SERVICE MANUAL

SKID-STEER LOADER
L-451, L-452, L-454, L-455

NEW HOLLAND

40045140

Reprinted

INTRODUCTION

This manual provides the technical information needed to properly service and maintain the Models L-451, L-452, L-454, and L-455 skid-steer loaders. Use this manual in conjunction with the operator's manual which is supplied with the loader. Keep both manuals available for ready reference. For information on engine repair, refer to the engine manufacturer's service manual.

On New Holland equipment, left and right are determined by standing behind the unit, looking in the direction of travel.

The easiest and least time-consuming removal, disassembly, and reassembly procedures are detailed in this manual. Modifying these procedures is not recommended.

The Model L-450 series skid-steer loader has been designed with emphasis on safety for operator protection. However, careless and negligent operation can still result in serious injury to persons or property. Be sure to read and follow all safety instructions in this manual.

Your New Holland dealer is interested in your obtaining the most from your investment. He will be glad to answer any questions you may have about your loader. When major service is required, his staff of trained servicemen is ready to serve you.

When in need of parts, always order genuine New Holland service parts from your New Holland dealer. Be prepared to give your dealer the model and serial number of the engine and loader. Locate these numbers now and record them below.

Loader Model _____

Loader Serial Number _____

Engine Model _____

Engine Serial Number _____

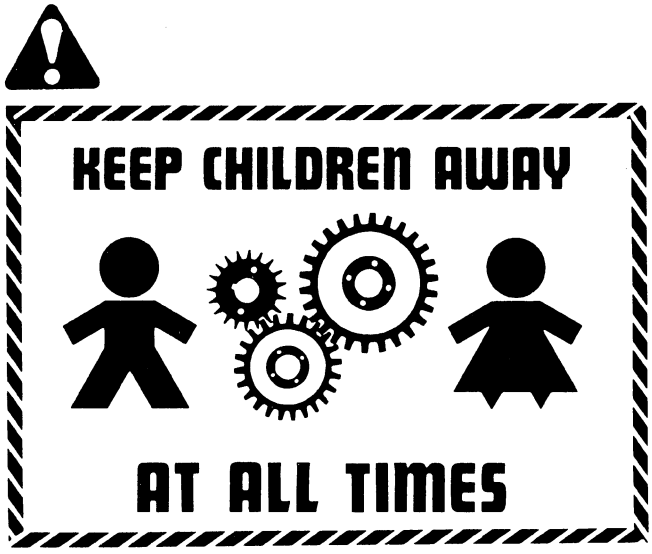
CAUTION: THIS SYMBOL IS USED THROUGHOUT THIS BOOK WHENEVER PERSONAL SAFETY IS INVOLVED. TAKE TIME TO READ AND FOLLOW THE INSTRUCTIONS. BE CAREFUL!

IMPROVEMENTS

New Holland is continually striving to improve its products. We reserve the right to make improvements or changes when it becomes practical and possible to do so, without incurring any obligation to make changes or additions to the equipment sold previously.

ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE

CONTENTS



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 OR DEATH.

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 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 THE LOADER TO OVERTURN.
3. AVOID STEEP HILLSIDE OPERATION WHICH COULD CAUSE THE LOADER TO OVERTURN.
4. REDUCE SPEED WHEN TURNING SO THERE IS NO DANGER OF THE LOADER OVER-TURNING.
5. ALWAYS LOOK BEHIND YOU BEFORE BACKING THE LOADER.
6. MAINTAIN PROPER TRANSMISSION OIL LEVEL TO PREVENT LOSS OF BRAKING CONTROL.
7. DO NOT ALLOW CHILDREN TO OPERATE THE LOADER OR RIDE ON THE LOADER AT ANY TIME.
8. DO NOT ALLOW ANYONE TO OPERATE THE LOADER WITHOUT PROPER INSTRUCTION. THIS MACHINE CAN BE DANGEROUS.

   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 THE LOADER AT ANY TIME. THEY COULD BE INJURED OR KILLED.
10. DO NOT OPERATE THE LOADER FROM ANY POSITION OTHER THAN THE OPERATOR'S SEAT WITH THE SEAT BELT SECURELY FASTENED, OR YOU COULD BE RUN OVER OR CRUSHED.
11. BEFORE STARTING THE ENGINE, BE SURE ALL OPERATING CONTROLS ARE IN NEUTRAL.
12. NEVER OPERATE THE LOADER ENGINE IN A CLOSED BUILDING WITHOUT ADEQUATE VENTILATION. ENGINE FUMES COULD INJURE OR KILL YOU.
13. REFUEL THE LOADER OUTDOORS WITH THE ENGINE SHUT OFF. REPLACE THE FUEL CAP SECURELY. USE AN APPROVED FUEL CONTAINER. DO NOT SMOKE WHEN HANDLING FUEL. AVOID SPILLING FUEL.
14. AFTER OPERATING THE ENGINE, NEVER TOUCH THE MUFFLER, EXHAUST PIPE OR ENGINE UNTIL THEY HAVE HAD TIME TO COOL.
15. DRESS APPROPRIATELY. WEAR RELATIVELY TIGHT-FITTING CLOTHING WHEN OPERATING THE LOADER. LOOSE OR TORN CLOTHING CAN CATCH IN MOVING PARTS OR THE CONTROLS.
16. PULL LOADS ONLY FROM THE REAR HITCH YOKE.
17. BEFORE SERVICING THE LOADER OR ANY OF ITS ATTACHED EQUIPMENT, BE SURE THE ATTACHMENTS ARE LOWERED TO THE GROUND OR THE BOOM ARMS ARE SUPPORTED BY THE BOOM LOCKS, THE UNIT IS SECURELY BLOCKED, AND THE ENGINE IS TURNED OFF. IF THE MACHINE WOULD MOVE OR THE BOOM DROP UNEXPECTEDLY, YOU COULD BE KILLED.
18. DO NOT WORK UNDER OVERHANGS, ELECTRIC WIRES, OR WHERE THERE IS DANGER OF A SLIDE.

