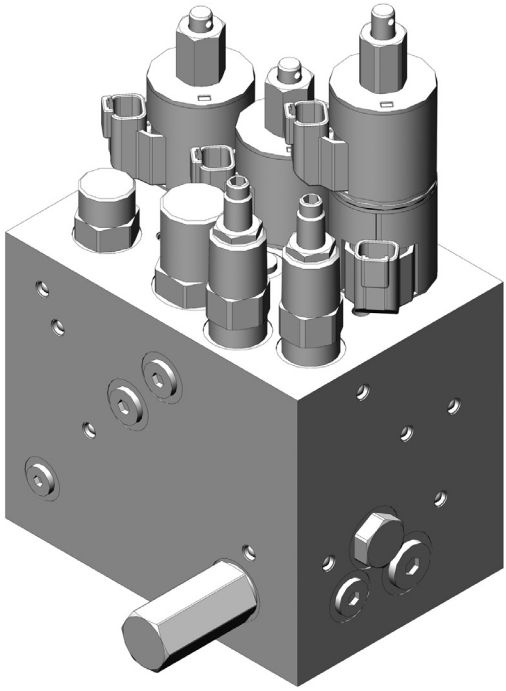
Muncie® Power Products

KEEP IN VEHICLE
READ OPERATING INSTRUCTIONS
INSIDE BEFORE OPERATING PTO

HF78906-12

INSTALLATION AND OPERATOR'S MANUAL

FEATURES • INSTALLATION • SERVICE



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FEATURES

DIRECT ACTING - PROPORTIONAL SOLENOID VALVES
For consistent and predictable flow control

ADJUSTABLE MAIN RELIEF

CONFIGURABLE FOR EITHER GEAR OR PISTON PUMPS

MANUAL OVERRIDES

SPECIFICATIONS

Maximum Inlet Flow ..... 20 GPM

Maximum System Pressure ..... 3,000 PSI
Factory Setting (2,500 PSI)

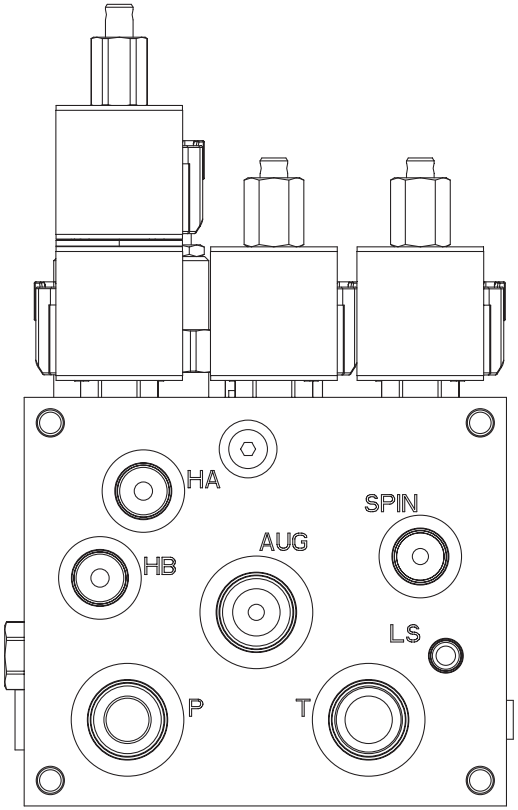
Auger Flow (Proportional) ..... 10 GPM

Spinner Flow (Proportional) ..... 5 GPM

Hoist Flow (Proportional) ..... 6 GPM

Hoist Downside Relief ..... 1,100 PSI
Factory Setting (950 PSI)

