Section XI
Model 23
Loader and Backhoe

Service Manual

9-70011H

Reprinted

CASE IH

SECTION XI

MODEL "23" LOADER AND BACKHOE

TABLE OF CONTENTS

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GROUP A - MODEL "23" LOADER

The Model "23" Loader has been expressly designed for installation on the Model 430 Construction King Diesel and Gasoline Wheel Loader

1. LOADER SPECIFICATIONS

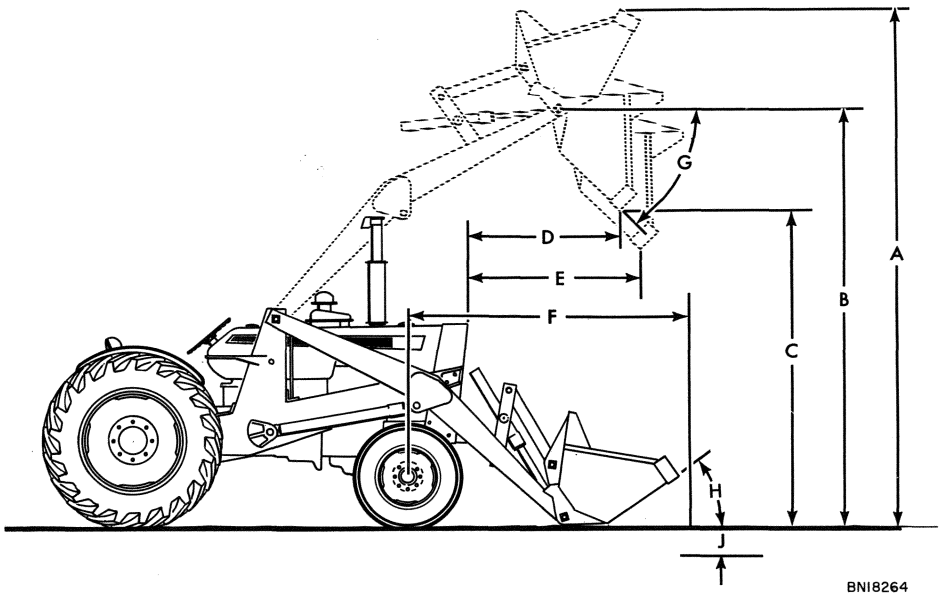

Figure 1 - Loader Specifications

DIMENSIONS

A.	Overall Height (Bucket Level - Maximum Height)	155 inches
*B.	Height to Bucket Hinge Pin (Fully Raised)	127 inches
*C.	Pump Clearance (Maximum Lift -45° Dump) Short Lip Bucket	104 inches
	Long Lip Bucket	98 inches
*D.	Dump Reach (Maximum Lift - 45° Dump)	29 inches
E.	Dump Reach (7 ft. Dump Height -45° Dump)	41 inches
*F.	Reach (Bucket on Ground - Bucket Flat)	74 inches
*G.	Dump Angle (Maximum Lift)	45°
*H.	Breakout Angle (Rollback)	35°
J.	Digging Depth Below Ground (Bucket Flat)	5 inches
	(Bucket at 4°)	7 inches
*	Overall Width of Tractor (60 Inch Tread)	75 inches
*	Height (To Top of Loader Frame)	62-1/2 inches
*	Overall Length (Bucket Flat on Ground to Rear of Counterweight)	180 inches
*	Ground Clearance (At Loader)	12 inches
*	Front Tread	54 inches
*	Rear Tread (Adjustable Rims Standard on Loader only Models)	52 to 64 inches
*	Wheel Base (Diesel)	76-1/2 inches
	(Gasoline)	75-1/4 inches
	Front Axle	Extra Heavy Duty, 7000 lb. Capacity (Dynamic Loading)
*	Hydraulic Lift Capacity (To Full Height)	2000 lbs.
*	Breakout Force	3500 lbs.
*	Raising Time to Full Height	5.0 seconds

* Lowering Time from Full Height ..... 2.5 seconds
* Bucket Dump Time ..... 1.0 seconds

NOTE: ASTERIK (*) INDICATES SPECIFICATIONS CONFORMS TO INDUSTRIAL EQUIPMENT MANUFACTURERS COUNCIL (IEMC) DEFINITIONS.

Data taken with optional 14.9 x 24 rear tires, standard 7.50 x 16 front tires, and 1400 pound rear counterweight.

HYDRAULIC SYSTEM

System Pump ..... Direct drive, gear type
Pump Capacity (Loader Only) ..... 13.5 G.P.M. @ 1750 R.P.M. @ 1750 P.S.I.
Pump Capacity (Loader and Backhoe) ..... 16.5 G.P.M. @ 1750 R.P.M. @ 1800 P.S.I.
Reservoir Refill Capacity (With Loader Only) ..... 5-1/2 U. S. Gallons
(With Loader and Backhoe) ..... 11 U. S. Gallons
Hydraulic Oil Filter ..... Return line — full flow type
Control Valve ..... Two spool valve with independent levers for raising or tilting the bucket
Hydraulic Lines ..... Steel tubing and steel wire mesh braided hose
Loader Main Relief Valve Pressure Setting ..... 1750 ±50 P.S.I.

HYDRAULIC CYLINDERS

Lift Cylinders ..... Double action, 2-1/2 x 31-7/16 inch stroke, 1-1/2 inch chrome plated piston rod
Bucket Dump Cylinder ..... Double Action, 3 x 20 inch stroke, 1-1/2 inch chrome plated piston rod

TIRE SIZES

TIRES	SIZE	PRESSURE
Loader, Standard	Rear 13.6 x 24, 4 ply Front 7.50 x 16, 6 ply	14 P.S.I. 32 P.S.I.
Loader, Optional	Rear 14.9 x 24, 4 ply or 6 ply Front 7.50 x 16, 10 ply	18 P.S.I. 56 P.S.I.
Loader-Backhoe, Standard	Rear 13.6 x 24, 6 ply Front 7.50 x 16, 6 ply	20 P.S.I. 32 P.S.I.
Loader-Backhoe, Optional	Rear 14.9 x 24, 6 ply Front 7.50 x 16, 10 ply	18 P.S.I. 56 P.S.I.

APPROXIMATE WEIGHTS

MODEL "430" TRACTOR WITH LOADER-COUNTERWEIGHT

Gasoline ..... 6930 lbs. (approximate)*
Diesel ..... 7080 lbs. (approximate)*

*Approximate weights include loader buckets.

J. I. Case Company reserves the right to change these specifications without notice and without incurring any obligation relating to such changes.

2. LOADER SERIAL NUMBER LOCATION

When ordering parts for the Model "23" Loader, always specify the Loader serial number, see Figure 2 for location.

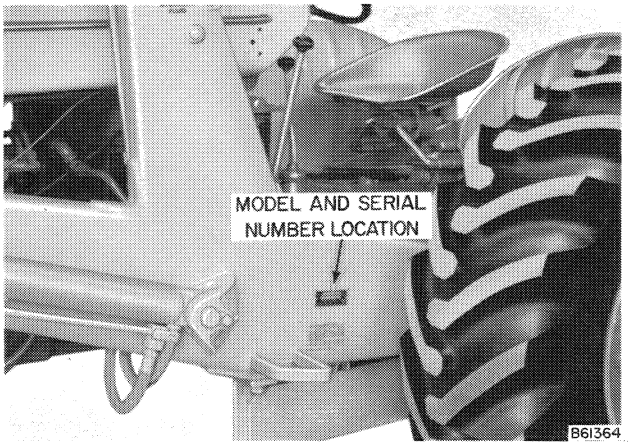

Figure 2 - Serial Number Location

3. LOADER LUBRICATION

The following lubrication information is presented as a guide for the serviceman. Complete lubrication information is shown in the Model "430" Wheel Tractor and Model "23" Loader and Backhoe Operator's Instruction Manual.

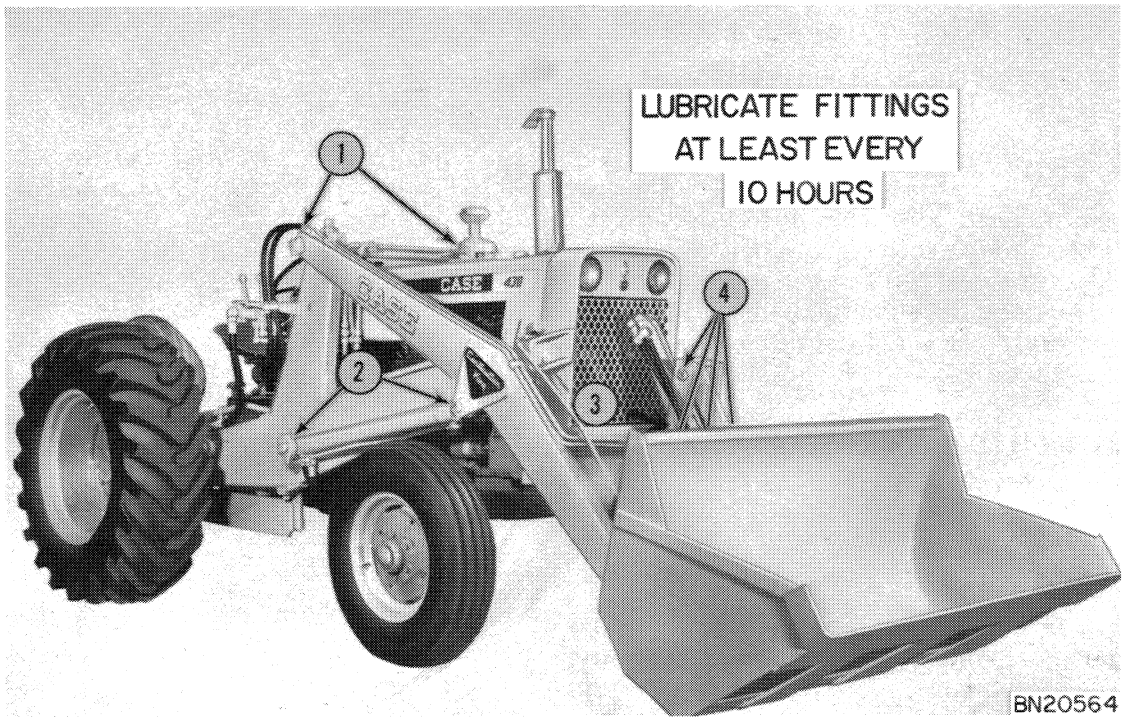

Figure 3 - Loader Pressure Fittings

LOCATION	NO. OF FITTINGS	*TIME INTERVAL
1. Cross Shaft	1 on each side	10 Hours
2. Lift Cylinder	1 front, 1 rear each side	10 Hours
3. Dump Cylinder Trunnion	1	10 Hours
4. Dump Linkage	4	10 Hours

*If the Loader is operated in mud or water, lubricate the fittings more often.

PRESSURE FITTINGS

Before applying a grease gun to pressure fittings, wipe all accumulated dirt from each fitting tip.

RECOMMENDED LUBRICANT

Pressure Fittings.	Lithium "Soap-Base" Grease
Grade Recommendations (Winter)	#1
(Summer)	#2
(Tropical Areas).	#3

4. LOADER-BACKHOE HYDRAULIC SYSTEM

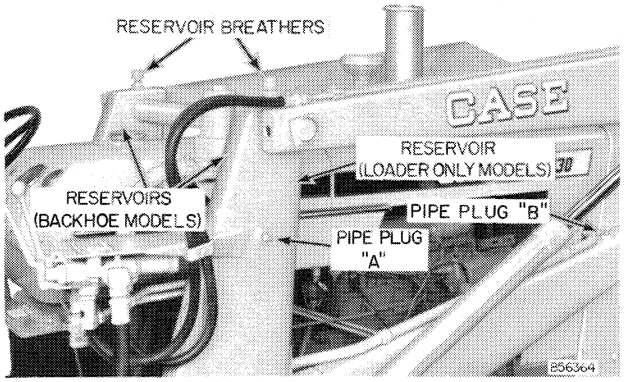

Figure 4 - Hydraulic Reservoirs

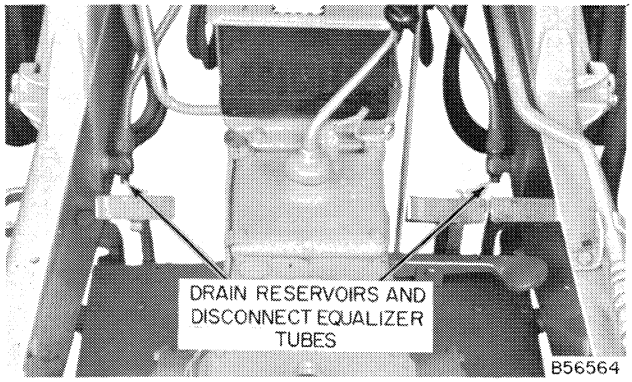

Figure 5
Hydraulic Reservoir Drain Plugs

On the Model "23" Loader or Backhoe, the vertical Loader arms serve as reservoirs for the hydraulic oil. If the Tractor is equipped with Loader only, the right hand reservoir contains hydraulic oil, see Figure 4. If the Tractor is equipped with Loader and Backhoe, both the right hand and left hand reservoirs are used.

CHECKING HYDRAULIC OIL LEVEL

In order to obtain an accurate measurement of the reservoir oil level, it is necessary to:

a. Have the Tractor standing on a level spot;
b. Run the hydraulic system until the oil warms up;
c. Have the Backhoe (if used) in transport position; and
d. Have the loader lift cylinders retracted with the bucket resting on the ground and the bucket floor in a level position.

Remove pipe plug "A" from the top of the right hand reservoir, see Figure 4. The hydraulic oil level should be even with the opening. If the oil level is too high, it could overflow from the reservoir through the breather. If the oil level is too low, there is a possibility of starving the pump, causing foaming, overheating, and damage to the hydraulic system.

DRAINING HYDRAULIC OIL RESERVOIRS

After the first 100 hours operation, and every 1000 hours thereafter, drain the hydraulic oil and replace it with clean, new Case Hi-Lo TCH Oil.

