

# Troubleshooting, Testing & Adjusting

Your test equipment needs careful attention at all times and maintained in such a manner that the accuracy remains constant. Use the correct gauge in a given test location and do not assume that a gauge is accurate merely by rating its appearance. Many times recalibration is required to maintain acceptable standards of workmanship during repair procedures. (See Fig. 90)

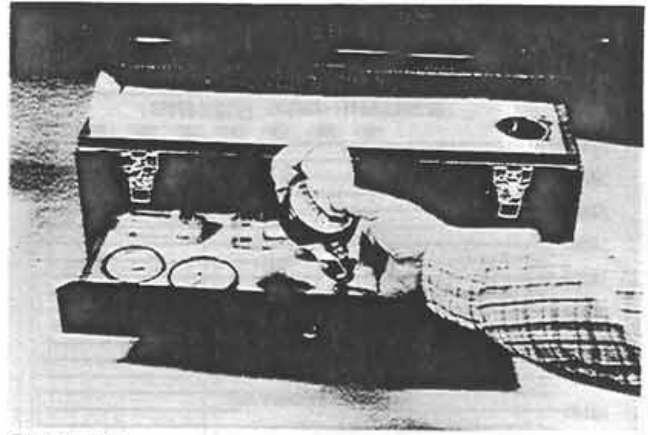


Figure 90:

A final note before we leave the subject of testing. If the tractor is equipped with a pressurized reservoir, fully remove the vent valve assembly. Inspect for dirt or corrosion. If it cannot be cleaned, then replace it. (See Fig. 91)

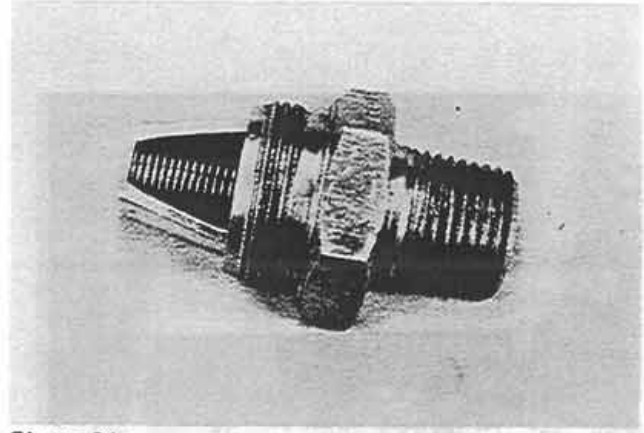


Figure 91:

When a major failure of the hydraulic system has occurred, the entire system must be cleaned internally. If this was to be done manually, it would be time consuming and expensive for the customer, to say the least. On certain occasions, however, it is necessary to prevent contamination from entering a newly installed component. If a new or repaired pump is installed, or it is known that the system must be flushed of contamination before testing and adjusting are done, an alternate method is permitted. (See Fig. 92)

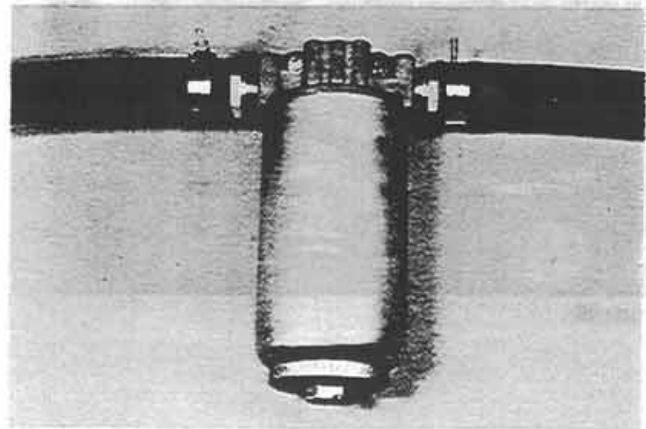


Figure 92:

