

Troubleshooting, Testing & Adjusting

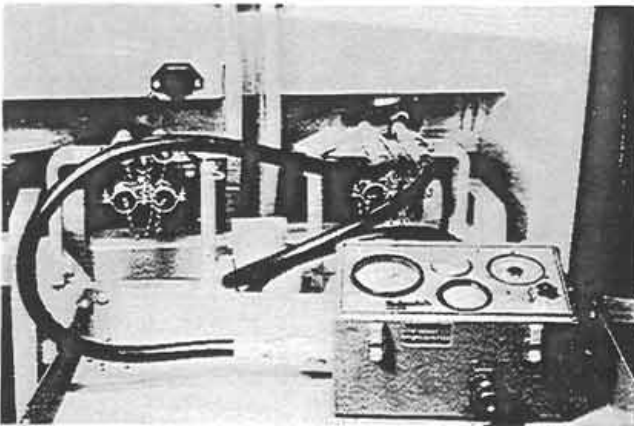


Figure 80:

To test the flow regulator, connect the flow analyzer to any of the implement coupler sets.



WARNING: Again for this test, prevent any possible articulation of the tractor as previously described.

Open the load valve, start the engine and select the control valve position, which will properly furnish flow through the analyzer. (See Fig. 80)

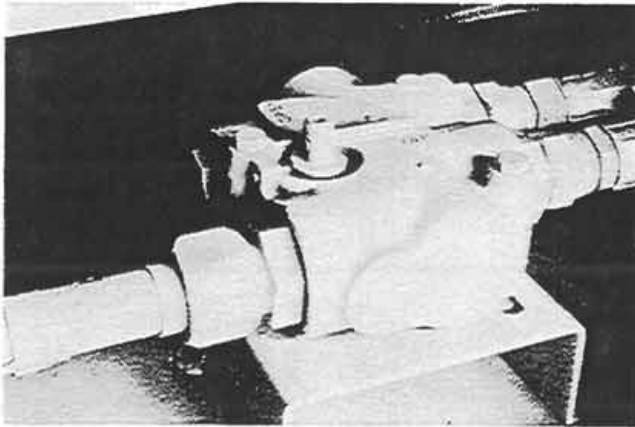


Figure 81:

Run the engine at rated speed and set the flow regulator adjusting spool to its minimum flow (the hole or lever through the spool shank will align with the word "OFF," which is cast into the regulator body). (See Fig. 81)

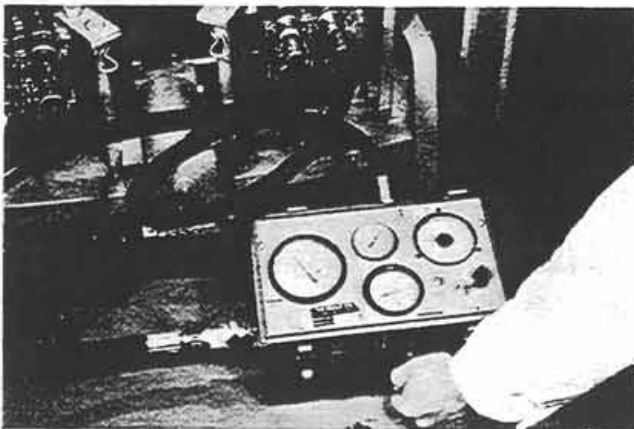


Figure 82:

Now begin to close the load valve and observe the flow meter until the detent is released. During this time the flow should be maintained at a constant minimum rate that is specified, regardless of the circuit pressure. (See Fig. 82)

Troubleshooting, Testing & Adjusting

For the final flow regulator test, open the load valve and keep the engine speed as it was before. Turn the flow regulator adjusting spool to its maximum flow (the hole or lever through the shank will align with the word "OPEN," which is cast into the regulator body). (See Fig. 83)