To drain the reservoir(s), proceed as follows:

1. Drive the tractor onto a level spot.
2. Place the Backhoe (if used) in transport position.
3. Retract the loader lift cylinders with the bucket floor in a level position.
4. Remove pipe plug "A" from the right hand reservoir.
5. ON LOADER ONLY MODELS - Remove the plug from the elbow at the bottom of the right hand reservoir (See Figure

5) and allow oil to drain into a suitable container.

6. ON LOADER-BACKHOE MODELS - Remove the plugs from the elbows at the bottom of both the right hand and left hand reservoirs (See Figure 5) and allow the oil to drain into a suitable container.

The Loader hydraulic system holds approximately 8 U.S. gallons of oil, while the Backhoe system holds approximately 11 U.S. gallons of oil. However, only approximately 5-1/2 U.S. gallons of oil will drain from each reservoir as the lines, valves, cylinders, and pump hold oil. It is not necessary to drain the oil from these components, unless the oil has been contaminated.

CAUTION !

DO NOT RUN THE TRACTOR ENGINE WITH THE OIL DRAINED FROM THE RESERVOIR. THIS COULD DAMAGE THE HYDRAULIC PUMP IN A FEW SECONDS TIME.

FILLING HYDRAULIC OIL RESERVOIRS

Refer to Figure 4 and remove fill plug "A" and pipe plug "B". (On Loader-Backhoe models remove pipe plug "B" from both reservoirs).

IMPORTANT !

FAILURE TO REMOVE PIPE PLUG "B" CAN CAUSE A "VOID" IN THE RESERVOIR AND RESULT IN INSUFFICIENT OIL IN THE SYSTEM.

Fill the reservoir using Case Hi-Lo TCH Oil or an approved substitute until the oil begins to run from pipe plug hole "B". Replace pipe plug "B" and continue filling until the oil is level with the bottom of fill plug hole "A". Replace fill plug "A".

Start the tractor engine and put each hydraulic control through several operational cycles to make sure all air is out of the system. Then check the oil level and add oil if necessary.

RESERVOIR REFILL CAPACITIES

Loader Only - 5-1/2 U.S. Gallons
Loader-Backhoe - 11 U.S. Gallons

HYDRAULIC SYSTEM FILTER

The filter element should be replaced after the first 20 hours of operation. Thereafter it should be changed every 200 hours or whenever indicated by the filter condition indicator gauge.

The hydraulic system filter is conveniently located above the level of the oil in the hydraulic reservoirs which permits the element to be replaced without draining the reservoirs.

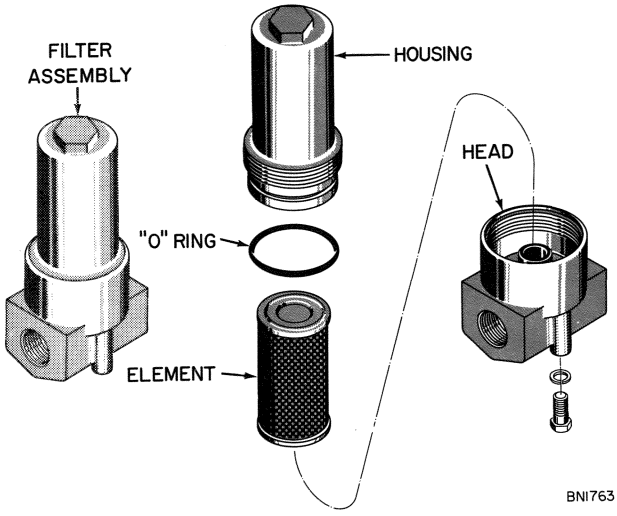

Figure 6 - Hydraulic System Filter

Unscrew the housing from the filter head and remove the element, discard it, and replace with a new Genuine Case Replacement Filter element.

Lubricate the threads and "O" ring in the housing and reassemble the filter. DO NOT TIGHTEN THE HOUSING IN EXCESS OF 90 FOOT POUNDS TORQUE.

A clogged or dirty filter element can cause serious damage to the hydraulic system.

When the filter is clogged or dirty, the oil by-passes the filter element and enters the system through the by-pass valve in the filter head.

FILTER CONDITION INDICATOR

This gauge indicates return line pressure. As the filter removes particles from the hydraulic oil, the element tends to plug, causing increasing pressure in the return line. As the pressure increases, the needle moves toward the red end of the dial.

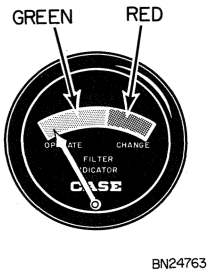

Figure 7 - Filter Condition Indicator

The gauge scale is calibrated in two colors for quick, easy reading.

GREEN-OK-ZONE: When the needle is pointing in the green zone, the element does not require changing.

RED-DANGER-ZONE: When the needle is pointing in the red zone, the element requires changing. Start of the red zone indicates a pressure of 45 P.S.I.

Always read the gauge while the engine is running at full throttle, the hydraulic oil is up to operating temperature (reservoir warm to touch) and the Loader or Backhoe is not in operation. DISREGARD surge, the unsteady pressures that occur while the Loader or Backhoe is in operation. Also DISREGARD any pressure reading taken while the oil is cold or the engine is not operating at full throttle.

After the first 20 hours operation and after each 200 hours operation thereafter, service the hydraulic filter regardless of condition indicated by the indicator gauge.

HYDRAULIC OIL RECOMMENDATION

With high precision and complex hydraulic pumps and systems, the choice of a superior type hydraulic oil is the key to long life and low maintenance. In cooperation with one of the leading refineries, Case Hi Lo TCH Oil has been developed as a scientific answer to the protection of these finely machined components.

This non-foaming oil is for all season use. It remains stable from -55° to 230° F. Central Parts Division in Racine has this oil in stock. It is recommended as the best oil available for use in the Model "23" Loader-Backhoe hydraulic system.

ALTERNATE OIL RECOMMENDATION

Use a heavy duty motor oil meeting American Petroleum Institute (A.P.I.) service designation MS-DG. Only a good grade oil with non-foaming characteristics should be used.

VISCOSITY RECOMMENDATIONS

(Above 32° F.)	SAE 10-W
(Below 32° F.)	*SAE 5-W

*If SAE 5-W oil is not obtainable locally, Automatic Transmission Fluid, type "A", may be used.

CHEAP GRADES OF OIL ARE NOT SUITABLE FOR USE IN HYDRAULIC SYSTEMS.

If Case Hi-Lo TCH Oil for all season use is not used, be sure to follow the viscosity recommendations above for the alternate oil.

Too high an oil viscosity may cause the system to be slow. This is because the pump will not be able to draw in the required amount of oil. Vacuum bubbles will form, resulting in accelerated wear on the pump gears, plates, etc.

Too low an oil viscosity may also cause the system to be slow. Slowness may be caused by the thin oil escaping through normal operating clearances of the pump. Thin oil will not lubricate the system properly, thus the pump will wear excessively.

Both conditions may cause the system to overheat, with damage to pump, valves, seals, etc.

FOREIGN MATERIAL IN SYSTEM

If foreign material enters the system, the entire system must be disassembled and component parts thoroughly cleaned. Flushing reservoirs alone will not remove all of the foreign matter - material remaining will ruin the system.

RESERVOIR BREATHER

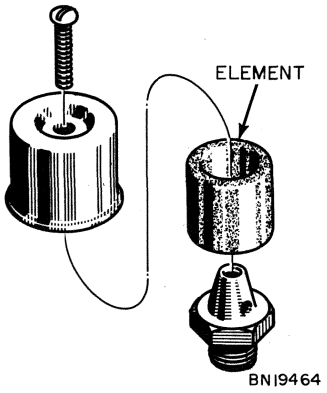

Figure 8 - Reservoir Breather

The breather, located on top of the reservoirs, contains an "edge wound" cartridge element. So that air may enter or escape the reservoir rapidly as the cylinders are operated; clean the element in solvent after every 50 hours operation.

INFERIOR GRADE OF OIL

If an inferior grade of oil must be added during an EMERGENCY, the entire system (reservoirs and components) must be drained as soon as possible, and refilled with Case Hi-Lo TCH Oil.

COLD WEATHER OPERATION

During cold weather, the Tractor engine should be allowed to operate for approximately fifteen minutes, to allow the hydraulic oil to "warm up" before checking the level or operating the system.

IMPORTANT !

DIRT IS THE ENEMY OF ANY HYDRAULIC SYSTEM. THE BEST WAY TO FIGHT THIS ENEMY IS TO PREVENT ITS ENTRY INTO THE SYSTEM.

WHEN ADDING OIL TO THE SYSTEM, BE SURE OIL, FUNNELS, AND CONTAINERS ARE CLEAN.

5. HYDRAULIC PUMPS

The hydraulic pump is attached to the front of the Tractor and connected to the engine crankshaft by means of a splined coupling, a shaft, and a flexible coupling. See Figure 11.

REMOVING PUMP

On Loader only models, the Webster 3JDS pump is used (Case Part Number D33702) This pump is rated at 13.5 G.P.M. at 1750 R.P.M.

On Loader-Backhoe models, the Webster 4JDS pump is used (Case Part Number D33703). This pump is rated at 16.5 G.P.M. at 1750 R.P.M.

REFERRING TO FIGURE 9: Clean the exterior of the pump thoroughly with solvent.

Drain hydraulic oil from reservoir(s) as instructed under the heading "Draining Hydraulic Oil Reservoirs, page XI-4.

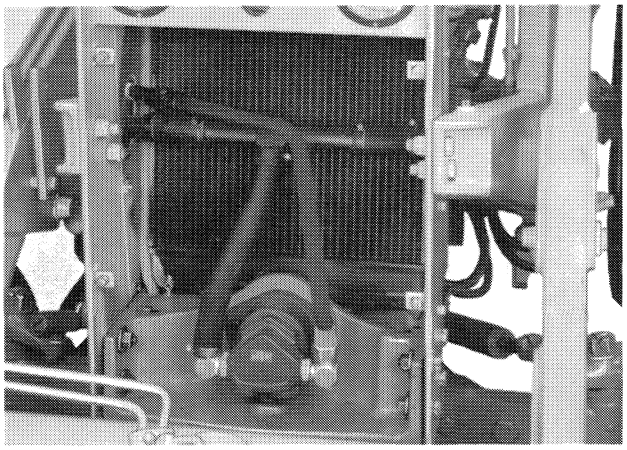

Figure 9 - Hydraulic Pump

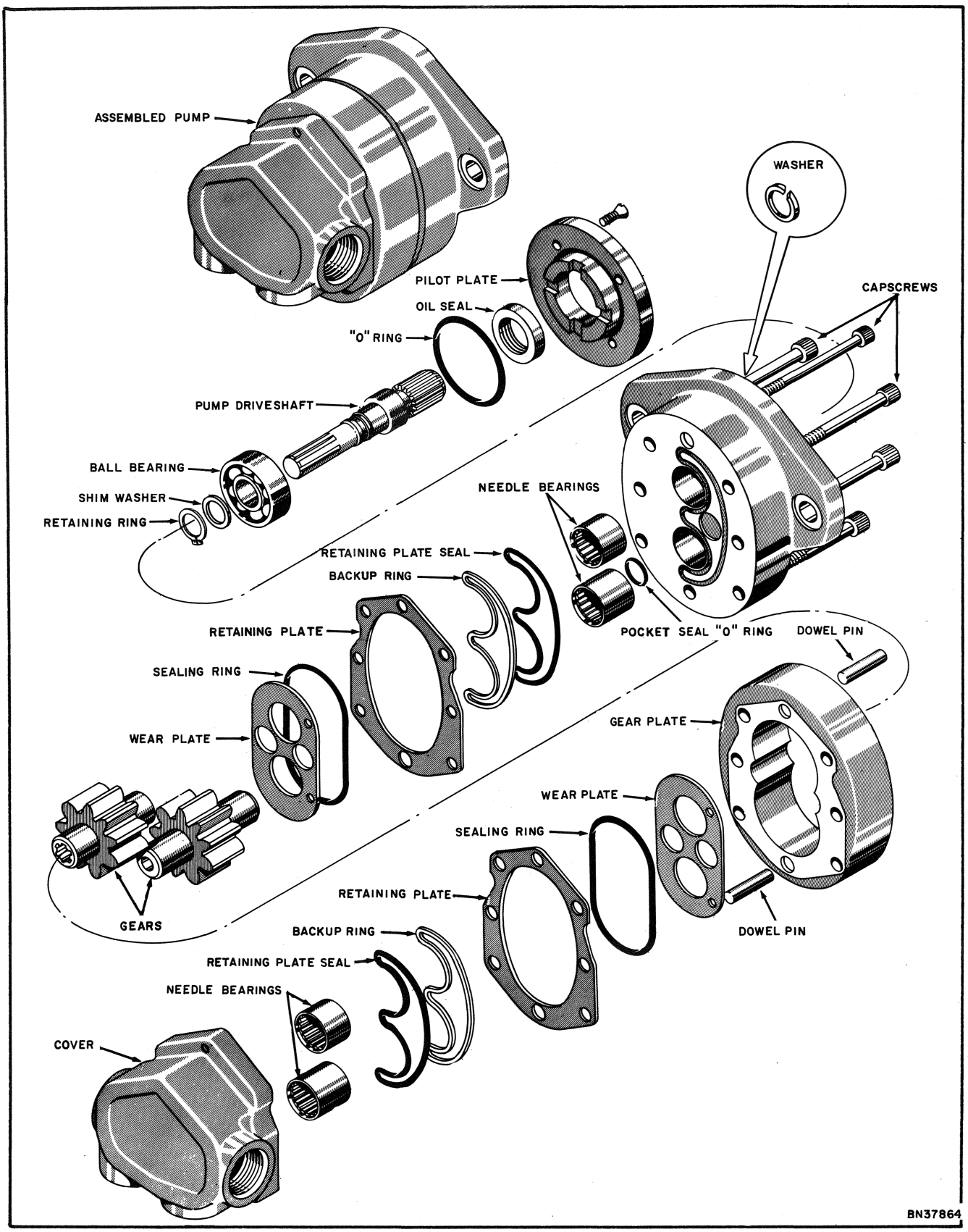

Figure 10 - Webster 3JDS And 4JDS Hydraulic Pumps

Then remove hoses and fittings at pump.

