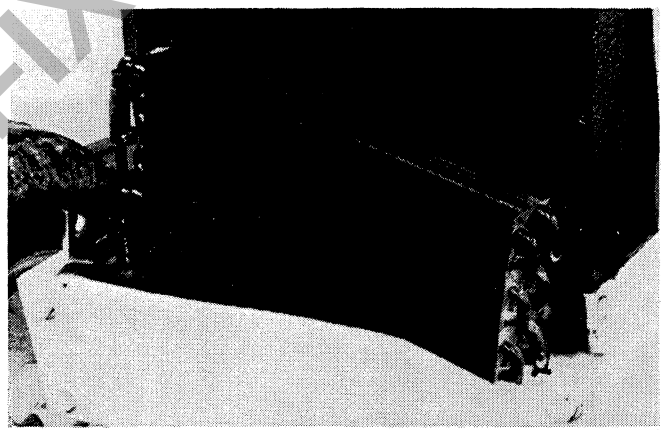
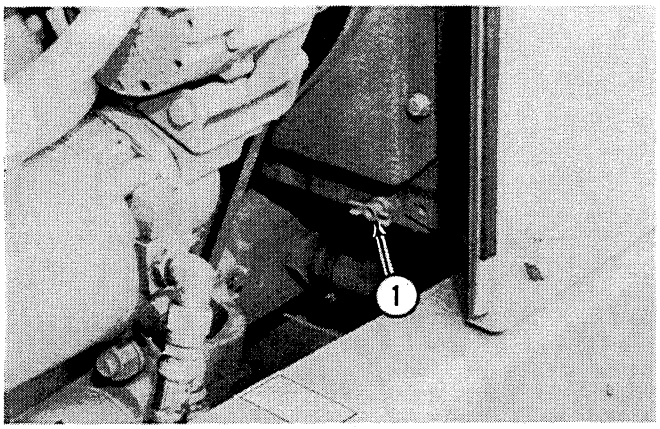


Figure 23

18. Put a container under the drain valve in the radiator. Open the drain valve and drain the coolant from the radiator.



1. Drain Valve

Figure 24

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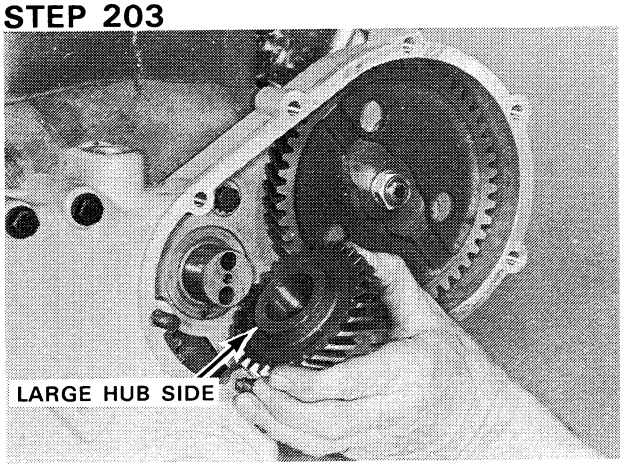
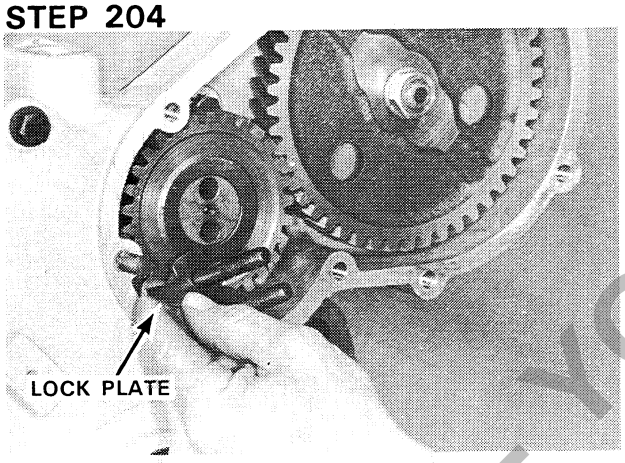
STEP 203



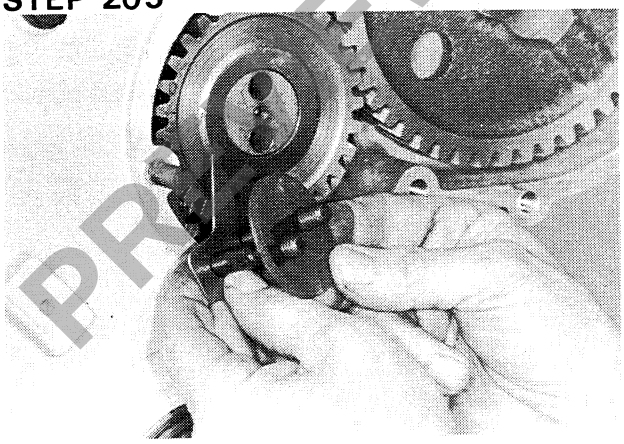
Install idler gear with large hub side towards the engine block, on the idler shaft.

STEP 204



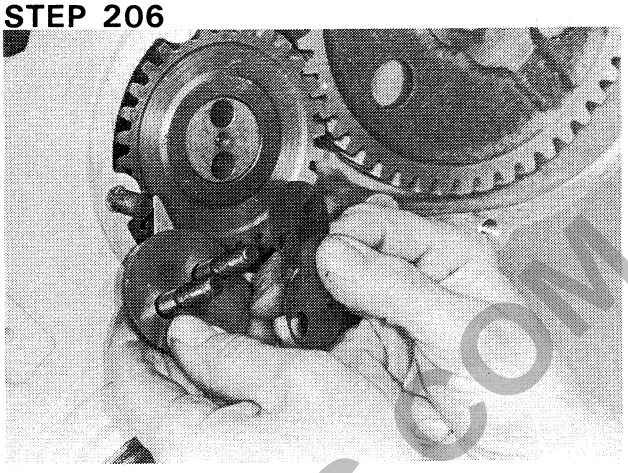
Install lock plate on idler gear bolts.

STEP 205



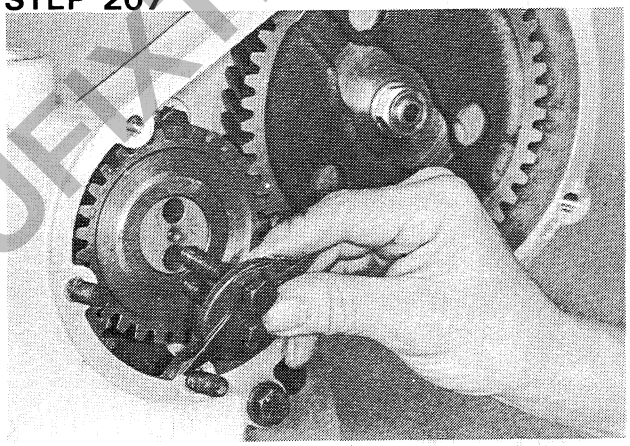
Install thrust plate next.

STEP 206



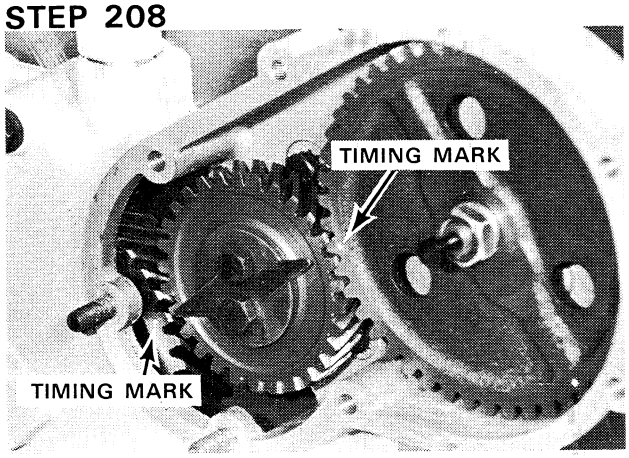
Install enough number of shims to maintain a running clearance between thrust plate and idler gear.

STEP 207



Install assembly into idler gear.

