
Single Shot Hydraulic Pump with Hydraulic Return
Model 85416
Series "A"

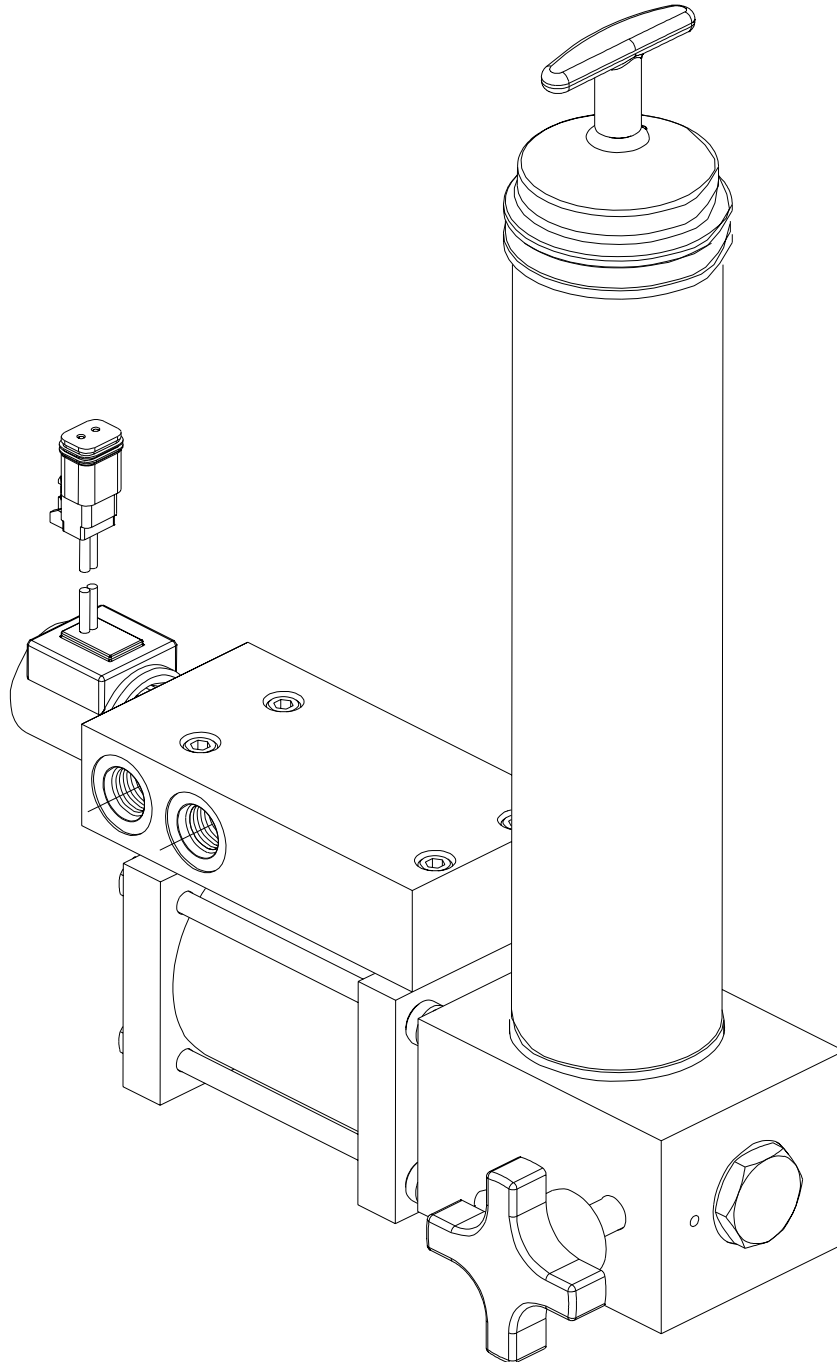


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Safety

Read and carefully observe these operating instructions before unpacking and operating the pump! The pump must be operated, maintained and repaired exclusively by persons familiar with the operating instructions. Local safety regulations regarding installation, operation and maintenance must be followed.

Operate this pump only after safety instructions and this service manual are fully understood.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

Safety Instructions

This equipment generates very high grease pressure. Extreme caution should be used when operating this equipment as material leaks from loose or ruptured components can inject fluid through the skin and into the body causing serious bodily injury. Adequate protection is recommended to prevent splashing of material onto the skin or into the eyes.