Remove pump mounting cap screws and slide pump from coupling.

Plug all openings and clean exterior of pump thoroughly with solvent.

NOTE!

REMEMBER DIRT IS THE ENEMY OF ANY HYDRAULIC SYSTEM. THE BEST WAY TO FIGHT THIS ENEMY IS TO PREVENT ITS ENTRY INTO THE SYSTEM. MAKE SURE YOU DISASSEMBLE AND REASSEMBLE THIS PUMP IN SPOTLESSLY CLEAN SURROUNDINGS.

SERVICING HYDRAULIC PUMPS

To properly service the Webster hydraulic pump, the following tools are recommended.

Description	Kent-Moore No.
Seal Driver	J8544
Handle for item 1	J7079-2
Shaft Thimble	J8541

All items are provided in the Kent-Moore Tool Kit J8566. All tools are available from your Case branch or Central Service in Racine.

REFERRING TO FIGURE 12: The pilot plate and wiper seal, the driveshaft and front ball bearing may be serviced without disassembling the pump sections.

Place marks on both the pump body and the pilot plate to insure reassembly in the same location.

Slip a protective sleeve over the shaft spline or wrap with masking tape. Kent-Moore shaft thimble (part no. J-8541) is very satisfactory for this application.

Remove the four flat head machine screws and lift the pilot plate from the pump.

REFERRING TO FIGURE 13: Inspect the wiper and, if necessary, remove the seal. Using a 1-3/8 inch diameter rod as a driver, remove seal from plate.

The wiper seal also functions as a low pressure driveshaft seal.

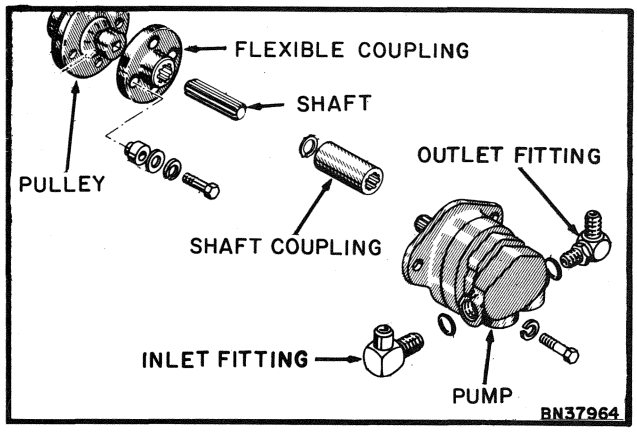

Figure 11 - Pump Driveshaft and Coupling

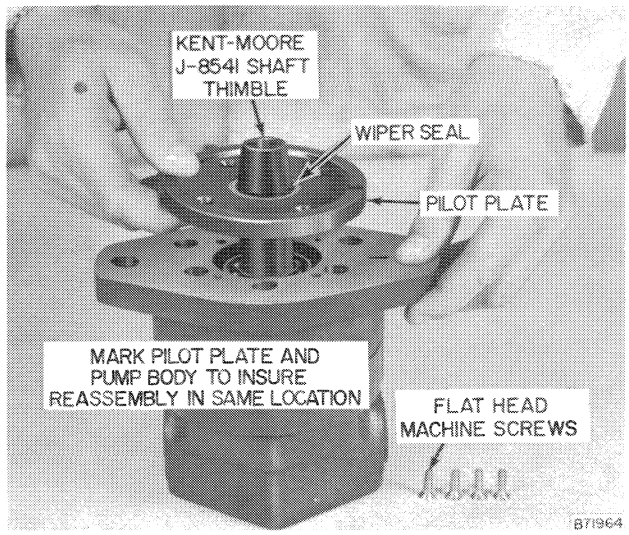

Figure 12 - Removing Pilot Plate

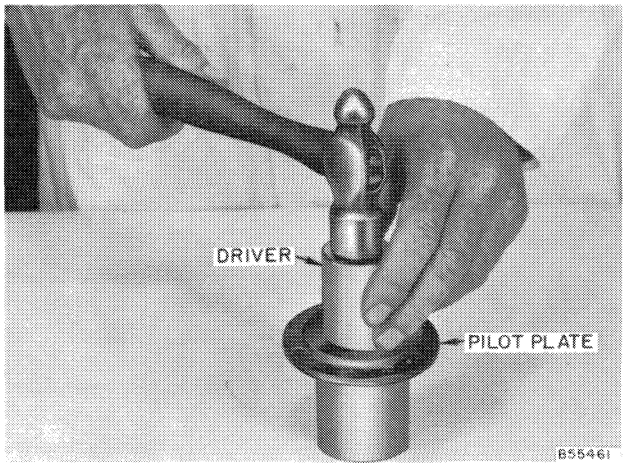

Figure 13 - Removing Wiper Seal

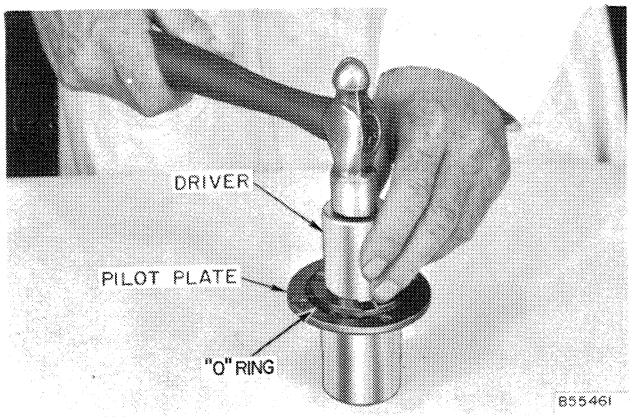

Figure 14 - Installing New Wiper Seal

REFERRING TO FIGURE 14: Using Kent-Moore seal driver (Part number J-8544) with handle (Part number J-7079-2), install new wiper seal. When installing the seal, have the side of the seal with the largest metal covering down.

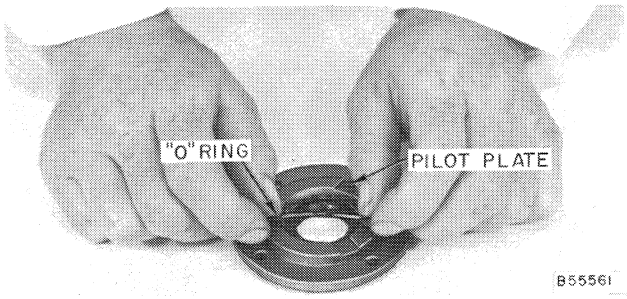

Figure 15 - Removing Pilot Plate "O" Ring

REFERRING TO FIGURE 15: Inspect the "O" ring for nicks or extrusion and, if necessary, install a new "O" ring. Coat the replacement "O" ring with oil or light grease and carefully install on pilot plate. BE CAREFUL - Do not roll the "O" ring into position.

If the pump is to be further serviced, follow instructions below. Otherwise, install the pilot plate as shown in Figure 16.

REFERRING TO FIGURE 16: Wrap pump shaft splines with masking tape or use Kent-Moore seal protector (J-8541) to protect the wiper seal during installation. Liberally coat the wiper seal with oil or light grease and slide into position, then remove tape or protector. Note position of marks placed on pump and line up pump body and pilot plate.

Install the four flat head machine screws and tighten securely.

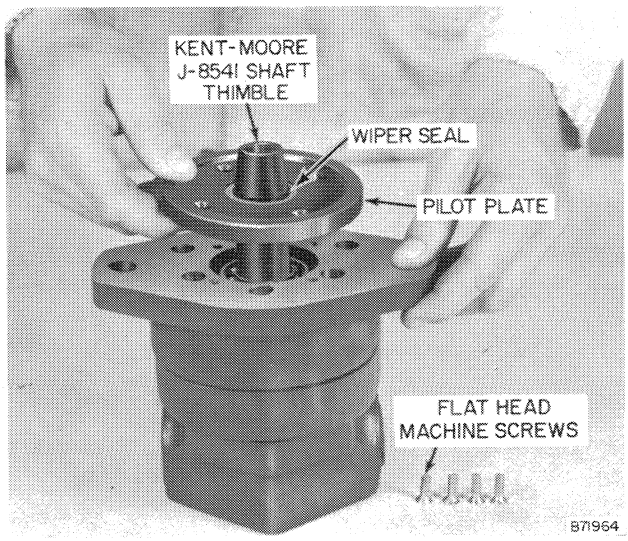

Figure 16 - Installing Pilot Plate

REFERRING TO FIGURE 17: After the pilot plate has been removed (See Figure 15), lift the driveshaft with attached ball bearing, from the pump. Carefully examine the shaft for wear on both splines and the wiper seal surface.

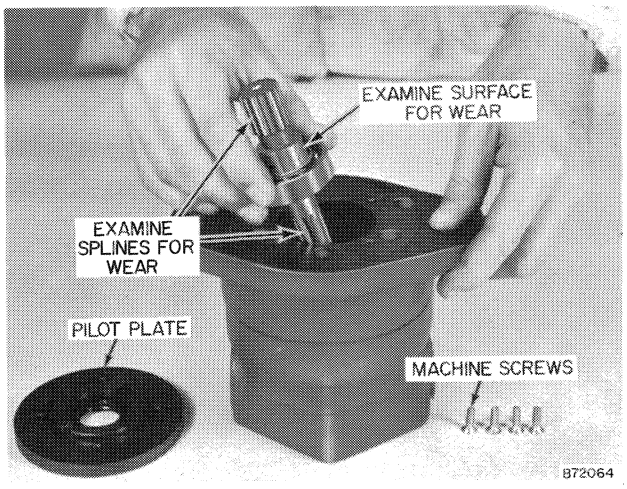

Figure 17 - Removing
Driveshaft - Ball Bearing Assembly

If the wear from the wiper seal can be felt with the fingernail, the shaft should be replaced.

Inspect the ball bearing for wear, flat spots, etc. If necessary to replace ball bearing, remove snap ring and press from shaft.

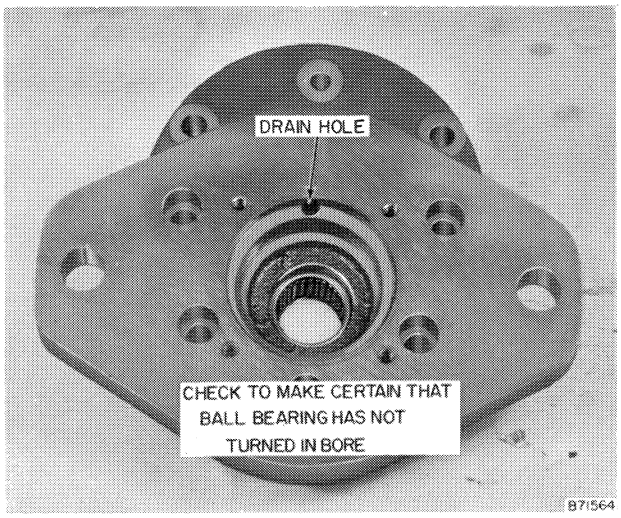

Figure 18 - Pump Body

Also inspect the ball bearing and pump body to make certain the bearing raceway has not been turning in the body. Make sure the wiper seal drain hole is open.

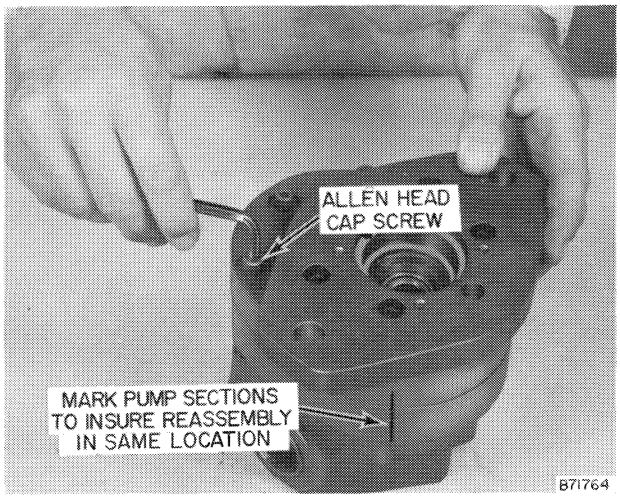

Figure 19
Removing Allen Head Capscrews

REFERRING TO FIGURE 19: Before proceeding with the pump disassembly, mark the three pump sections as shown. This will insure reassembly of the components in their original order.

Using 3/16 and 7/32 Allen wrenches, remove the eight Allen head cap screws.

Using a plastic or soft metal hammer, tap the pump body from the remainder of the pump.

REFERRING TO FIGURE 20: Mark the position of gears to one another; also wear plate and retainer plate to pump body.

Remove the gears and the gear plate.

CAUTION!

DO NOT PRY THE GEAR PLATE FROM THE PUMP COVER - GENTLY TAP FROM PLACE WITH A PLASTIC OR SOFT METAL HAMMER.

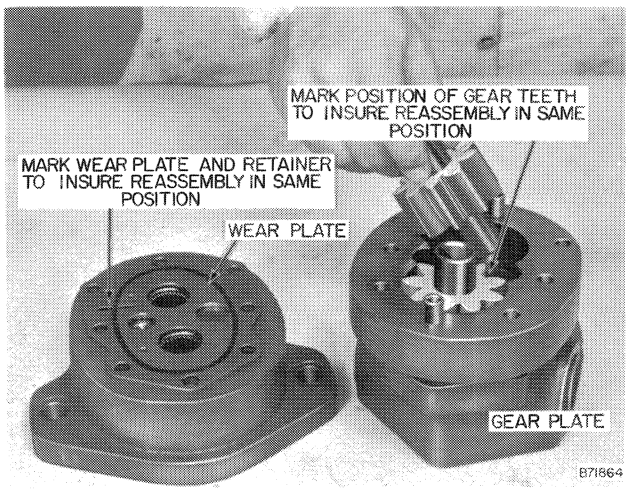

Figure 20 - Removing Gears

REFERRING TO FIGURE 21: Check both gears for wear. Use as a rule of thumb, if the wear is detectable, the gears can be considered worn. Also check gear teeth for score marks or a matte (shot blasted) appearance. A matte appearance indicates that foreign material is in the system, resulting in rapid wear of the pump.