19. WEAR AN APPROVED SAFETY HAT WHEN OPERATING THE MACHINE AND WHILE IN ANY WORK AREA.
20. WEAR A SUITABLE HEARING PROTECTIVE DEVICE SUCH AS EAR MUFFS OR EAR PLUGS IF YOU ARE EXPOSED TO NOISE WHICH YOU FEEL IS UNCOMFORTABLE.
21. WHEN DRIVING THE LOADER ON A ROAD OR HIGHWAY, USE WARNING LIGHTS OR WARNING DEVICES AS MAY BE REQUIRED BY LOCAL OR STATE GOVERNMENTAL REGULATIONS. HEADLIGHTS AND WARNING LIGHT KITS ARE AVAILABLE THROUGH YOUR NEW HOLLAND DEALER. SLOW MOVING VEHICLE SIGNS ARE SUPPLIED AS STANDARD EQUIPMENT.
22. KEEP THE LOADER CLEAN. DO NOT ALLOW TRASH, DEBRIS, OR OTHER ARTICLES TO ACCUMULATE IN THE CAB OR FLOOR AREA THAT MAY HINDER SAFE MACHINE OPERATION.
23. NEVER OPERATE THE LOADER WITH ANY OF THE SHIELDING REMOVED. THE SHIELDS ARE THERE TO PROTECT YOU.
24. NEVER OPERATE THE LOADER WITHOUT THE WINDOWS AND/OR SCREENS IN PLACE.
25. READ ALL SAFETY MESSAGES ON THE LOADER.
26. OBSERVE ALL WEIGHT LOAD LIMITS ON DOCKS, BRIDGES, AND TEMPORARY BRIDGING.

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.

CAUTION: PICTURES IN THIS MANUAL MAY SHOW PROTECTIVE SHIELDING OPEN OR REMOVED TO BETTER ILLUSTRATE A PARTICULAR FEATURE OR ADJUSTMENT.

BE CERTAIN, HOWEVER, TO CLOSE OR REPLACE ALL SHIELDING BEFORE OPERATING THE MACHINE.

DANGER!

FASTEN SEAT BELT

BEFORE STARTING ENGINE!

THIS LOADER IS A VERY STABLE UNIT, BUT IT CAN BE UPSET IF STOPPED SUDDENLY WHEN THE BUCKET IS RAISED AND LOADED.

THEREFORE, DO NOT START THE ENGINE BEFORE SECURELY FASTENING THE SEAT BELT, AND CARRY THE LOAD LOW.

SECTION 1
OPERATION

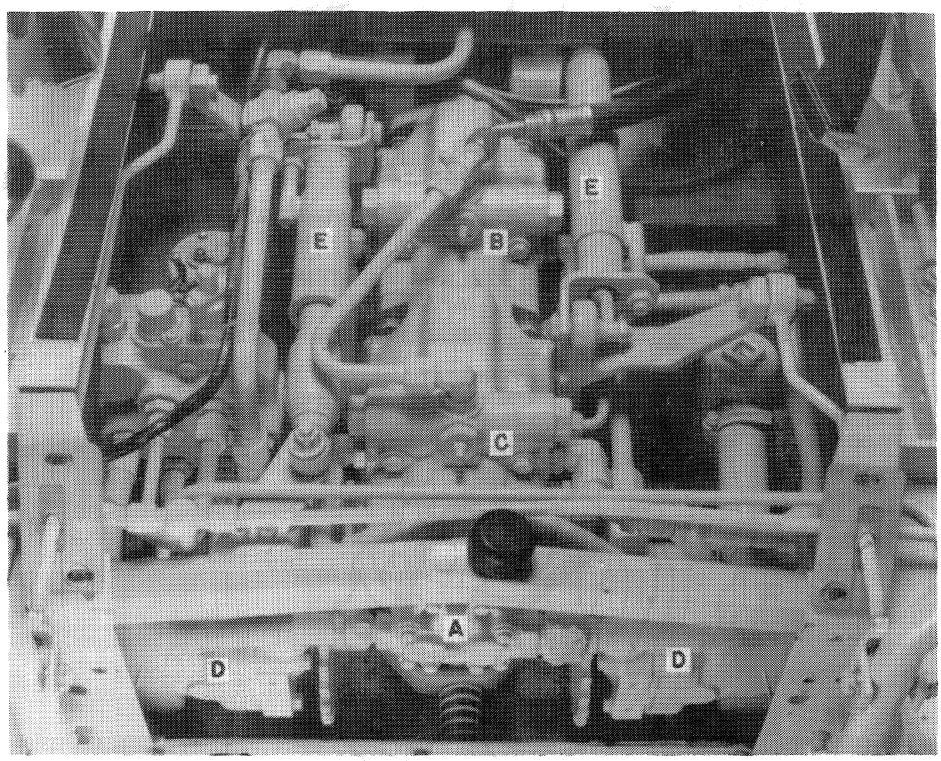


FIGURE 1-1

Figures 1-1 and 1-2 show the hydrostatic transmission and boom hydraulic systems of the skid-steer loader and point out the major components involved.

