



HF68416-12

INSTALLATION INSTRUCTIONS AND OWNER'S MANUAL

FEATURES • VALVE FUNCTIONS • ADJUSTMENTS • SCHEMATICS

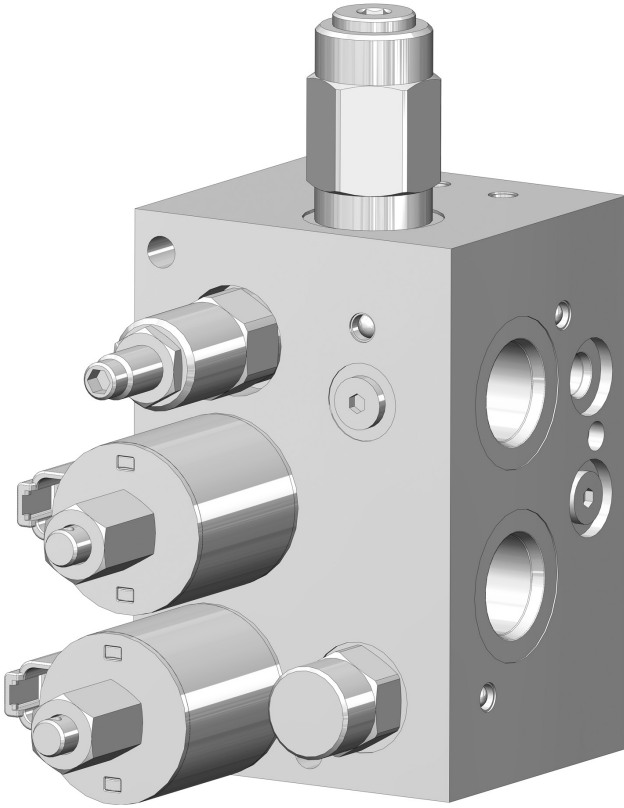


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FEATURES

DIRECT ACTING - PROPORTIONAL SOLENOID VALVES

For consistent and predictable flow control.

ADJUSTABLE MAIN RELIEF

PRESSURE COMPENSATED

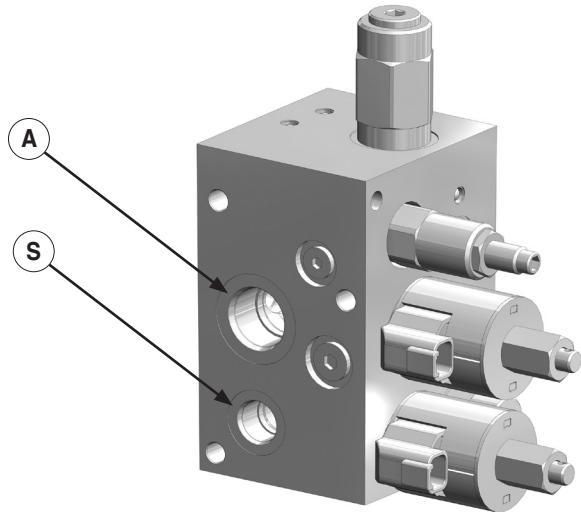
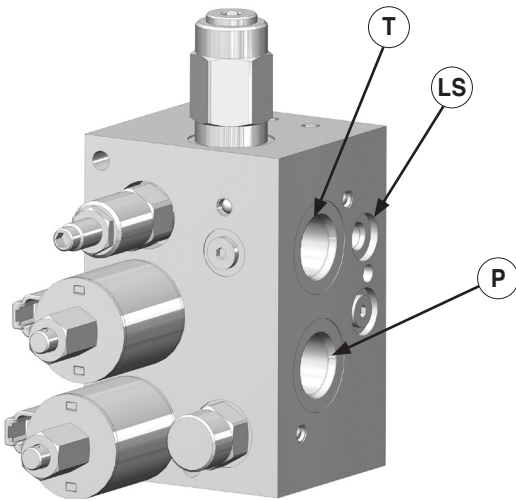
CONFIGURABLE FOR EITHER GEAR OR PISTON PUMPS