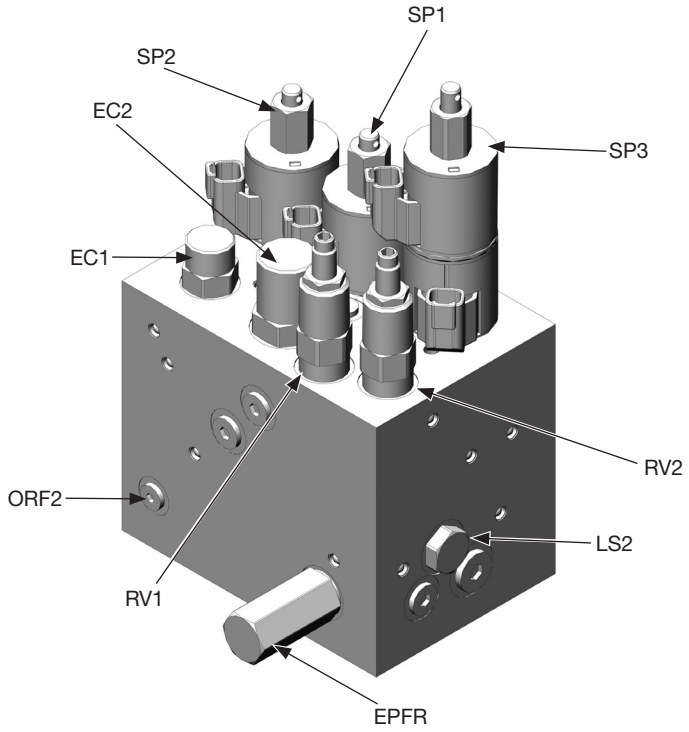
WORKPORTS



HF78906-12

DESIGNATION	DESCRIPTION	SIZE (SAE)
T	TANK	12
P	PUMP	12
HA	HOIST RAISE	08
HB	HOIST LOWER	08
LS	LOAD SENSE	04
AUG	AUGER	12
S	SPINNER	08

CARTRIDGE DESIGNATIONS AND PART NUMBERS

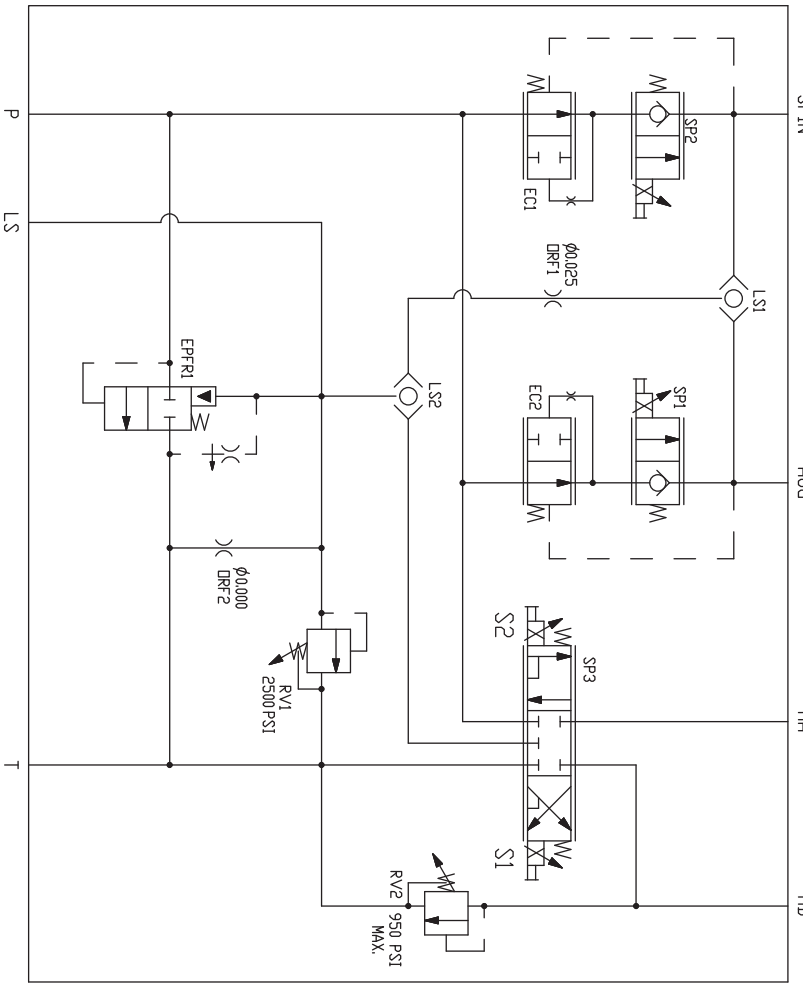


* COIL P/N: NX4303712

DESIGNATION	P/N	FUNCTION
EC1	NXEC10320N80	PRESSURE COMPENSATOR
EC2	NXEC12320N160	PRESSURE COMPENSATOR
EPFR	NXEPFR50S35T0N160	PUMP UNLOADER
LS1	NXLS04B300N	SHUTTLE CARTRIDGE
LS2	NXLS08300N	SHUTTLE CARTRIDGE
ORF1	NX6101040	LS ORIFICE
ORF2	NX6101000	ORIFICE PLUG
RV1	NXRV0820A0N33/25	MAIN RELIEF
RV2	NXRV0820A0N09/09.5	HOIST DOWNSIDE RELIEF
SP1	NXSP1020M0N00	SPINNER FLOW CTRL
SP2	NXSP1020M0N00	AUGER FLOW CTRL
SP3	NXSP1057CM0N00	HOIST CTRL

