

FHE USA LLC

OWNER'S/OPERATOR'S MANUAL

10K GREASE INJECTION SYSTEM WITH ACCUMULATORS

PART# FHE4000

SERIAL#

**FHE USA LLC
1597 CIPOLLA ROAD
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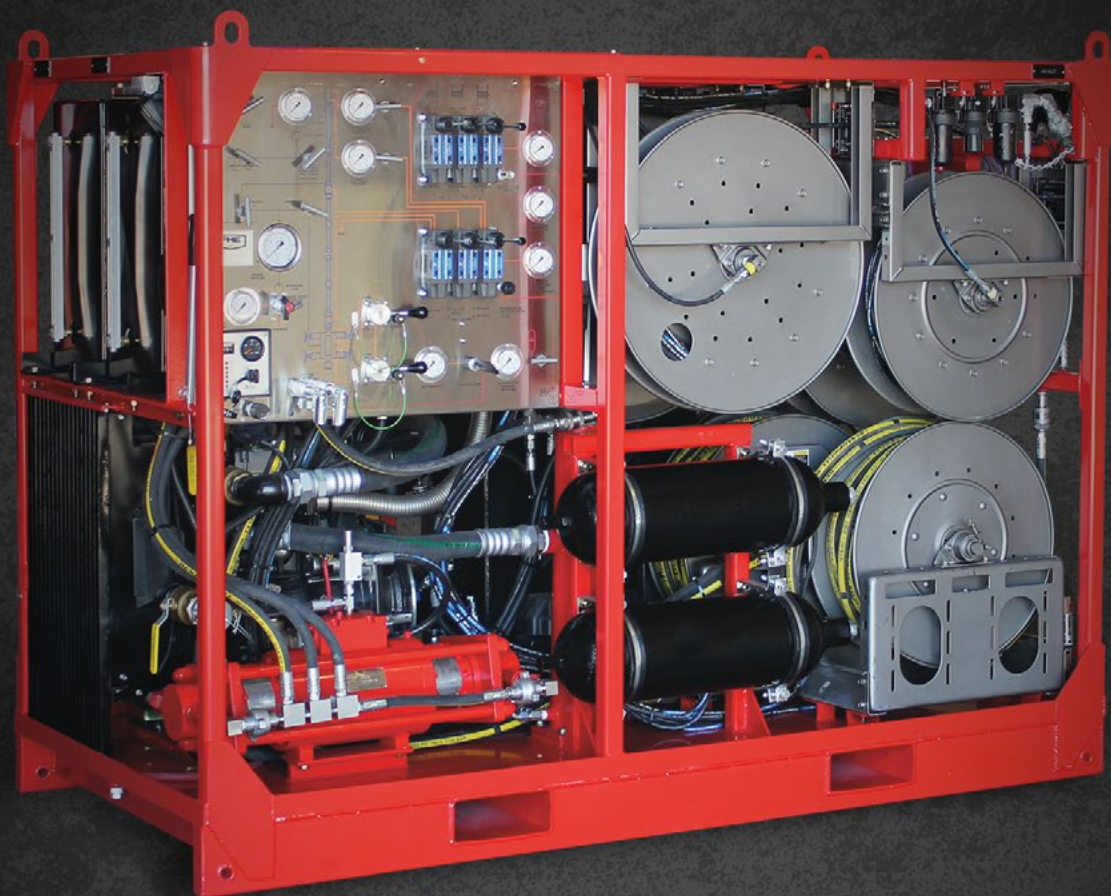


