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PLEASE READ CAREFULLY!

INCLUDED THROUGHOUT THIS MANUAL AND ON MACHINE DECALS YOU WILL FIND PRECAUTIONARY STATEMENTS SUCH AS "CAUTION", "WARNING" AND "DANGER", FOLLOWED BY SPECIFIC INSTRUCTIONS.

THESE PRECAUTIONS ARE INTENDED FOR THE PERSONAL SAFETY OF YOU AND THOSE WORKING WITH YOU. PLEASE TAKE THE TIME TO READ THEM.

PERSONAL SAFETY!

CAUTION: THE WORD "CAUTION" IS USED WHERE A SAFE BEHAVIORAL PRACTICE ACCORDING TO OPERATING AND MAINTENANCE INSTRUCTIONS AND COMMON SAFETY PRACTICES WILL PROTECT THE OPERATOR AND OTHERS FROM ACCIDENT INVOLVEMENT.

WARNING: THE WORD "WARNING" DENOTES A POTENTIAL OR HIDDEN HAZARD WHICH HAS A POTENTIAL FOR SERIOUS INJURY. IT IS USED TO WARN OPERATORS AND OTHERS TO EXERCISE EVERY APPROPRIATE MEANS TO AVOID A SURPRISE INVOLVEMENT WITH MACHINERY.

DANGER: THE WORD "DANGER" DENOTES A FORBIDDEN PRACTICE IN CONNECTION WITH A SERIOUS HAZARD.

ADDITIONAL PRECAUTIONARY STATEMENTS SUCH AS "ATTENTION" AND "IMPORTANT" ARE FOLLOWED BY SPECIFIC INSTRUCTIONS. THESE STATEMENTS ARE INTENDED FOR MACHINE SAFETY.

MACHINE SAFETY!

ATTENTION: THE WORD "ATTENTION" IS USED TO WARN THE OPERATOR OF POTENTIAL MACHINE DAMAGE IF A CERTAIN PROCEDURE IS NOT FOLLOWED.

IMPORTANT: THE WORD "IMPORTANT" IS USED TO INFORM THE READER OF SOMETHING HE NEEDS TO KNOW TO PREVENT MINOR MACHINE DAMAGE IF A CERTAIN PROCEDURE IS NOT FOLLOWED.

IMPORTANT!

FAILURE TO FOLLOW THE "CAUTION", "WARNING", AND "DANGER" INSTRUCTIONS MAY POSSIBLY RESULT IN SERIOUS BODILY INJURY.