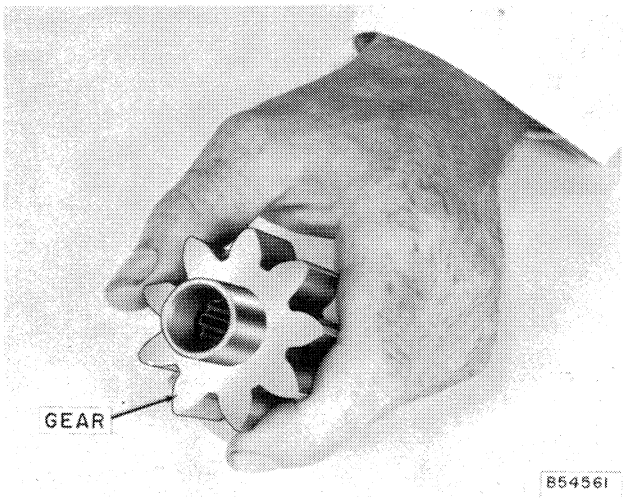

Figure 21 - Check Gears Carefully for Wear

IMPORTANT!

Keep these important precautions in mind:

1. Never replace just one gear, always use a factory supplied pair.

2. When gears are replaced, also replace the four needle bearings.

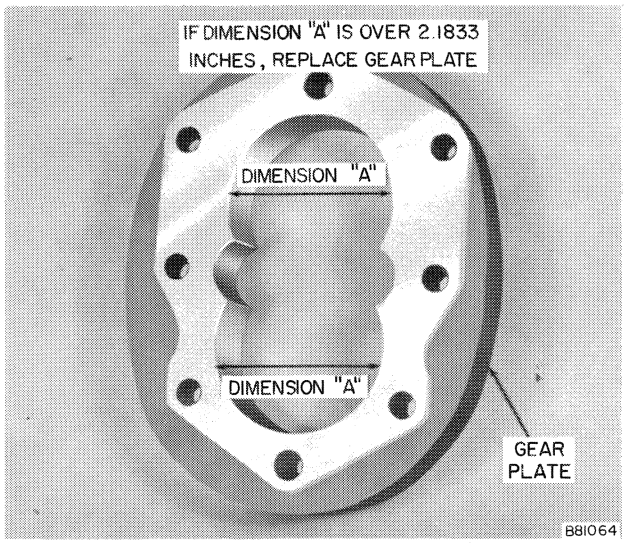

Figure 22 - Gear Plate Inside Diameter

REFERRING TO FIGURE 22: The nominal inside diameter of each circle inside the gear plate is 2.176 to 2.177 inches. If over approximately 6 thousandths (.006) inch wear is detected, replace the gear plate.

REFERRING TO FIGURES 23 and 24: This pump has pressurized wear plates. In operation, pressure pushes the wear plates against the gears, providing for minimum clearance in pump.

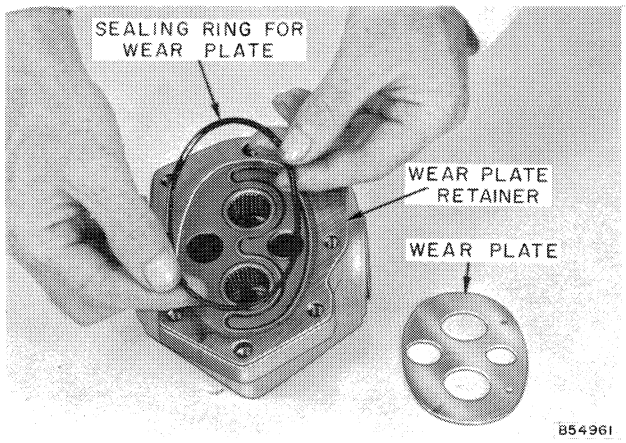

Figure 23
Removing Wear Plate Sealing Ring

The function of the sealing ring is to form and seal the compartment for pressurizing the wear plates. The backup ring prevents extrusion of the sealing ring.

Carefully inspect the wear plates used on both sides of the pump gears. Check for erosion around center grooves. Also check area in contact with gears for depth of wear; replace wear plate if worn to the extent that groove is over .005 inch deep.

The wear plate on the left is from a pump with a few hours use; the one on the right is badly scored, the probable result of overheating due to a lack of oil.

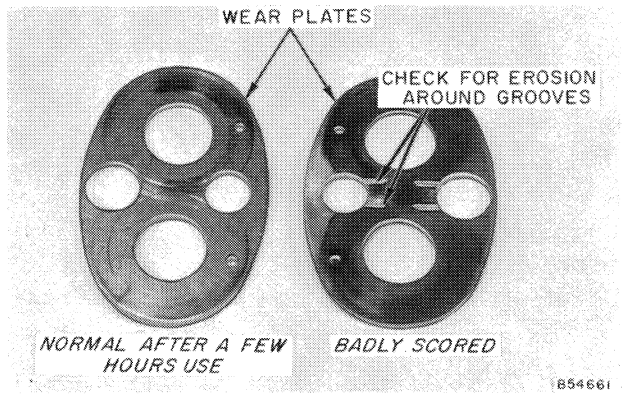

Figure 24 - Wear Plates

Carefully inspect the sealing ring for the wear plate. Replace if worn or extruded.

REFERRING TO FIGURE 25: Remove and inspect the sealing and backup rings for the wear plates. Check them carefully for wear and extrusion, and replace if necessary.

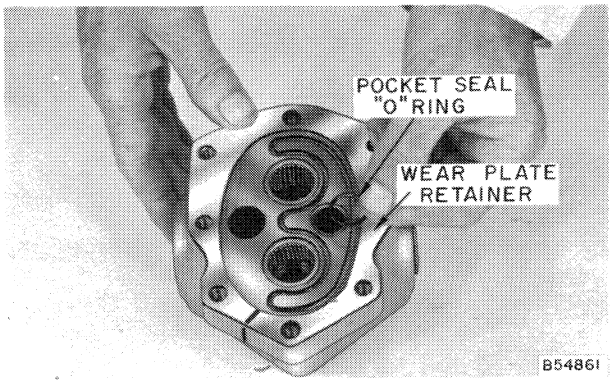

Figure 25
Removing Sealing and Backup Rings

REFERRING TO FIGURE 26: Remove the pocket seal "O" ring. Carefully check the "O" ring for nicks and extrusion; replace if necessary.

Remove the retaining plate for the wear plate.

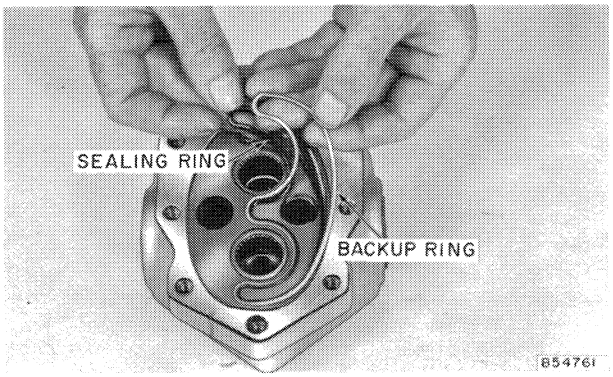

Figure 26 - Removing Pocket Seal "O" Ring

REFERRING TO FIGURE 27: Carefully inspect the needle bearings in both the cover and the body for spalling, case failure, or staggered needles. The shaft must not contact the bearing shell and the needles must be held securely by the shell.

If necessary, use a puller to remove the needle bearing. As the bearing will be damaged during disassembly procedures, DO NOT REMOVE UNLESS NECESSARY. Also keep in mind that when a needle bearing is replaced, both gears should also be replaced.

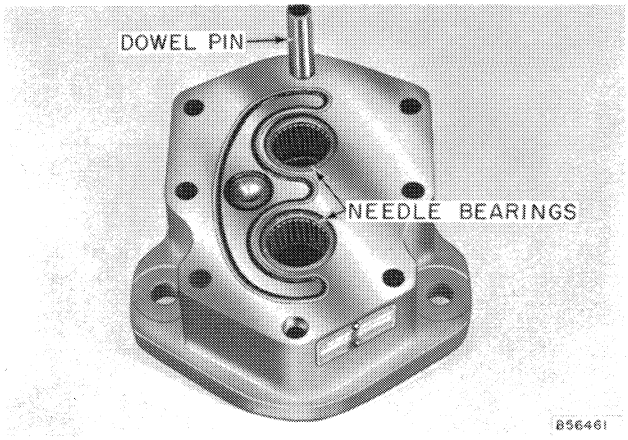

Figure 27 - View of Pump Body

Using a suitable driver, press the needle bearing in place. Be sure that the end of the bearing with the lettering is exposed and also that the bearing is properly aligned with the bore (square) prior to driving in place. The bearing should be installed 1/16 inch under flush.

REFERRING TO FIGURE 28: Using an India stone, carefully remove burrs or nicks from faces of pump, cover, gear plate, wear plates, wear plate retainers, and gears.

Wash all parts in solvent, allow to drain, and blow dry with compressed air.

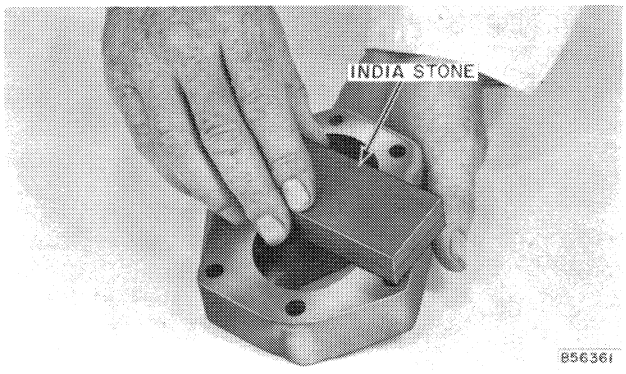

Figure 28 - Removing Burrs with India Stone

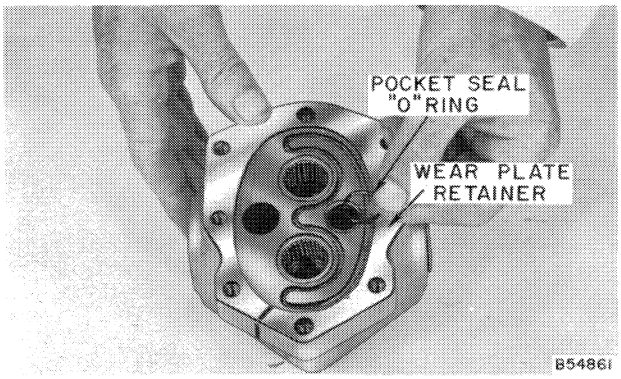

Figure 29 - Installing Pocket Seal "O" Ring

REFERRING TO FIGURE 29: Apply light grease to the "O" ring for use as an adhesive. Then install the "O" ring on the cover.

Install the wear plate retainer.

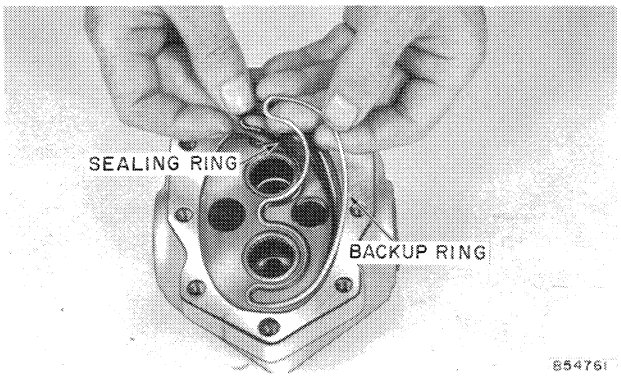

Figure 30
Installing Sealing and Backup Rings

REFERRING TO FIGURE 30: Carefully install well lubricated sealing ring, then the backup ring.

REFERRING TO FIGURE 31: Position well lubricated retaining plate seal around inside of wear plate retainer with feathered edge down.

Carefully install well lubricated wear plate with small diameter holes over compartment formed by sealing ring. Bronze side of wear plate always goes next to gears.

Using a plastic or metal hammer install the gear plate. Be absolutely certain marks line up, if original parts are reused.

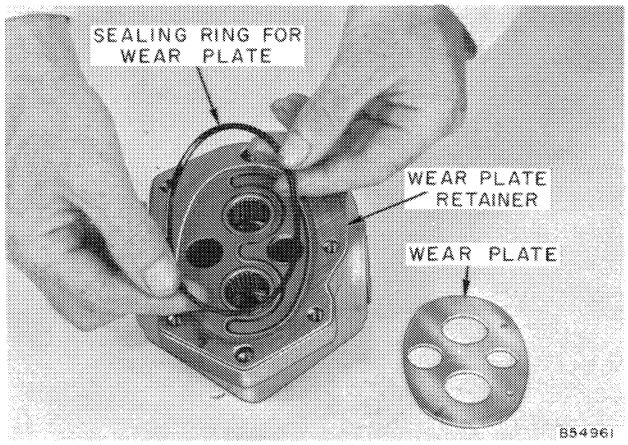

Figure 31 - Installing Wear Plate Sealing Ring

REFERRING TO FIGURE 32: Install well lubricated gears, lining up teeth with marks placed on gears at time of disassembly.

Refer to information given in Figures 29, 30, and 31 and install "O" ring, sealing and backup ring, wear plate and retainer.