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SPECIFICATIONS FOR FHE4000

DIMENSIONS AND WEIGHT:	
Skid Size:	48 in. (W) x 96 in. (L) x 77 in. (H)
Weight (Skid Unit w/ Hoses and Dry):	5,500 lbs.
Finish:	Custom Painted
POWER:	
Diesel Engine:	Perkins GN65674-FHE, 4 Cylinder, Liquid-Cooled, Electric Start, Low Oil Pressure Shutdown
Diesel Tank:	15 Gallon
Horse Power:	50 HP @ 2,000 RPM
RPM:	3,000 Max
GREASE SYSTEM:	
High Pressure Pump:	McFarland MAC-26, Hydraulically Powered Grease Injection Pump, Dual 1 3/4 in. Plungers w/ 6 in. Power Cylinder and 2 in. Stroke, 1,300 Max PSI Hydraulic @ 18 GPM Max
Pressure Capacity:	15,000 PSI 10,000 PSI (WP)
Pump Capacity:	13–15 Gallons Per Hour
Reservoir Capacity:	Dual 50 Gallon Grease Tanks
Backup Pump:	Lincoln Air Pump, 10,000 PSI Grease Pressure
HYDRAULIC SYSTEM:	
Hydraulic Tank:	35 Gallon Hydraulic Tank, AW42
Pump:	Pressure Comp Load Sense Piston Pumps, 15/24 GPM @ 18,000 RPM
Pressure:	3,000 PSI Max
Hose Reels:	Hannay High Pressure Hydraulic Rewind Hannay Spring Rewind
Accumulators:	5 U.S. Gallon Each, 1,250 PSI Charge, 5 U.S. Gallon Total Usable Oil
MANUFACTURER:	
	FHE USA LLC 1597 Cipolla Road, Fruita CO 81521 Phone: 970-243-0727 Fax: 970-243-7703