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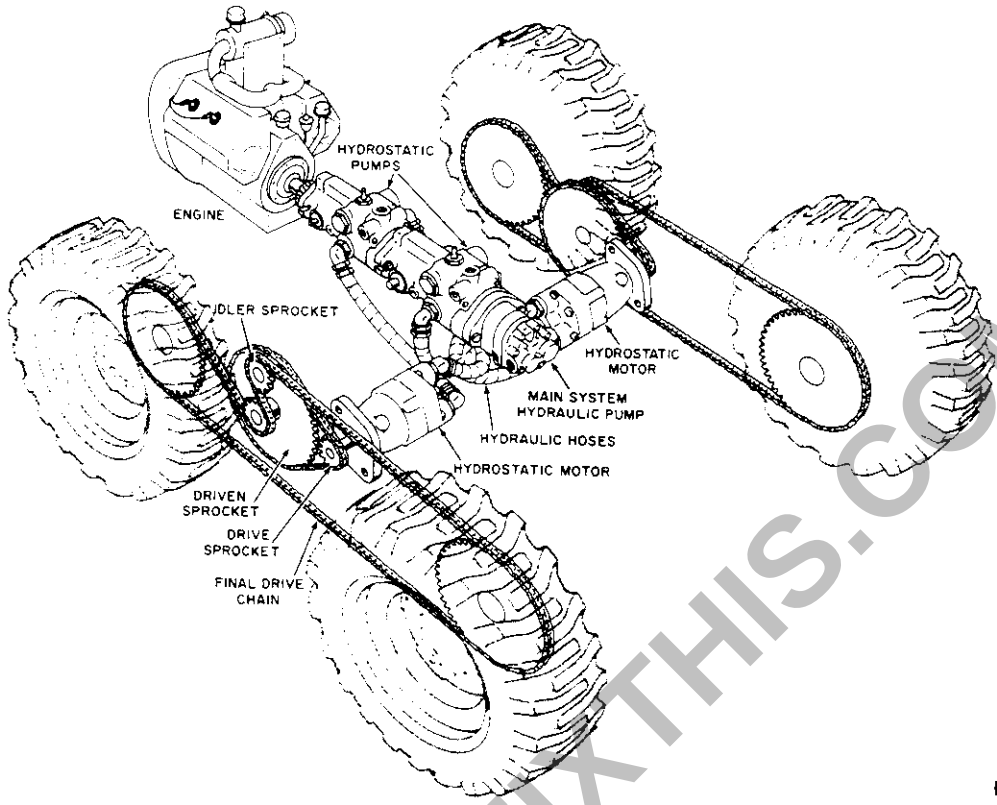
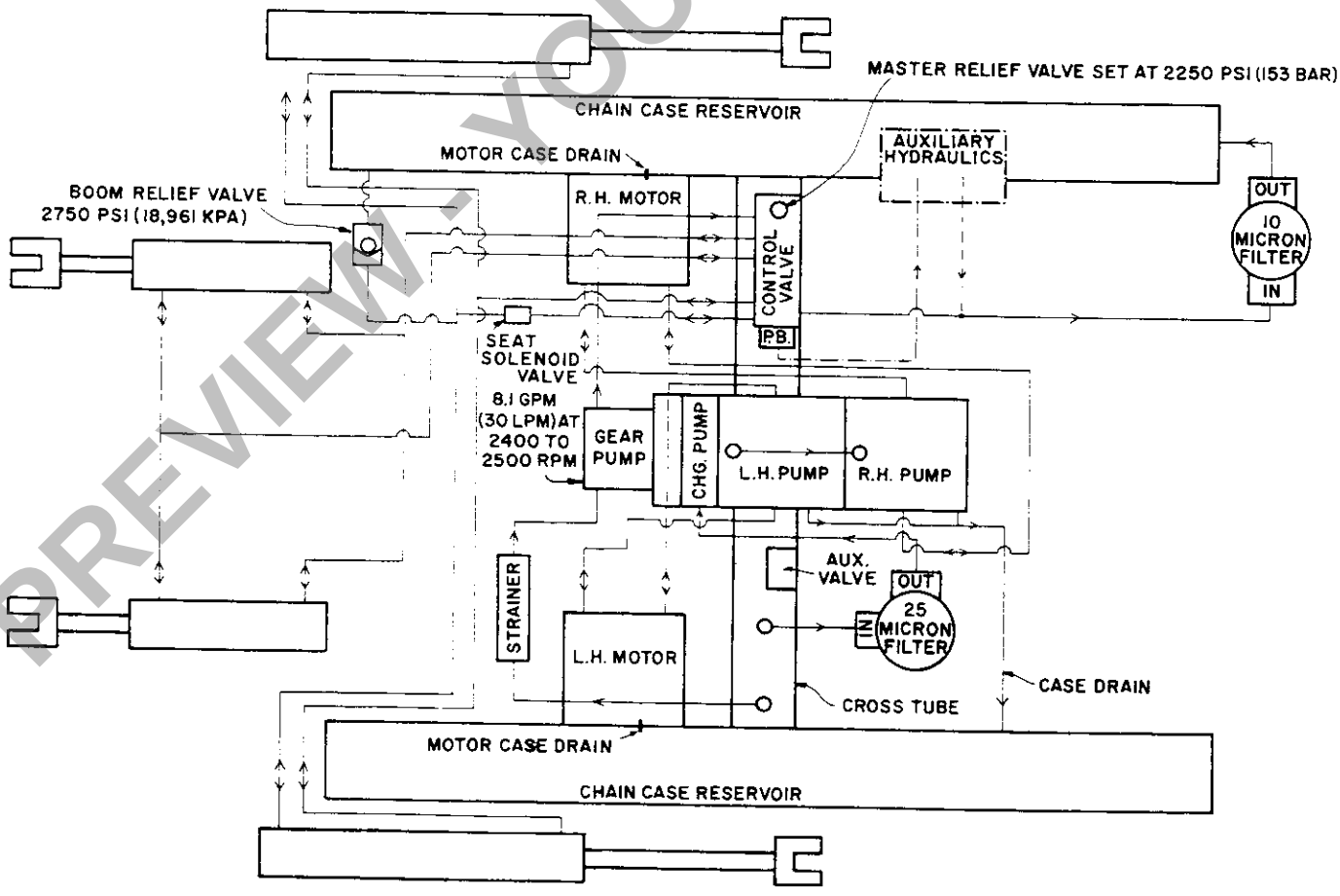


FIGURE 1 A



L-445 LOADER HYDRAULIC DIAGRAM

FIGURE 2

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SECTION 11
ELECTRICAL SYSTEM

ALTERNATOR TEST FOR STANDARD 12-VOLT NEGATIVE GROUND RA SERIES MOTOROLA ALTERNATORS WITH ISOLATION DIODE

The following tests are made with the alternator in the loader with output and regulator connections maintained to the alternator except as noted in steps 4 and 5. Steps 4 and 5 require the removal of the regulator and disconnection of leads between the regulator and the alternator. Remove and disconnect carefully.

CAUTION: BEFORE WORKING ON LOADER BE SURE PARKING BRAKE IS SET AND BOOM IS FULLY RAISED AND RESTING ON THE BOOM LOCK ARMS. USE THE SEAT BELT WHILE TESTING THE UNIT OR MOVING UNIT AROUND.

TEST PRECAUTIONS:

DO NOT disconnect alternator output lead while alternator is operating.

DO NOT disconnect voltage regulator while alternator is operating.