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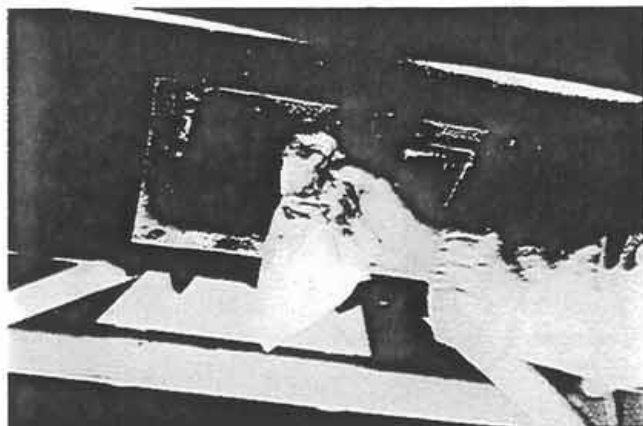


Figure 93:

First, drain the hydraulic reservoir. Remove the access cover, unscrew the suction screen and scrub the debris from the inside of the reservoir. (See Fig. 93)

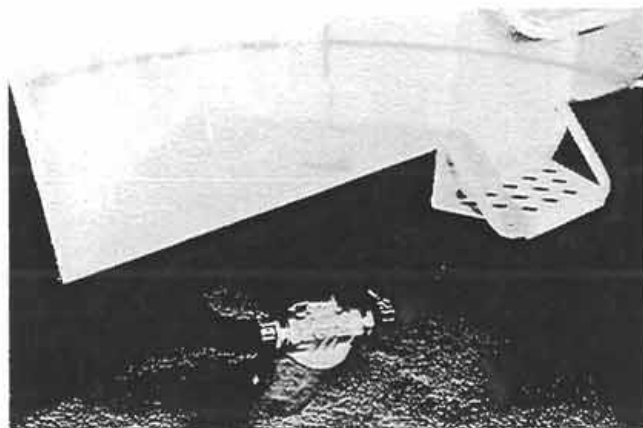


Figure 94:

Reinstall the access cover. Temporarily leave out the suction screen and adapt a filter assembly between the pump and reservoir. The ideal filter for this purpose is found in your Steiger Service Tool Catalog. This assembly has no by-pass, so all oil passing through it is filtered. (See Fig. 94)

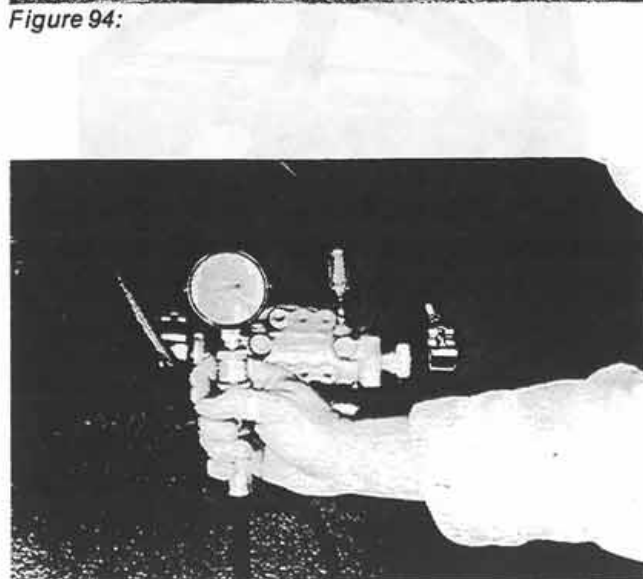


Figure 95:

There are two gauge ports in the filter base. Install a vacuum gauge to the outlet port of the base. (See Fig. 95)

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Replacement filter elements are covered by Steiger part number 01-4988. They should be changed when the vacuum gauge registers 20 inches of mercury with warm oil and the engine at rated speed. (See Fig. 96)



Figure 96:

Refill the reservoir with new oil and run the engine at a fast idle so oil is turbulent enough to have a cleansing action. During this time, all hydraulic controls must be operated to enable clean oil to reach all areas of each component. Steer the tractor to the extreme right and left turn positions as quickly as possible. Do this for at least 20 complete cycles. While cycling the steering cylinders, activate the steering relief valve at the end of each stroke by holding the steering wheel in a full steering demand position for a short interval. (See Fig. 97)



Figure 97:



**WARNING:** When tractor service operations of this type are done, be sure there is enough space for the machine to articulate without endangering neighboring equipment and occupants. **DO NOT** allow by-standers on or near the tractor when performing these operations.