STEP 208



With engine on top dead center with number one cylinder on compression stroke, there will be a timing mark on the camshaft gear lined up with idler gear pointer. Be sure injection pump drive gear timing mark is aligned with other end of idler gear pointer.

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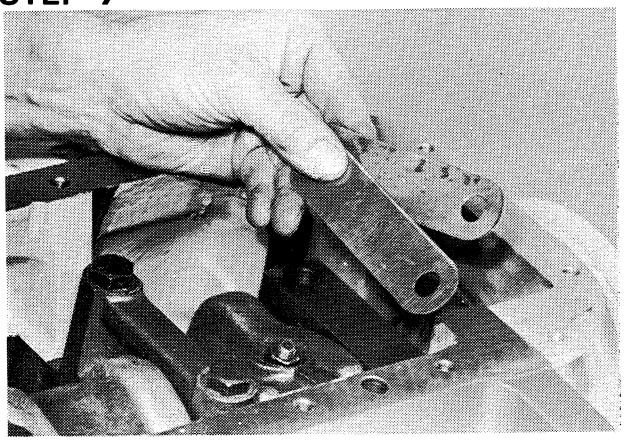
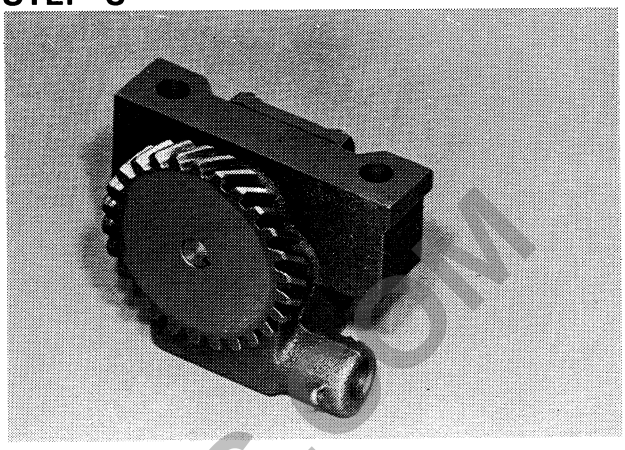
STEP 7



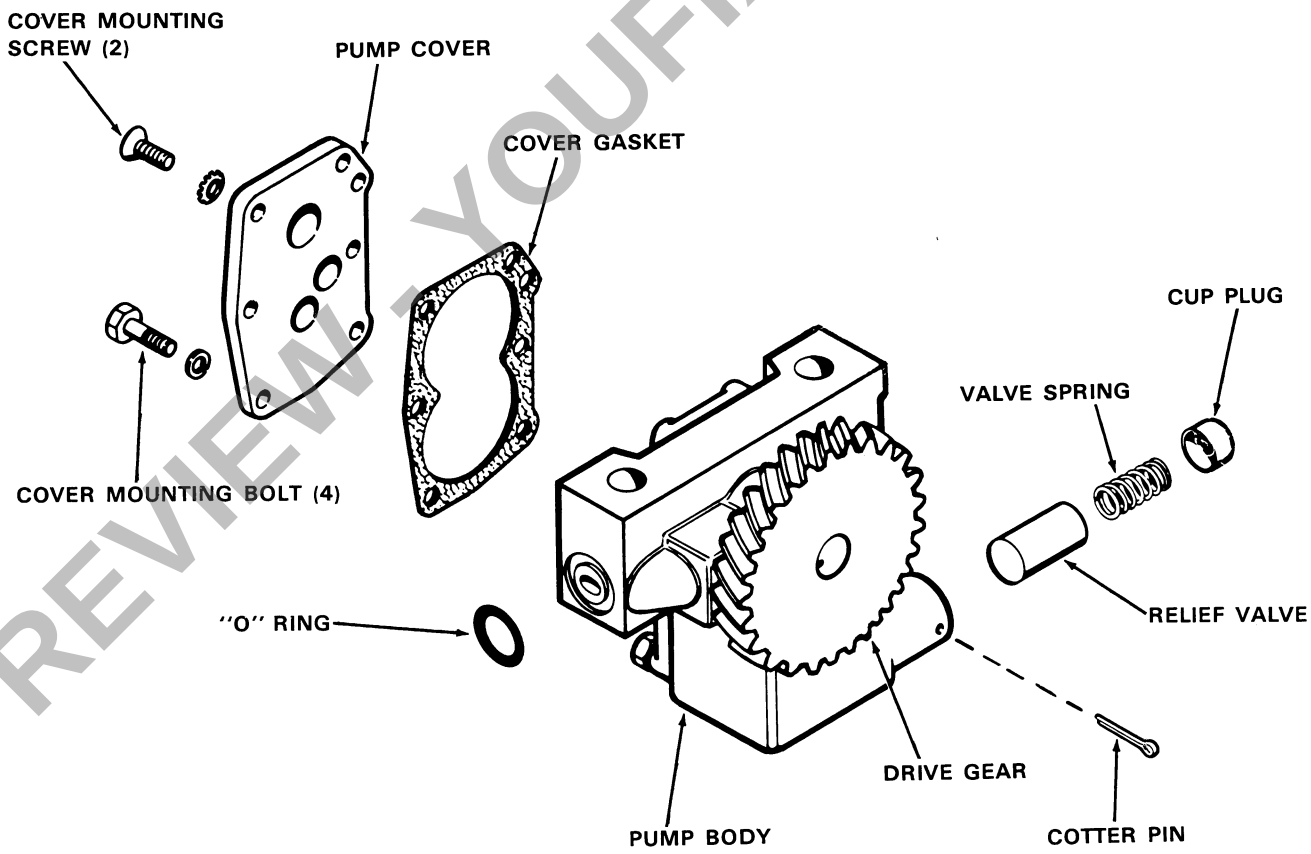
Remove shims from top of front main bearing.

STEP 8



Engine oil pump removed.

Oil Pump Inspection



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OPERATING PRINCIPLES

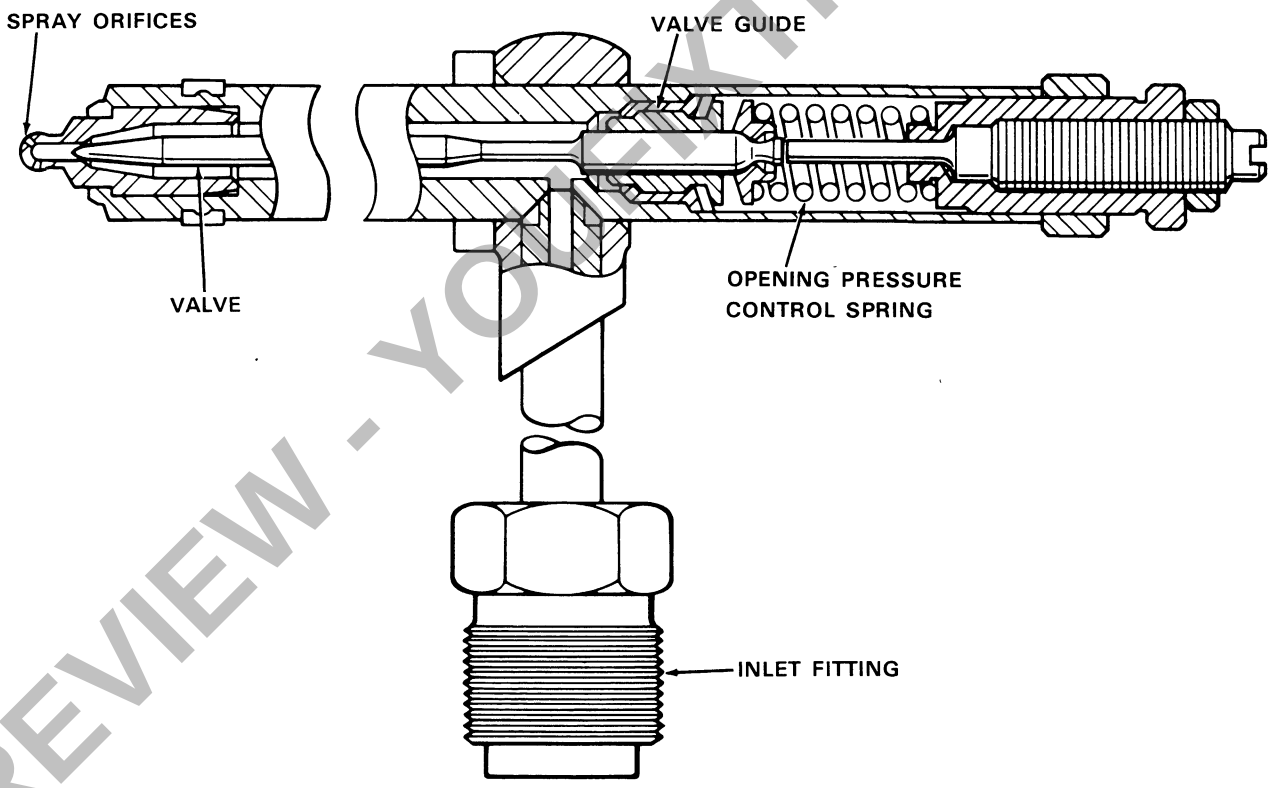
The operation of the injector is simple and positive.