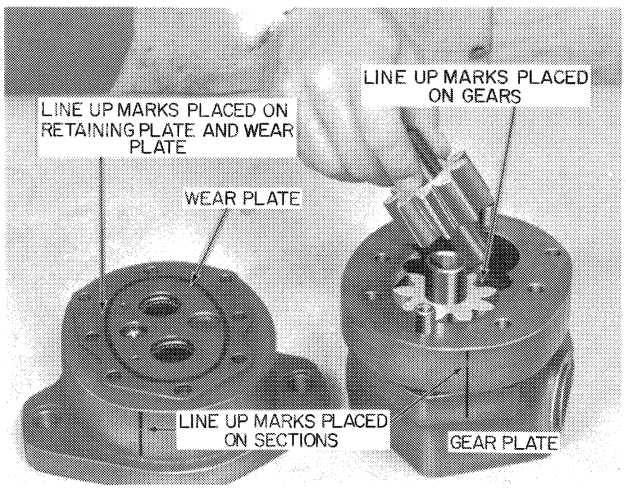

Figure 32 - Installing Gears

REFERRING TO FIGURE 33: Install well lubricated driveshaft-ball bearing assembly.

be careful.....
avoid accidents

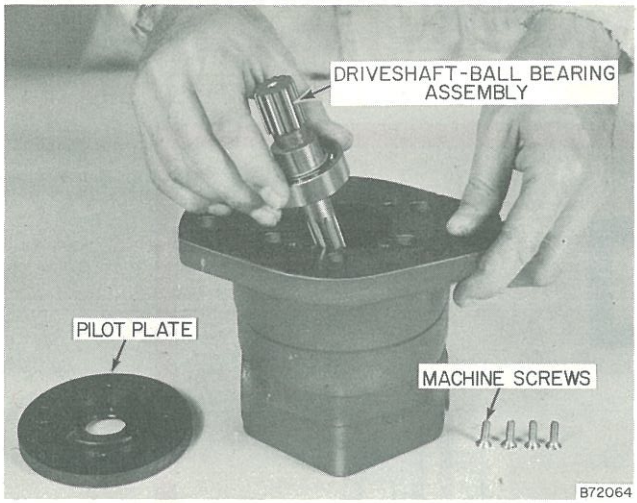

Figure 33 - Installing
Driveshaft - Ball Bearing Assembly

REFERRING TO FIGURE 34: Install eight (8) Allen head cap screws in pump body. TIGHTEN CAP SCREWS EVENLY TO torque shown on illustration.

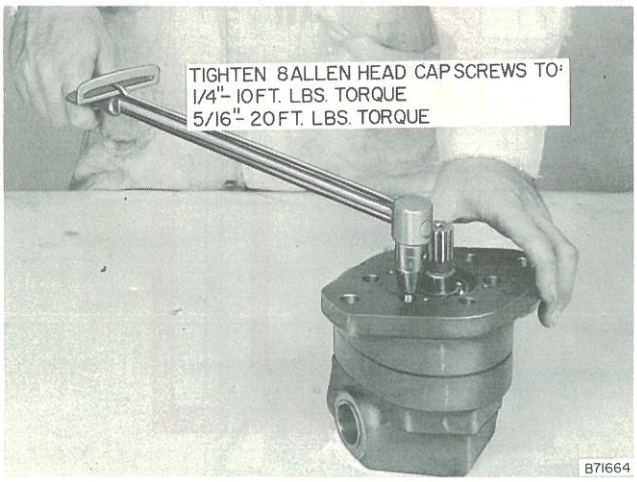

Figure 34 - Torquing Capscrews

REFERRING TO FIGURE 35: After the cap screws have been tightened to proper torque specifications, place an eight inch long wrench on the shaft. If the shaft can be rotated with only a slight drag, clearances are satisfactory.

If too much effort is required, loosen cap screws and tighten them more evenly to the proper torque, while rotating the shaft.

If the pump is still too tight, it must be disassembled and checked to determine the cause of the bind.

Install pilot plate (refer to instruction on page XI-10).

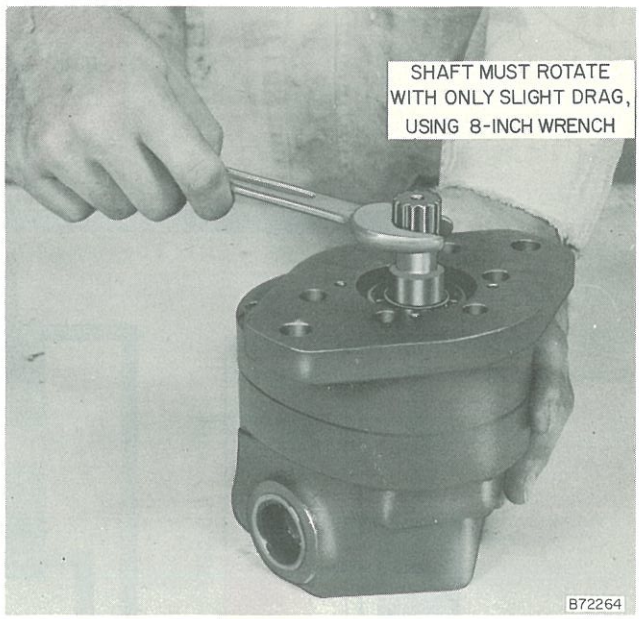

Figure 35 - Checking Pump Tightness

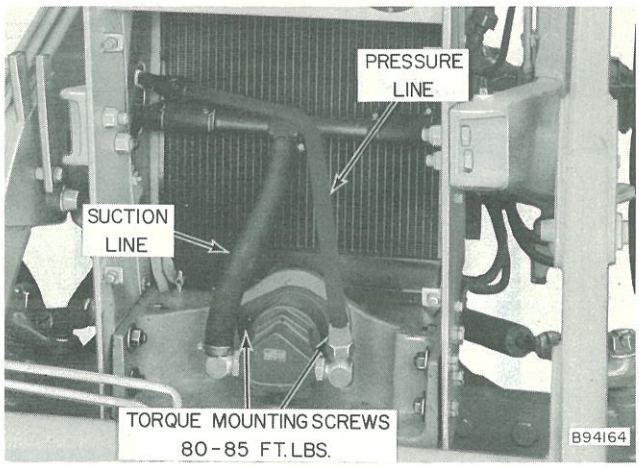

Figure 36 - Pump Installed on Tractor

REFERRING TO FIGURE 36: Install pump on Tractor. Torque the two mounting cap screws to 80-85 ft. lbs. Reconnect hydraulic circuits to pump.

To avoid possible damage to a new or rebuilt pump due to excessive hydraulic pressure, back off the main relief valve adjusting screws on BOTH the Loader and Backhoe main relief valves before operating the pump. After the pump has run in for 30 minutes at zero pressure, (all control levers in neutral position) adjust both Loader and Backhoe main relief valve pressures (instructions on pages XI-61 and XI-62.