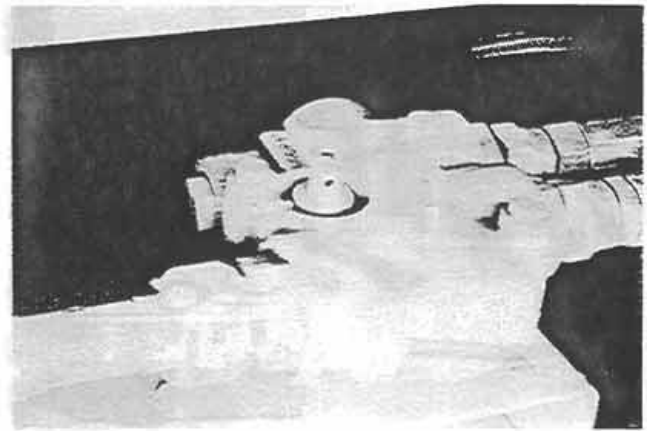


Figure 83:

Again, close the load valve and observe the flow meter until the detent is released. During the gradual closing of the load valve, the maximum specified flow rate should have been maintained according to specifications. (See Fig. 84)

If the regulator does not have the flow qualities that were described, it must be disassembled and checked for piston seizure, spring breakage or control orifice blockage. When damage has occurred, replace the regulator as an assembly. Adjust it to the flow setting needed, depending upon implement application.

Troubleshooting, Testing & Adjusting

TRACTOR MODEL	ST 210 RC 210	ST 220 ST 251 ST 310	PT 225 PT 250 ST 250 PT 270 ST 270	ST 320 PT 350 ST 350	ST 325	ST 450 (#130)
Engine Make And Model	CAT 3208	Cummins N-855 NT-855 NTA-855	Cat 3306	Cummins VT-903	Cat 3406	Cummins KTA-1150
Engine Idle Speed(RPM)	830	830	830	830	830	Use 830 for test purposes
Engine Rated Speed	2800	2100	2200	2600	2100	2100
Maximum Pump Output GPM at idle-No Load	7.1	11.3	12.2	10.5	12.4	15.9
Minimum Pump Output GPM at idle-No Load	6.4	10.2	11.0	9.5	11.2	14.3
Minimum Pump Output GPM at idle-2250 PSI Pressure	4.3	8.5	9.1	6.3	9.3	11.9
Maximum Pump Output GPM at rated speed No Load	23.9	28.7	32.4	33.8	32.9	38.9
Minimum Pump Output GPM at rated speed No Load	21.5	25.8	29.1	30.4	29.6	35.0
Minimum Pump Output GPM at rated speed 2250 PSI Pressure	19.1	22.9	25.9	27.0	26.3	31.1
Minimum Main And Secondary Relief Valve Setting PSI. Locate Lowest Pressure Curve Area	2250	2250	2250	2250	2250	2250
Maximum Main And Secondary Relief Valve Setting PSI At Highest Area Of Pressure Curve	2450	2450	2450	2450	2450	2450
Steering Circuit Load Sense Relief Valve Pressure Setting PSI	2000	2000	2000	2000	2000	2000
Detent Release Pressure Setting PSI	2150	2150	2150	2150	2150	2150
Minimum Control Pressure PSI at idle speed	150	150	150	150	150	80
Maximum Control Pressure PSI at rated speed With Flow Regulator at Highest Flow	340	270	ST-300 PT-350	ST-350 PT-460	340	430
Reservoir Pressure Relief Setting PSI	5	Atmospheric	5-PT only ST-Atmospheric	5-PT only ST-Atmospheric	Atmospheric	5
Oil Temperature During all Testing °F and °C	160 71	160 71	160 71	160 71	160 71	160 71
Steering Performance Time in Seconds Req. to turn lock to lock. Check at test idle speed & traveling on hard surface.	5.2 to 6.3	4.5 to 5.4	ST-4.4 to 5.2 PT 4.9 to 5.9	ST-4.8 to 5.7 PT-5.4 to 6.5	4.5 to 5.4	6.5 to 8.0 see note
Flow Regulator Valve Adjustment Range GPM	8 to 20	8 to 20	8 to 20	8 to 20	8 to 20	12 to 25
Neutral Pressure at steering valve exhaust - PSI at test idle speed.	2 to 3	2 to 3	2 to 3	2 to 3	2 to 3	8 to 10
Neutral Pressure at steering valve exhaust -PSI at rated speed	5 to 7	5 to 7	ST 5 to 7 PT 7 to 9	ST 5 to 7 PT 8 to 10	5 to 7	15 to 20