Description

General Description

This unit is a hydraulically operated, single acting, hydraulic return, positive displacement pump designed to deliver grease under pressure. The pump is primarily designed for Airless Spray Lube and Single Line Progressive Centralized Lubrication Systems. A 12-volt DC four-way solenoid valve to control hydraulic input is integrated into the pump.

The pump uses grease from standard 14.5 oz. grease cartridges, eliminating the need for bulk filling equipment. The pump may be filled from a bulk lubricant container if desired.

Appropriate Use

- This pump is exclusively designed to dispense grease in centralized and Airless Spray lubrication systems.
- It should be operated only with hydraulic power.
- The maximum ratings given should not be exceeded.
- Any other use not in accordance with the instructions will result in loss of claims for warranty and liability.

Product Specification

Pump Ratio	25:1
Output per Stroke	0.11 in ³
Hydraulic Inlet	
Pressure (max.)	300 psig (21 bar)
Output Pressure (max.)	7500 PSIG (520 bar)
Operating Temperature	-10°F to +160°F (-23°C to +65°C)
Operating Voltage	12 VDC
Initial Current Draw	1.22 amps
Hydraulic Ports	SAE -6 J1926 (3/8") (9/16-18 UNF)
Pump Outlet	SAE -6 J1926 (3/8") (9/16-18 UNF)
Weight (empty)	13 lbs. (6.0 kg)

Pump Operation

When the lube system timer/controller requires lubricant, the four-way solenoid valve is energized. This allows pressurized hydraulic fluid to enter the hydraulic cylinder, which moves the piston and plunger forward. The plunger forces pressurized lubricant past the outlet check and into the system. Hydraulic fluid on the back side of the hydraulic piston is vented through the four-way solenoid valve and the tank port back to the hydraulic reservoir.

When the system timer controller turns off the pump, the solenoid valve is de-energized, allowing pressurized hydraulic fluid to enter the back side of the hydraulic piston. This moves the piston and plunger back to their starting positions. Hydraulic fluid on the front side of the hydraulic piston is vented through the four-way solenoid valve, through the tank port back to the hydraulic reservoir.

As the plunger returns, it opens the lubricant inlet port, lubricant flows into the cavity due to vacuum in the cavity and the pressure exerted on the grease cartridge by the follower spring.

With Airless Spray Lube Systems, this process may be repeated until the Airless Spray Lube System requirements are fulfilled.

Installing the Pump

The pump preferably should be mounted with the grease cartridge housing in the vertical position, but it may be mounted in the horizontal position. Be sure to allow sufficient space for filling and servicing. Mount in an area where the pump can be observed for monitoring lubricant level and pump operation.

1. Mount securely to an even, stable and solid surface with 5/16" [8mm] dia. screws.
2. Connect material supply line to the pump outlet.
3. Connect hydraulic supply line to the **INLET** port and connect the hydraulic return line to the **TANK** port.
4. Connect 12 VDC power line from timer/controller to the solenoid valve (2). Use Connector Plug (1) supplied with the pump.
5. Fill the pump with grease. See Filling Pump with Grease instructions.
6. System may be primed by cycling the pump or by filling manually with lever gun or other grease pump.

Filling Pump with Grease Removing Empty Cartridge

1. Pull back on follower handle until the follower rod is fully extended and latch the follower rod groove into the slot on the tube cap.
2. Unscrew grease Cartridge Housing (22) from Pump Head (15).
3. Carefully release follower handle to eject empty cartridge from container tube.

Installing Grease Cartridge

1. Visually check follower seal lip direction before loading a new cartridge. The follower seal lip must be directed toward the follower handle for cartridge loading. See Illustration #1. To change direction of the follower seal, unscrew tube cap from container tube and pull on handle to remove follower seal from tube. Flip follower seal over and re-assemble.
2. Pull back on follower handle and latch the follower rod groove into the slot on the tube cap.
3. Remove the plastic cap from the grease cartridge and insert cartridge into container tube, with the open end against the follower seal.
4. Remove the pull tab from grease cartridge and screw Grease Cartridge Housing (22) into Pump Head (15).
5. Release follower rod from slot. Purge air from pump. See air purging instructions.