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Figure 98:

Prepare the implement circuit for flushing by using a short hose length with male coupler tips on each end. Install this hose to a single coupler set. With the engine at a fast idle, activate the control valve section which corresponds to the coupler which has the hose connected. Operate the lever in each direction for at least one minute. Continue to the remaining valve sections after relocating the hose loop for the proper coupler assembly. (See Fig. 98).

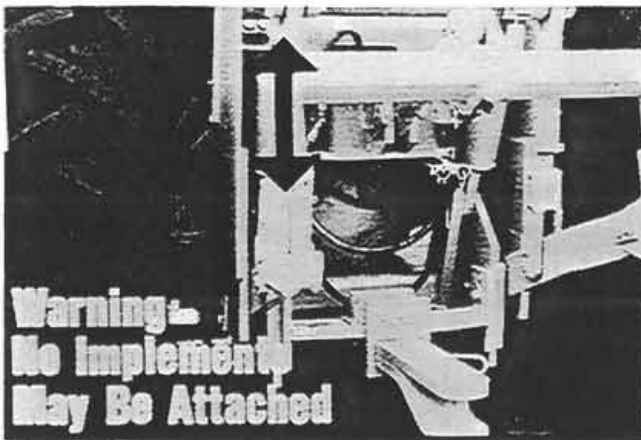


Figure 99:

If the tractor is equipped with a 3-point hitch, the mounted implements must be removed. Cycle the hitch up and down rapidly for at least 20 full cycles. (Fig. 99)



**WARNING:** During fast operation of the three-point hitch, no implements may be attached. To ignore this warning can cause personal injury or damage to the implements.

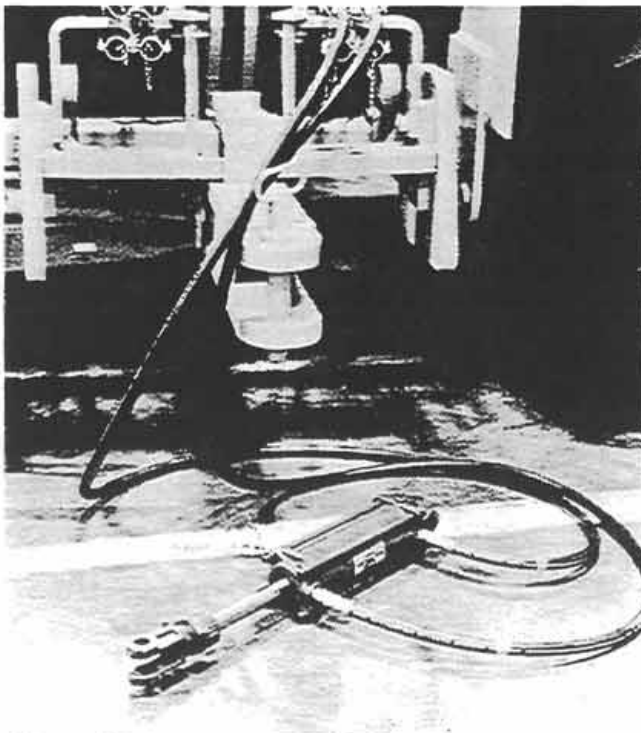


Figure 100:

Activate the main system relief valve to flush its drain line. This is accomplished by operating any valve section which has no loop hose connected to it. A time span of 10 seconds is sufficient. Another way to accomplish the same effect is to attach an implement cylinder for flushing. When it reaches the end of its stroke, hold the control lever in that delivery position for a moment. The flushing procedure is now completed. The reservoir can be drained. Use a clean container if the oil is to be reused in the system later. (See Fig. 100)

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Again, rinse out the bottom of the reservoir to get rid of any particles which may have accumulated since the beginning of the flushing procedure. Install a new or freshly cleaned suction screen and secure the access cover. (See Fig. 101)

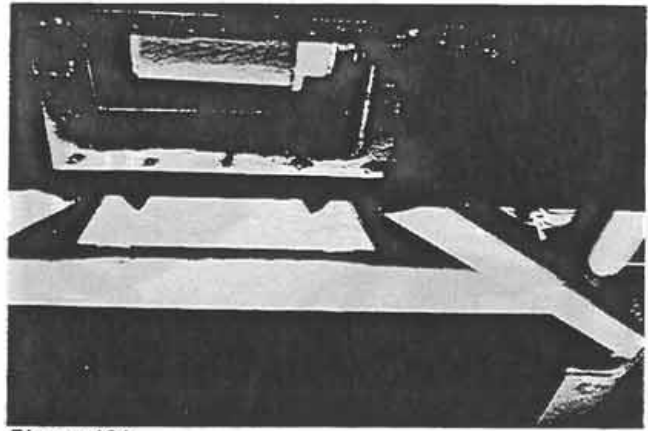


Figure 101:

Replace the return filter element with a new one. Remove the 01-4168 filter assembly from between the pump and reservoir, and reinstall the proper suction tube. The reservoir may now be refilled with fresh oil. The oil that was drained may be reused ONLY if no extra contamination was found in the reservoir after completing the decontaminating procedure. ( Fig.102)



Figure 102:

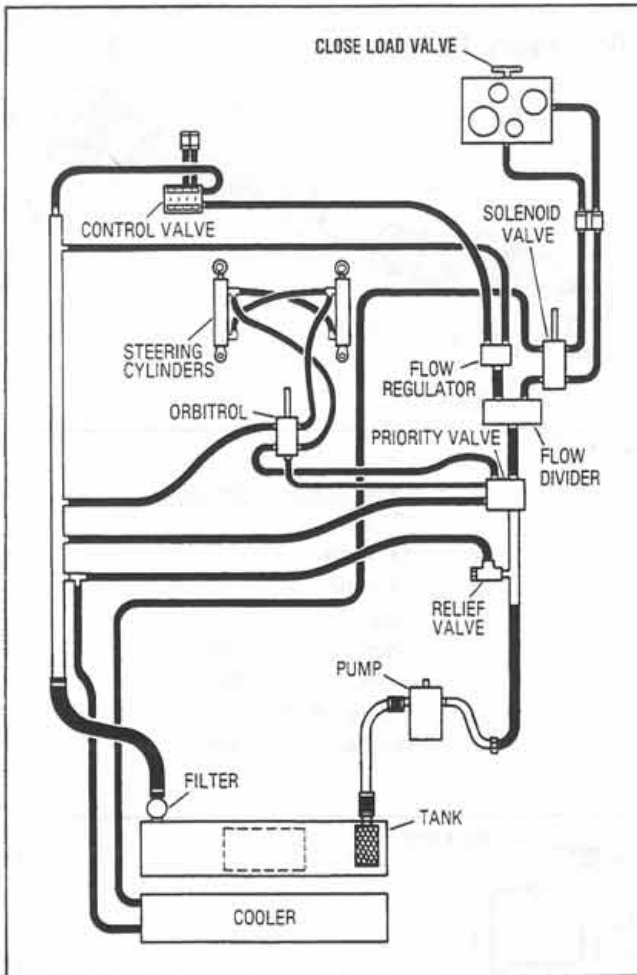


Figure 103:

## Accessory Circuit Relief Valve

The accessory solenoid valve has a BUILT-IN Relief Valve Cartridge that has a shim adjusted pressure setting. This relief valve limits pressure of the accessory circuit only, however, the MAIN SYSTEM RELIEF VALVE must be in proper adjustment BEFORE any other relief valves can be successfully tested or adjusted.

Prepare for the test by adapting a flow/pressure tester into the couplers for the accessory circuit (Fig. 103).

**IMPORTANT:** The flow must enter the tester in the proper direction - the PRESSURIZED LINE must furnish flow to the INLET port of the tester.

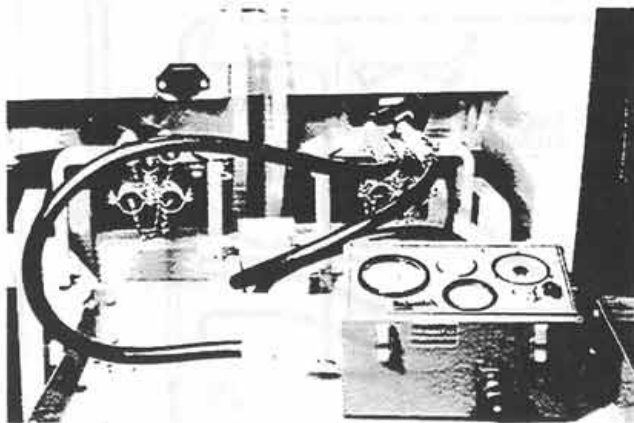


Figure 104:

Start the engine and activate the solenoid valve to furnish flow to the tester. Close the load valve on the tester and record the pressure from the gauge, (Fig. 104) then compare with SPECIFICATIONS.