NOTE: On ST 450 Models, steering performance at low engine speed is influenced by the flow regulator setting for the power brake booster. Ensure the regulator is adjusted according to the brake systems service manual before judging the remainder of the system.

Figure 84:

Troubleshooting, Testing & Adjusting

Leave the flow analyzer installed to test control valve detent release pressure. For this test, the engine may run at idle. Watch the pressure gauge on the analyzer as the load valve is slowly closed. The control valve detent should automatically release as the gauge approaches the specified release pressure setting. (See Fig. 85)

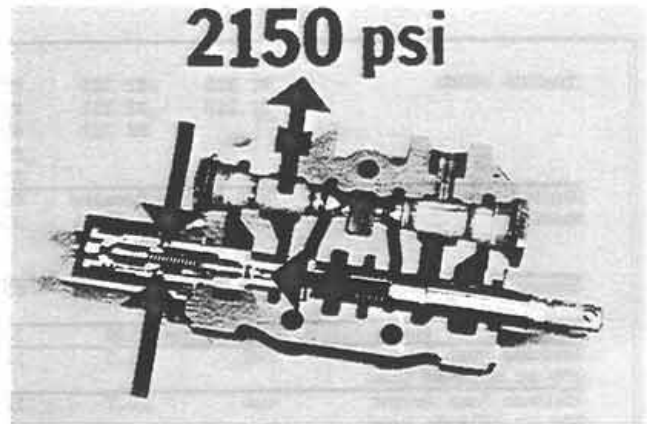


Figure 85:

Pressure changes are accomplished by turning the detent adjusting screw after loosening the spanner type locknut. Turning clockwise will increase the pressure release point. Relocation of the flow analyzer at the couplers is required for the adjustment of each detent unit. (See Fig. 86)

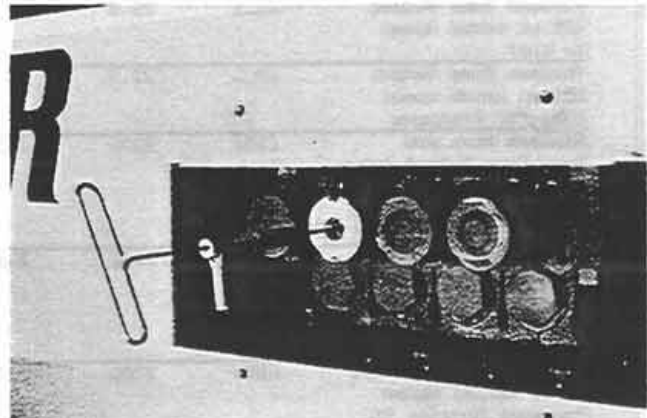


Figure 86:

The secondary relief valve is tested next with the flow analyzer installed as it was. It will be used to measure pressure only, so the load valve can be completely closed. The appropriate control valve section should be activated to furnish flow in the proper direction to the analyzer. The control lever must be blocked in this delivery position or the detent release adjustment can be temporarily reset above its normal pressure range to maintain spool position during the test. (See Fig. 87)