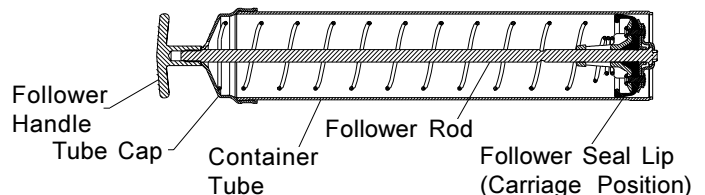


Illustration 1

Manual Filling

1. Unscrew Grease Cartridge Housing (22) from Pump Head (15).
2. The follower seal lip must be directed toward the pump head when cartridges are not used. To change direction of follower, unscrew tube cap from container tube and pull on handle to remove follower from tube. Flip follower seal over and re-assemble.
3. Pack container tube follower end with grease to eliminate air pocket.
4. Dip packed end of the container tube about one inch into bulk container.
5. Slowly pull follower handle back while gradually pushing container tube deeper into grease.
6. When follower rod is fully extended pull sideways to latch it into slot in tube cap.
7. Wipe excess grease from outside of container tube.
8. Screw Grease Cartridge Housing (22) into Pump Head (15).
9. Release follower rod from slot. Purge air from pump. See air purging instructions.

Air Purging

1. Engage the Follower Rod with the follower by lightly pulling up and rotating the Follower Handle.
2. Loosen the Container Tube from the Pump Head about 1 turn, or until it is loose.
3. Push in the Follower Handle to force any air pockets out of Pump Head around Container Tube Threads.

4. Tighten container tube into Pump Head Container Tube Threads.
5. Open Purge Valve by rotating Purge Valve counter clockwise 1 turn.
6. Cycle Pump until lubricant, free of air, is present at Purge Port.
7. Close Purge Valve by turning clockwise, finger tight.

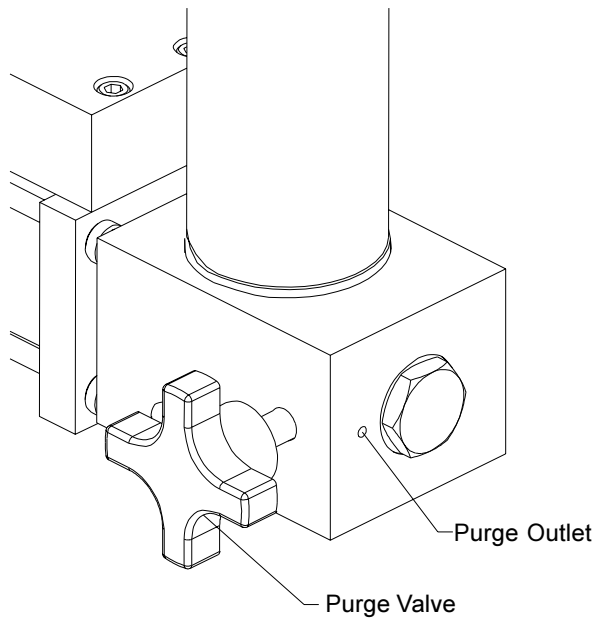


Illustration 2

Maintenance and Repair

Relieve pressure from the pump and supply lines and remove power from the solenoid before servicing or repairing the pump, to reduce the risk of an injury from injection, splashing fluid or moving parts.



Disassembly Procedure (See Illustration #4)

Tools Required:

- 3/16" Allen wrench
- 1" wrench
- 1/2" wrench
- 9/16" wrench
- 3/4" wrench
- 7/8" wrench

1. Disconnect Solenoid Coil (2) at Connector (1).
2. Remove tension on follower spring in Grease Cartridge Housing (22) by pulling up on follower handle and latching notch on follower rod into slot on tube cap.
3. Remove Grease Cartridge Housing (22).
4. Remove Grease Cartridge.