6. LOADER CONTROL VALVE

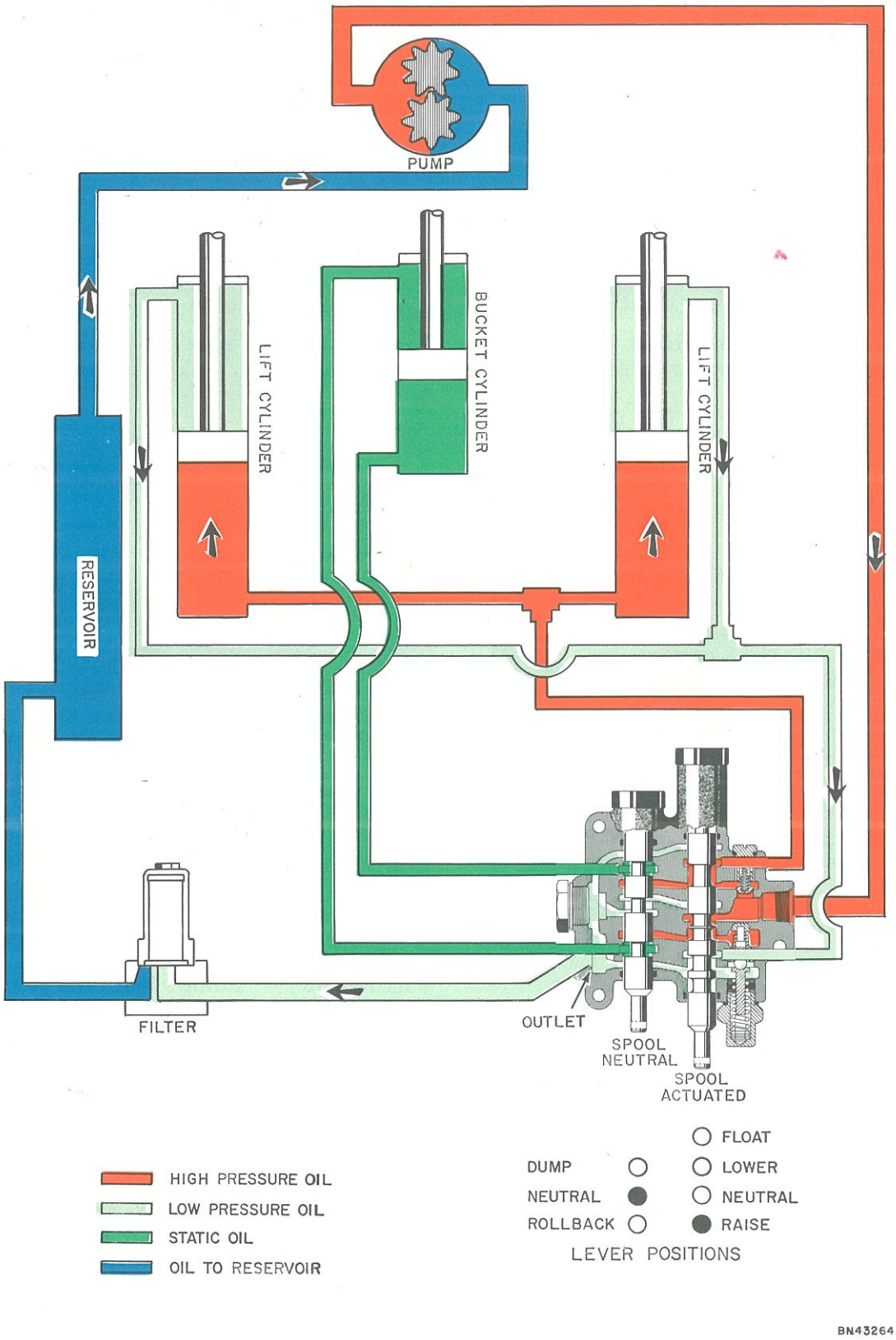

Figure 37 - Oil Flow Through Valve - Raising Bucket

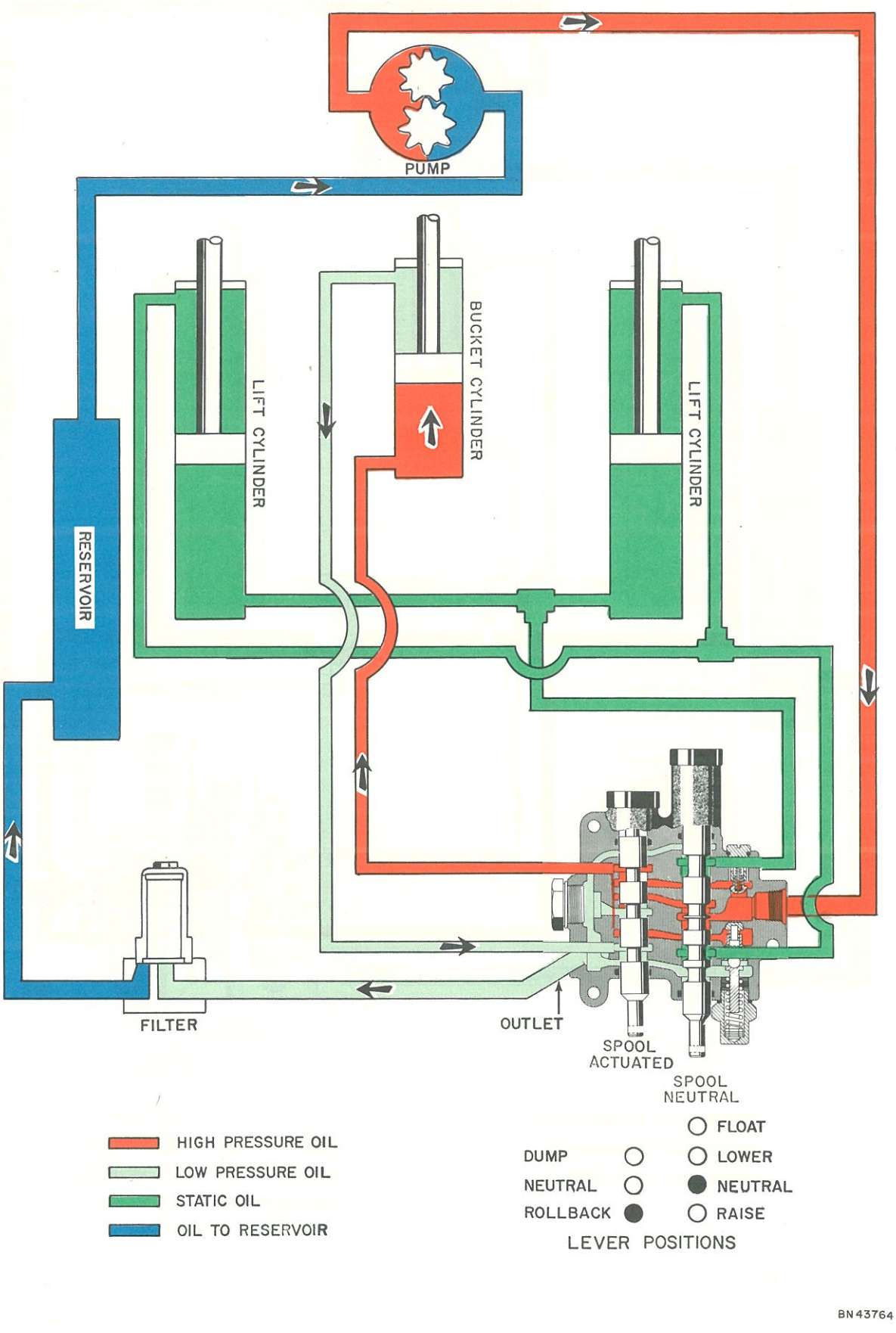

Figure 38 - Oil Flow Through Valve - Rolling Bucket Back

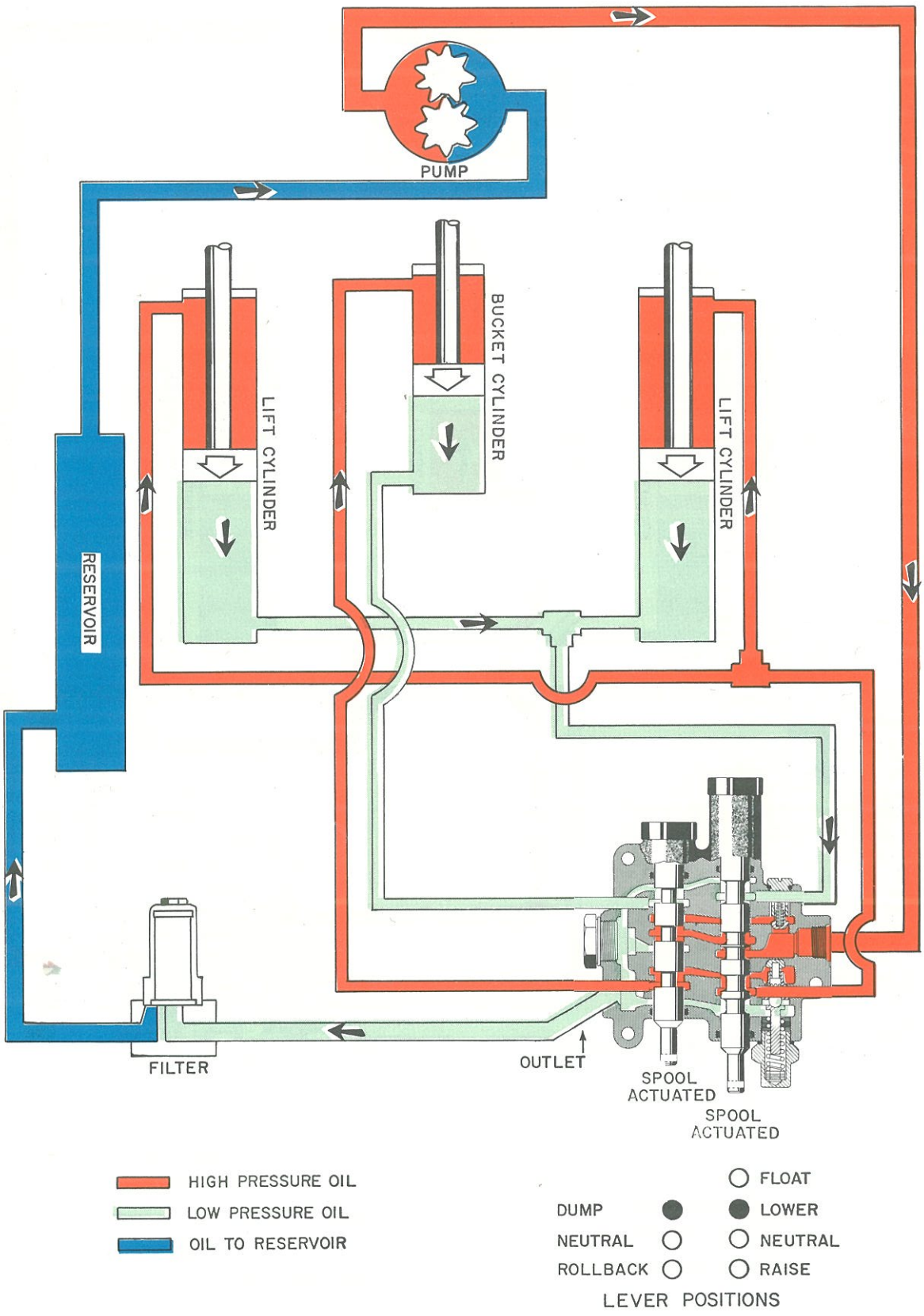

Figure 39 - Oil Flow Through Valve - Lowering and Dumping Bucket

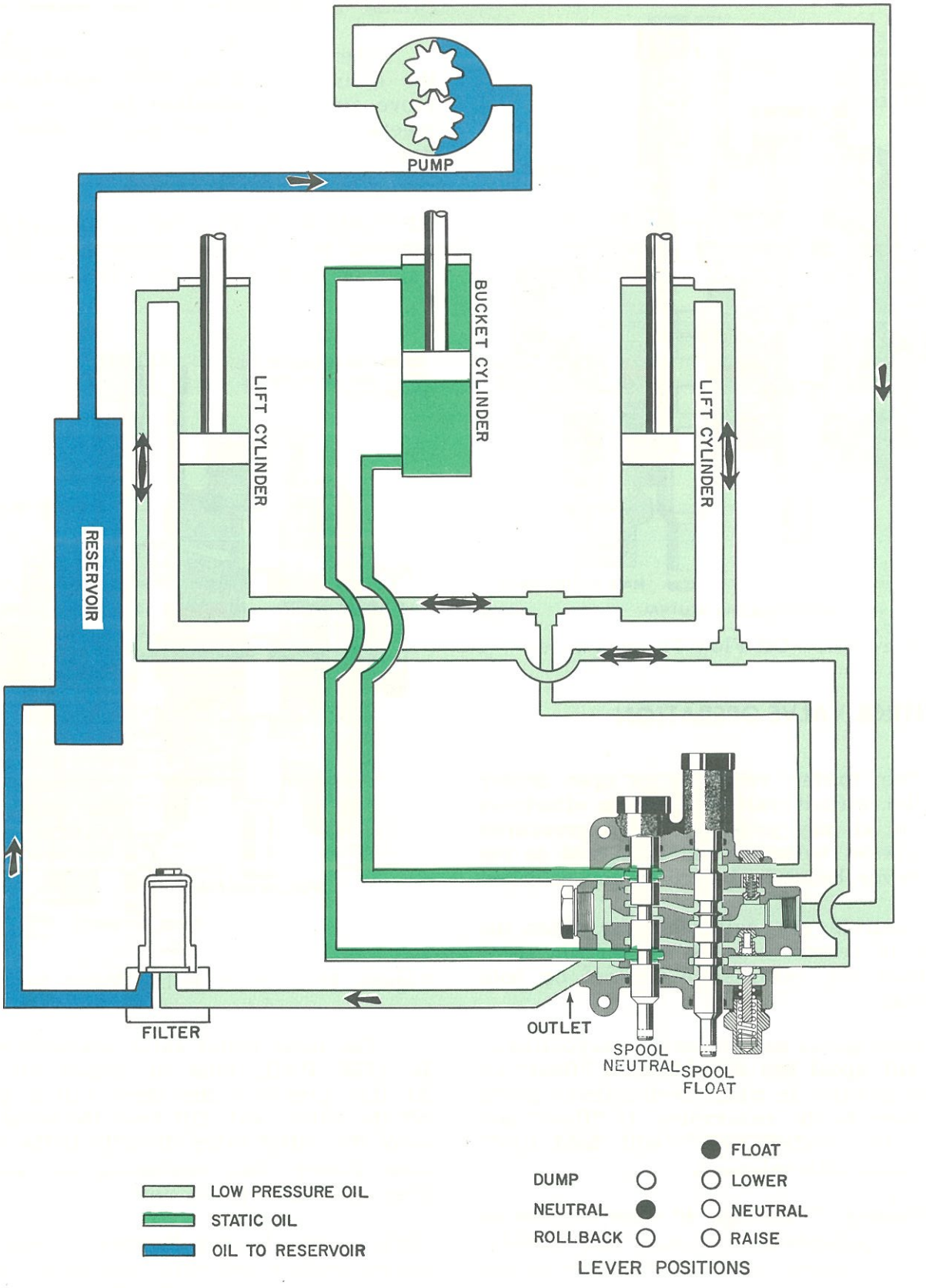

Figure 40 - Oil Flow Through Valve - Float Position

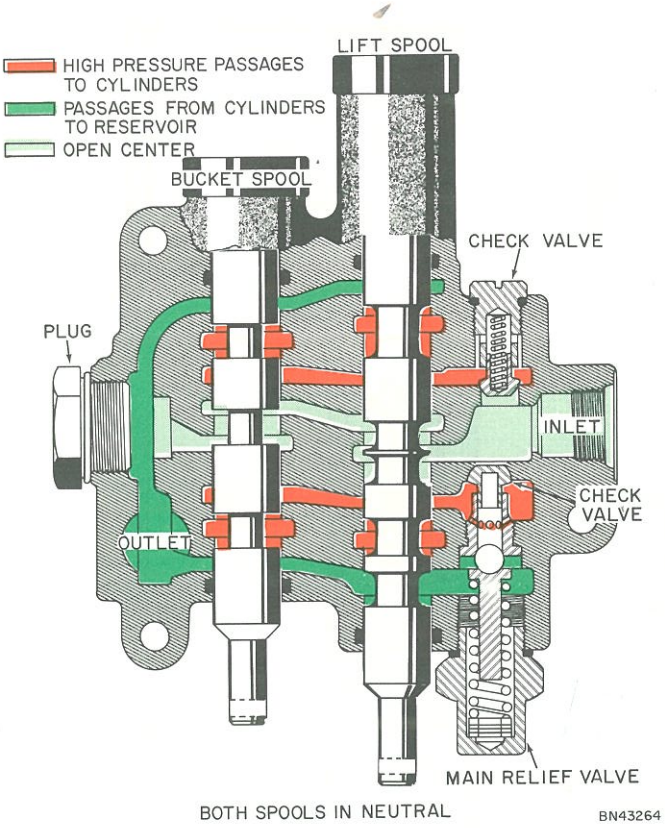

Figure 40A - Oil Flow Through Valve

CONTROL VALVE OPERATION

The loader valve is an open center parallel circuit valve that gives effortless control at any pressure. High pressures are always balanced and equalized so the unit never becomes locked in any position.

Controls are self-centering. When the lever is released the spring-driven spool automatically returns to neutral or hold position.

Both spools have three control positions. The lift spool has an additional "float" or detent position in which both cylinder ports are open to the reservoirs. In "float" position the control lever will hold itself in position until released.

Figures 37 through 40 show oil flow in various applications. On loader only models, oil is received directly from the pump.

On Loader-Backhoe models, the high pressure oil first goes through the Backhoe control valve. This is called "power beyond". When any Backhoe spool is actuated, oil cannot be supplied to the loader valve.

When both Loader spools are actuated the cylinder with the least resistance will move first and continue to move until it meets more resistance than the other cylinder.

REFERRING TO FIGURE 41: When a cylinder bottoms or is held by a load the main relief valve opens to protect the hydraulic system.

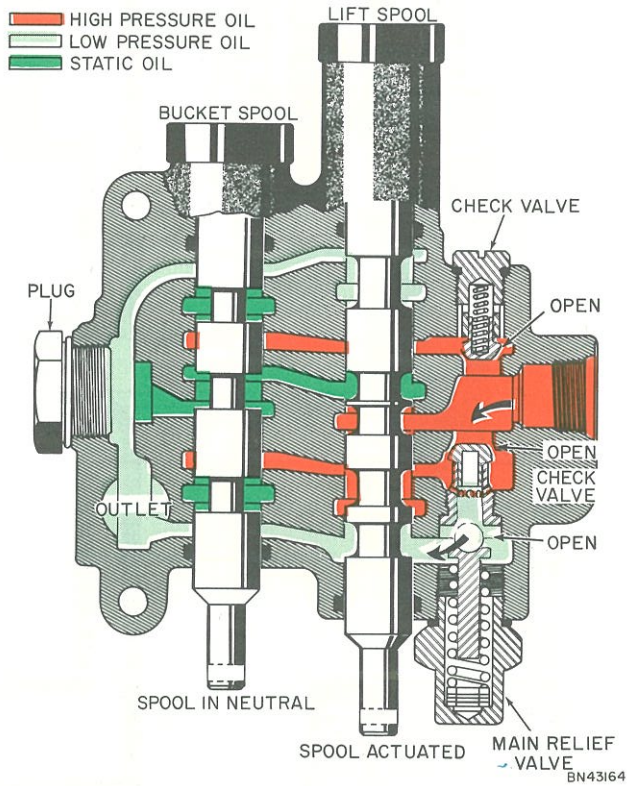

Figure 41 - Main Relief Valve Bypassing

The main relief valve pressure setting is 1750 P.S.I. plus or minus 50 P.S.I. At this pressure the steel ball is pushed off the valve seat. Oil from the pump flows over the relief valve directly to the reservoir rather than continuing to build up pressure within the system.

NOTE: On Loader-Backhoe models, the loader main relief valve pressure must be set lower than the Backhoe main relief pressure.

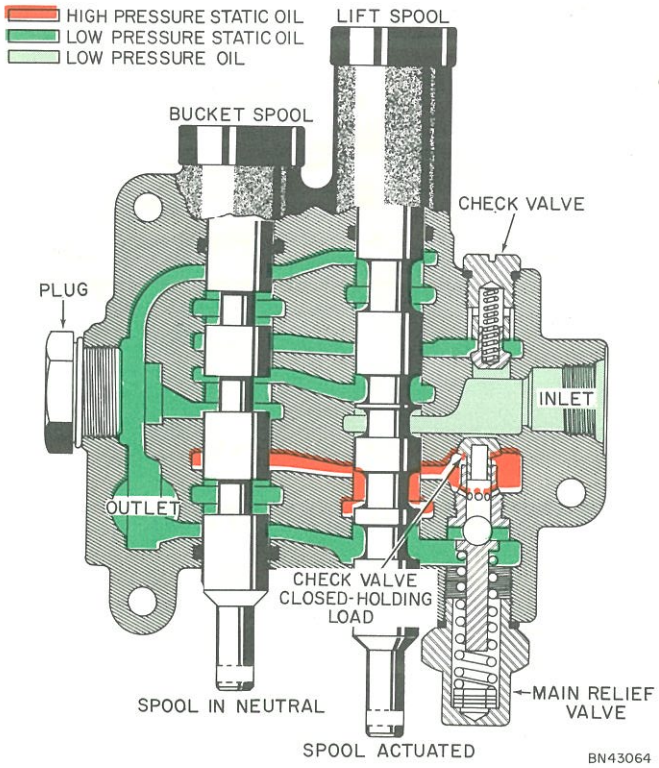

Figure 42 - Check Valve Holding the Load

REFERRING TO FIGURE 42: Two check valves, one for each spool, are placed in the valve to give positive load control. They function when a control lever is "feathered" (actuated slightly).