A metered quantity of fuel under high pressure from the injection pump flows through the inlet line of the injector around the injector valve.

At the instant the pressure of the fuel against the valve exceeds the predetermined spring force, the valve is forced from its' seat allowing fuel under high pressure to flow through the four spray orifices to the combustion chamber.

The instant the fuel delivery ceases, the pressure against the valve is reduced and the control spring snaps the valve to its' seat. This eliminates any possibility of dripping after the metered amount of fuel has been delivered. In actual operation, the valve opens and closes very rapidly with a distinct chatter.

During injection, a small amount of fuel leaks through the closely controlled clearance at the guide, lubricating all the moving parts in the injector. This fuel then flows off through leak-off lines at the top of the injector and returns to the fuel tank.



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Section

5005

STEERING PUMP

Written In *Clear And Simple English*

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CASE CORPORATION

9-69270
January 1981

PRINTED IN U.S.A.

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11. Hit the lock pin with a hammer to loosen the lock pin.

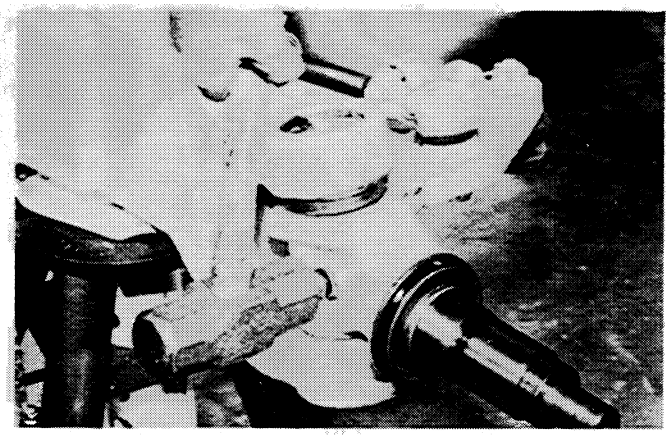

Figure 55

12. Remove the nut and lock washer from the lock pin.

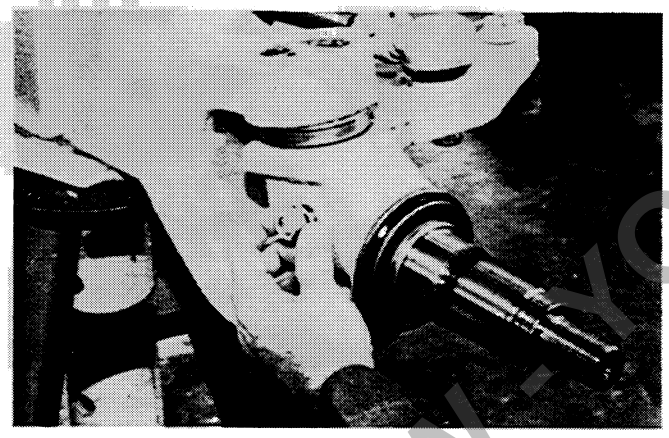

Figure 56

13. Remove the lock pin.

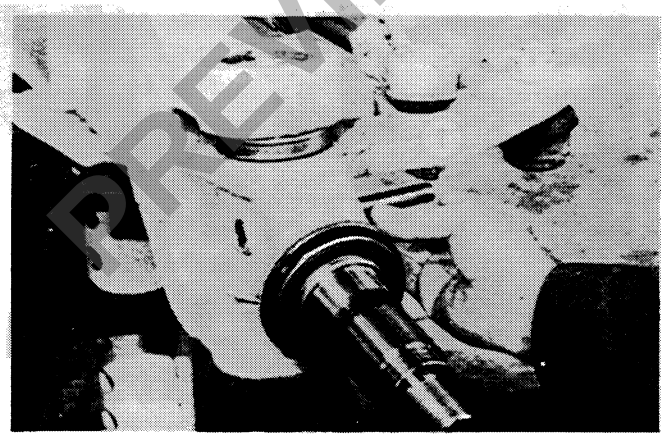

Figure 57

14. Remove the cotter pin from the nut and ball joint for the tie rod.



Figure 58

15. Loosen and remove the nut from the ball joint.

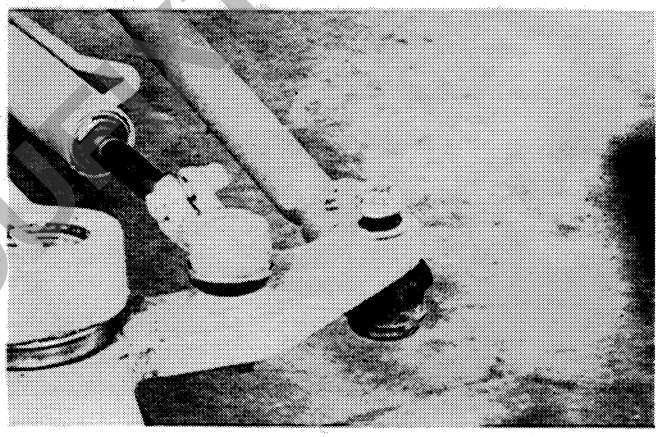

Figure 59

16. Remove the flat washer(s) from the ball joint.

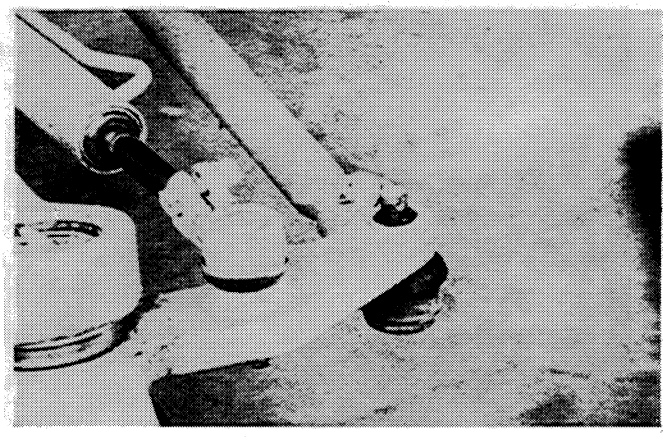

Figure 60

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14. Lift the charging pump from the cover.