If the pressure setting must be changed, remove the cap from the relief valve cartridge (Fig. 105) and remove the spring and poppet. Either ADD shims to "increase" pressure or REMOVE shims to "decrease" pressure and retest again. The shims are available in .003 and .020 inch (.076 and .508 mm) thickness sizes.

When the pressure test is performed, load and unload the system several times to be sure the valve opens at the same pressure every time. If there is a pressure difference each time, then disassemble the relief valve and inspect for causes relating to a sticking poppet.

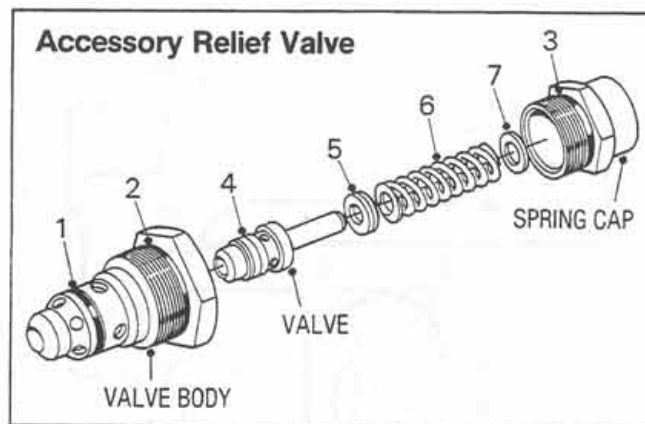


Figure 105:

Ref.	Description	Remarks
1	'O' Ring	
2	'O' Ring	
3	'O' Ring	
4	Seal	
5	Shim	.003"
	Shim	.020"
6	Spring (Red)	
7	Washer	.064"

### Accessory Flow Divider

Efficiency of the flow divider can be tested by flow comparison between the implement and accessory circuits. Certain preparations are needed before the testing is performed. Expected performance values depend upon the condition of the PUMP, MAIN RELIEF, FLOW REGULATOR, SECONDARY RELIEF AND ACCESSORY RELIEF VALVE. If any of these components are not operating properly, then your testing will be useless. Defects in the supply TO the FLOW DIVIDER can cause misleading flow values on the DISCHARGE to the IMPLEMENT AND ACCESSORY CIRCUITS.

TEMPORARILY adjust the ACCESSORY RELIEF to the same pressure setting as the SECONDARY RELIEF (SEE SPECIFICATION PAGE FOR ALL PRESSURES). When flow divider tests are completed, readjust the accessory relief pressure to its normal operating value.

Connect a FLOW/PRESSURE TESTER to a coupler set on the IMPLEMENT CIRCUIT. Leave the tester LOAD VALVE in the OPEN position as the tester will be used for measurement of FLOW only (Fig. 106).

**IMPORTANT:** Flow must enter the tester in the proper direction. The PRESSURIZED LINE must furnish flow to the INLET port of the tester.

Run the engine and position an implement control lever to properly furnish flow to the tester. ADJUST engine speed to give 20 GPM (75.7L) on the flow meter. Activate the ACCESSORY SOLENOID, its relief valve should operate because the couplers are closed. The flow meter reading should NOT register more than 20.5 GPM (77.6L), record all readings taken during the test procedures.