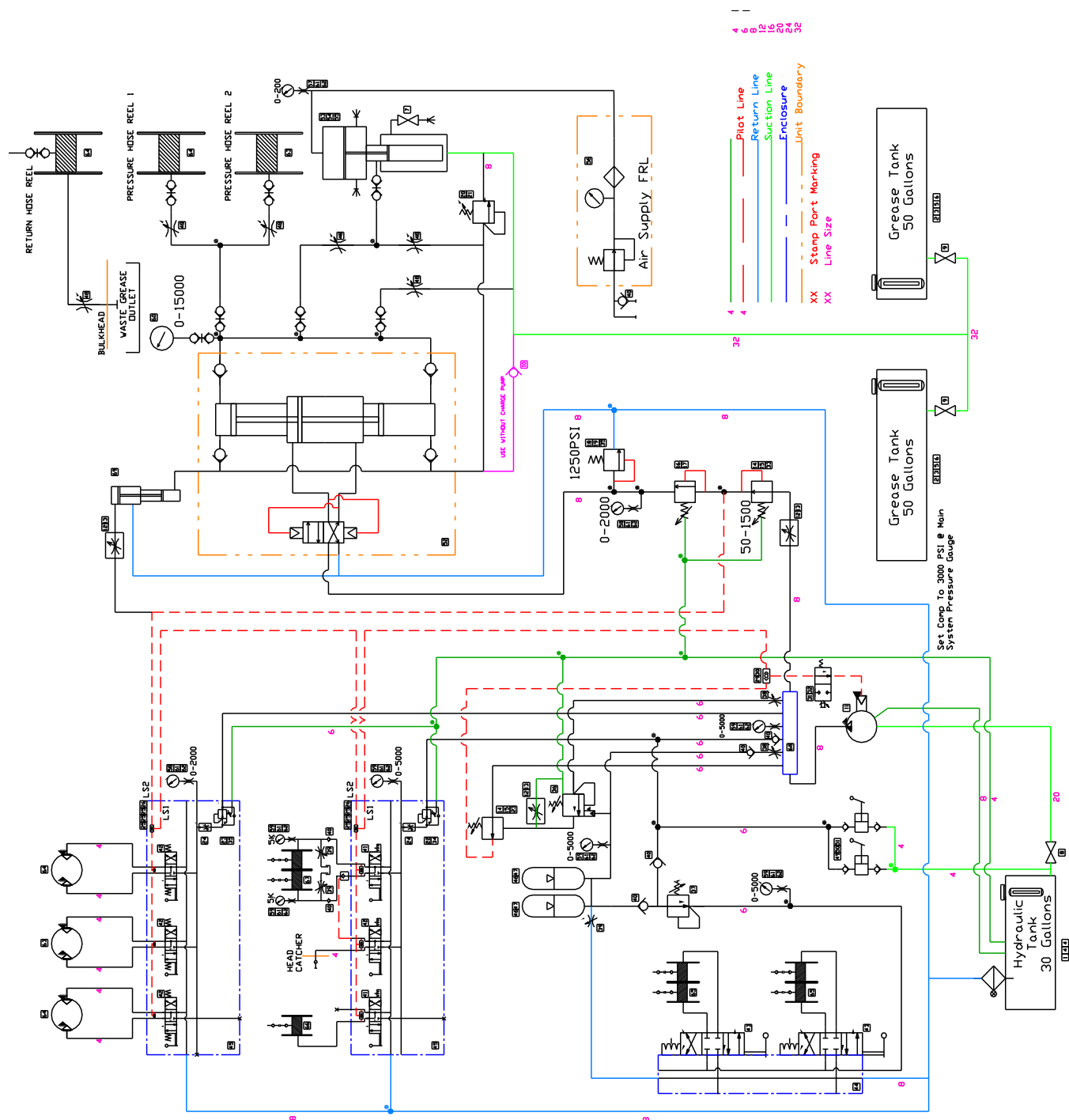
FILTRATION AND LUBE

The table below shows the recommended filter and oils. These part numbers can be converted to any name brand filter.

FILTER KIT FOR 10K GREASE INJECTION UNIT W/ PERKINS GN65674N			
BRAND	PART NUMBER	DESCRIPTION	MAINTENANCE INTERVAL
Donaldson	PT707-HD10	Hydraulic Tank Filter	Change-every 500 service hours
Baldwin	RS4680	Engine Air Filter	Change-when required
Baldwin	B1405	Engine Oil Filter	Change-when engine oil is changed
Baldwin	BF825	Engine Fuel Filter	Change-every 500 service hours
OILS AND FLUIDS			
	AW32 Hydraulic Oil	Winter Months	Biannually with change of seasons
	AW46 Hydraulic Oil	Summer Months	Biannually with change of seasons
	Select Engine Oil Based on Temperature. See Chart Below.	Engine Oil	Change-every 500 service hours

ENGINE OIL VISCOSITY		
EMA LRG-1 API CH-4 Viscosity Grade	Ambient Temperature	
	Minimum	Maximum
SAE 0W20	-40° C (-40° F)	10° C (50° F)
SAE 0W30	-40° C (-40° F)	30° C (86° F)
SAE 0W40	-40° C (-40° F)	40° C (104° F)
SAE 5W30	-30° C (-22° F)	30° C (86° F)
SAE 5W40	-30° C (-22° F)	40° C (104° F)
SAE 10W30	-20° C (-4° F)	40° C (104° F)
SAE 15W40	-10° C (14° F)	50° C (122° F)