The New Holland loader features a fully hydrostatic drive with a tandem pump configuration. Two variable displacement piston pumps, B and C, Figure 1-1, operate the propulsion system, and one gear pump operates the hydraulic system, A, Figure 1-1. They are assembled as a unit and receive power directly from the engine. The two piston pumps are connected to two piston motors, D, Figure 1-1, (one for each final drive) by high pressure hoses.

The transmission pumps are controlled with two steering control levers. The control levers are connected to two neutralizers (spring-loaded shock absorbers), E, Figure 1-1, which automatically return the pintle arms to a positive neutral position. As the control levers are moved, they stroke the hydrostatic transmission pump pintle arms to the desired position. Hydrostatic pulsations and the torque feedback generated by drive train loads are resisted by the internal shock absorber neutralizer rather than by the operator's arms. This results in smoother operation and less operator fatigue.

Skid-steer loader usage is typified by rapid changes of speed and direction, with accompanying low speeds at times of heavy loader power demands. It is under those conditions that a hydrostatic transmission is more efficient than a mechanical drive train.

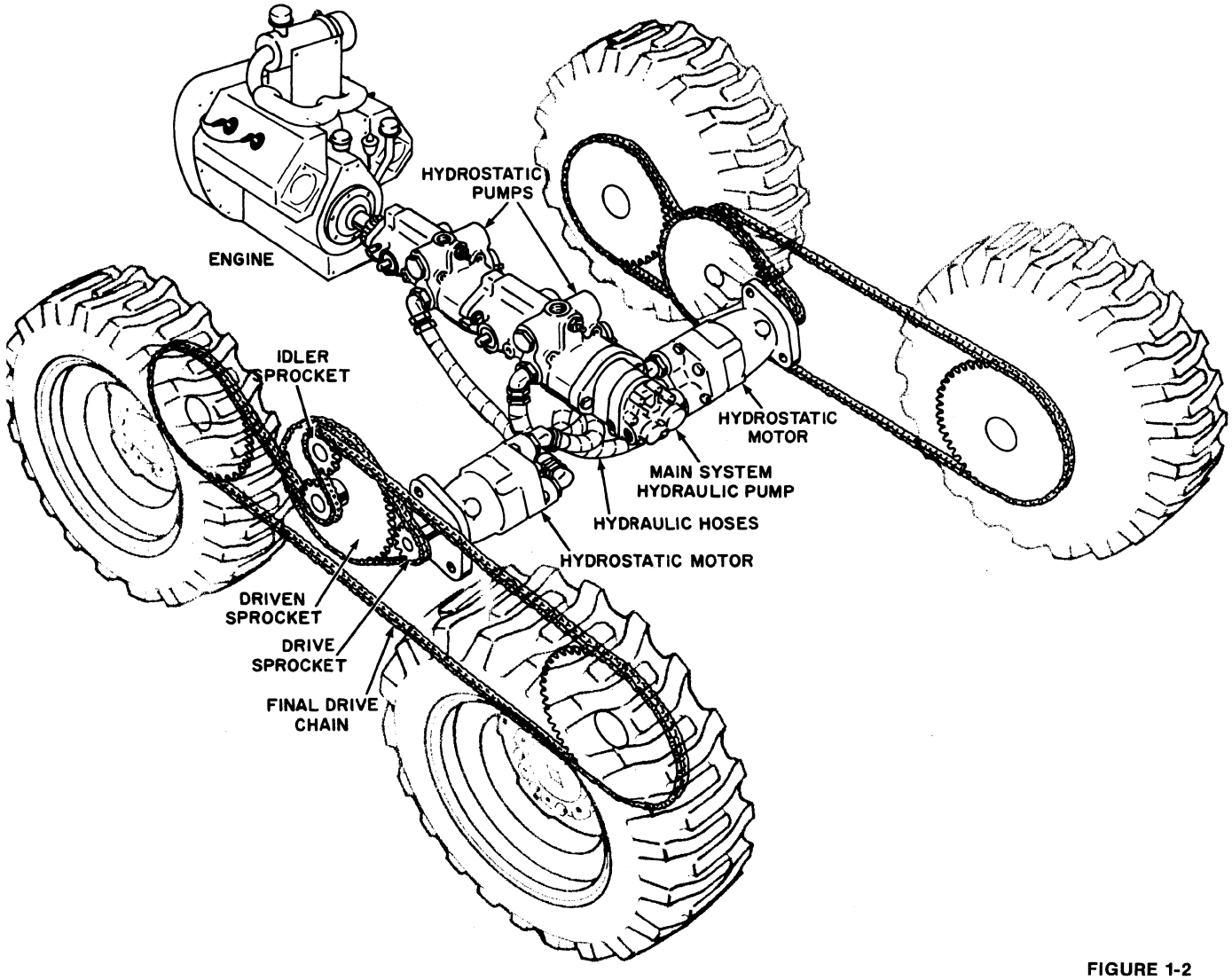


FIGURE 1-2

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 Skid-Steer Loader Safety Manual.**
2. **The operating instructions in the Operator's Manual.**
3. **The controls on the loader.**

When a loader digs into a pile of dirt, the operator strives to exert maximum tractive effort with very little speed. The variable displacement hydrostatic units are destroked so they drive the motors at the required slow speed while generating maximum torque. Minimum power losses occur because input speeds are reduced drastically below levels attainable with slipping clutches as used in mechanical drives.