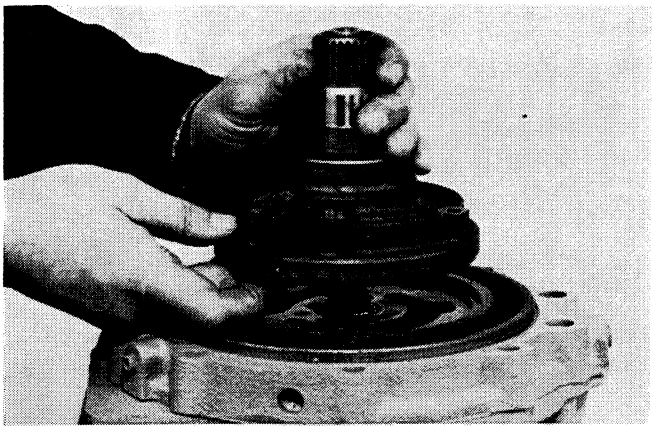
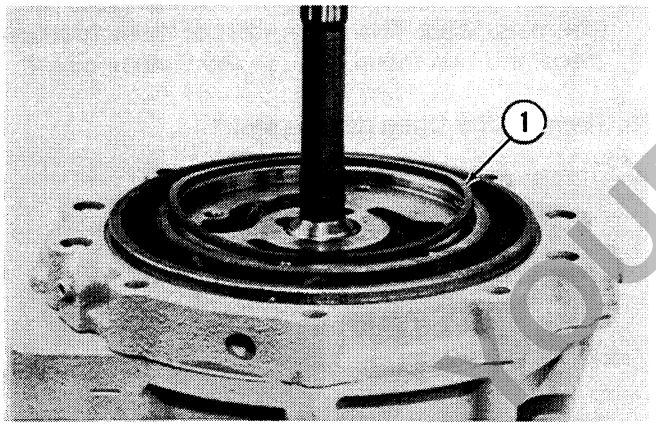


Figure 56

15. Remove the gasket from the cover.



1. Gasket

Figure 57

16. Use a dial indicator to check the end play of the input shaft.

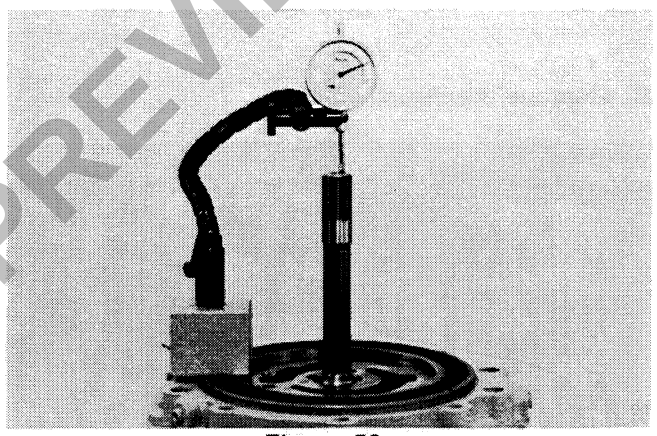


Figure 58

17. The end play must be .010 - .086 inch (0.25 - 2.18 mm). If the end play is not correct, check the thrust washers on the forward clutch assembly for wear.

18. Loosen and remove the Ferry head screws that fasten the cover to the housing.

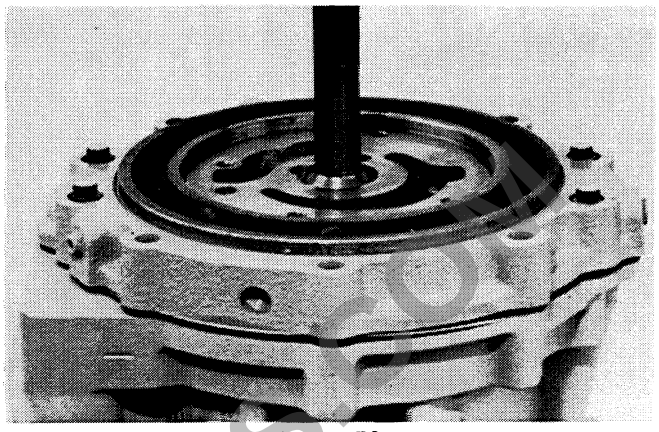


Figure 59

19. Remove the cover.

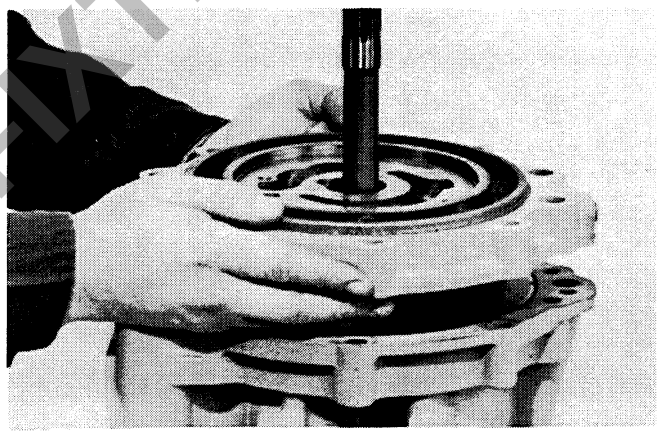


Figure 60

20. Remove the gasket.

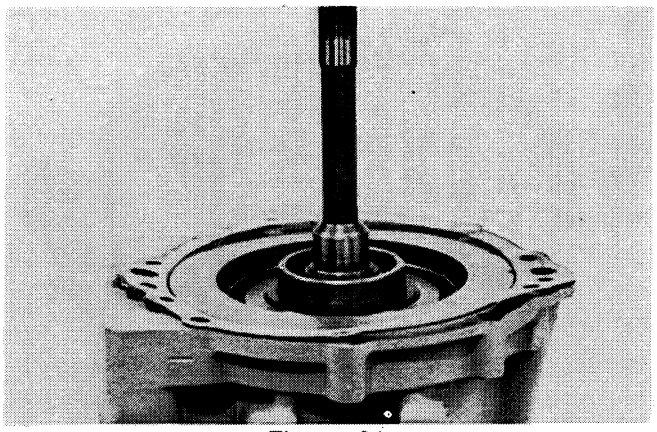


Figure 61

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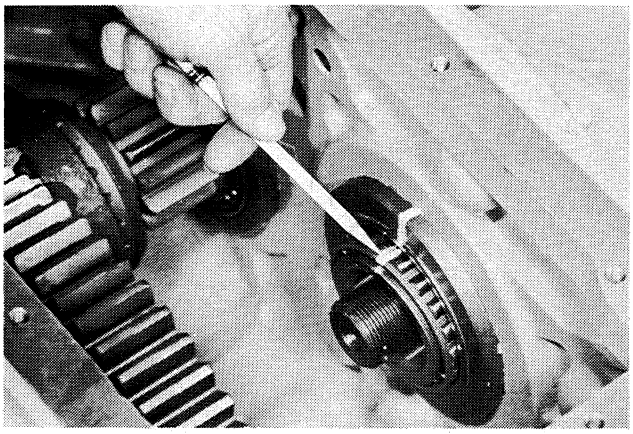
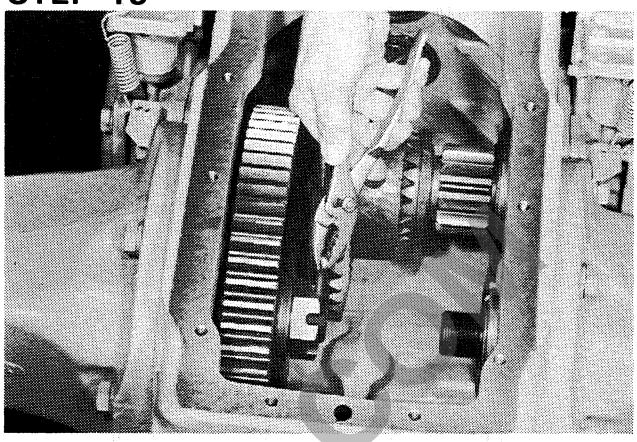
STEP 18



Mark the axle housing, bearing cup and cone before removal for correct side placement of parts during assembly. *NOTE:* If either bearing cup or cone are replaced, always replace both halves of the bearing.

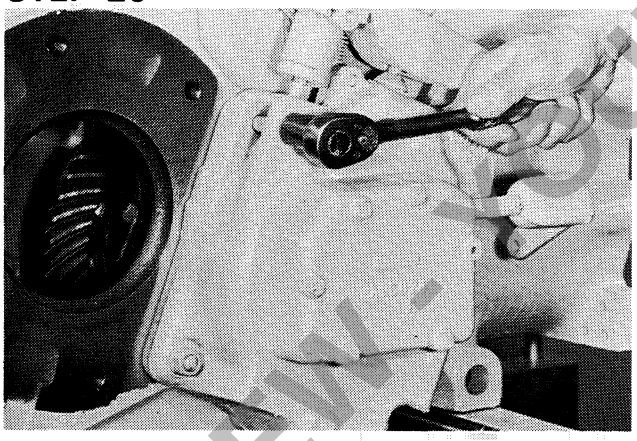
STEP 19



Remove the cotter pin securing the other final drive gear nut and repeat Steps 15 thru 18 for final drive gear removal.