SCHEMATIC



BILL OF MATERIALS

#	Manufacturer	FHE Item No.	Long Description	Base Qty
1	American Mobile Power	FP6005	Tank, Hydraulic/Diesel, Deck Mounted	1
2	American Mobile Power	FP6000	Tank, 50 Gallon	2
3	McMaster Carr	FP6006	Gauge, Liquid Level, 18 in., 1/2 in. NPT Ports	2
4	McMaster Carr	FP6007	Gauge, Liquid Level, 24 in., 1.2 in. NPT Ports	2
5	PT Couplings	FP6012	Flange x Cam-Lock 3 in., Aluminum, 6 in. Bolt Circle	2
6	PT Couplings	FP6013	Cap, Cam-Lock 3 in., Aluminum	2
7	McMaster Carr	FP3000	Valve, Ball, 1/4 in. NPT Female, Brass	1
8	McMaster Carr	FP3001	Valve, Ball, 1-1/4 in. NPT Female, Brass	1
9	McMaster Carr	FP3002	Valve, Ball, 2 in. NP Female, Brass	2
10	McMaster Carr	FP3006	Valve, Swing Check, 2 in. NPT Female, Brass	1
11	Mataris	FP0001	Pump, Pressure Comp, Load Sense, 28 CC, SAE b 13-T Shaft, SAE B 4 in. Pilot	1
12	Sun Hydraulics	FP2005	Cartridge, Flow Control, Pressure Comp, .1-12 GPM, Revers Free Flow Check, T-5A	1
13	Sun Hydraulics	FP4007	Manifold, Flow Control, Pressure Comp, T-5A, -8 SAE	1
14	Sun Hydraulics	FP1007	Cartridge, Pressure Reducing, T-2A, 25-1,500 PSI	1
15	Sun Hydraulics	FP4006	Manifold, Pressure Reducing, Line Mount, T-11A, -10 SAE/-6 SAE	1
16	Sun Hydraulics	FP1012	Cartridge, Sequence Valve, 15 GPM, T-11A, 50-1,500 PSI	1
17	Sun Hydraulics	FP4011	Manifold, Sequence, Line Mount, T-11A, -10 SAE/-6 SAE	1
18	Sun Hydraulics	FP1011	Cartridge, Relief, T-10A, 50-1,500 PSI	1
19	Sun Hydraulics	FP4009	Manifold, Relief, Line Mount, T-10A, -8 SAE, 90 Degree	1
20	Sun Hydraulics	FP1010	Cartridge, Relief, T-162A, -8 SAE	1
21	Sun Hydraulics	FP4005	Manifold, Relief, Line Mount, T-162A, -8 SAE	1
22	Sun Hydraulics	FP1008	Cartridge, Pressure Reducing/Relieving, 10 GPM, T-11A, 50-3,000 PSI	1
23	Sun Hydraulics	FP1009	Cartridge, Pressure Reducing/Relieving, 10 GPM, T-11A, 50-1,500 PSI	1
24	Sun Hydraulics	FP2004	Cartridge, Needle Valve, T-5A	2
25	Sun Hydraulics	FP3013	Cartridge, Shuttle Valve, 3 Port, Back-to-back check, Signal at Port 3, 2.5 GPM, T-11A	6
26	Sun Hydraulics	FP3014	Cartridge, Shuttle Valve, 3 Port, Single Ball, Signal at Port 2, 2.5 GPM, T-11A	2
27	Sun Hydraulics	FP3022	Cartridge, Directional, 2 Position, 3 Way, Direct Action, Port 4 Drain, T-21A	1
28	Sun Hydraulics	FP4020	Manifold, Directional, Line Mount, T-162A, -8 SAE	1
29	Sun Hydraulics	FP3015	Cartridge, Shuttle Valve, Signal at Port 2, T-162A, -4 SAE Port 3	1
30	Sun Hydraulics	FP4005	Manifold, Relief, Line Mount, T-162A, -8 SAE	1
31	Sun Hydraulics	FP3017	Cartridge, Directional Poppet Valve, 2-Way Normally Closed, T-13A	1
32	Sun Hydraulics	FP4012	Manifold, Directional Poppet Valve, 2-Way Normally Closed, T13A, -4 SAE	1
33	Sun Hydraulics	FP6048	Kit, Knob, Try Prong, Black	1
34	Sun Hydraulics	FP6038	Kit, Knob, Round, Black	1
35	Sun Hydraulics	FP6082	Cover, Tamper Resistant, Series 1	2
36	Hydraforce	FP1006	Cartridge and Manifold, Unloading Pilot, CV10-4, -6 SAE	1
37	Hawe	FP1015	Valve, Pressure Reducing, 25-250 Bar, 1/4 in. NPT Ports, Manually Adjustable	1
38	Parker	FP2003	Valve, Needle, Steel, 1/4 in. FNPT	1

BILL OF MATERIALS CONT.