To obtain maximum torque at the wheels, the control levers should be close to the neutral position. This differs from a mechanical drive unit where the operator pushes the control levers as far forward as possible to prevent the clutches from slipping. The positiveness of the hydrostatic drive at low speeds allows the operator to ease the bucket into loads, rather than using the impact loading technique which is so often necessary when using mechanically driven units.

SECTION 2
STEERING ADJUSTMENTS

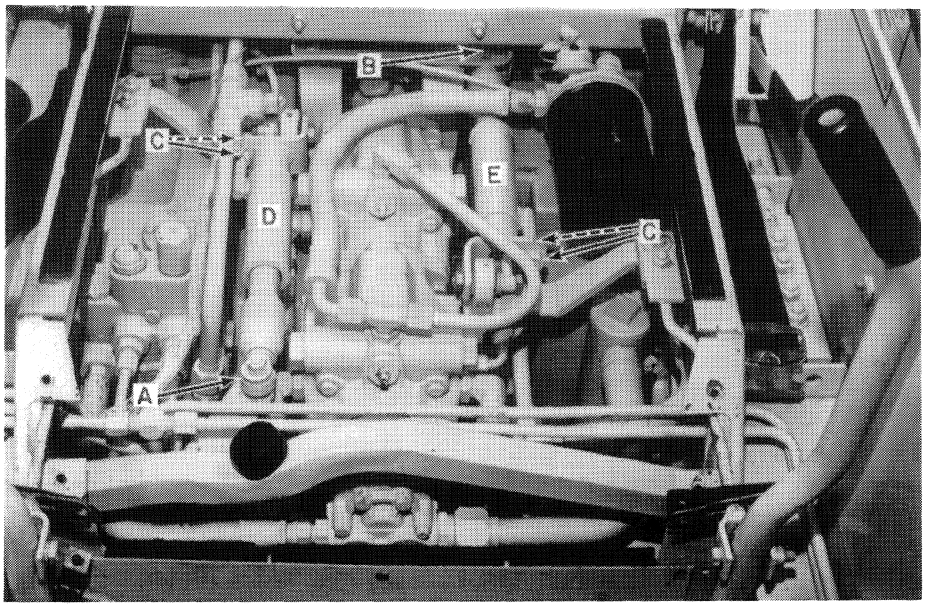


FIGURE 2-1

CAUTION: MAKE ALL ADJUSTMENTS WITH THE ENGINE STOPPED UNLESS OTHERWISE SPECIFIED.

If the machine creeps or the transmissions make a noise indicating they are being slightly stroked, a neutralizing adjustment is required.

Neutralizer, D, Figure 2-1, controls the right drive wheels. Neutralizer, E, controls the left drive wheels. Check for free play in the neutralizer tube assembly first. If free play is found, adjust nuts, C, on the side being adjusted until no free play is present. Tighten nuts, C, securely.

Remove all free play from the neutralizer tube assembly before adjusting the creep to insure the steering levers return to the set position each time.

CAUTION: TO ADJUST THE NEUTRALIZERS, BLOCK THE MACHINE OFF THE GROUND SO THE WHEELS TURN FREELY. RAISE THE BOOM AND PLACE IT ON THE BOOM LOCK ARMS. WHEN THE ENGINE IS RUNNING, STAY CLEAR OF THE ROTATING WHEELS AND ENGINE DRIVE SHAFT.

First loosen the bolts retaining the neutralizers (front end on right neutralizer, A, and rear end on left neutralizer, B, Figures 2-1 and 2-2). Start the engine. If the wheels creep forward, adjust one or both neutralizers to the rear. If the unit creeps rearward, adjust the neutralizers to the front. Stop the engine. Retighten the hardware.