5. Remove Packing (21) from Pump Head (15).
6. Remove Solenoid Coil (2) from Solenoid Valve Cartridge (3).
7. Remove Solenoid Valve Cartridge (3) from Valve Body (14).
8. Loosen four Hex Head Screws (4) from Pump Body and remove Cylinder from Pump Body, pulling Plunger free of Pump Body.
9. Remove four Hex Head Screws (4) and four Spacers (27) from cylinder assembly.
10. Remove four Socket Head Cap Screws (13) and Valve Body.
11. Remove two O-Rings (26) from Cylinder Ends (5 & 25).
12. Remove Cylinder End (25) from Cylinder (7).
13. Remove Cylinder (7) from Cylinder End (25).
14. Remove Plunger and Piston Assembly from Cylinder End (25).
15. Disassemble piston (9) from Plunger (11) by removing nut (10) and sliding piston (9) off Plunger (11).
16. Remove U-Cup Seals (8) from Piston (9).
17. Remove O-Ring (12) from Plunger (11).
18. Remove O-Ring (6) from Cylinder Ends (5 & 25).
19. Disassemble Cylinder End (25) by removing U-Cup (24) and Wiper (28).
20. Disassemble Pump Body by removing Purge Valve Screw (16) and ball (29).
21. Remove Check Valve Assembly by removing Check Plug (20), Spring (18) and Check Ball (17) from Pump Body (15).
22. Remove O-Ring (19) from Check Plug (20).
23. Remove Wiper (28) from Pump Body (15).
24. It is recommended that all seals which are included in the seal kit, be replaced when re-assembling the pump.
25. Reassembly is the reverse of the disassembly procedure.
26. When installing wiper (28) into Pump Body (15) the single lip on the Wiper (28) must face out of the Pump Body (15) towards the Cylinder End (25). Do not cut seal.
27. When installing Wiper (28) into Cylinder End (25) the single lip on the Wiper (28) must face out of the cylinder end (25) facing towards the pump body (15). Do not cut seal.
28. When installing U-Cup into Cylinder End (25) the seal lips must face towards Cylinder (7). U-Cup snaps into groove. Do not cut seal.
29. When installing U-Cup Seals (8) on Piston (9), the seal lips must face away from each other.
30. Pre-Assemble the Hydraulic Cylinder prior to assembling to the Pump Body, in reverse order of assembly. Leave the Socket Head Cap Screws (13) loose until final assembly is made.
31. When assembling the Hydraulic Cylinder to the Pump Body, carefully work the chamfered end of the plunger (11) into the Wiper Lips (28) so the wiper is not damaged.
32. Slide the four Hex Head Screws (4) through both Cylinder Ends (5 & 25) through four spacers (27) and into pump body (15).
33. Tighten four Hex Head Screws (4) for a snug fit. Fully tighten four Socket Head Cap Screws (13). Then tighten fully four Hex Head Screws (4).