39	Noshok	FP2000	Valve, Mini Needle, Steel, 10,000 PSI - 1/4 NPT, 90 Degree	3
40	Parker	FP3007	Valve, Check, 1/4 in. FNPT	7
41	Northman	FP3010	Valve, Motor Spool Manually, Operated, Detented	2
42	Northman	FP3009	Valve, Motor Spool Manually, Operated, Spring Centered	4
43	Webster Instruments	FP3012	182-EOF Rotary Control Valve, Closed, Center, 10,000 PSI 4/3	2
44	Western Slope	FP4001	Manifold, Custom Two Station, Rotary Valve 182-EOF	1
45	M&W Manufacturing	FP4000	Manifold, Custom Three Station D03	2
46	PacSeal Hydraulics	FP6054	Accumulator, Bladder, 5 Gallon, 1-1/4 in. NPT, Bottom Load Repairable	2
47	Tobul	FP6057	Mounting Bracket Set, 2.5-15 Gallon Accumulator, Upper and Lower	2
48	Noshok	FP2002	Valve, Needle, Steel, 10,000 PSI - 1/2 in. NPT	6
49	Hydraforce	FP4003	Manifold, 2-by-2, Size 10, Two Cavities	1
50	Hydraforce	FP0008	Hand Pump, Cartridge, 1,500 PSI, .65 CU. IN. Per Stroke, -8 SAE	1
51	Hydraforce	FP0009	Hand Pump, Cartridge, 3,000 PSI, .45 CU. IN. Per Stroke, -8 SAE	1
52	McFarland	FP0016	Pump, Grease, McFarland	1
53	Lincoln	FP0017	Air Motor, 140:1 Lincoln Pump, "Use with Tube 85305 ONLY"	1
54	Lincoln	FP0018	Pump Tube, 140:1 Lincoln Pump, "Use with Air Motor 84806 ONLY"	1
55	Bulldog	FP6078	Bushing, Custom, (Secure Lincoln Pump 85305 to Suction Reservoir	1
56	Parker	FP6079	Filter-Regulator-Lubricator Assembly, 3/4 in. NPT, with Gauge	1
57	Noshok	FP6087	Gauge, Back Mounted, 200 PSI, 1/4 in. NPT	1
58	Noshok	FP6088	Gauge, Back Mounted, 2,000 PSI, 1/4 in. NPT	2
59	Noshok	FP6089	Gauge, Back Mounted, 5,000 PSI, 1/4 in. NPT	6
60	Noshok	FP6092	Gauge, 4 in. Face, Lower Back Mount, 1/2 in. NPT, SS Bezel and U-Clamp	1
61	Noshok	FP6085	Gauge, Clamp, Panel Mount-2 1/2 in.	9
62	Noshok	FP6086	Gauge, Flange, Mounting, 2.5 in. Back Connected Gauge	9
63	Hannay Reels	FP6046	(**HD6016-25-26-RB H10M) Hose Reel, .70 Hydraulic Motor, 1/2 in. NPT, Bottom Wound w/ Assembly C2	1
64	Hannay Reels	FP6047	(**HD6016-25-26-LB H10M) Hose Reel, .70 Hydraulic Motor, 1/2 in. NPT Bottom Wound w/ Assembly C2	2
65	Hannay Reels	FP6049	(**617-25-26-15.5ASR Hose Reel, Spring Rewind, Double Hose, 3,000 PSI 1/2 in. NPT	2
66	Hannay Reels	FP6048	(**716-23-24-15.5GSR) Hose Reel, Spring Rewind, Single Hose, 3,000 PSI 1/2 in. NPT	1
67	Hannay Reels	FP6052	Hose Reel, Spring Rewind, Double Hose, 150 ft., 5,000 PSI, Custom	1
68	XXX	FP4021	Manifold, Header, 6 Station, Aluminum, 3,000 PSI, -8 SAE, -6 SAE	1
69	Graco Dyna-Star	FP0011	Pump, Hydraulic Reciprocator and Pump	1

PRESSURE SETTINGS

Pressures	Factory Pressure Settings	Notes	DO NOT EXCEED
Main Pressure System:	3,000 PSI	Accumulators charged and no functions actuated	3,400 PSI
Comp Pressure:	3,000 PSI	Max system pressure	3,000 PSI
System Pressure:	3,000 PSI	Normal operating pressure	1,250 PSI
McFarland Relief Pressure:	1,250 PSI	BOM item 44 located in manifold behind panel	12,000 PSI
Grease Pressure:	12,000 PSI	Discharge pressure at reels	12,000 PSI
Suction Charge Pressure:	400 PSI	BOM item 20 located on back of McFarland Pump	600 PSI
Accumulator Charge Pressure:	1,250 PSI	Charged with nitrogen gas	3,000 PSI
Accumulator Pressure:	3,000 PSI	Fill automatically to system pressure	3,000 PSI
Reel Pressure:	900 PSI	Pressure reducing item 23 operator should be able to pull on hose and stop hose reel	900 PSI
Air Pressure:	40–100 PSI	Adjust at air regulator BOM item 56	100 PSI

Pre-Start Check List:

- ☐ Check engine oil level
- ☐ Check engine coolant level
- ☐ Check hydraulic oil level
- ☐ Open ball valve on hydraulic tank
- ☐ Check grease level
- ☐ Open ball valve on grease tank
- ☐ Inspect all belts and filters
- ☐ Close accumulator dump valve

Engine Start Instructions:

1. Turn start valve to START (Located below the engine controller)
2. Turn the key and heat the glow plugs
3. Start engine and bring up to 2,000 RPMs
4. Turn start valve to RUN (Located below the engine controller)
5. Operate at 2,000 RPMs

10K GREASE INJECTION SYSTEM OPERATION

Set all panel mounted valves to their neutral or off positions. Follow start procedures on page 10.