DO NOT ground field terminal.

Check battery condition. Use a fully charged battery when testing alternator.

Disconnect ground cable of battery when removing and installing the alternator.

VOLTAGES INDICATED ARE FOR CORRECT OPERATION.

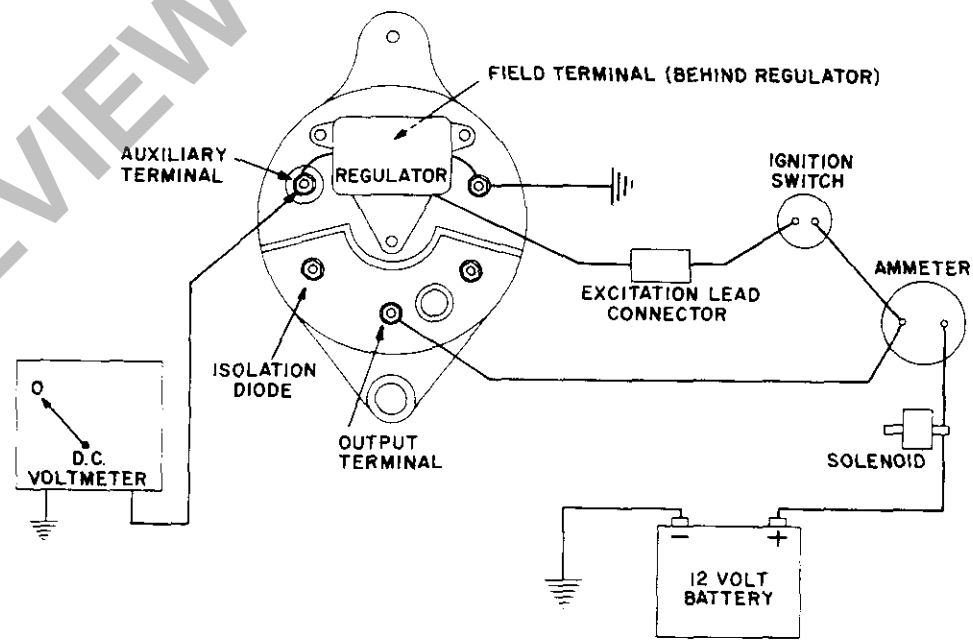


FIGURE 132

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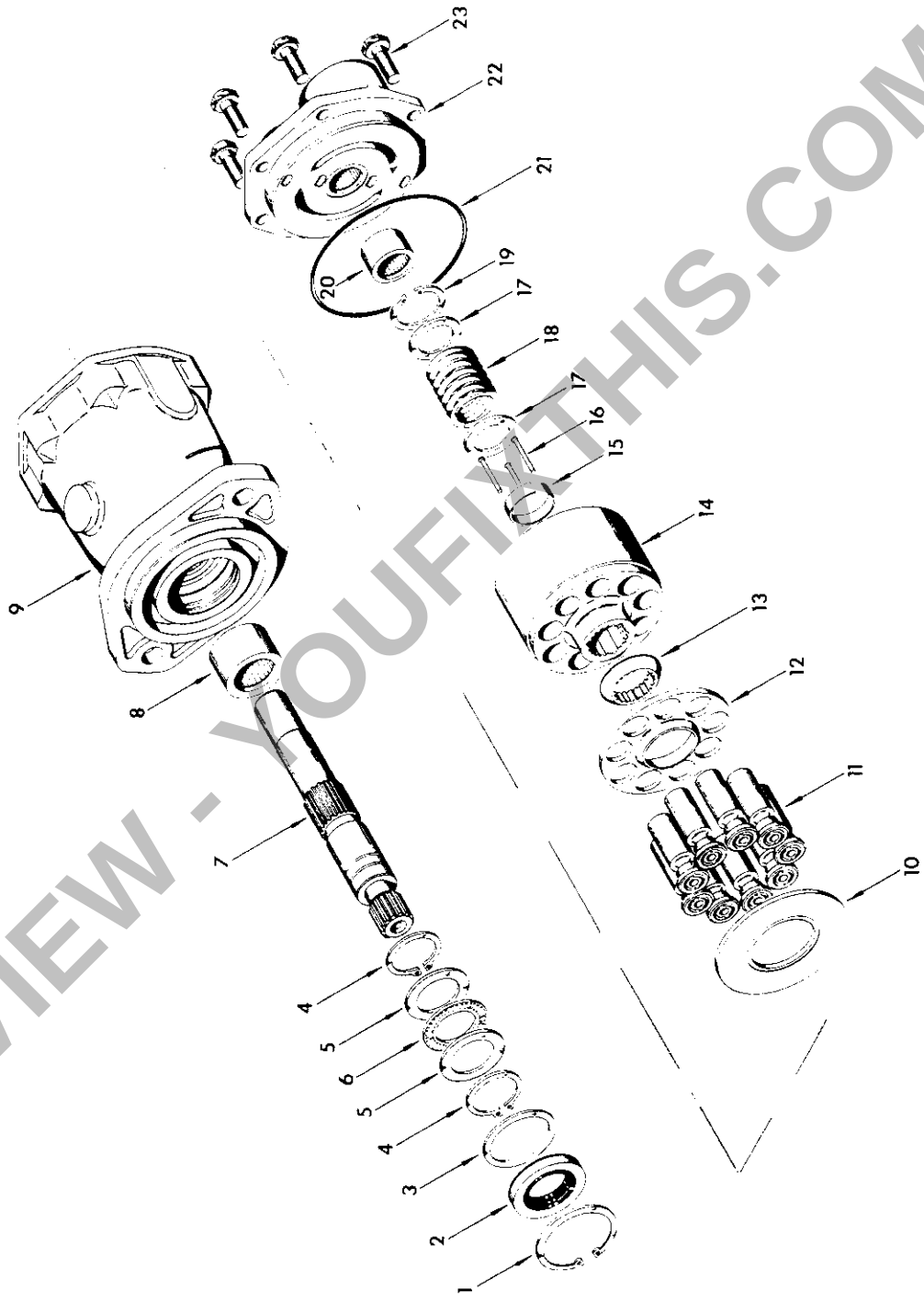