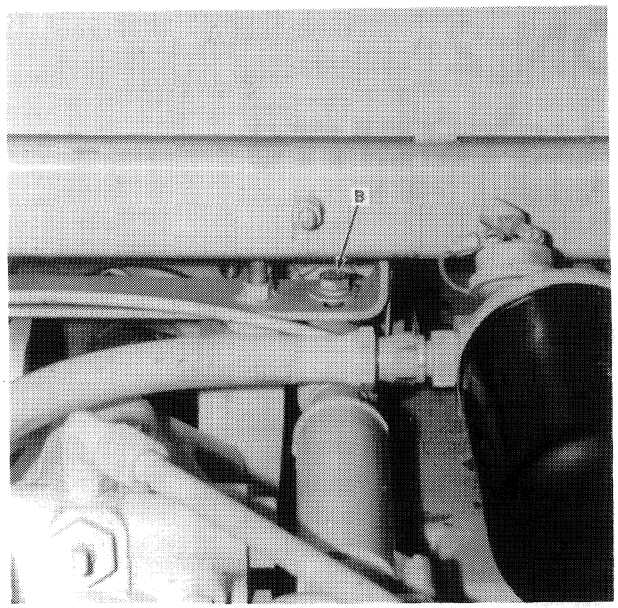


FIGURE 2-2

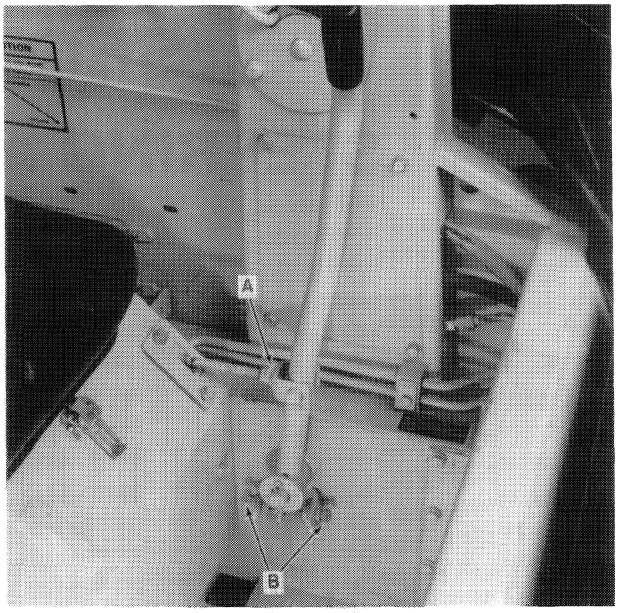


FIGURE 2-3

This procedure works best if the neutralizer hardware is left snug and the adjustment is achieved by bumping the control arms with the palms until proper adjustment is achieved. If, after adjusting the neutralizers, the control arms are not vertical, adjust the yoke on the end of the control rod so this is achieved, A, Figure 2-3.

CAUTION: STOP THE ENGINE BEFORE LOOSENING OR TIGHTENING BOLT, B, FIGURES 2-1 AND 2-2.

If the control arm yokes must be adjusted, readjust the control arm stop bolts. Rotate bolts, B, Figure 2-3, at the bottom of the control levers so they just touch the control levers when fully stroked in each direction. Then screw in all four bolts an additional ½ turn so they, rather than the transmissions, provide the stop.

IMPORTANT: If the external stops are not accurately set, the transmission pintle shaft and the rubber connector in the control linkage are susceptible to damage.

Use the jam nuts to lock the bolts in place. Any further adjustment to provide equal speed of both sides at full stroke should be done by further screwing in the stop on the faster side, B, Figure 2-3.

LABOR GUIDE

The following labor amounts are listed as a guide only. Working conditions and experience will vary the time it actually takes to complete each job.

Job	Man-Hours
Adjust neutral - both drives	1 hr.
Remove and rebuild one neutralizer assembly	1 hr.

SECTION 3

HYDROSTATIC TRANSMISSION REMOVAL

SPECIFICATIONS

HYDROSTATIC PUMPS

Hydrostatic pump to engine

Bell housing bolt torque ..... 3/8" x 2¼" - 25 ft. lbs. (34 N·m)

Hydrostatic pump mount to isolation mount

Bolt torque ..... 3/8" x 1½" - 25 ft. lbs. (34 N·m)

Hydrostatic pump isolation mount

Bolt torque ..... 3/8" x 2" - 20 ft. lbs.-25 ft. lbs. (27 N·m-34 N·m)

Cam plate control arm clamp bolt ..... 3/8" x 2" - 25 ft. lbs. (34 N·m)

HYDROSTATIC MOTORS

Hydrostatic motor housing to final drive

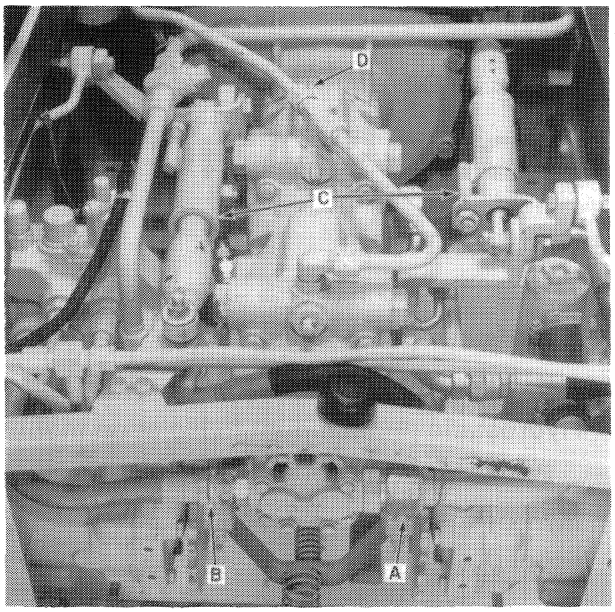
chain housing ..... ½" x 1¾" - 66 ft. lbs. (89 N·m)

CAUTION: BEFORE SERVICING THE LOADER OR ANY ATTACHED EQUIPMENT, BE SURE THE ATTACHMENTS ARE LOWERED TO THE GROUND OR THE BOOM ARMS ARE SUPPORTED BY THE BOOM LOCK ARMS.