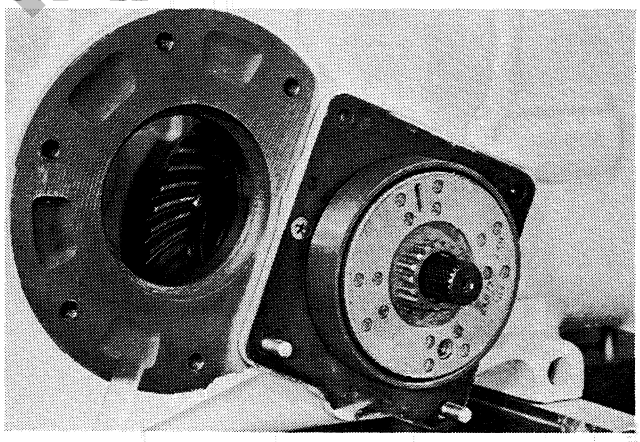
Differential Side Gears and Center Wheel Removal

STEP 20



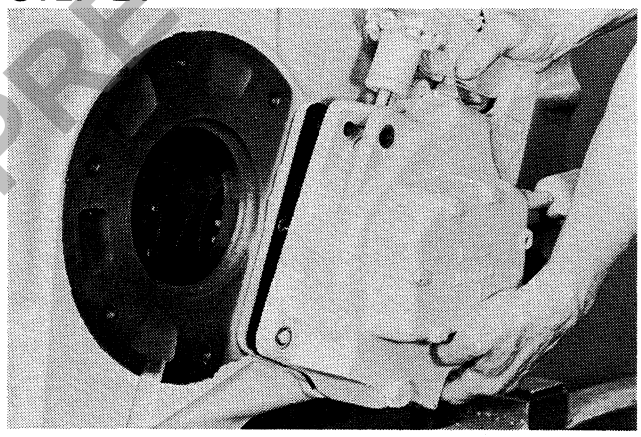
Remove brake return spring and bolts securing brake housing.

STEP 22



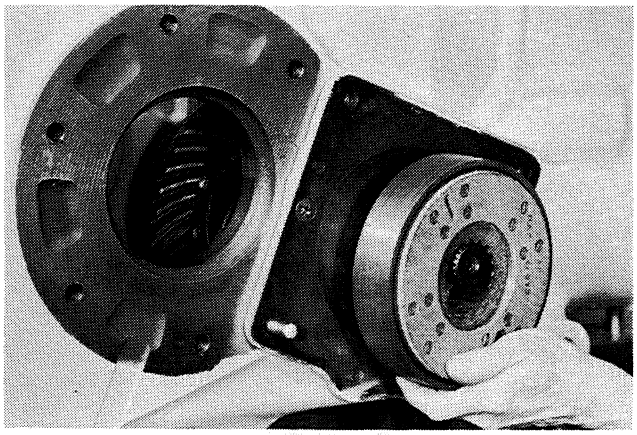
Brake housing removed from transaxle case.

STEP 21



Remove the brake housing.

STEP 23



Remove the brake drum assembly.

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2. Use your hand to start one of the bearing caps into one of the bores in the shaft yoke. Put the shaft yoke in the vise as shown in Figure 34. Tighten the vise until the inner end of the bearing cap is even with the inner edge of the bore in the shaft yoke.

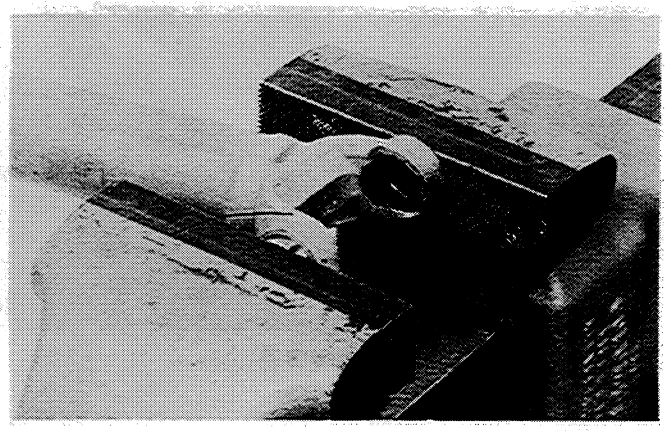

Figure 34

3. Remove the shaft yoke from the vise. Put the cross into the shaft yoke.

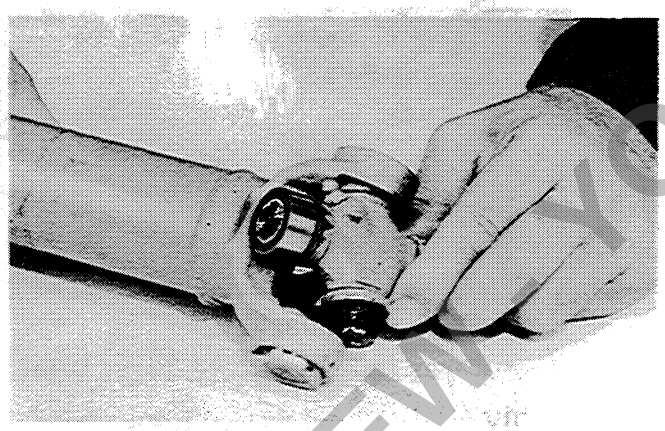

Figure 35

4. Use your hand to start the other bearing cap into the shaft yoke and onto the end of the cross.

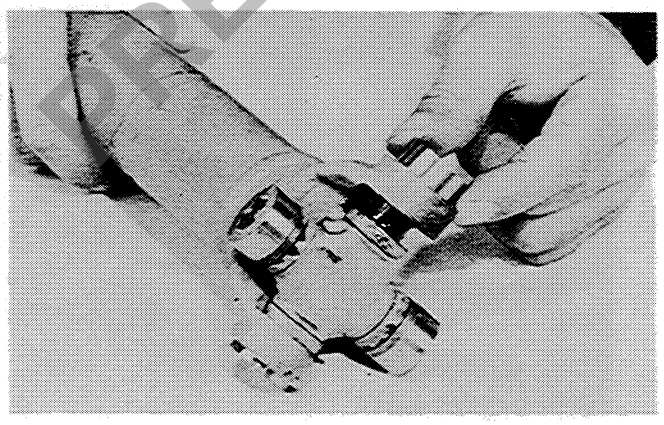

Figure 36

5. Put the shaft yoke in the vise with a socket of the correct size against the bearing cap. The socket must have an OD which will fit into the bore of the shaft yoke. Tighten the vise until the outer end of the bearing cap is just inside the snap ring groove in the bore of the shaft yoke. Remove the shaft yoke from the vise.

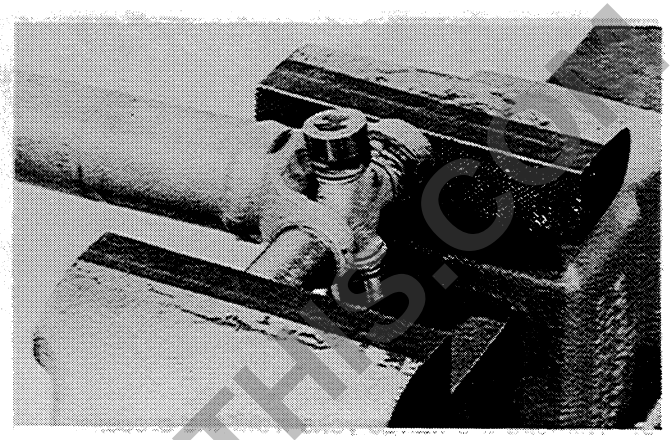

Figure 37

6. Put the shaft yoke in the vise with the socket against the other bearing cap. Tighten the vise until the outer end of the bearing cap is just inside the snap ring groove in the bore of the shaft yoke. Remove the shaft yoke from the vise.