SCHEMATIC

Open Center



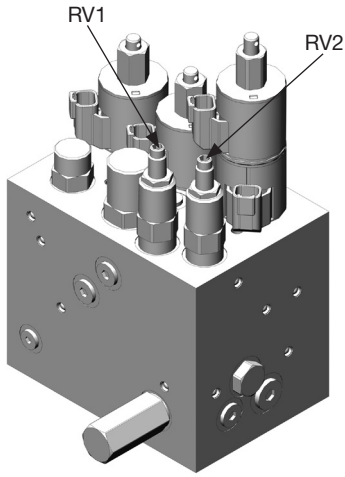
RELIEF VALVE ADJUSTMENTS

Main System Relief (Factory Setting 2,500 PSI) – RV1

1. The tools required for adjusting the main relief setting includes: ¾" wrench and a ¼" Allen drive.
2. Tee a pressure gauge into the pump port (gauge greater than 3,000 PSI)
3. Loosen the RV1 lock nut while holding the Allen screw stationary.
4. Start the truck and deadhead flow at either the auger or spinner. (Pressure will increase to the main relief setting)
5. While observing the pressure gauge, turn the Allen screw CCW to decrease pressure, and CW to increase pressure.

* **DO NOT EXCEED 3,000 PSI**

6. Once the desired pressure has been established, hold the Allen screw stationary and tighten the lock-nut.



Downside Hoist Relief (Factory Setting 450 PSI) – RV2

1. The tools required for adjusting the hoist downside relief setting includes: ¾" wrench and a ¼" Allen drive.
2. Tee a pressure gauge into the hoist lower (HB) port (Gauge greater than 1,000 PSI)
3. Loosen the lock nut while holding the Allen screw stationary.
4. Start the truck and deadhead the hoist down. (Pressure will increase to the downside relief setting)
5. While observing the pressure gauge, turn the Allen screw CCW to decrease pressure, and CW to increase pressure.
6. Once the desired pressure has been established, hold the Allen screw stationary and tighten the lock-nut.

MANUAL OVERRIDE INSTRUCTIONS

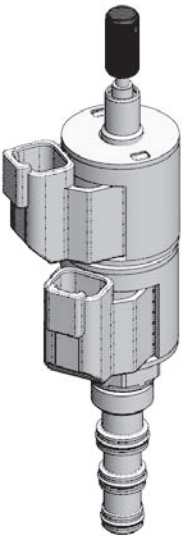
SP1 & SP2 – Spinner/Auger

1. To manually override SP1 or SP2: Push the red override down and turn CCW. (Up Position)

2. To disengage SP1 or SP2: Push the red override down and turn CW. (Down Position)

Normal Operation: Push down and turn CW

SP3 - Hoist



1. To manually override SP3: Push Down to raise the hoist, or Pull up to lower the hoist.

To shift the valve manually from neutral to activate S1 (Lower the Hoist), push the knob down slight, rotate 90 degrees counterclockwise, then pull. To lock in this position, rotate the knob an additional 90 degrees counterclockwise.

To shift manually to activate S2 (Raise the Hoist), push the knob down all the way. To lock in this position, rotate the knob 90 degrees clockwise to lock in the lower detent groove.

CONVERTING MANIFOLD FROM OPEN-CENTER TO LOAD SENSE

Instructions:

1. Remove EPFR and replace with NXCP10-S30-N

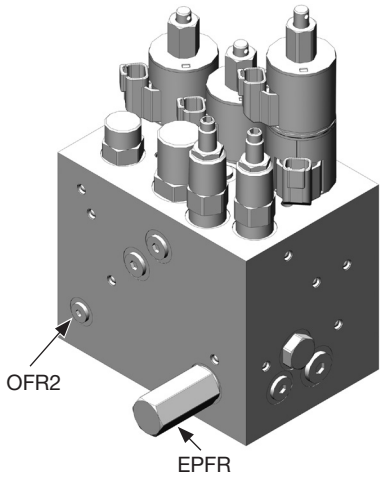
2. Remove the ORF2 SAE plug.