FIGURE 41

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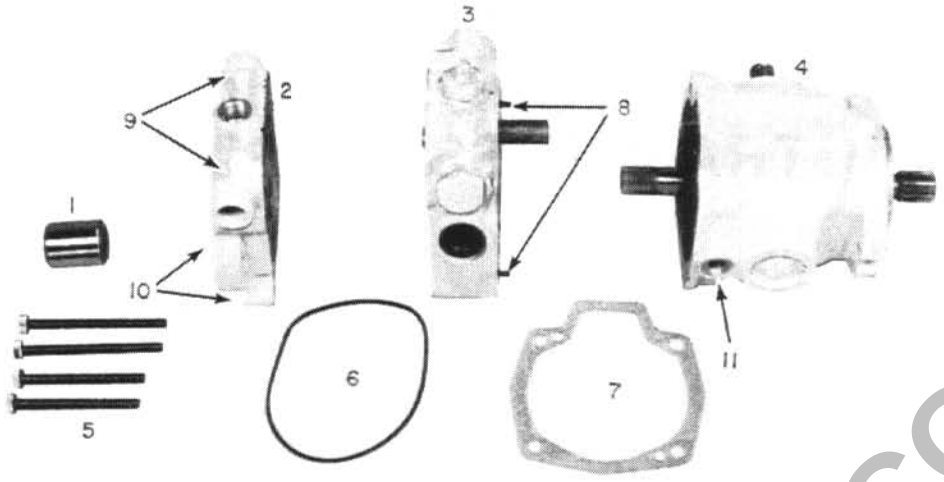


FIGURE 23

HYDROSTATIC PUMP DISASSEMBLY

1. Figure 23 shows the disassembly of the right (rear) hydrostatic pump assembly.
2. Thoroughly clean the outside of the pump.
3. Remove the four cap screws (5), Figure 23. Coupler (1) should be easily removed from adaptor plate (2).
4. Hold housing (4) securely and use a plastic mallet to tap adaptor plate (2) and loosen it from the back plate assembly (3). It may be necessary to secure the pump drive shaft in a protected jaw vise with the housing up to tap the adaptor plate free.
5. Remove the adaptor plate (2) and set aside.
6. In a similar manner, use a plastic mallet to tap and loosen the back plate (3). Remove the back plate assembly and set aside. An O-ring (6) seals the adaptor plate to the back plate, and a gasket (7) seals the back plate to the housing (4).
7. Figure 24 shows the two mating surfaces between back plate (3) and adaptor plate (2).
8. In Figure 24, (1) is the sealing O-ring, (4) plug, (5) tow valve, (6) charge check valves, (7) main system relief valves (4,000 psi or 4,500 psi — check parts book for application), (8) high pressure oil ports to hydrostatic motor, and (9) charge oil inlet port to the adaptor plate.
9. The charge check valves (1), Figure 25, can be removed by simply pulling them from the back plate with a pair of pliers. The charge check valve consists of a ball and pin retainer and is held in the back plate with an O-ring and back-up washer. The O-ring is installed next to the retainer pin end and the back-up washer on the ball seat end.