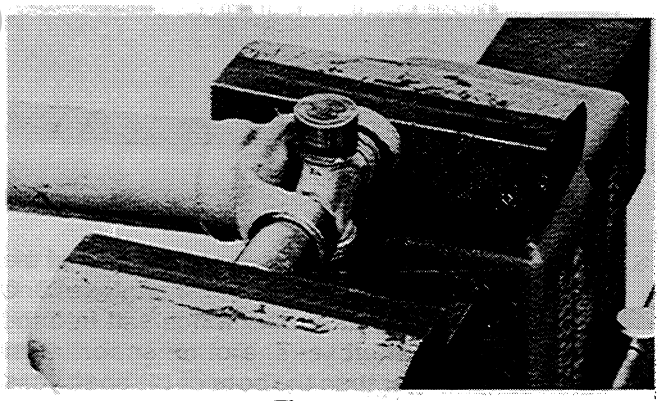

Figure 38

7. Install the snap rings in the shaft yoke.

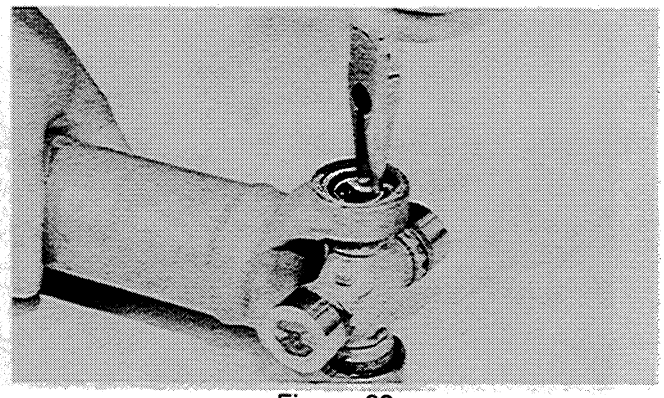

Figure 39

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Bad Performance in All Circuits

CHECK	INSTRUCTIONS
1. Maintenance.	1. Check the pivot points for wear and damage. Make sure that all pivot points are lubricated and move freely. Check the breather for the hydraulic reservoir.
2. Attachments.	2. Check field installed attachments that can be causing poor performance in the hydraulic system.
3. Oil level.	3. Check the level of the oil in the hydraulic reservoir.
4. Drive coupling for the hydraulic pump.	4. Check to make sure that the drive coupling is not broken or damaged.
5. Neutral pressure.	5. See page 8002-33 and measure the neutral pressure in the hydraulic circuit.
6. Check the pressure setting of the main relief valve.	6. See page 8002-27.
7. Check the engine stall speeds.	7. See Section 2003 and do the stall checks to see if the engine is operating correctly.
8. Check the hydraulic system with a flowmeter.	8. See the instructions starting on page 8002-38 and do the flowmeter tests.

Bad Performance in the Backhoe Circuits or Three Point Hitch Circuits: Loader Circuits Work Correctly

CHECK	INSTRUCTIONS
1. Neutral pressure.	1. See page 8002-33 and measure the neutral pressure in the hydraulic circuit.
2. O-ring on the power beyond fitting in the loader control valve.	2. Remove the power beyond fitting from the loader control valve and check the O-rings on the power beyond fitting.
3. Check the hydraulic system with a flowmeter.	3. See page 8002-38 and do the flowmeter tests to find the cause of the problem.

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2. Install the poppet into the body.

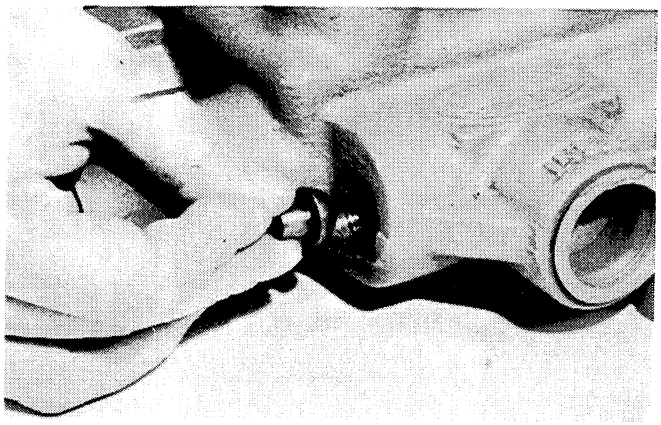


Figure 273

3. Install the spring into the poppet.

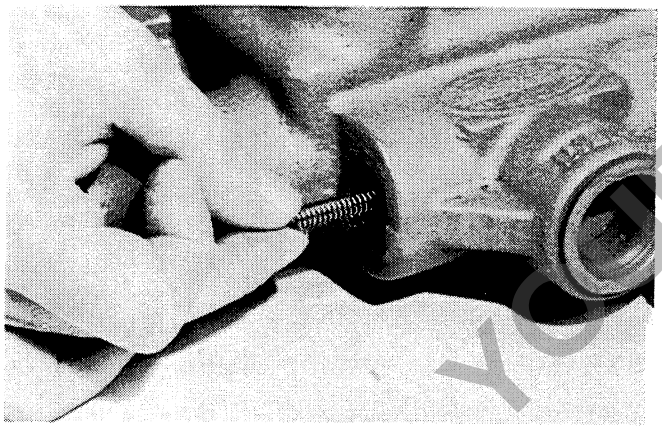


Figure 274

4. Put clean oil on the O-ring and install the plug into the body.

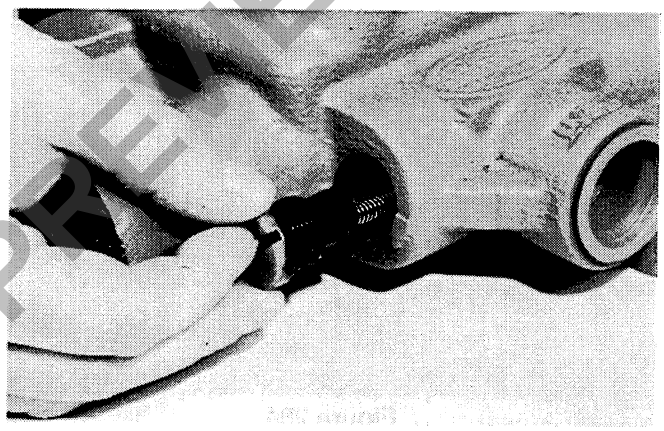
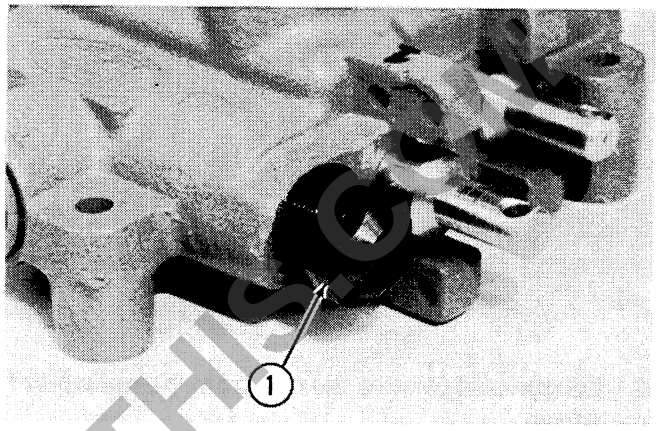


Figure 275

Main Relief Valve

Disassembly

1. Loosen and remove the main relief valve from the body.



1. Main Relief Valve

Figure 276

2. Remove the poppet from the body.

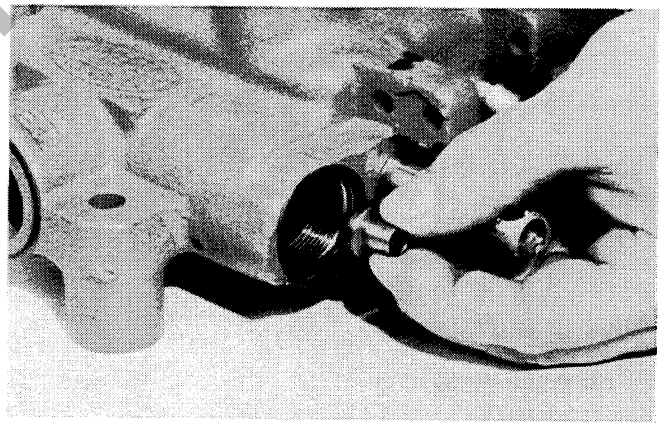


Figure 277

3. Remove the O-ring from the main relief valve.

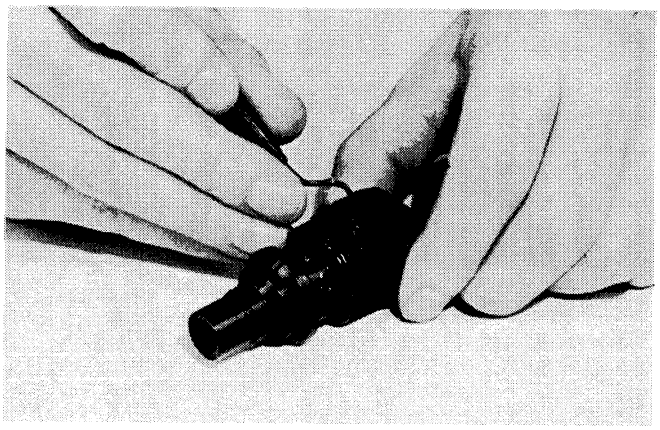


Figure 278

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8. Put the inlet/outlet housing in the vise with the port for the flow control valve at the top.

