International Harvester

Service Manual

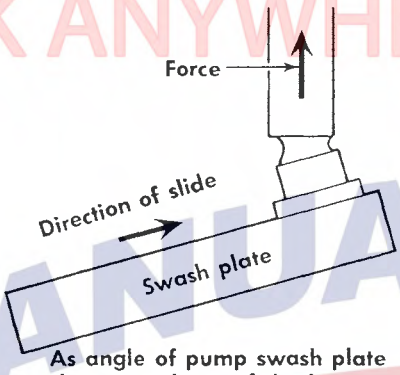
Hydrostatic Transmission Service & Testing

544, 656, 70, 86 & 666 Tractors

Service® Manual

IH-S-HYDRO TRN

CONTENTS



Illust. 3. Swash plate and piston.

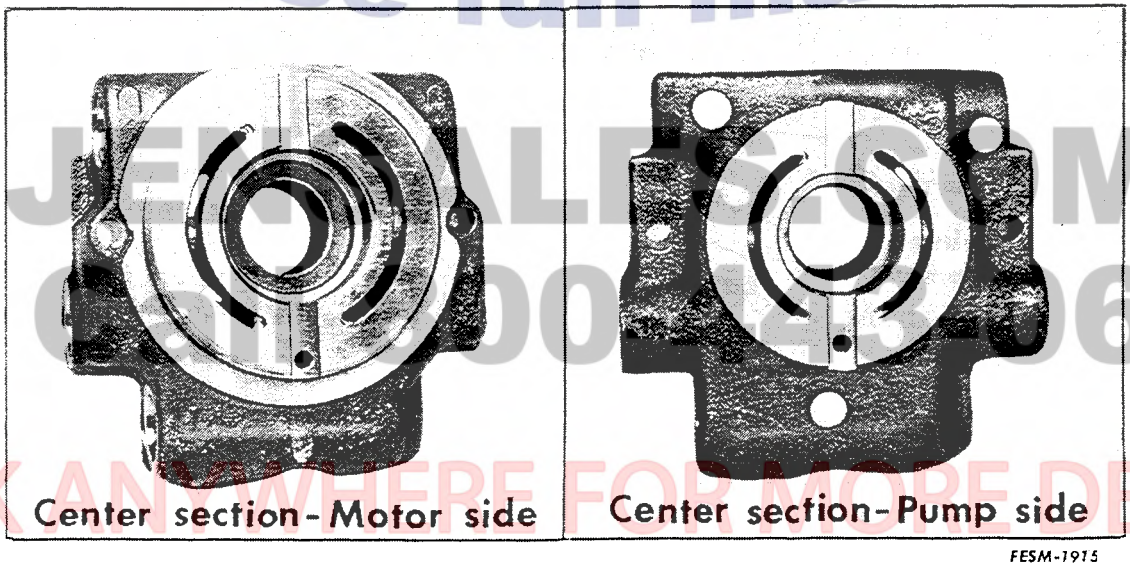
The distance they reciprocate depends on the angle of the swash plate, Illust. 3. The drive shaft and cylinder block assembly are the only parts that rotate. The pump cylinder block always rotates the same direction as the engine.

The swash plate is mounted on trunnions supported by tapered bearings mounted in the transmission case. The swash plate does not rotate but merely tilts back and forth from a vertical plane. The vertical plane is a "zero output" position as the pistons are not reciprocating. The drive shaft drives through a center hole in the swash plate and does not touch it.

The center section (Illust. 4) which separates the pump and motor shown in Foldout No. 1 is fixed and is bolted to the transmission case. "Kidneys" which are open passages from the pump to the motor are the only connection between them. See Foldout No. 1 "NEUTRAL".

NOTE: The function of the Hydrostatic unit described below is for the Hand controlled models and is the same as for Foot controlled models except for swash plate angles and specifications.

In the reversing swash plate pump the inlet and outlet kidneys can be reversed by tilting the swash plate from one side of the zero output or vertical position to the other side. See Illust. 2. The pump swash plate can be tilted from -18 degrees to +16 degrees.



Illust. 4. Center section.

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INTRODUCTION

Inasmuch as the hydrostatic drive tractors are new and most servicemen have had a limited amount of experience with them, a very complete service Manual GSS-1397 has been prepared. In GSS-1397, full explanations are given for the function of each component including removal and servicing of every component. It should be studied thoroughly and must be completely understood before troubleshooting can become easy for serviceman.

This trouble shooting and testing manual is not intended to replace GSS-1397 and both should be used while making field service calls. The handbook contains some new information not in GSS-1397 but is mainly intended as a condensed quick reference book.

Most problems encountered on the tractor are of a minor nature and can be pinpointed quickly and fixed easily once the system is fully understood.

IN ORDER TO MAKE THE MOST EFFICIENT USE OF TIME WHEN MAKING FIELD SERVICE CALLS, SERVICEMEN SHOULD MAKE UP A "HYDROSTATIC FIELD SERVICE KIT" WHICH CONTAINS THE FEW SPECIAL SERVICE TOOLS NEEDED AND PARTS AND SUPPLIES REQUIRED. MANY PROBLEMS CAN BE FIXED DURING THE FIRST CALL IF THIS KIT ACCOMPANIES THE SERVICEMAN.