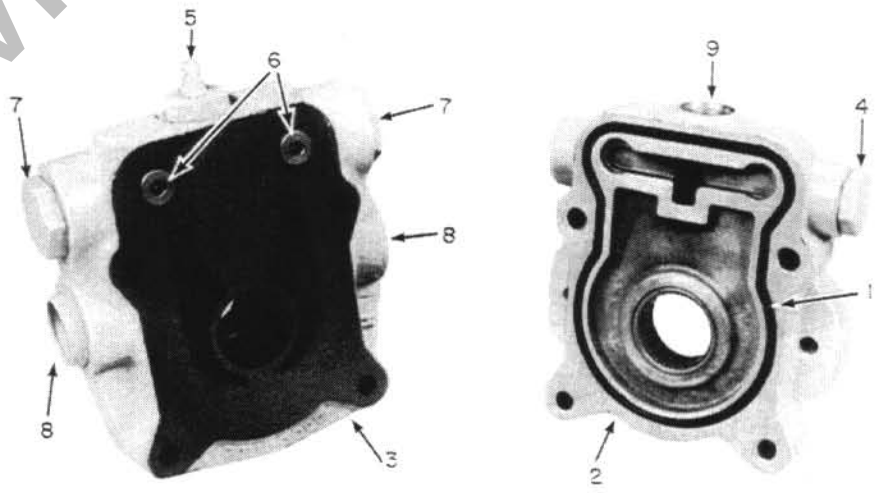


FIGURE 24

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SMALL FRAME LOADER
TROUBLE SHOOTING CHART

SERVICE PROBLEM	PROBABLE CAUSE	CORRECTION
I. Loader will not function —only engine runs. Transmission charge light stays on.	A. Main coupler from engine to pump assembly failed.	Check to see if engine output shaft is turning but input pump shaft is not. Remove and repair chain type coupler. Coupler can be replaced with drive shaft.
	B. Low oil level in reservoir.	Check reservoir for proper oil level and type of oil. Check for leaks, loose fittings and/or hoses and hose clamps.
	C. Plugged charge line filter and/or plugged inlet screen.	Remove and replace charge filter (no bypass type). Remove and clean inlet screen in suitable solvent.
II. Loader will not move yet boom and bucket operate properly.	A. Transmission control linkage loose or misadjusted.	Check steering linkage back to the transmission pintle shafts for proper hardware torque. Be sure square key is in keyway on pintle shafts. Adjust linkage properly.
	B. Winching valves turned to "winch" position.	Winching valves should be turned straight in line from front to rear of machine. This is the operating position. See loader operator's manual "Winching Valve" section.
	C. Internal failure of hydrostatic transmission. (Charge pressure light blinks on).	Check charge pump for proper pressure. See "Loader Start-up" section of this manual. If no or low pressure, check for loose charge pressure relief valve in charge pump inlet. Check for scored or faulty gerotor assembly.
		Check high pressure output of hydrostatic pump. See the following section on "Transmission Trouble Shooting".
	D. Final drive chain failure.	Turn the winching valves to the "winch" position; release brake and see if the wheels can be rotated by hand (two persons may be needed). Both wheels on one side should turn together. If one wheel turns only or the wheels appear to be locked, open the center inspection cover on the chain case and check for final drive failure. See "Final Drive Repair" section of this manual.

Refer to the operator's manual for other service and trouble shooting tips.

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SPECIFICATIONS

L-225

ENGINE

Manufacturer	Wisconsin
Model	TJD
Speeds —	
Fast (No Load)	3000 ± 50 PRM
Idle (No Load)	1100 — 100 RPM
Horsepower (Manufacturer's Rating)	18 @ 3000
Valve Clearance —	
Intake (Cold)	0.008" (0.203 mm)
Exhaust (Cold)	0.016" (0.406 mm)
Spark Advance	20° @ 2000 RPM
Spark Plug Gap	0.030" (0.76 mm)
Breaker Point Gap (Magneto)	0.015" (0.38 mm)
Spark Plug Tightening Torque	24-26 ft. lbs. (33-35 N·m)

CAPACITIES

Gas Tank	10 gal. (38.1 l)
Engine Crankcase	3.5 qts. (3.31 l)
Chain Case Reservoir	16 gal. (57.1 l)

HYDRAULIC SYSTEM

Pump —	
Make and Model	Cessna Gear Type
Output	7.3 GPM (27.6 l/min) @ 3000 RPM - 2250 psi (153 bar)

TRANSMISSION

Manufacturer	Cessna
Pump	Variable Displacement Piston Type
Motor	Fixed Displacement Piston Type
Filter — Suction — No by-pass	25 Micron Replaceable Cartridge (252329)
Charge Pressure Setting	90-150 psi (6.8-10.2 bar)
Charge Pressure Warning Light Setting	50 psi (3.4 bar)
Relief Pressure (Transmission)	4000 psi (272 bar)
	Early Models — 4500 psi (306 bar)

ELECTRICAL SYSTEM

Battery	12-volt BCI group — 3ET with a 20 hour rate of 75 amp hours minimum
Alternator Capacity	30 amp
Light Circuit Protection	Fuse — 20 amp

TRAVEL SPEEDS

Forward and Reverse	0 to 6.9 mph (0-11 km/hr)

TIRES SIZES AND INFLATION

27 x 8.50 x 15	40 psi (3.2 kg/cm²)
27 x 10.50 x 15	40 psi (3.2 kg/cm²)

OPERATING WEIGHT (WITH FULL FUEL TANK)

With 54" Utility Bucket and 175 lb. Operator	3028 lb. (1373 kg)

LIFTING CAPACITY

Hydraulic Lifting Capacity to Maximum Height (SAE)	900 lbs. (407 kg)