Wireline Valve (WLV) Operation

Accumulators will automatically charge to 3,000 PSI. Set WLV pressure with WLV regulator high enough to operate all WLV rams. Cycle UPPER MIDDLE AND LOWER WLV rams checking that no hydraulic lines are crossed or reversed. Leave WLV regulator set at the minimum pressure required to close all WLV rams.

Pack-off

Line Wiper

Tool Trap

Auxiliary

Head Catcher

Shift each of these directional valves to their middle position then back out the "PRESSURE CONTROL." There is only one pressure control for all of these functions.

Pack-off: First close the dump valve located next to the pack-off pressure gauge. Shift the directional valve on the right up to PACK-OFF. Hold middle valve in the PACK-OFF SAFETY position and increase pressure with the "PRESSURE CONTROL" valve. Middle valve must be held up in order to increase pressure on PACK-OFF. Reduce pressure by opening the dump valve.

Line Wiper: First close the dump valve located next to the line wiper pressure gauge. Shift the directional valve on the right down to LINE WIPER. Increase pressure with the "PRESSURE CONTROL" valve. Reduce pressure by opening the dump valve.

Tool Trap: Shift the directional valve on the left up for open or down for close (unless using a single tool trap, then down for auxiliary). Increase pressure with "PRESSURE CONTROL" valve. Shift directional valve back to its middle position to drain all pressure off of the tool trap.

Head Catcher: Shift middle directional valve down and hold it in that position. Increase pressure with the "PRESSURE CONTROL" valve. Let the directional valve shift back to its middle position to drain all pressure off of the head catcher.

McFarland

Turn on and increase pressure by turning the "PRESSURE CONTROL GREASE" valve in. Decrease pressure and turn off by turning the "PRESSURE CONTROL GREASE" valve out. McFarland should move at 33-40 strokes per minute.

Accumulators

Pre-charged with nitrogen 10 1,250 PSI. Close the accumulator drain needle valve located in the lower right corner of the control panel. Accumulators will automatically recharge when pressure drops 30% below their full charge.

WARNING! Always drain accumulators during any maintenance and transportation.

PRESSURE SETTING

Part # FHE4000

FOLLOW PROCEDURES IN THE ORDER THAT THEY ARE WRITTEN

Do not adjust any pressure or flow settings unless it has a hand adjustable knob

Call FHE USA LLC at 970-243-0727 with any questions.

PURGE INSTRUCTIONS

FHE4000 Series, 10K Grease Injection System

Description:	Diesel Powered, 10K Grease Injection System w/ Accumulators, Dual 50 Gallon Grease Tank, and Backup Air Powered Grease Pump
	Refer to schematic and bill of materials for valve numbers

CAUTION: Failure to follow instructions can cause system damage and potential injury!

Purge Instructions

1. Select grease tank 1 or grease tank 2
2. Open the suction ball valve #9 on the selected grease tank.
3. Open vent valve #7 located at the Lincoln pump reservoir
4. Begin filling the selected grease tank with grease. As you fill, watch for overflow from vent valve #7 on the Lincoln pump reservoir
5. When this vent overflows close vent valve #7
6. Open "Pre-charge McFarland" needle valve located on control panel. Close "Grease Backup Lincoln Pump" also located on the control panel
7. Open "DUMP" needle valve
8. Connect air hose to Lincoln pump and begin pumping grease with Lincoln pump (approximately 5 minutes). Stop Lincoln pump and disconnect air supply.
9. Close "DUMP" needle valve and open Reel #1 or Reel #2 to send grease to Reel 1 or Reel 2

Follow engine start procedure on page 10. Turn on McFarland and Grease Pump. Check for grease discharge through hose reel 1 or 2. The pump should be purged and ready for connection and operation.

NOTE: If McFarland is cavitating, repeat steps 1 through 8.

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