MANUAL OVERRIDES

SPECIFICATIONS

Maximum Inlet Flow	40 GPM
Maximum System Pressure	3,000 PSI
Factory Setting (1800 PSI)	
Auger Flow (Proportional)	17 GPM
Spinner Flow (Proportional)	8 GPM

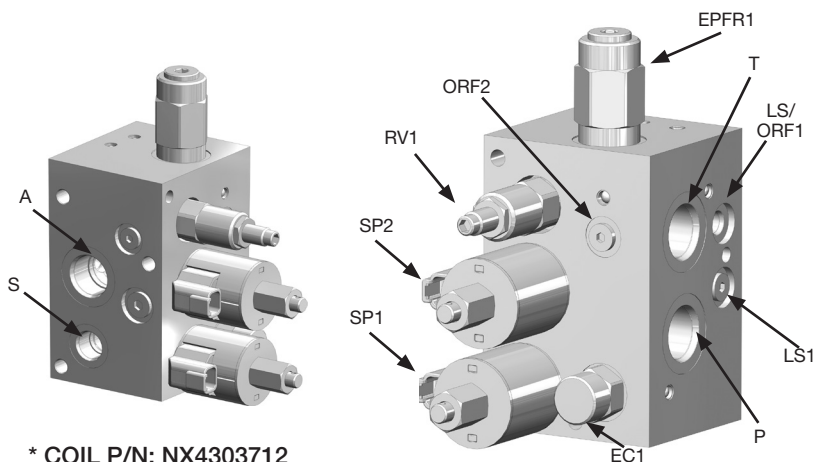
WORKPORTS



HF68416-12

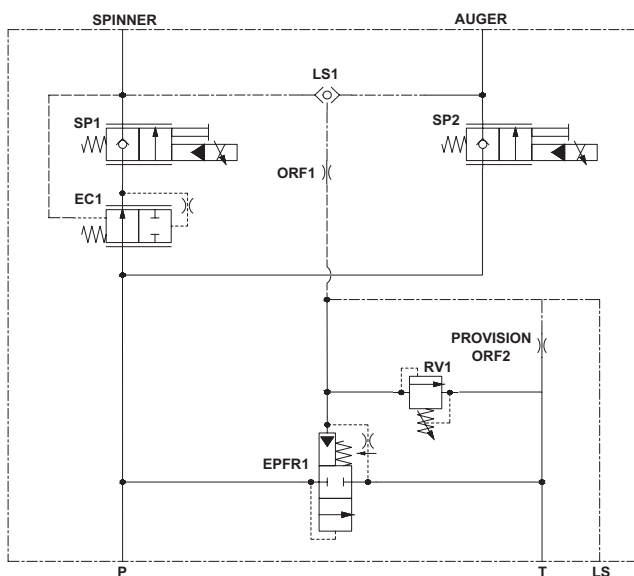
DESIGNATION	DESCRIPTION	SIZE (SAE)
T	TANK	12
P	PUMP	12
LS	LOAD SENSE	04
A	AUGER	12
S	SPINNER	08

CARTRIDGE DESIGNATIONS PART NUMBERS AND SCHEMATIC



* COIL P/N: NX4303712

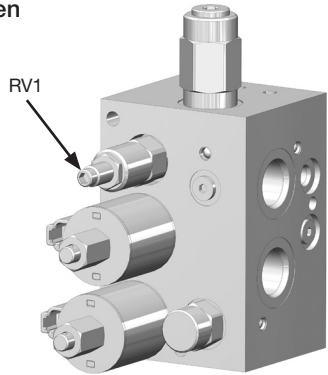
DESIGNATION	P/N	FUNCTION
EC1	NXEC10320N80	Pressure Compensator
EPFR1	NXEPFR52S35TON160	Pump Unloader
LS1	NXLS04B300N	Shuttle Cartridge
ORF1	NX6101040	LS Orifice
ORF2	NX6101000	Orifice Plug
RV1	NXRV0820A0N3318	Main Relief
SP1	NXSP1020M0N00	Spinner Flow Ctrl
SP2	NXSP1020M0N00	Auger Flow Ctrl



RELIEF VALVE ADJUSTMENTS

Main System Relief (Factory Setting 1800 PSI)