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SMALL FRAME LOADER SERVICE

BOLT TORQUE CHART

	(Foot Pounds) Ft. lbs.	(Newton-Meters) N·m
FINAL DRIVE		
#60 Chain Idler Nuts	66-70	89-94
Brake Disc Bolts (⅜") 9.5 mm	30	41
Brake Disc Bolts (5/16") 7.9 mm	15-18	20-24
Chain Case Cover Bolts (5/16") 7.9 mm	15-18	20-24
Wheel Lug Bolts	150	203
Bearing Cap Bolts	18	24
GEAR PUMP		
Case Bolts	25-28	34-37
TRANSMISSION		
Pump - Case Bolts	18	24
Tie Bolts	25	34
Mounting Bolts	25	34
Cam Plate Arm Bolts (5/16") 7.9 mm	15	20
Motor - Case Bolts	15-18	20-24
Mounting Bolts	66	89
CYLINDERS		
Bucket Cylinder Piston Nut	50-60	67-81
Spanner Nut	50-55	67-74
Boom Cylinder Piston Nut	65-70	81-101
Bearing Nut	100-125	135-168
ENGINE MOUNTING HARDWARE		
Wisconsin — L-425, L-445		
Engine Mount to Frame Bolts	66	89
DEUTZ — L-445 — F2L - 411 F2L - 511		
Engine to Engine Mount Bolts	14 mm 94 (4 on rear)	126
	12 mm 57 (3 on front)	76
	10 mm 32 (2 on front)	43
Engine Mount to Frame Bolts	⅝" 140 (4 under)	190
	½" 66 (4 rear)	89
Kohler — L-325		
Engine Mount to Frame Bolts	66	89

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CAUTION!

BE A SAFE OPERATOR. Before attempting to operate the loader, thoroughly acquaint yourself with:

1. The safety information in the operator's manual and the skid-steer loader safety manual.
2. The operating instructions in the operator's manual.
3. The controls on the loader.

OSHA REQUIREMENTS NOW MAKE IT THE EMPLOYER'S RESPONSIBILITY TO FULLY INSTRUCT EACH OPERATOR IN THE PROPER AND SAFE OPERATION OF ALL OPERATIVE EQUIPMENT. BOTH EMPLOYER AND EMPLOYEE SHOULD THOROUGHLY FAMILIARIZE THEMSELVES WITH THE FOLLOWING SECTIONS.

SAFETY INFORMATION

UNSAFE OPERATING PRACTICES AND IMPROPER USE OF THE LOADER AND ITS ATTACHMENTS ON THE PART OF THE OPERATOR CAN RESULT IN INJURIES. OBSERVE THE FOLLOWING SAFETY PRECAUTIONS AT ALL TIMES:

1. **GIVE COMPLETE AND UNDIVIDED ATTENTION TO THE JOB AT HAND SO COMPLETE CONTROL OF THE LOADER IS MAINTAINED AT ALL TIMES.**
2. **DRIVE SLOWLY OVER ROUGH GROUND AND ON SLOPES. KEEP ALERT FOR HOLES, DITCHES AND OTHER IRREGULARITIES THAT MAY CAUSE LOADER TO OVERTURN.**
3. **AVOID STEEP HILLSIDE OPERATION WHICH COULD CAUSE LOADER TO OVERTURN.**
4. **REDUCE SPEED WHEN TURNING SO THERE IS NO DANGER OF LOADER OVERTURNING.**
5. **ALWAYS LOOK BEHIND YOU BEFORE BACKING UP.**
6. **MAINTAIN PROPER TRANSMISSION OIL LEVEL TO PREVENT LOSS OF BRAKING CONTROL.**
7. **DO NOT ALLOW CHILDREN TO OPERATE THE LOADER.**
8. **DO NOT ALLOW ADULTS TO OPERATE LOADER WITHOUT PROPER INSTRUCTIONS.**

   OSHA REQUIRES THAT ALL OPERATORS BE INSTRUCTED ON THE PROPER OPERATION OF THE MACHINE BEFORE THEY OPERATE THE UNIT.
9. **DO NOT ALLOW PASSENGERS TO RIDE ON LOADER AT ANY TIME.**
10. **DO NOT OPERATE LOADER IN ANY POSITION OTHER THAN WHILE IN THE OPERATOR'S SEAT WITH THE SEAT BELT SECURELY FASTENED.**
11. **BEFORE STARTING ENGINE, BE SURE ALL OPERATING CONTROLS ARE IN NEUTRAL.**
12. **NEVER OPERATE LOADER ENGINE IN A CLOSED BUILDING WITHOUT ADEQUATE VENTILATION.**
13. **RE-FUEL LOADER OUTDOORS WITH THE ENGINE SHUT OFF. REPLACE GAS CAP SECURELY. USE AN APPROVED GASOLINE OR DIESEL CONTAINER. DO NOT SMOKE WHEN HANDLING FUEL. AVOID SPILLING.**