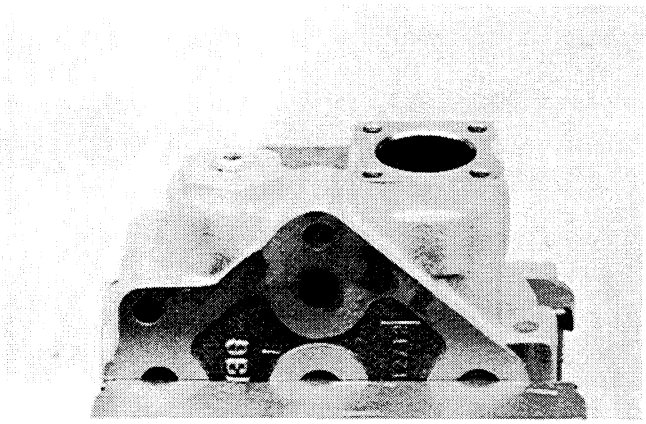

Figure 110

9. Install the guide in the bore of the housing.

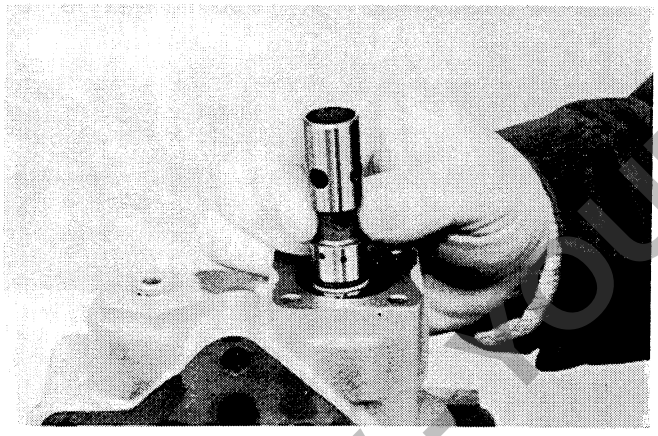

Figure 111

10. Push the guide into place at the bottom of the bore.

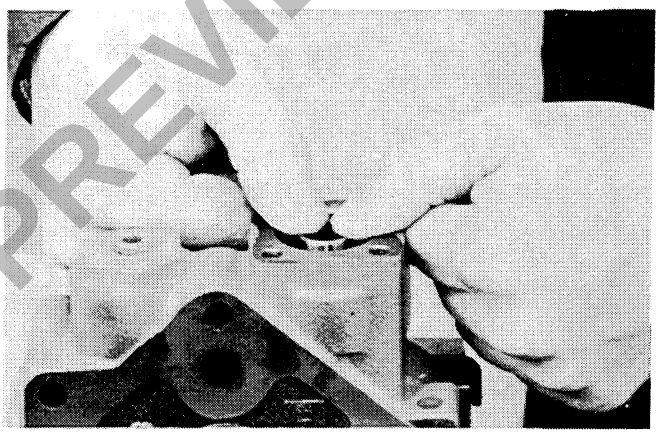

Figure 112

11. Install the metering sleeve on the guide.

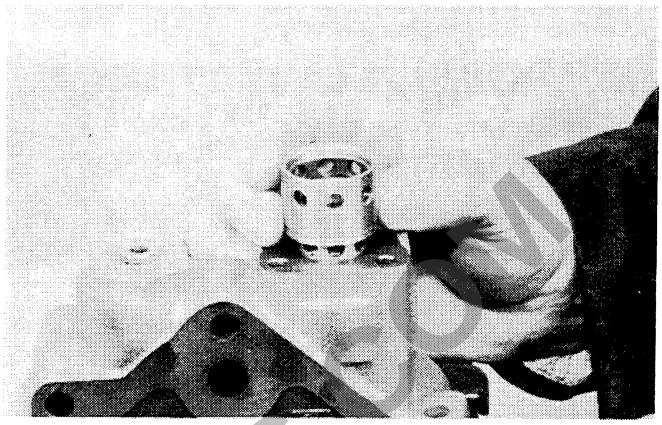

Figure 113

12. Install the collar on the metering sleeve.

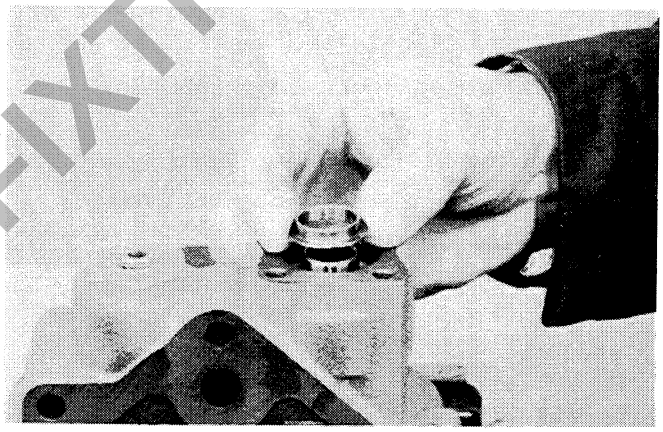

Figure 114

13. Install the piston into the guide.

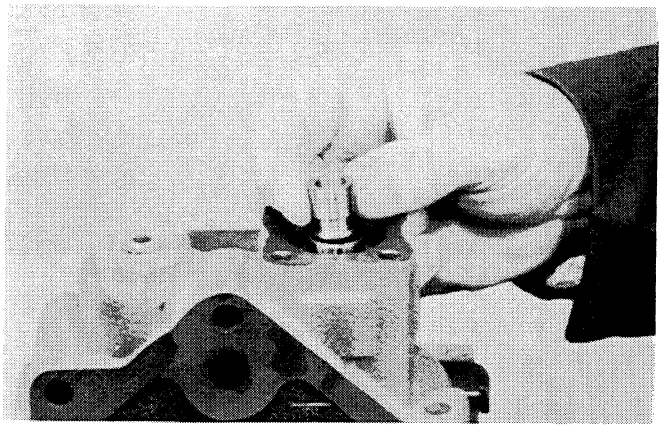

Figure 115

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OPERATION

Oil Flow, Boom Spool Actuated

See Figure 5. In this example the boom is being raised.

1. When the boom spool is moved out of the boom section, the open center passage is closed by the spool and passages to the boom cylinder are opened.

2. With the open center passage closed, pressure in the parallel passage increases. When the pressure in the parallel passage is more than the pressure in the rod ends of the boom cylinders, the load check poppet in the boom section opens letting the oil flow to the B port of the boom section. From the B port of the boom section, the oil flows to the rod ends of the boom cylinders which raises the boom.

3. At the same time the A port of the boom section is opened to the return passage to let the oil that is pushed out of the closed ends of the boom cylinders return through the outlet section to the hydraulic reservoir.