When it happens that the oil pressure from the pump is not as great as that created by the load, the check valve prevents oil from being forced back through the valve. This checking action keeps the lift arms from dropping slightly or the bucket tipping as a control lever is actuated.

The check valves also hold the load if the engine stalls while a spool is actuated.

REMOVING CONTROL VALVE

REFERRING TO FIGURE 44: The Loader control valve is attached to a bracket on the Loader frame by means of three hex head cap screws. Clean exterior of valve thoroughly with solvent to eliminate possibility of entrance of dirt into system. Rest Loader bucket on ground. With Tractor engine shut off, put each control lever through

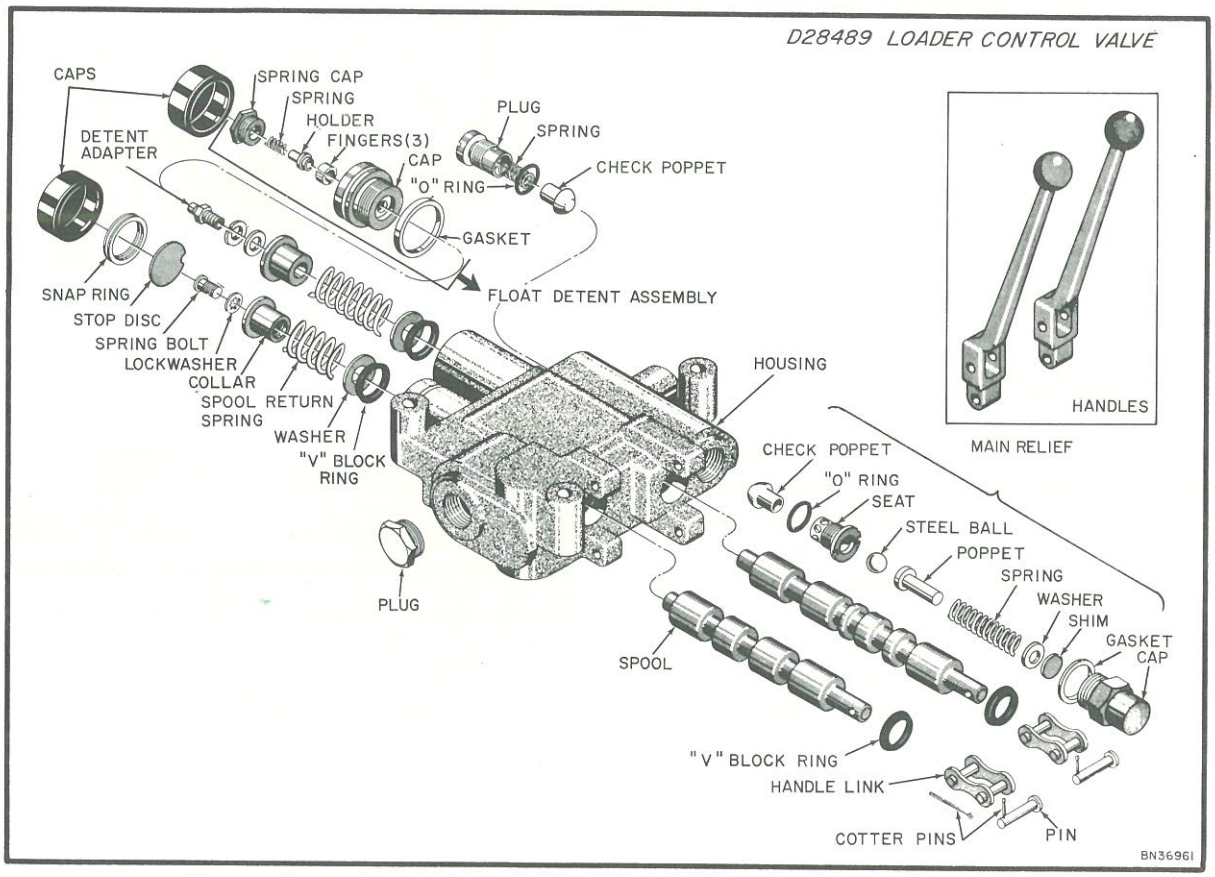

Figure 43 - Exploded View of Loader Control Valve

several operational cycles to equalize pressures within the system. Then remove hoses and tubes from valve. Be sure to tag all lines from valve and identify location of each.

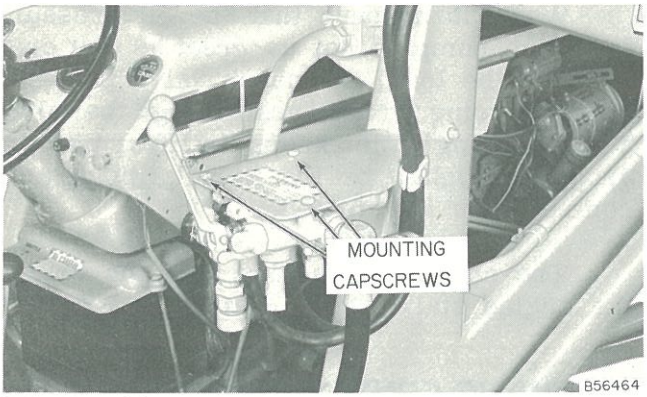

Figure 44 - Location of Loader Control Valve

After hoses and tubes are removed, cap ends of lines to eliminate possibility of foreign matter entering the system. Also be sure hoses are not left dangling to eliminate possible excessive oil loss.

IMPORTANT !

DO NOT UNDER ANY CONDITIONS RUN TRACTOR ENGINE WITH VALVE DISCONNECTED.

Remove cap screws and remove valve.

Plug all openings in valve and clean exterior thoroughly with solvent.

SERVICE TOOLS

REFERRING TO FIGURE 45: These are special tools required for servicing the Gresen valve. In fact, these tools will service nearly all Gresen valves. These tools, available from your Branch, have, the following part numbers:

Gresen No. T-9 — Special Tool for Inserting Spool through "V" Block Ring;

Gresen No. T-51 — Special Tool for Removing Relief Valve Seat.

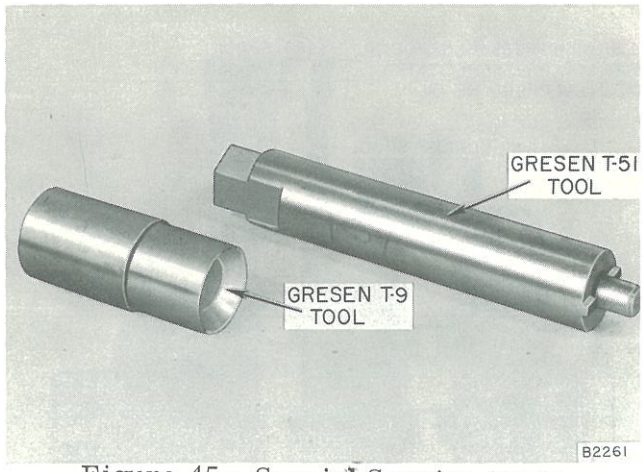

Figure 45 - Special Service Tools

DISASSEMBLING LIFT SPOOL

REFERRING TO FIGURE 46: Remove the rubber cap. With the spool in neutral position, remove the float detent cap assembly and gasket.

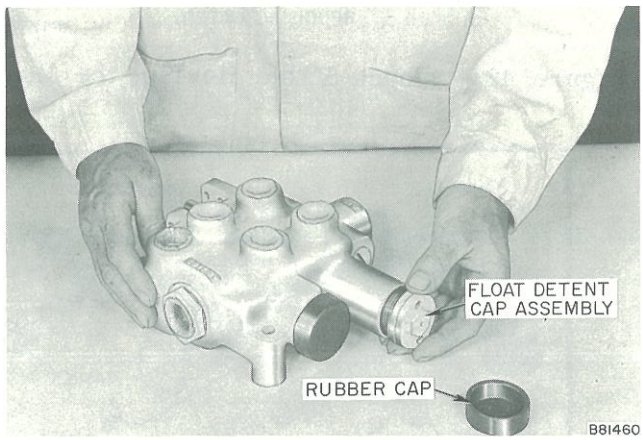

Figure 46
Removing Float Detent Cap Assembly

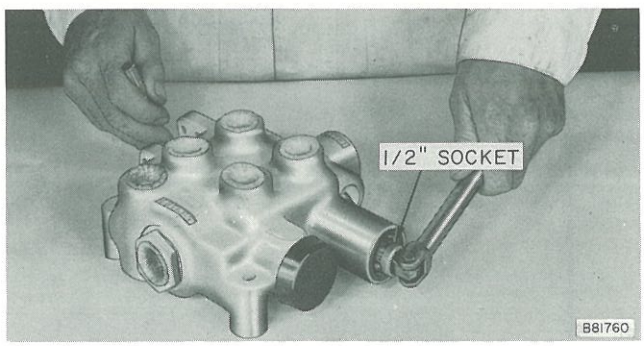

Figure 47 - Removing Detent Adapter

REFERRING TO FIGURE 47: Use a 1/2 inch socket and remove the detent adapter, lockwasher, and flat washer.

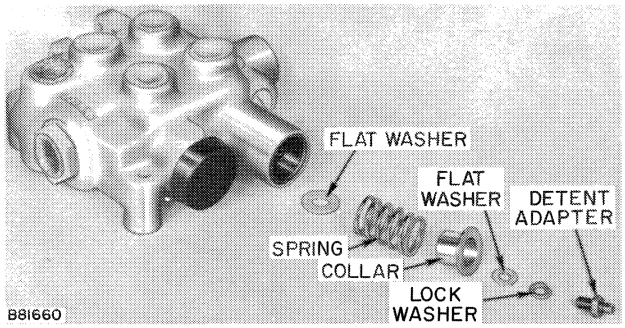

Figure 48 - Spool Spring Assembly

REFERRING TO FIGURE 48: Slip collar, spring, and washer from housing.

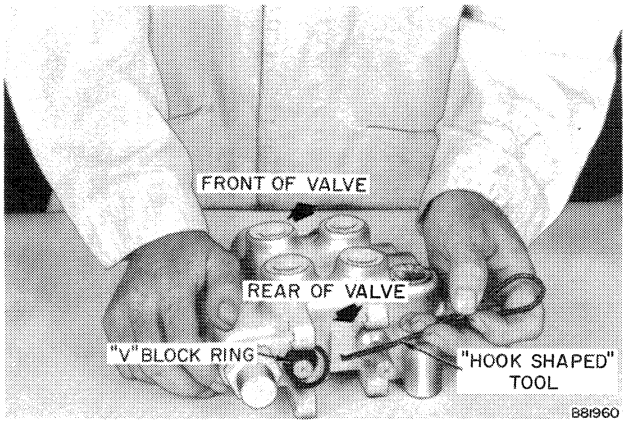

Figure 49 - Removing Rear "V" Block Ring

REFERRING TO FIGURE 49: The rear of the valve is the end with the handles. Push the spool toward the front of the valve until the rear "V" block ring is exposed.

A convenient hook-shaped tool can be fabricated from a piece of wire for removing "V" block rings. Using the hook-shaped tool, remove the rear "V" block ring.

REFERRING TO FIGURE 50: From the front of the valve, carefully push the spool out of the rear of the housing, being careful not to damage or nick grooves.

Remove the front "V" block ring. Thoroughly clean both "V" block ring and grooves in the housing, being careful not to damage or nick grooves.

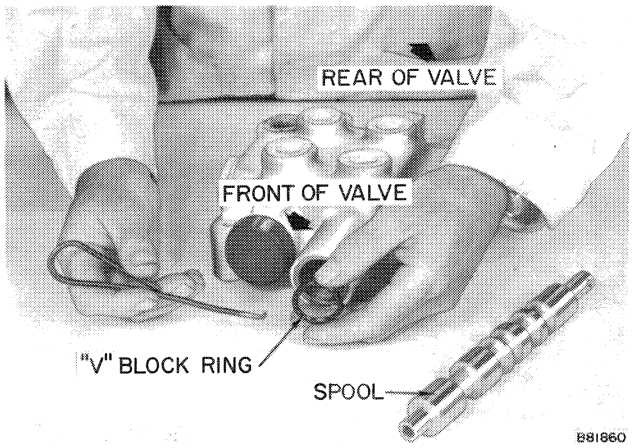

Figure 50
Removing Front "V" Block Ring

If the spool or bore in housing is worn or damaged, it will be necessary to replace the housing and both spools. These parts are not serviced individually.

ASSEMBLING LIFT SPOOL

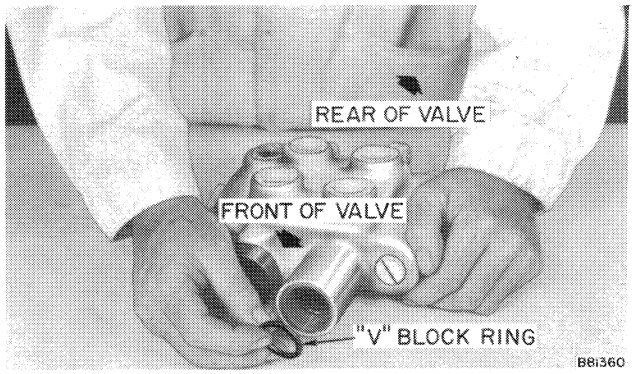

Figure 51 - Installing Front "V" Block Ring

REFERRING TO FIGURE 51: Insert well lubricated spool into hole from the front of the housing. Push spool back far enough to permit installation of front "V" block ring.

Lubricate new "V" block ring with oil or light grease.

IMPORTANT !

Insert ring in front groove in housing—BE SURE "V" EDGES ARE POINTING TOWARD CENTER OF VALVE HOUSING.

REFERRING TO FIGURE 52: Carefully work the "V" block ring into the groove. Lubricate the outside of the Gresen T-9 tool with oil or light grease. With a twisting motion, carefully insert the tool through the "V" block ring, until the tool shoulder touches the housing.