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6. Install Teflon piston ring over O-ring by carefully working Teflon ring over piston and into the groove. The Teflon ring will stretch as it is installed on the piston and it must be compressed after installation to help it return to its original size. It is suggested that a hose clamp could be used as a field tool to compress the piston ring. Do not damage the Teflon ring with the clamp.
7. Install the piston on the piston rod and retain with lock nut, torque lock nut to 60-75 ft. lbs. (81-101 N·m). Use a liberal amount of Loctite® sealant between the piston and piston rod at (2), Figure 76. This will seal the rod to the piston.
8. Oil piston liberally and insert in barrel I.D.
9. Slide piston into barrel until bearing can be inserted into barrel.
10. Torque the bearing to 100-125 ft. lbs. (135-168 N·m).
11. Cycle cylinder and check for leaks.

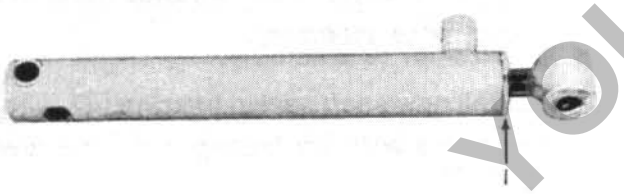


FIGURE 78

BUCKET TILT CYLINDERS

A. Disassembly

1. Thoroughly clean outside of the cylinder.
2. Use a spanner wrench to unscrew the stake nut from the barrel. See (1), Figure 78.

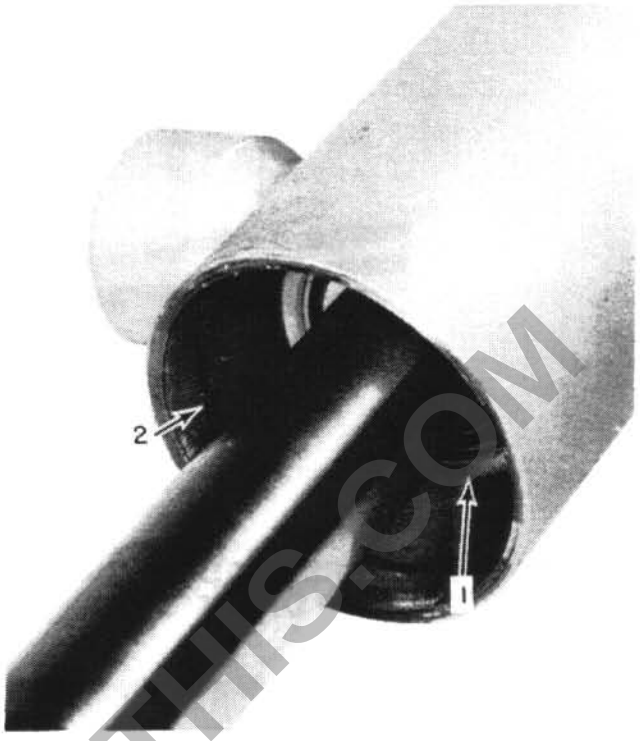


FIGURE 79

3. Depress the bearing (1), Figure 79, approximately 1" (25 mm) to expose lock ring (2).
4. Use a screw driver to insert and remove the lock ring from the groove.
5. Pull the piston rod assembly out to remove the bearing. See Figure 80.
6. Remove the piston retaining nut (1) from the rod and remove piston (2), Figure 80.
7. Remove Teflon piston ring and O-ring at (2), Figure 80 (O-ring under Teflon ring).
8. Remove O-ring (3), back-up washer (4), wiper seal and shaft seal (5) from bearing. See Figure 80. The piston ring, O-ring, back-up washer, lock ring, and shaft seals should be replaced as new items. These items are included in the seal repair kit.
9. Thoroughly clean and dry all parts.