Before removing the hydrostatic transmission pumps or motors from the loader, make a complete check of the hydraulic system. Use the "Troubleshooting" section of this manual as a guide to eliminate external transmission failures. The hydrostatic pumps or motors can be removed independently of each other if the problem is in only one component.

CAUTION: FOR EASIER ACCESS TO THE TRANSMISSION AREA, RAISE THE BOOM AND REST IT ON THE BOOM LOCK ARMS. IF THE LOADER MUST BE LIFTED OFF THE GROUND, ALWAYS USE JACK STANDS OR BLOCKS OF GOOD QUALITY. NEVER WORK BENEATH THE UNIT WHEN IT IS SUPPORTED BY THE HYDRAULIC SYSTEM.

SHIELDS REMOVED FOR CLARITY. **FIGURE 3-1**



SHIELDS REMOVED FOR CLARITY. **FIGURE 3-2**

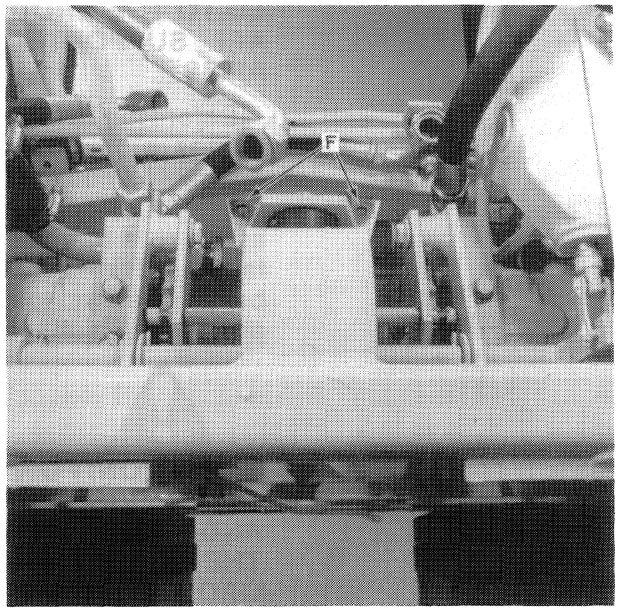
HYDROSTATIC PUMP REMOVAL

Steam clean the loader before any repairs are made to the hydraulic system. To insure maximum cleanliness of internal transmission parts, remove the tandem pump assembly as a unit, and plug all ports and lines as they are opened.

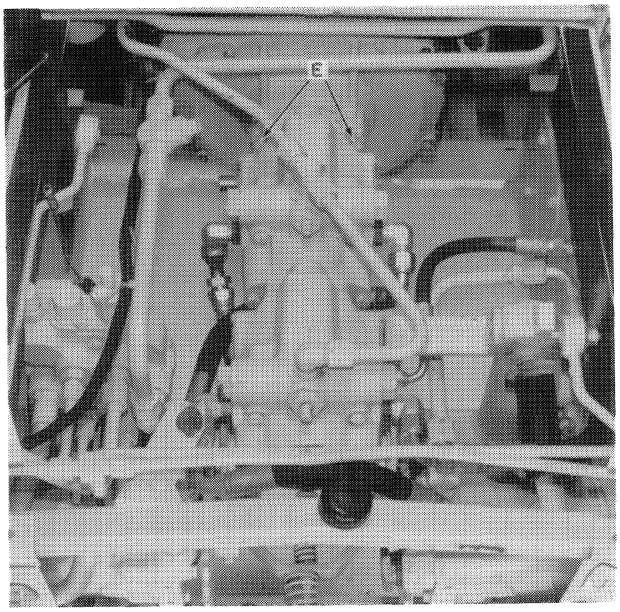
1. Raise the boom and extend the boom lock arms, A, Figure 3-1. Stop the engine. Turn the key to the "ON" position and work the boom and bucket pedals to relieve any residual hydraulic pressure before dismounting from the loader. Turn the ignition key off.
2. Jack up the loader and block it securely, B, Figure 3-1.

   NOTE: Hydrostatic pumps and motors can be removed without removing the fuel tank. Depending on the severity of the problem, you may want to remove the fuel tank at this time.
3. Remove the seat and front panel.
4. Remove suction hose, A, and high pressure hose, B, from the gear pump, Figure 3-2.
5. Remove the two retaining cap screws from the pump mount flange and slide the gear pump off the hydrostatic pumps.
6. Remove the steering neutralizers C, Figure 3-2, from the pintle lever control arms.
7. Remove charge pressure line, D, Figure 3-2, and all the hydraulic hoses from the hydrostatic pumps.
8. Remove the two mounting bolts, F, Figure 3-3.

   NOTE: The hydrostatic pumps were removed for clarity in Figure 3-3.



SHIELDS REMOVED FOR CLARITY. **FIGURE 3-3**



SHIELDS REMOVED FOR CLARITY. **FIGURE 3-4**

9. Remove the two mounting bolts, E, Figure 3-4, and slide the hydrostatic pumps out of spline, G, Figure 3-5.

   NOTE: Some models may use a U-joint drive coupler.

10. The complete hydrostatic pump assembly, Figure 3-6, can now be removed through the top or, if the belly pan and fuel tank have been removed, through the bottom.