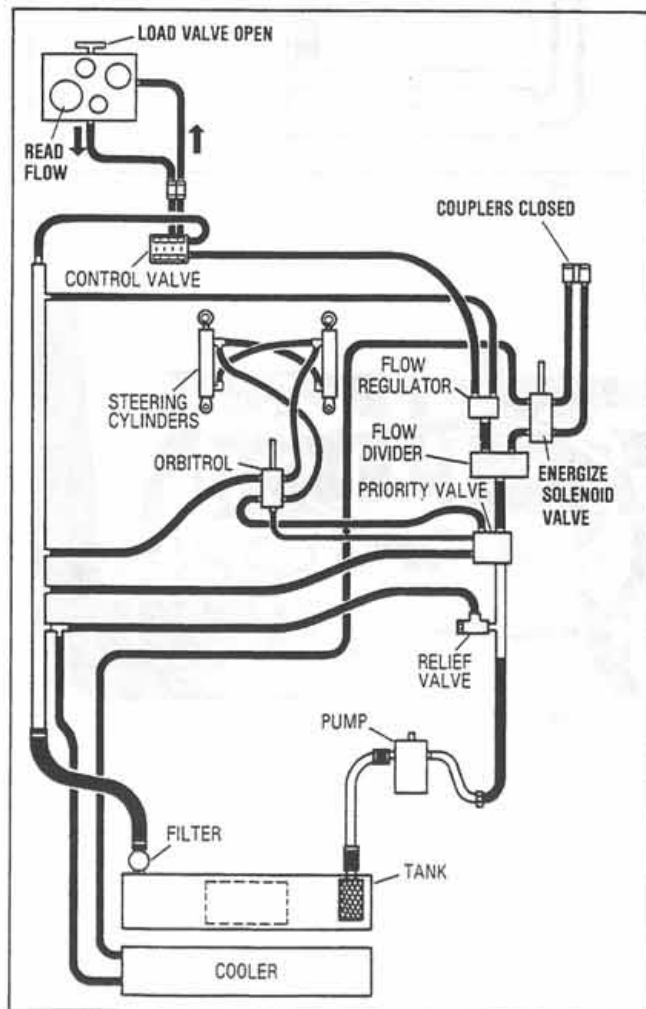


Figure 106:

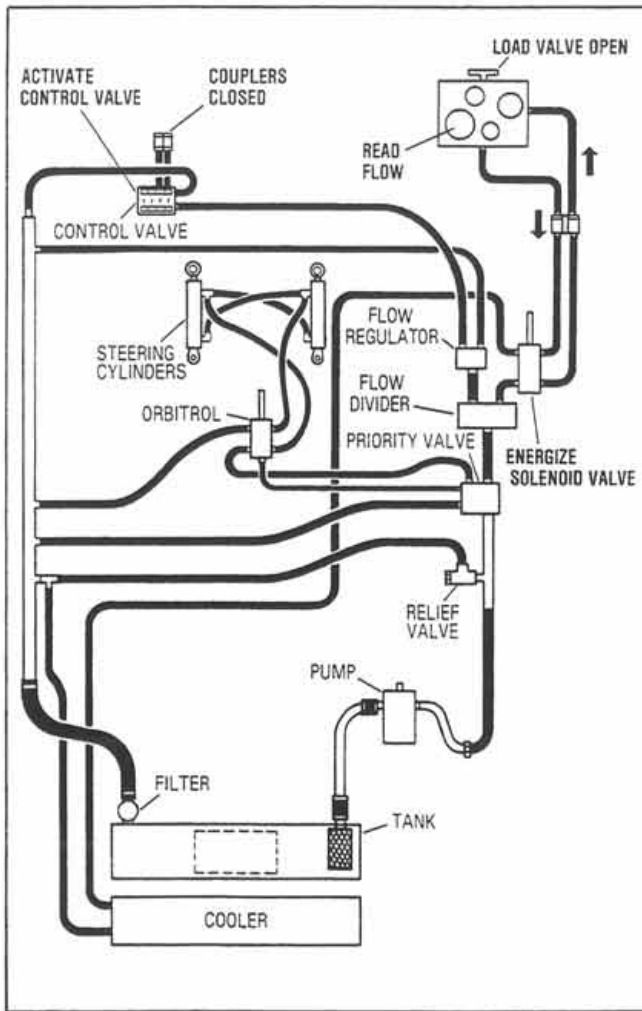


Figure 107:

Neutralize all controls and stop the engine. Properly adapt the flow/pressure tester to the ACCESSORY CIRCUIT, (Fig. 107), run the engine and activate the accessory solenoid. ADJUST the engine speed to give 10 GPM (37.8L) on the flow meter. Again, leave the load valve OPEN. Operate an IMPLEMENT CONTROL CIRCUIT that corresponds with any closed coupler, this should operate the SECONDARY RELIEF VALVE. The flow meter reading should NOT register more than 11 GPM (41.6L). Record these readings also.

If the test results did not meet the above specifications remove, disassemble and repair (or replace) the flow divider. Look for the same types of wear or damage as found in the Inspection and Failure Analysis for pumps in this manual.