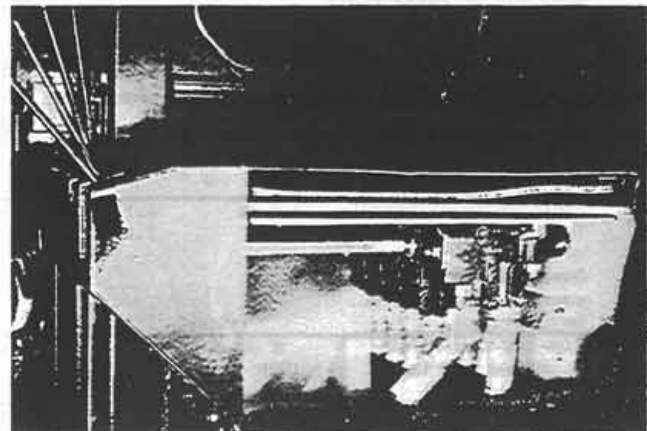


Figure 87:

Troubleshooting, Testing & Adjusting

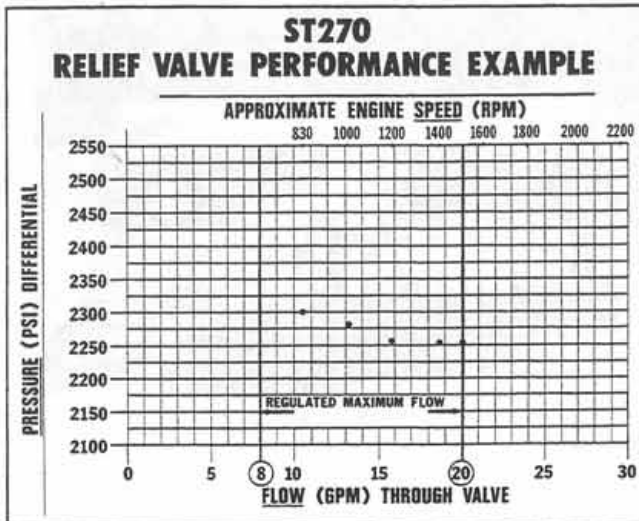


Figure 88:

Remember the main relief valve test? The secondary relief valve should have the same test values. Of course the maximum flow seen by the secondary relief will be limited by the flow regulator, meaning that approximately 65% of rated engine speed is all that is needed to obtain the highest flow through the valve. (Fig. 88)

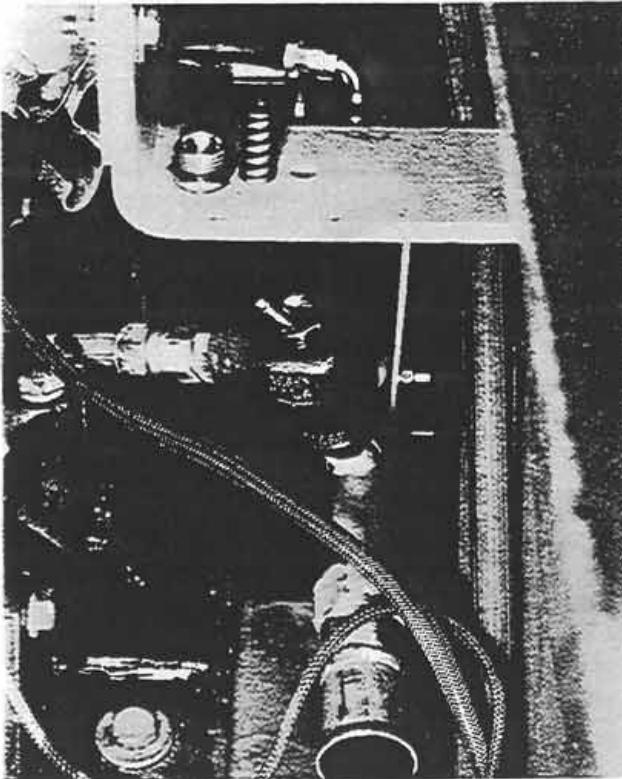


Figure 89:

Since both the main and secondary relief valves are intended to have the same pressure settings, you must temporarily isolate the main relief to obtain the proper results at the secondary relief. Accomplish this by temporarily adding a shim on the main relief until the test is completed. Remove this shim after completion of the test. (See Fig. 89)