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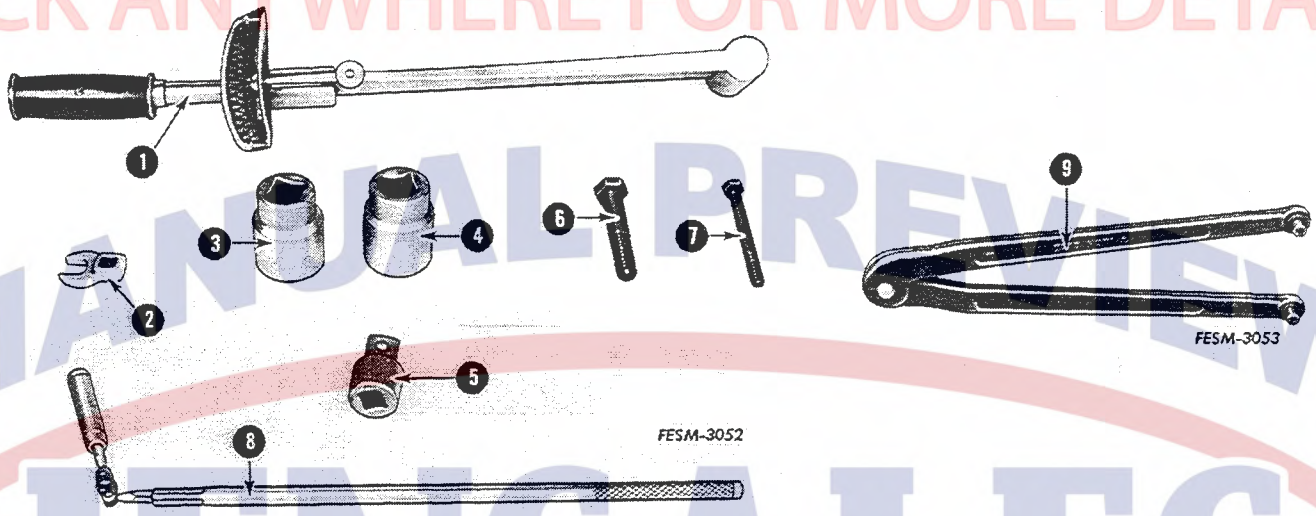
Tools Required for Servicing Check Valves, Relief Valves and Servo Cylinders



Ref. No.	Tool Number	IH Part Number	Quantity Required
1.	0-150 Ft. Lb. Torque Wrench Very important for torquing high pressure relief valves.	—	1
2.	3/8" Drive 9/16" Crofoot Wrench For disconnecting high pressure lines at relief valves.	—	1
3.	1-3/8" x 3/4" Drive Socket For removing check valve plugs.	—	1
4.	1-5/16" x 3/4" Drive Socket For removing high pressure relief valves.	—	1
5.	1/2" Female to 3/4" Male Socket Adapter	—	1
6.	4" x 1/2" N.C. Capscrew For removing check valves.	—	1
7.	4" x 5/16" N.C. Capscrew For removing servo anchor shaft.	—	1
8.	Magnet For retrieving tools or parts dropped into transmission during servicing.	—	1
9.	Williams #482 - 2" Face Spanner For servicing servos. (Order through Service Tools.)	—	1

Miscellaneous Tools and Supplies

(a) GSS-1397 656 and 544 Hydrostatic Service Manual.

(b) Funnel

(c) Clean containers for draining tractor

(d) 10 gallons of Hy-tran

BASIC EXPLANATION OF EACH SYSTEM COMPONENT AND POSSIBLE MALFUNCTIONS

High-Low Range Transmission

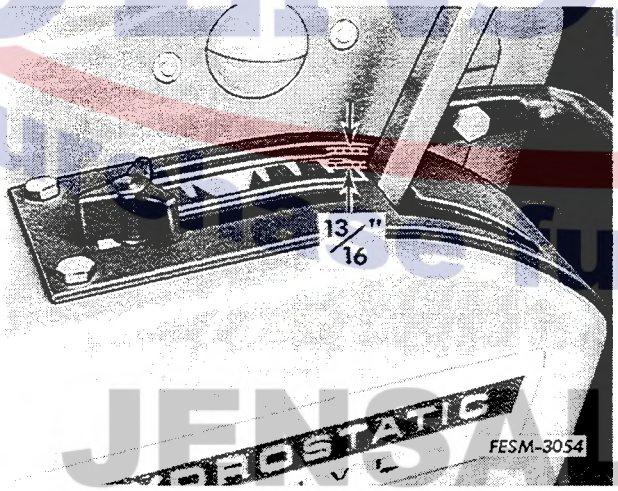
The high- low range is a simple sliding gear arrangement. High range is direct drive. Low range is through the counter shaft. If any problem is experienced with not staying in high range, adjust linkage for increased tooth engagement. Range selection should only be made with the tractor stopped but it is not necessary to depress the Foot-N-Inch Valve.

