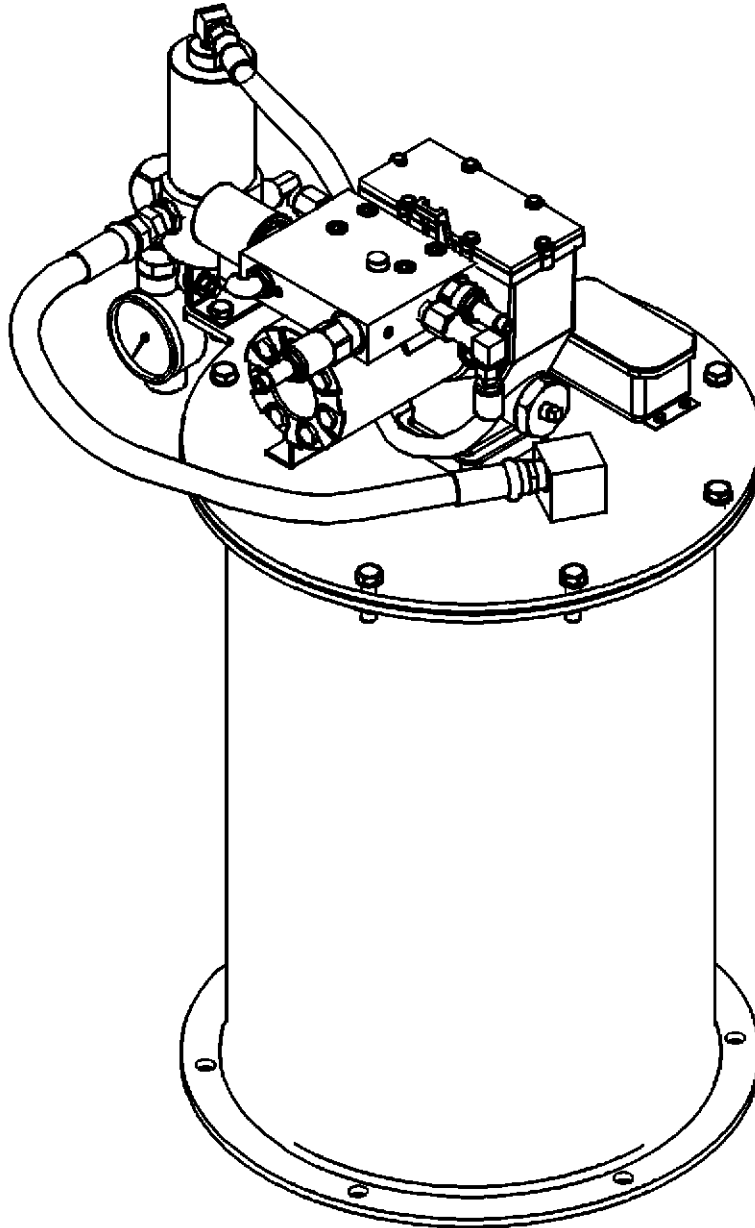




**FlowMaster™ Rotary Driven Hydraulic Pump
Model 85644 With Low Level Indicator
Model 85645 Without Low Level Indicator
Series "B"**



**FlowMaster™ Rotary Driven Hydraulic Pump
Model 85644 With High Level Indicator
Model 85645 Without High Level Indicator**



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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.

! WARNING

This symbol indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury. Please refer to the 85717© operation manual, section C8, page 341©, series for all other safety considerations.

PRODUCT SPECIFICATIONS

Supply inlet hydraulic pressure, maximum, PSIG (bar) -	3,500 (241)
Operating working hydraulic pressure, PSIG (bar) -	300 to 450 (21 to 31).
Max. output pressure, PSIG (bar) -	3500 (241)
Hydraulic inlet flow, GPM (l/min) -	Up to 7 (27)
Pump ratio with manifold -	9:1 at low inlet pressure (300 to 350 PSI [21 to 24 bar]) and low inlet flow (below 2 gpm [7.5 lpm]) Pump ratio approaches 11.0:1 ratio at higher inlet pressure and flow.
Ambient oper. temp. °F (°C) -	-20 to +150 (-29 to +66)
Operating voltage, VDC -	24
Hydraulic inlet port, In -	SAE 4
Tank return port, In -	SAE 6
Maximum hydraulic fluid temp., °F (°C) -	200 (93)
Weight, Pump Only Lbs (Kg) -	93 (41)
Container capacity, Lbs (Kg) -	60 (27)

! WARNING

Do not exceed 3,500 PSIG (241 bar) maximum supply inlet hydraulic pressure or 3500 PSIG (241 bar) maximum outlet pressure. Exceeding the rated pressures may result in damage to system components and personal injury.