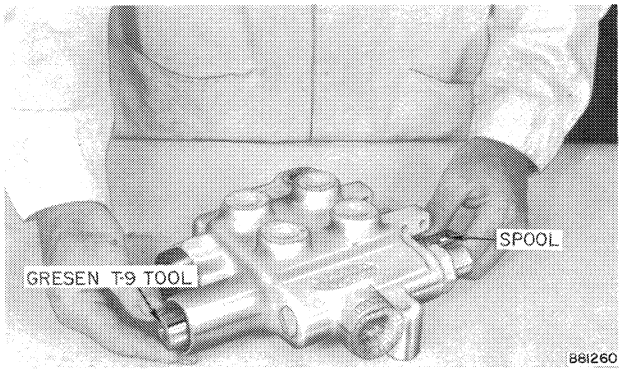

Figure 52 - Pushing Spool into Position

Keep a firm grip on the special tool. With a twisting motion, push the spool from the rear into the housing, until you can see the rear "V" block ring groove. DO NOT PUSH THE SPOOL TOO FAR—GROOVES ON THE SPOOL MAY CUT THE FRONT "V" BLOCK RING.

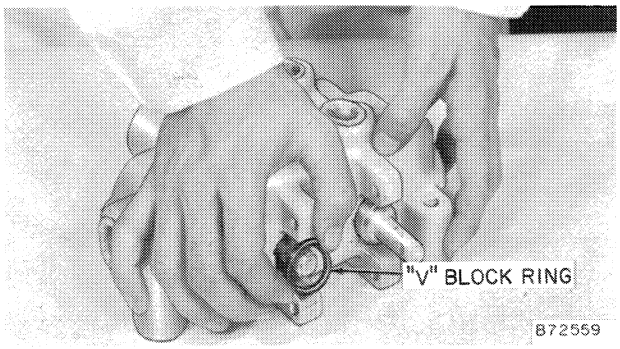

Figure 53 - Installing "V" Block Ring

REFERRING TO FIGURE 53: Lubricate new "V" block ring with oil or light grease. Insert ring in rear groove in housing. BE SURE "V" EDGES ARE POINTING TOWARD CENTER OF VALVE HOUSING.

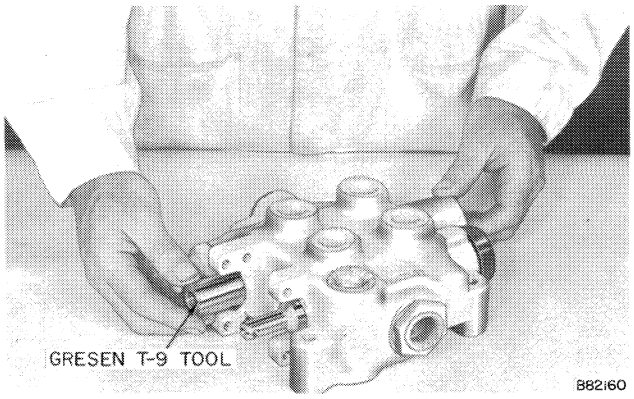

Figure 54 - Pushing Spool into Position

REFERRING TO FIGURE 54 : Carefully work the "V" block ring into the groove. Lubricate the outside of the Gresen T-9 tool with oil or light grease. With a twisting motion, carefully insert the tool through the "V" block ring, until the tool touches the spool.

Keep a firm grip on the special tool. Push the spool into the housing with a twisting motion. Keep pushing until the spool is in operating position. CAUTION: Do not push too far as grooves on the spool may cut the "V" block rings.

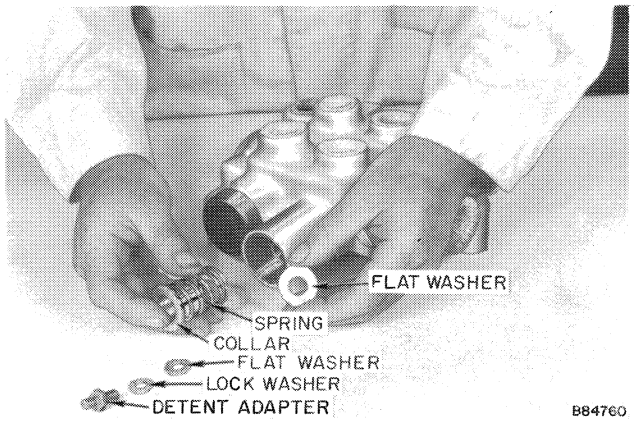

Figure 55 - Installing Spool Spring Assembly

REFERRING TO FIGURE 55 : Install washer, spring, and collar. Then secure in position with detent adapter, washer, and lockwasher.

be careful..... avoid accidents

REFERRING TO FIGURE 56: Using a socket, tighten the detent adapter securely.

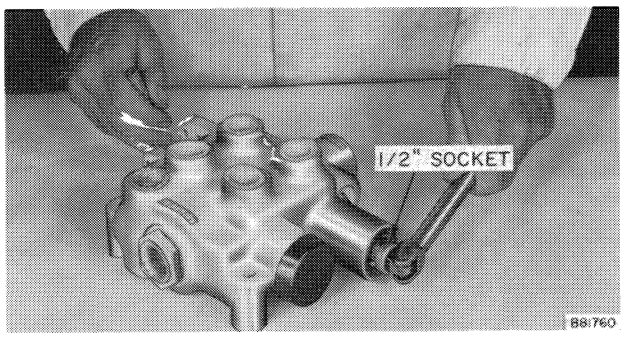

Figure 56 - Installing Detent Adapter

REFERRING TO FIGURES 57 and 58: If the spool will not stay in detent (float) position, the detent adapter may be worn. If so, disassemble the detent assembly. HOWEVER, DO NOT DISASSEMBLE UNLESS NECESSARY AS IT IS DIFFICULT TO RE-ASSEMBLE.

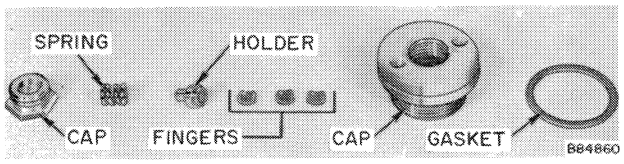

Figure 57 - Float Detent Assembly

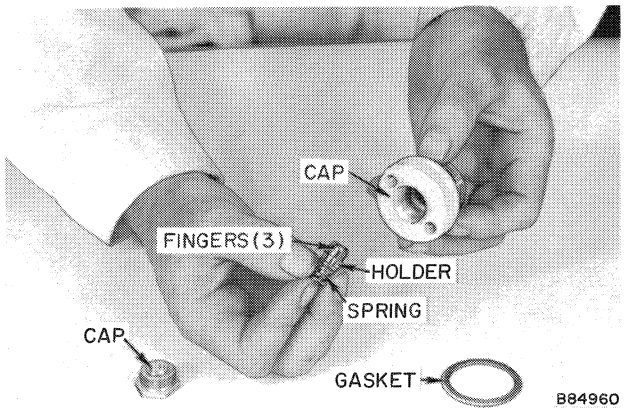

Figure 58 - Installing Detent Holder

To disassemble the detent assembly, remove the cap and extract the spring, fingers, and holder. Carefully inspect the parts for wear or other defect. Replace parts as required. Apply grease to fingers to help hold them in position when reassembling. Then reassemble detent assembly as shown in Figure 58.

REFERRING TO FIGURE 59 - Reinstall float detent cap assembly in housing and replace rubber cap.

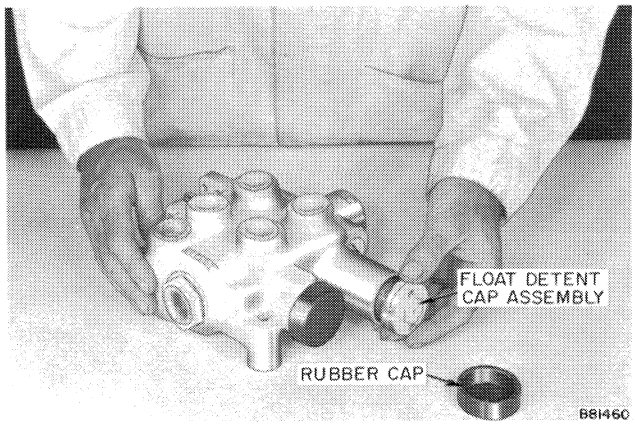

Figure 59
Installing Float Detent Cap Assembly

SERVICING DUMP SPOOL

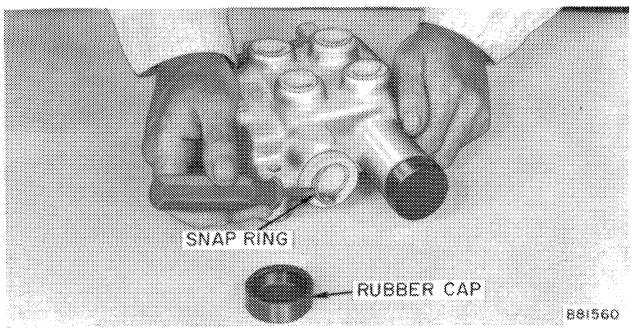

Figure 60
Removing Snap Ring for Dump Spool

REFERRING TO FIGURE 60: The procedure for servicing the dump spool is exactly as that given for the lift spool, except the dump spool does not have the float detent.

Remove the rubber cap. Using a small screwdriver, remove the snap ring and stop disc. Then proceed to service the spool in the same manner as described for the lift spool.

MAIN RELIEF VALVE AND CHECK POPPETS

REFERRING TO FIGURE 61: Remove the main relief valve cap as shown.

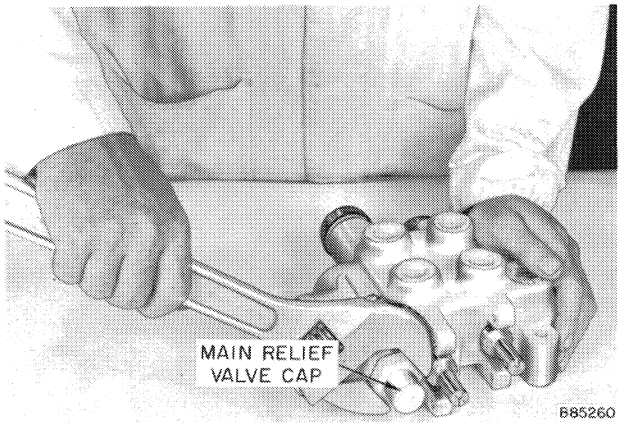

Figure 61
Removing Main Relief Valve Cap

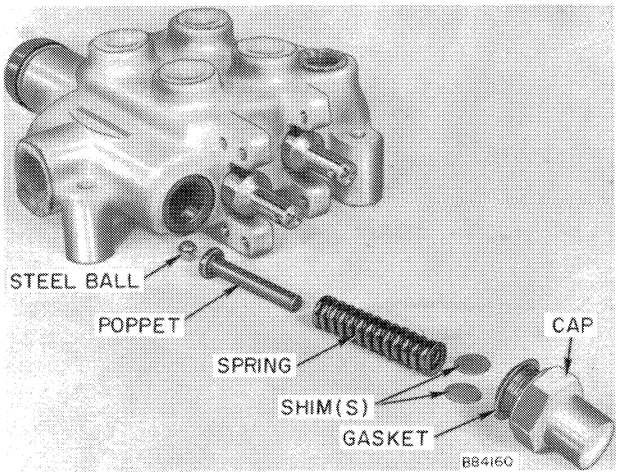

Figure 62
Exploded View of Main Relief Valve

REFERRING TO FIGURE 62: After the cap has been removed, pull spring, poppet, and steel ball from housing. Then remove (and lay aside to prevent loss) all shims located in cap. (NOTE: Examine the inside of the cap — if the end appears flat, shims are stuck inside; if conical shaped, all shims have been removed).

Carefully examine the steel ball for wear, such as pits, out of round, etc. Replace ball if worn.

REFERRING TO FIGURE 63: Using the Gresen T-51 Special Tool, remove the relief valve seat.

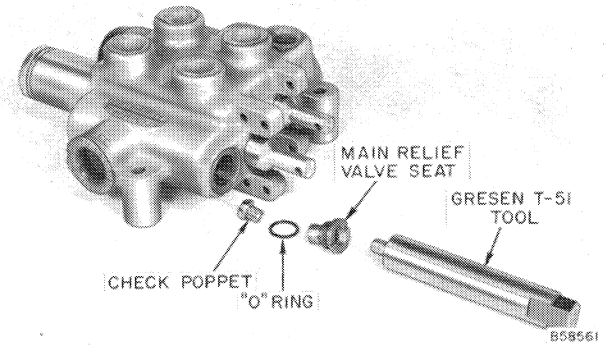

Figure 63 - Exploded
View of Valve Seat and Rear Check Poppet

REFERRING TO FIGURE 63: Carefully examine the relief valve seat for wear. Replace if necessary.

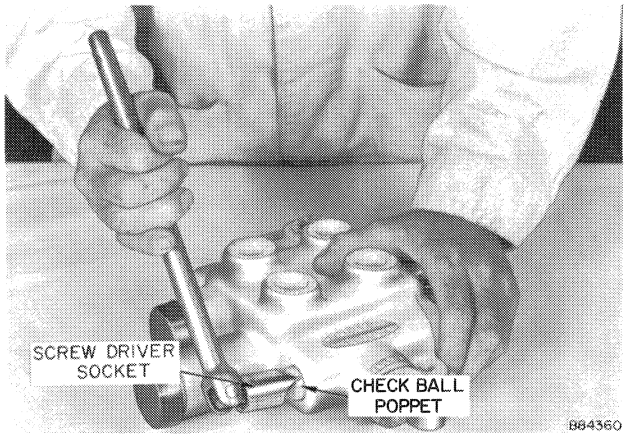

Figure 64 - Removing Check Poppet Plug

REFERRING TO FIGURE 64: Use a screwdriver socket to remove the front check poppet plug.

The check poppets (one on the front and one on the back of the valve) are placed in the system to eliminate the possibility of the lift arms dropping slightly or bucket tipping as a control lever is "feathered". As the control lever is placed in the full flow position, hydraulic pressure overrides the function of the check poppets.

Reinstall the parts, replacing those as required. Leave several shims out of the main relief valve to prevent too high a pressure