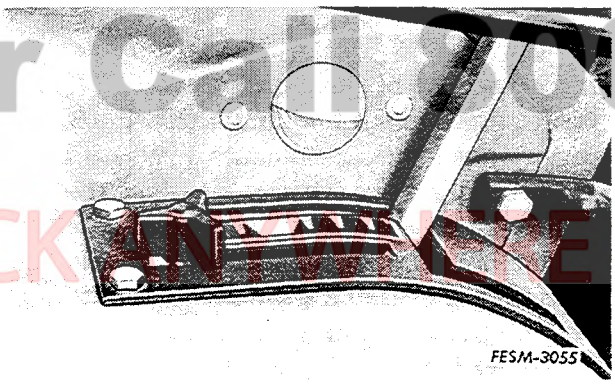
When to use Low or High Range

1. Low Range should be used for heavy field work. If the load can be pulled at the desired field speed, and the S-R lever can be kept in the blue-line, maximum efficiency will be attained.

2. High Range may be used doing field work at speeds above 5 MPH if engine speed can be maintained. Maximum efficiency, however, is attained by operating with the S-R lever at the blue line.

S-R Lever and Effects of Poor S-R Lever Adjustment



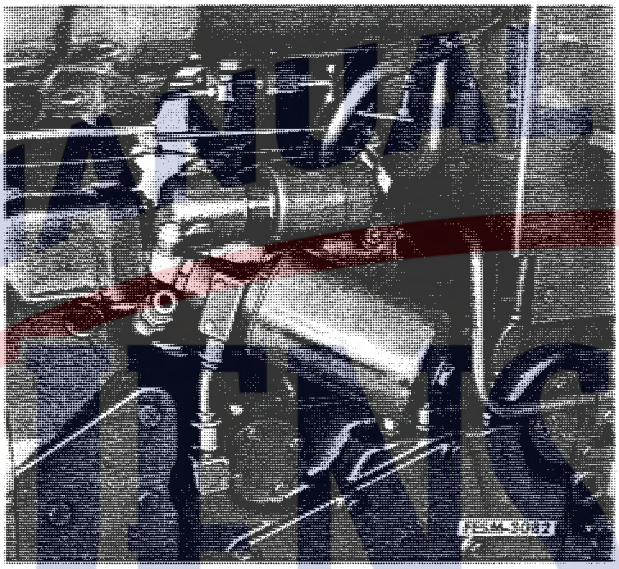


(For complete information on the S-R lever and drive Control Valve (see GSS-1397, Pages 24, 72, 77 and 95).

The S-R Lever does two things:

1. Initial movement to the right limit of the neutral slot (Zero Forward) moves the drive control valve spool approximately 5/8" outward, and movement to the left (Zero Reverse) limit moves the spool approximately 5/8" inward.

CHECKING CHARGE FLOW ON TRACTORS EQUIPPED WITH RECIRCULATING FILTER PARTS ACCESSORY NO. 530 976 R91.



Illustrations on pages 28, 29, and 30 show the use of the flo-rater making charge flow checks covering tractors not equipped with a recirculating filter. Charge flow should be checked on tractors with a recirculating filter in the following manner.

1. Disconnect the recirculating line at the filter elbow, loosen both outlet fittings and position the filter and elbow.

2. Connect the flo-rater and proceed with checks as described previously.

1. FES 98-9 male connector
2. FES 2-48 hoses
3. To Flo-Rater inlet
4. From Flo-Rater outlet to filter

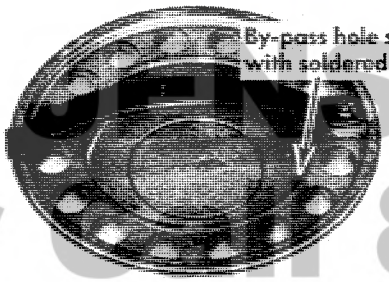
CLEAN-UP PROCEDURE AFTER MAJOR OVERHAUL

It is essential that any tractor which has been torn down follow a prescribed clean-up procedure. This was covered in GSS-1397 pages 61 and 62. It is recommended that the Recirculating Filter parts accessory 530 976 R91 be installed and the procedure below be used.

CLEAN-UP PROCEDURE FOR TRACTORS WITH RECIRCULATING FILTER

1. Flush out the rear frame with mineral spirits.

2. Remove and thoroughly clean the oil cooler. This can best be done by immersing it in a tub of diesel fuel and shaking it and turning it over to work the fluid through the cooler in the reverse flow. Blowing air through it will only be effective when it is full of fluid. Flush the cooler lines and reverse them at the multi-valve to backflush the cooler during the clean-up procedure.



FESM-2662

Dummy by-pass valve

3. Install a recirculating filter as shown on page 34.

4. Install a dummy by-pass valve in the main filter.

5. Operate the tractor for 2 hours with the wheels off the ground and turning alternately in forward and in reverse. Operate the power steering, hitch and auxiliary valves to flush all components.

6. Replace the main filter and reinstall the regular by-pass valve.

7. Change the recirculating filter.

8. Re-connect the cooler lines in their normal positions.

9. Advise the operator to change the filters at 10, 100 and 250 hours.