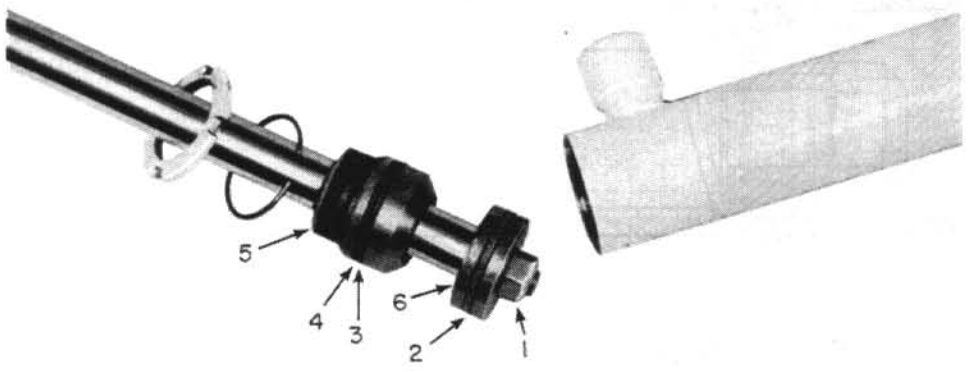


FIGURE 80

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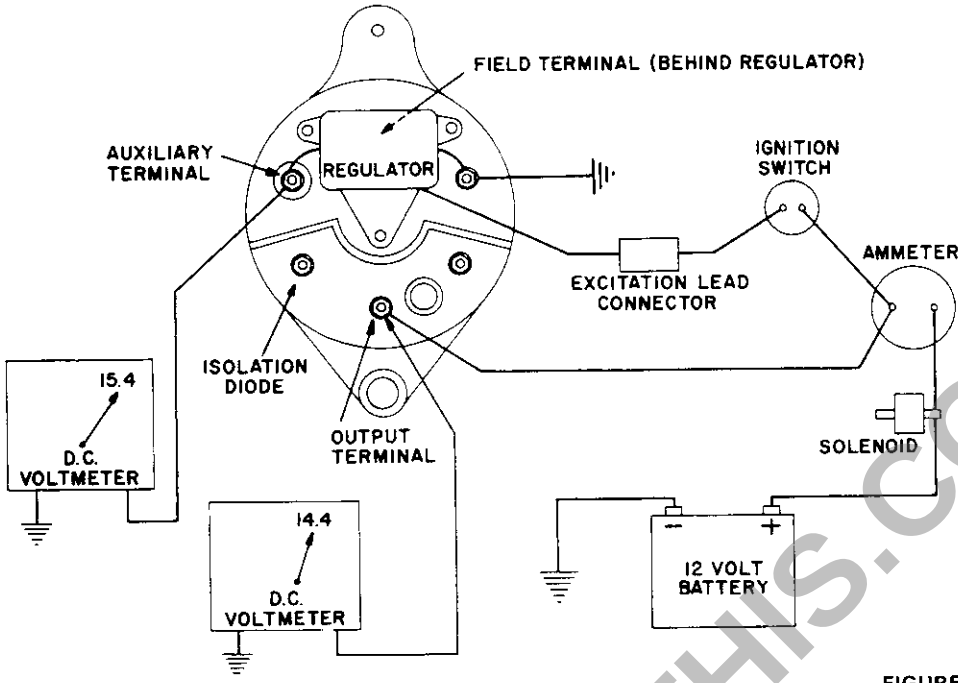


FIGURE 134

4. **Alternator Field Draw Test**
(Key off.)

Remove regulator and disconnect leads between regulator and alternator.

NOTE: Battery cable should be removed from battery when removing regulator. This test evaluates complete field circuit, independent of voltage regulator. Circuit is through brushes, slip rings, field coil to ground. Current should be 2 to 2.5 amps. If less than this, check brushes and slip rings.

It is desirable to use a field rheostat in series with meter for protection of the meter. If field is shorted, excessive current would flow through meter and possible damage would result. See Figure 135.

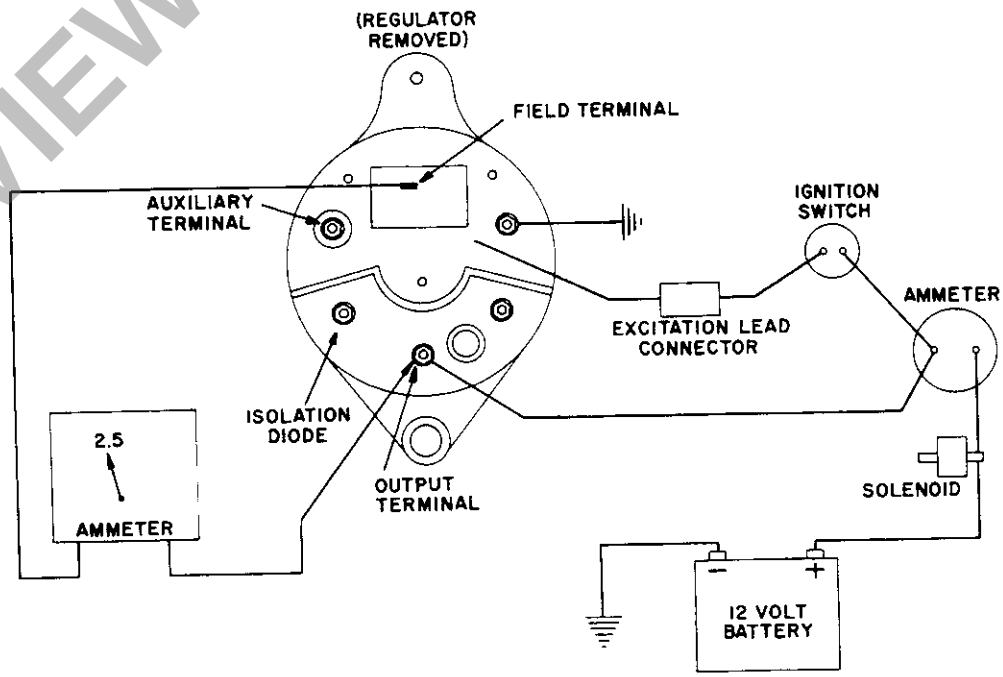


FIGURE 135

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