Single Shot Hydraulic Pump

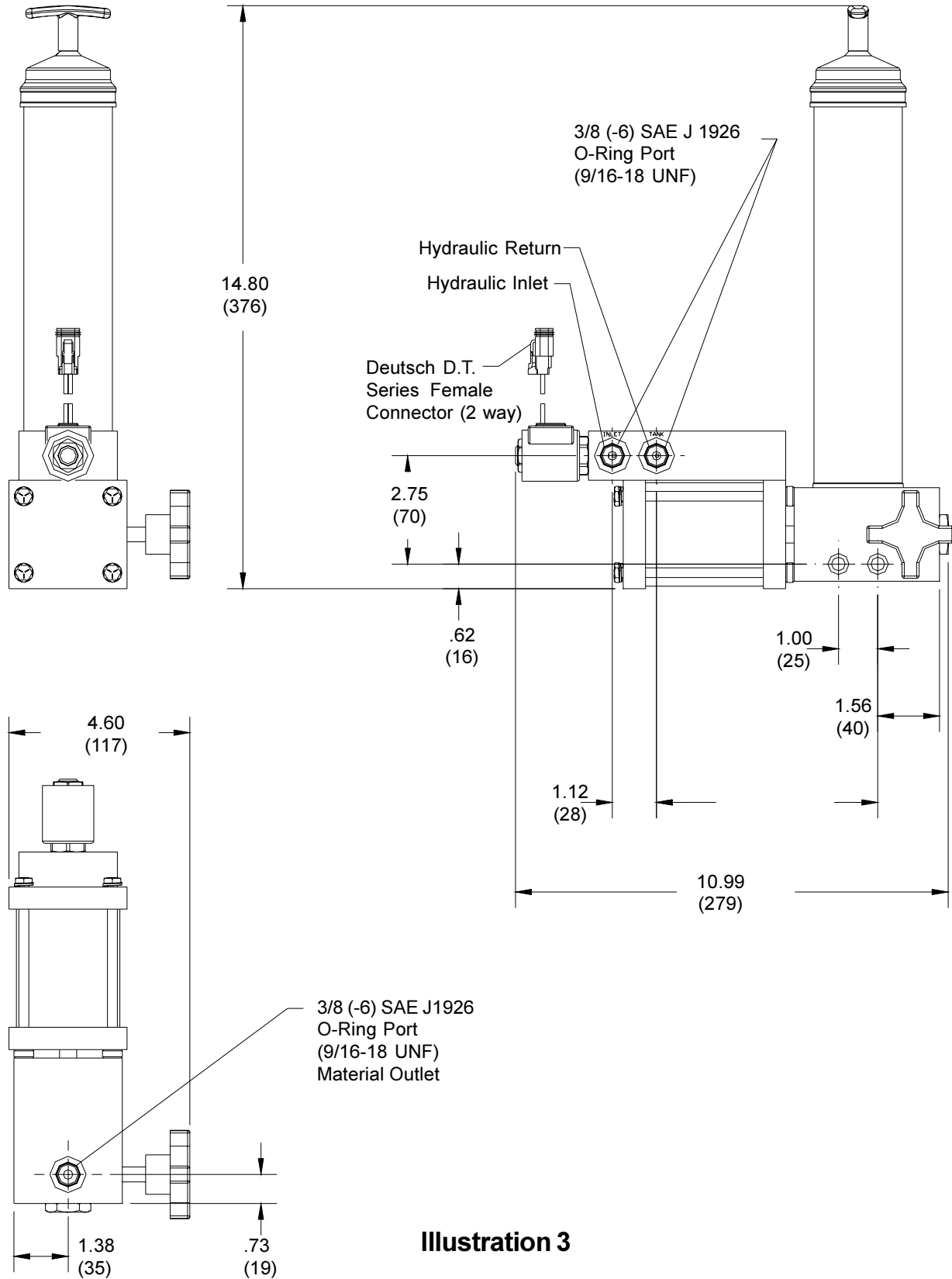


Illustration 3

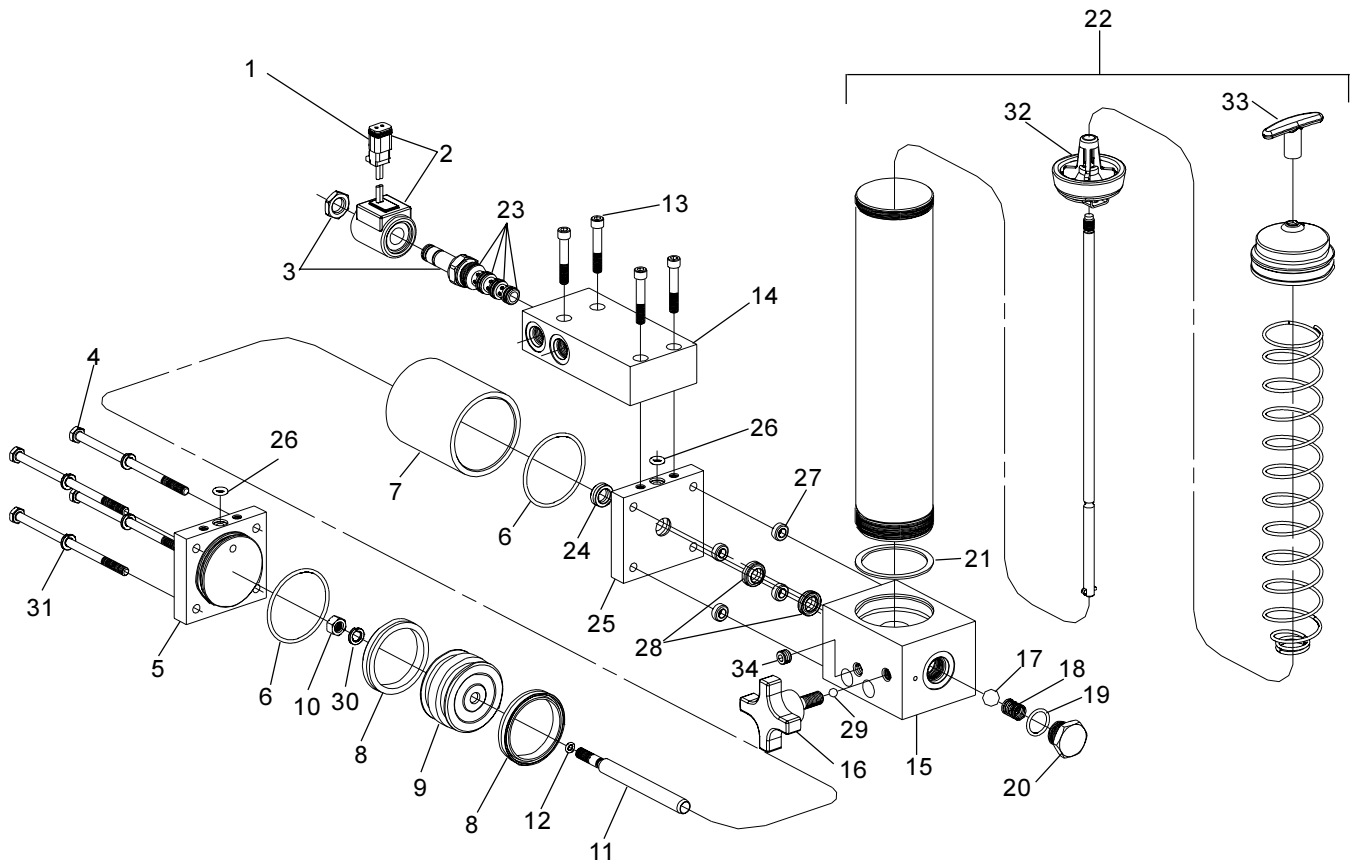


Illustration 4

Repair Parts List

Item	Qty	Description	Part No.
1	1	Connector	270926
2	1	Solenoid Coil (includes Item 1)	270852
3	1	Solenoid Valve Cart (includes Item 23)	270849
4	4	Hex Screw 1/4-28 x 5"	270847
5	1	Cylinder End	270837
6	2	O-Ring (Nitrile)	Note 1
7	1	Cylinder	270833
8	2	U-Cup (Polyurethane)	Note 1
9	1	Piston	270841
10	1	Nut (5/16-18 UNF)	51026
11	1	Plunger	270844
12	1	O-Ring (Nitrile)	Note 1
13	4	Socket Head Cap Screw (1/4-28 x 1 1/2)	270848
14	1	Valve Body	270839
15	1	Pump Body	270831
16	1	Knob & Stud (3/8 - 16 x 1")	270856
17	1	Check Ball	270863
18	1	Check Spring	270846
19	1	O-Ring (Nitrile)	Note 1
20	1	Check Plug	270845
21	1	Packing (Nitrile)	34793
22	1	Grease Cartridge Housing (Includes Item 32 & 33)	249786
23	1	Seal kit (Nitrile)	270859
24	1	U-Cup (Polyurethane)	Note 1
25	1	Cylinder End	270835
26	2	O-Ring (Nitrile)	Note 1
27	4	Spacer	16073
28	2	Double Lip Wiper (Nitrile)	Note 1
29	1	Ball	66003
30	1	Lockwasher (5/16")	66246
31	4	Lockwasher (1/4")	66186
32	1	Follower Assembly	93485
33	1	Handle	261514
34	1	Pipe Plug	68645

NOTE 1: Seal kit 270858 contains all seals required for rebuilding the pump assembly. This kit does not contain items 23, 21 or 32.

Troubleshooting

Condition	Possible Cause	Corrective Action
Pump does not operate.	No hydraulic pressure to pump.	Turn on or connect hydraulic supply.
	No electric power to solenoid.	Turn on or connect timer/controller to solenoid.
	Solenoid valve failure.	Replace Solenoid Valve.
	Piston or plunger is stuck.	Disassemble pump, inspect for damaged or worn parts. Replace if necessary.
Pump does not dispense grease.	Grease cartridge empty.	Replace empty grease cartridge.
	Follower is stuck.	Check cartridge housing for damage.
	Pump is air bound.	Purge pump - see Air purge procedure
Pump fails to build pressure.	Check valve is not working.	Disassemble Check Valve & inspect for worn or damaged parts.
	Plunger leaks.	Disassemble pump & inspect for worn or damaged parts.
Pump fails to build pressure.	Solenoid Valve Failure.	Replace Solenoid Valve.
Excessive leakage between Pump Body & Hydraulic Cylinder	Seal Failure	Disassemble Pump inspect for torn or damaged seals.

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