3. Remove the set-screw that is sitting inside of the ORF2 cavity

4. Replace the setscrew with P/N: NX6101025

5. Reinstall the ORF2 SAE plug.

6. Locate the LS port on the manifold and route back to the variable displacement pump.



TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE
Either the auger or spinner operates wide open.	• Check manual overrides of SP1 or SP2 (Reference pg. 7 for manual override instructions) – disengage if necessary. • Remove SP1 or SP2 from manifold and inspect cavity and cartridge for contamination.
Either the auger or spinner are inoperative.	• Inspect wiring and check continuity of Deutsch connector into solenoid receptacle. • Verify that the flow is not bypassing motor (loss of efficiency). • Verify that the SP1 or SP2 are magnetizing when energized.
No function operates, System doesn't build pressure.	• Remove EPFR from manifold and inspect cavity and cartridge for contamination. • Check main relief (RV1) for contamination. • Verify that pump is producing flow.
The hoist will not operate.	• Inspect plumbing – verify that the HA port is connected to the cap end of the cylinder and HB is connected to the rod of the cylinder. • Inspect Wiring • Increase the main relief pressure setting (pg. 7)
Manifold operates continuously at main relief pressure (1800 PSI).	• Inspect plumbing – If applicable, check quick disconnects. • Remove EPFR from manifold and inspect cavity and cartridge for contamination.
Chattering noise occurs while system is bypassing fluid and goes away when spreader system is active or higher RPM's.	• This is due to the EPFR becoming unstable at low flow conditions. 1.Try downsizing the inlet hose to a minimum of a -8 (½") running from the pump outlet to the manifold. 2.Downsize ORF6 from a 0.04" orifice to 0.025" orifice. Contact Muncie Power for more details.

DETAILED DESCRIPTION OF HF78906-12

Reference Schematic on pg.6

EPFR1 – Pump bypass, pre-pressure compensation, and internal LS drain cartridge. EPFR is a normally closed – two position – two way – pilot operated cartridge. It can provide a low pressure path for pump flow to escape to tank. This is its primary function when no functions are operating.

The EPFR cartridge also establishes the differential or boost pressure of the system. The differential or boost pressure is a function of the spring tension of the EPFR. The purpose of the differential or boost pressure is to increase the pump pressure over the load sense pressure.

When the EPFR has a load sense pressure applied, which is communicated from the LS1 (load sense shuttle) this will add to the pressure required for the EPFR to drain back to tank. For example, if the load sense pressure for a spreader motor is 1,000 PSI, this will be added to the (160 PSI +) spring bias pressure of EPFR. Now EPFR cannot begin to open its path to tank until the pump pressure has achieved something slightly higher than 1,160 PSI. Pump pressure would equal 1,160 PSI or more, and the L.S. pressure would equal 1,000 PSI. In this way the system will always attempt to sustain a differential or boost pressure.

RV1 – Main system relief valve. RV1 is an adjustable relief cartridge that is used in conjunction with EPFR to limit the maximum pump pressure. RV1 is located in the pilot path (Spring Side) of EPFR. It is preset from the factory at 2,500 PSI. This can be adjusted to a maximum setting of 3,000 PSI. Do Not Exceed 3,000 PSI. When RV1 opens, it drains the pilot (Spring Side) of EPFR at whatever pressure RV1 has been set. The pressure of the pump (bottom pilot of) EPFR will build slightly higher and force EPFR to begin opening, which provides a tank path for the pump.

RV2 – Hoist downside relief. RV2 is an adjustable relief cartridge that is used to limit the maximum pressure to the rod side of the cylinder. It is preset from the factory at 950 PSI. This can be adjusted to a maximum setting of 1,100 PSI.

ORF1 – Flow limiting orifice. ORF1 limits the amount of LS flow to a fraction of a gallon per minute back to the EPFR valve.

SP1 – Auger/conveyor flow control valve. SP2 is a proportional solenoid flow control valve. In the non-energized state it provides a blocked path between the pump flow and the auger/conveyor work port. When it is energized it provides an adjustable orifice opening to flow as a function of electric current to its solenoid coil. The range of flow control is 0 – 1,710 gallons-per-minute.

SP2 – Spinner flow control valve. SP1 is a proportional solenoid flow control valve. In the non-energized state is provides a blocked path between the pump flow and the spinner work port. When it is energized it provides an adjustable orifice opening to flow as a function of electric current to its solenoid coil. The range of flow control is 0-5 gallons-per-minute.

SP3 – Hoist directional control valve. SP3 is a proportional solenoid directional control valve. In the non-energized state it provides a blocked path between the pump flow and the hoist cylinder. When it is energized it provides an adjustable orifice opening to flow as a function of electric current to its solenoid coil. The range of flow control is 0 – 6 gallons – per – minute.

LS1 – Load shuttle cartridge. LS1 is similar to two check valves set back to back. Its purpose is to communicate the load pressure of the highest spreader motor pressure back to the EPFR.

LS2 – Load shuttle cartridge. LS2 is similar to two check valves set back to back. Its purpose is to communicate the highest load pressure between the spreader motor and hoist cylinder back to the EPFR.

EC1 – Spinner pressure compensator. EC1 limits flow and provides pressure compensation for the spinner flow control valve (SP2). The purpose is to create a constant pressure drop across the valve. The pressure compensator ensures consistent flow despite fluctuating pressures.

EC2 – Auger pressure compensator. EC2 limits flow and provides pressure compensation for the auger flow control valve (SP1). The purpose is to create a constant pressure drop across the valve. The pressure compensator ensures consistent flow despite fluctuating pressures.

Muncie Power Products®

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