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REPLACEMENT OF CUTTING EDGE

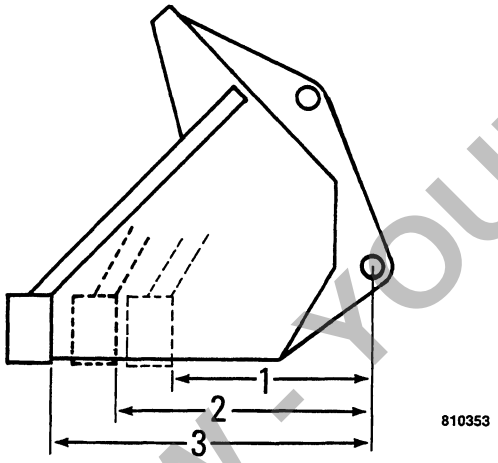
1. If the bucket is not removed, disconnect the wiring from the alternator.

2. Put the bucket at an acceptable height and put supports under the bucket to hold the bucket in place.

3. If there are bucket teeth on the cutting edge, use carbon arc rod to remove the bucket teeth.

4. Use carbon arc rod or an acetylene cutting torch (smoke wrench) to remove the cutting edge. Keep distortion to a minimum amount when removing the cutting edge.

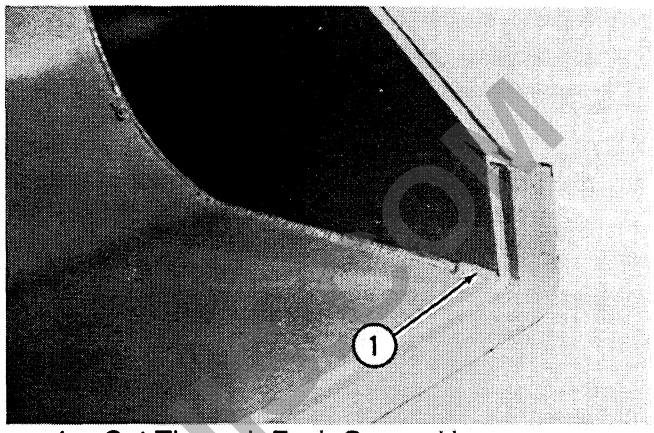
5. When removing the weld at the rear of the cutting edge, cut off the cutting edge according to the dimension in Figure 1.



1. 64 INCH (1625 mm) BUCKET - 29 INCHES (737 mm)
2. 74 INCH (1880 mm) BUCKET - 23.3 INCHES (592 mm)
3. 82 INCH (2083 mm) BUCKET - 23.3 INCHES (592 mm)

Figure 1

6. Cut through each corner of the bucket in the area shown in Figure 2.



1. Cut Through Each Corner Here

Figure 2

7. Use a grinder to remove any welds or extra metal on the bucket that will prevent the new cutting edge from fitting correctly.

8. Put the new cutting edge in place and use C-clamps to hold the cutting edge in place. See Figure 1 for the correct dimension to the rear of the cutting edge.

(Continued on next page)

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15. Install a plug (part no. 218-777) in the hose and a cap (part no. 218-335) on the tube.

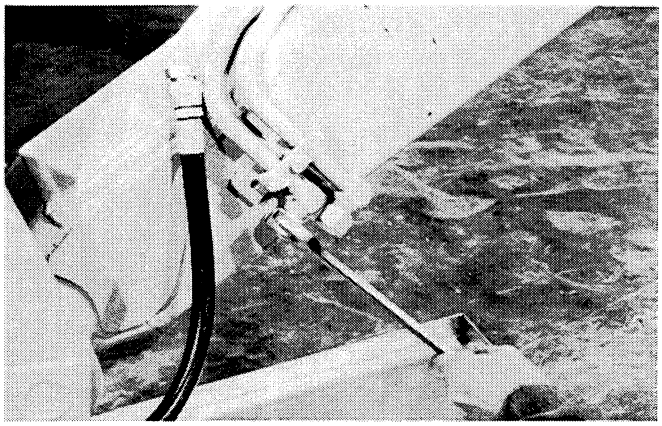

Figure 23

16. If equipped with an extendable dipper:

    a. Disconnect the hose from the tube on the right side of the boom.

    b. Install a plug (part no. 218-776) in the hose and a cap (part no. 218-756) on the tube.

    c. Fasten an identification tag to the hose just disconnected.

17. Loosen and remove the self-locking nut from the bolt that fastens the hose clamp(s) to the right side of the swing tower. Remove the spacer if equipped with an extendable dipper.

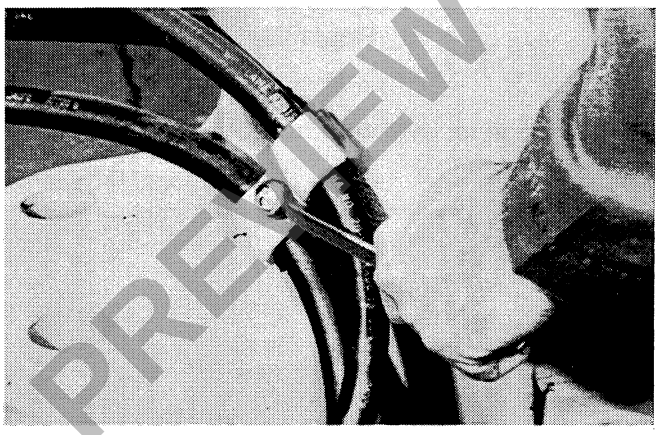

Figure 24

18. Remove the hose clamp.

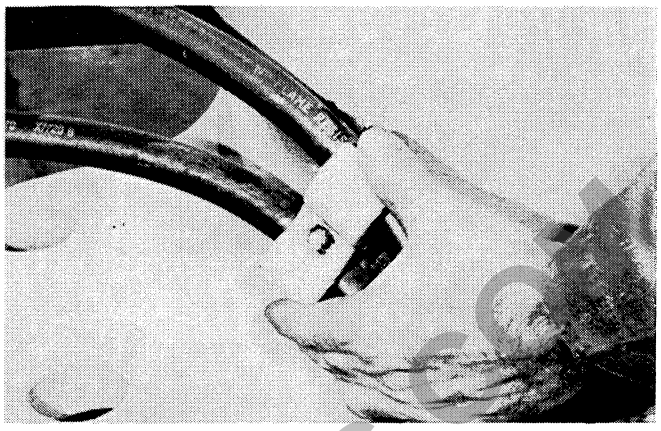

Figure 25

19. Remove the spacer.

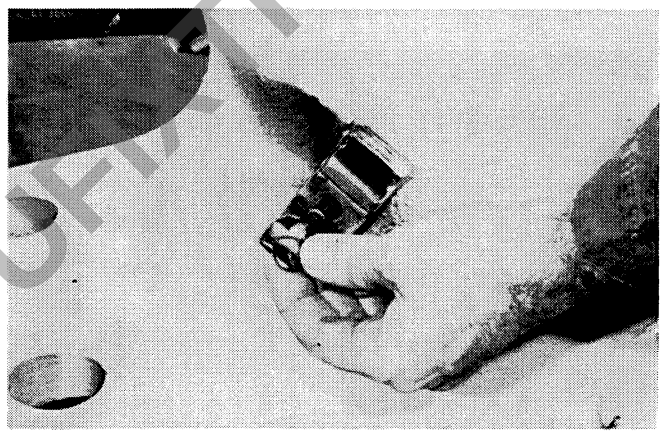

Figure 26

20. Remove the bolt and hose clamp.

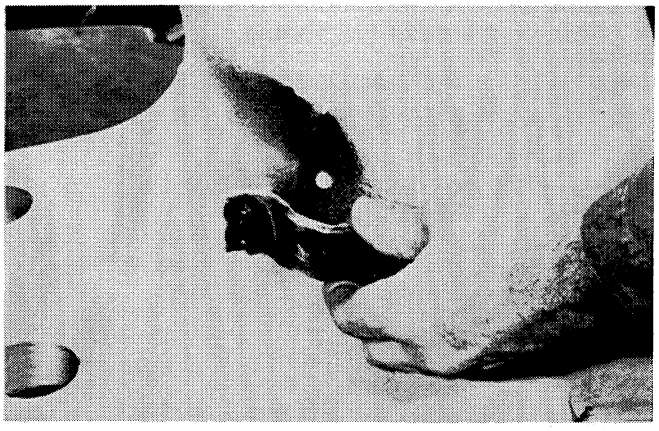

Figure 27

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