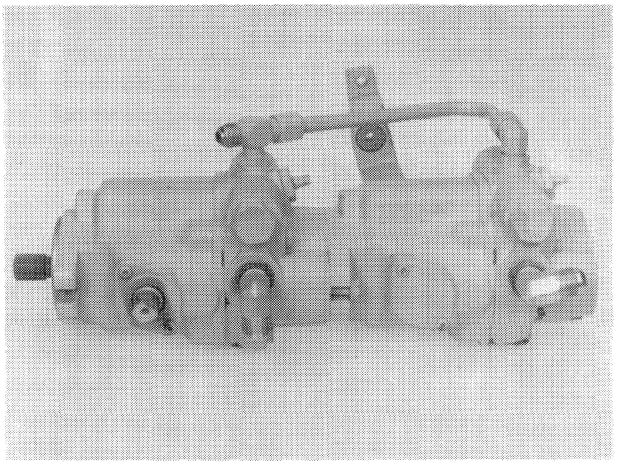


FIGURE 3-6

HYDROSTATIC MOTOR REMOVAL

Steam clean the loader before any repairs are made to the hydraulic system. Drain the hydraulic oil before removing the hydrostatic motors. To insure maximum cleanliness of the internal transmission parts, plug all ports and lines as they are opened.

1. Follow steps 1, 2, and 3 in the "Hydrostatic Pump Removal" section.
2. Remove the eight cap screws that secure the chain case side cover, Figure 3-7.
3. Either remove snap ring, A, Figure 3-7, so the motor shaft can be pulled out of the motor drive sprocket, or loosen the final drive chain and remove the #50 chain from the motor drive sprocket.

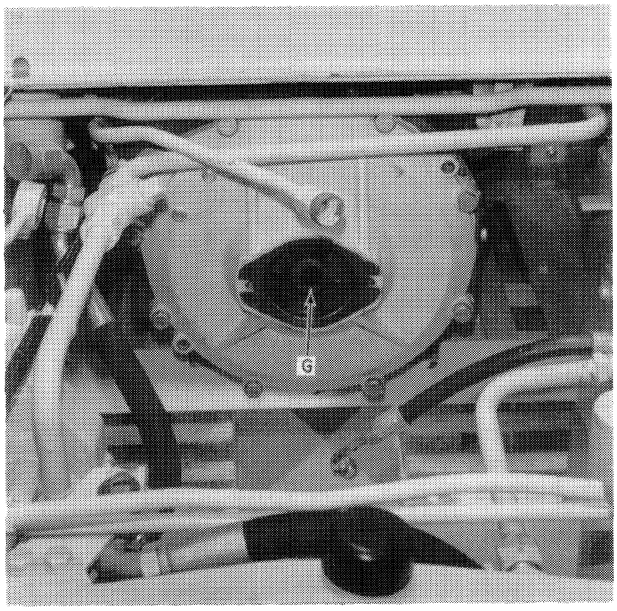


FIGURE 3-5

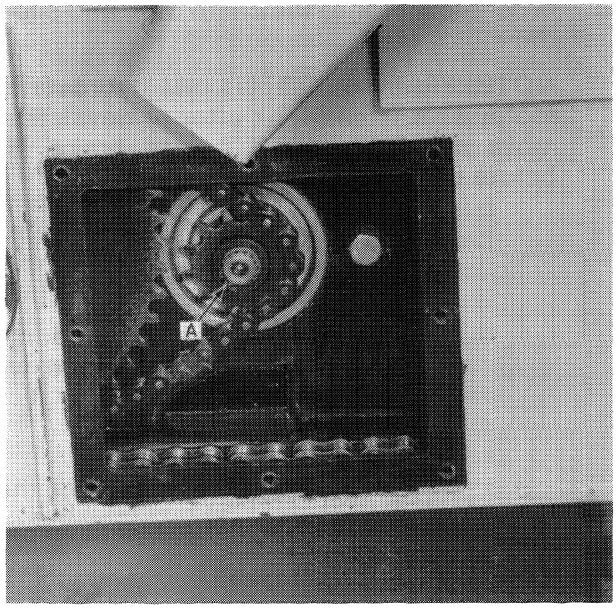
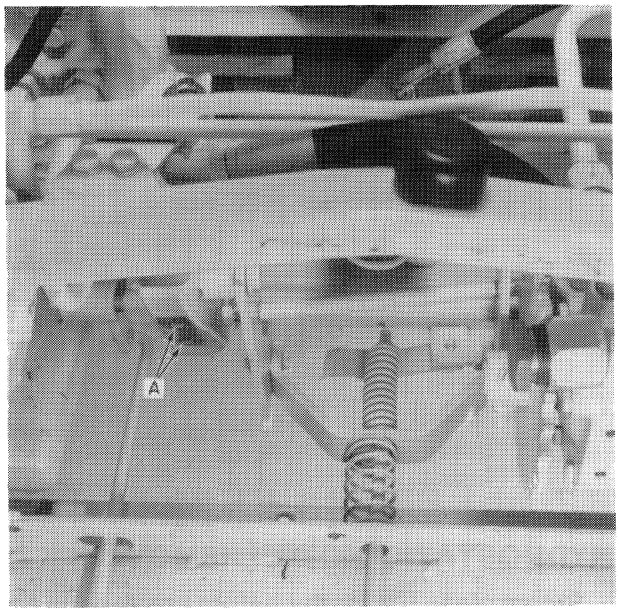