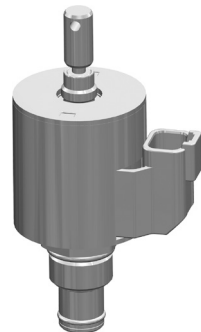
1. The tools required for adjusting the main relief setting includes: $\frac{3}{4}$ " wrench and a $\frac{1}{4}$ " Allen drive.
 2. Tee a pressure gauge into the pump port (gauge greater than 3,000 PSI)
 3. Loosen the lock nut while holding the Allen screw stationary.
 4. Start the truck and deadhead 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 3000 PSI**
6. Once the desired pressure has been established, hold the Allen screw stationary and tighten the lock-nut.



MANUAL OVERRIDE INSTRUCTIONS

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)

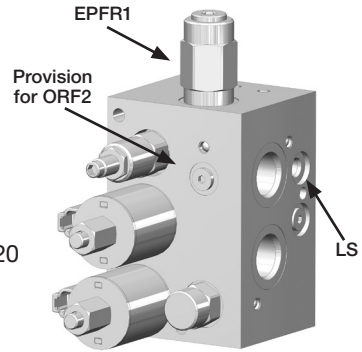
Normal Operation: Push down and turn CW



CONVERTING MANIFOLD FROM OPEN-CENTER TO LOAD SENSE

Instructions:

1. Remove EPFR1 and replace with NXCP12-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: NX6101020
5. Reinstall the ORF2 SAE plug.
6. Locate the LS port on the manifold and route back to the variable displacement pump.



Troubleshooting

SYMPTOM	SOLUTION
<ul style="list-style-type: none"> • Either the auger or spinner operate wide open. 	<ul style="list-style-type: none"> • Check manual overrides of SP1 or SP2 (Reference pg. 7 for manual override instructions)
<ul style="list-style-type: none"> • Either the auger or spinner are inoperative 	<ul style="list-style-type: none"> • Remove SP1 or SP2 from manifold and inspect cavity and cartridge for contamination
<ul style="list-style-type: none"> • Both auger and spinner do not operate 	<ul style="list-style-type: none"> • 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
<ul style="list-style-type: none"> • Both auger and spinner do not operate 	<ul style="list-style-type: none"> • Remove EPFR from manifold and inspect cavity and cartridge for contamination. • Check RV1 for contamination • Verify that pump is producing flow
<ul style="list-style-type: none"> • Manifold operates continuously at main relief pressure (1,800 PSI) 	<ul style="list-style-type: none"> • Inspect plumbing – If applicable, check quick disconnects. • Remove EPFR from manifold and inspect cavity and cartridge for contamination.

DETAILED DESCRIPTION OF HF68416-12

REFERENCE SCHEMATIC ON PG. 4

EPFR1 – Pump bypass, pre-pressure compensation, and internal LS drain cartridge. EPFR1 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 EPFR1 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 EPFR1. The purpose of the differential or boost pressure is to increase the pump pressure over the load sense pressure.

When the EPFR1 has a load sense pressure applied, which is communicated from the LS1 (load sense shuttle) this will add to the pressure required for the EPFR1 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 EPFR1. Now EPFR1 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 EPFR1 to limit the maximum pump pressure. RV1 is located in the pilot path (Spring Side) of EPFR1. It is preset from the factory at 1,800 PSI. This can be adjusted to a maximum setting of 3,600 PSI. **Do Not Exceed 3,000 PSI.** When RV1 opens, it drains the pilot (Spring Side) of EPFR1 at whatever pressure RV1 has been set. The pressure of the pump (bottom pilot of) EPFR1 will build slightly higher and force EPFR1 to begin opening, which provides a tank path for the pump.

ORF1 – flow limiting orifice. ORF1 limits the amount of LS flow to a fraction of a gallon per minute back to the EPFR1 valve.

SP1 – Spinner flow control valve. SP1 is a proportional solenoid flow control valve. In the nonenergized state it 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 0-9 Gallons – per – minute.

SP2 – 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 – 17 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 EPFR1.

EC1 – Spinner pressure compensator. EC1 limits flow and provides pressure compensation for the spinner 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.



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IN12-02 (Rev. 02-18)

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