FIGURE 3-7



SHIELDS REMOVED FOR CLARITY. **FIGURE 3-8**

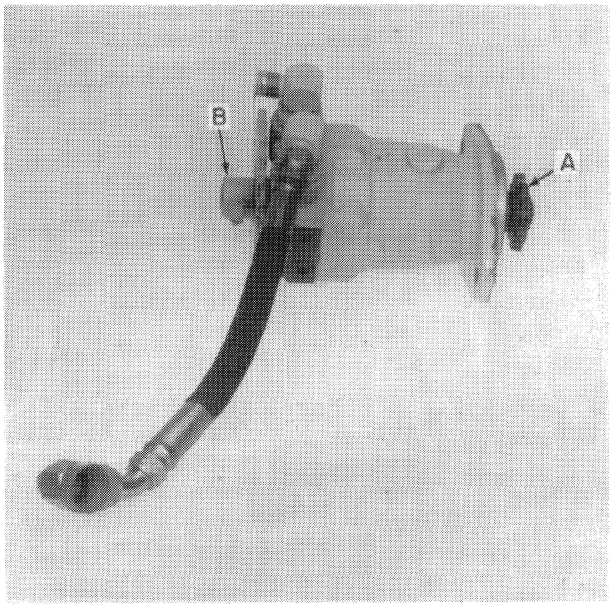


FIGURE 3-9

4. Remove the two brake bracket mount bolts, A, Figure 3-8. Be sure brake is disengaged before removing mount bolts.

   NOTE: Figure 3-8 shows one hydrostatic motor removed. The two brake bracket mount bolts are used to secure the bracket shown in Figure 3-8 to the rear of the hydrostatic motor.

5. Remove both hydraulic hoses from the hydrostatic motor.

6. Remove the two nuts that secure the hydrostatic motor to the chain case and slide the motor out.

   NOTE: Figure 3-9 shows one hydrostatic motor as it would look after removal. Remove motor sprocket, A, and brake, B, before disassembling the motor.

INSTALLATION OF HYDROSTATIC PUMPS AND MOTORS

Reverse the removal procedures.

NOTE: When installing the hydrostatic motors, lightly coat the two mounting bolt studs and mounting surfaces with silicone sealer. Be sure the hydraulic tubes and hoses are not rubbing anything that would damage them. Torque all hardware.

LABOR GUIDE

The following labor amounts are listed as a guide only. Working conditions and experience will vary the time it actually takes to complete each job.

Job	Man-Hours
Remove, repair, and replace the tandem pumps	7 hrs.
Remove, repair, and replace one hydrostatic motor	6 hrs.

Suggest:

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first, and then click the above link

to download the complete manual.

Thank you so much for reading

SECTION 4
HYDROSTATIC PUMP OVERHAUL

SPECIFICATIONS

Pump housing to valve plate bolts
5/16" x 2" or 5/16" x 2½" Grade 5 cap screw ..... 15 ft. lbs.-18 ft. lbs. (20 N·m-24 N·m)

Hydrostatic pump coupler bolts
⅜" x 1⅜" Grade 5 cap screw ..... 27 ft. lbs.-31 ft. lbs. (37 N·m-42 N·m)

Front and rear transmission mount bolts
⅜" x 2" or ⅜" x 1½" Grade 5 cap screw ..... 27 ft. lbs.-31 ft. lbs. (37 N·m-42 N·m)

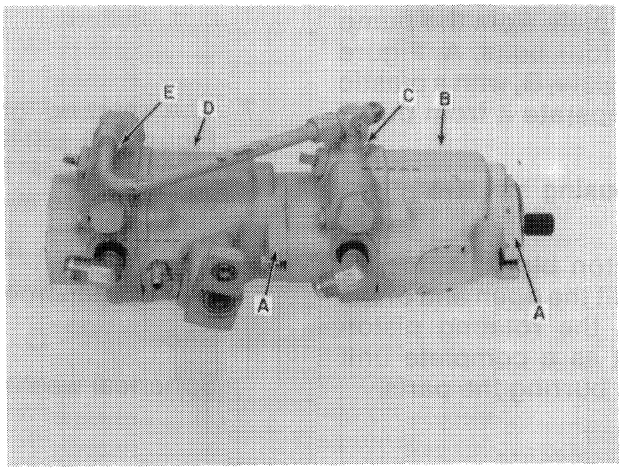

FIGURE 4-1

The hydrostatic pump assembly, Figure 4-1, consists of the right transmission pump, B, the right valve block, C, the left transmission pump, D, and the left valve block, E.

The valve blocks carry high pressure oil from the pumps to the motors via high pressure hoses. Low pressure oil from the motors flows back to the pumps through the valve blocks to complete the closed loop circuit.

NOTE: Dealer adjustment requests for oil leak repairs, other repairs, or overhaul of transmission pumps must include the model number of the transmission and the date code. These are stamped in the flange of the pump housings, A, Figure 4-1.

DISASSEMBLY

1. Clean the complete pump assembly, Figure 4-1, before teardown.
2. To insure proper reassembly, use a scratch awl to scratch lines across the pump housing and valve plates as shown by the dotted lines in Figure 4-1.
3. As the transmission pump is being overhauled, lay the parts on a clean wooden bench top or heavy cardboard to prevent damage to the machined surfaces.