DESCRIPTION

General Description 85644 and 85645

The Models 85644 and 85645 are pumping units designed to operate a Centro-Matic® lubrication system. The units include a vent valve to relieve the line pressure to recharge the injectors. FlowMaster™ Rotary Driven Hydraulic Pump includes pressure reducing valve, flow control valve and solenoid operated (24 VDC) “On” and “Off” valve.

The FlowMaster pump is fully automatic when used with Model 85530 Controller and a pressure switch. The FlowMaster pump is double acting, dispensing lubricant on both the “Up” and “Down” strokes. This unit is designed to be used with SL-1, SL-11, SL-32 and SL33 series injectors or a combination of these.

Model 85644 includes an electrically monitored low level indicator.

Model 85645 has no electrically monitored low level indicator.

Appropriate Use

- The pump on this unit is exclusively designed to pump and dispense lubricants using hydraulic power only.
- The maximum specification ratings should not be exceeded.
- Any other use not in accordance with instructions will result in loss of claims for warranty and liability.

SYSTEM OPERATION

Operation with Model 85530 System Controller

When Model 85530 times out, it will initiate a lube cycle. The solenoid is energized to deliver hydraulic pressure to the pump and vent valve. Pump begins dispensing lubricant through injectors to the bearings.

When all bearings have received lubricant, pressure rises in the system to actuate the pressure switch. When pressure switch actuates, the control is reset to de-energize the solenoid valve cutting off hydraulic oil pressure to the pump and vent valve. Pump stops, pressure vents and pressure switch de-actuates. Control begins timing toward next lube event.

© Indicates change

INSTALLING THE PUMP

Place the unit in the approximate location making sure that electric and hydraulic power connections are accessible. Mark center locations of the four holes at the bottom of the reservoir. Then drill four 5/8" (16 mm) holes. The use of 1/2" (13 mm) bolts will offer some flexibility in securing the reservoir to the equipment.

Lubricant outlet of pump should be connected to system with suitable hose capable of 3,500 PSI (241 bar) working pressure. Hydraulic inlet connection should be made with at least 3/8" (9 mm) I. D. hose capable of at least 3,500 PSI (241 bar) operating pressure. Hydraulic return to tank connection line should be 3/4" (19 mm) I. D. hose or pipe.

Please refer to the 85481 operation manual, section C8, page 269, series "B" for setting the pump pressure and flow control.

PUTTING PUMP INTO OPERATION

Filling Reservoir

To bulk fill the reservoir, remove the lower pipe plug and upper elbow and nipple from the side of the reservoir (see Figure 10). Attach the appropriate bulk-filling pump to the lower inlet (3/4 NPT). Fill reservoir until grease appears at the top 1/2 NPT vent high level port. Remove the bulk-filling pump. Replace upper elbow with nipple and lower plug.

MAINTENANCE & REPAIR

WARNING

When filling the reservoir, caution should be used as extreme pressure can cause damage to the reservoir or serious personal injury.

General Maintenance

- Keep area around pump clean. Clean off filling port area prior to filling reservoir. Clean area around filler after filling as lubricants will attract dirt.
- Keep lubricants clean and free of dirt and debris.
- When replacing grease pails be especially careful to prevent any foreign matter from entering the grease pail or contaminating the grease, as it adheres to the pump.

In Case of System Malfunction (See Trouble Shooting Chart Page 8)

- Use the **Trouble Shooting Charts** to determine where to look if problems occur.
- See the sections below for replacement and repair of specific areas of the check valve, vent valve or safety unloader valve.
- Each part is identified with a number keyed to the matching part on the illustrated views.

- General recommendations of tools required are also specified in each step.
- Pay particular attention to the **Warning** statements to prevent personal injury and possible damage to pump components.

Outlet Check Service (See Figures 1, 2, 8 & 9, Pages 4, 5 & 6)

The pump will not build up sufficient lubricant pressure if the outlet check (3) is fouled. Foreign material may lodge beneath the Check Ball (24) or between check disc (21) and the seat of bushing assembly (20). Sealing surfaces of the seat must form a perfect seal. Clean parts or replace if pitted, worn or scored.

1. Turn off and disconnect the hydraulic and electric power supply to the pump assembly.
2. Standard tools required are a bench mounted vice, a set of open end wrenches ranging from 7/16" to 1-1/2", a large 24" (600 mm) adjustable wrench and a smaller 10" (254 mm) adjustable wrench.
3. Remove bolts and lock washers (37 & 36).
4. Loosen adapter union. Set vent valve assembly to the side.
5. Remove entire outlet check assembly (3) by loosening adapter (2) from pump outlet.
6. Remove adapter (2) from outlet check assembly (3).
7. Remove outlet connector (25) from bushing (20).
8. Remove ball check seat (22) from outlet connector (25).
9. Inspect all check components (20, 21, 22, 24) for presence of foreign material, scoring and or other damage, which may cause internal leakage. Replace components if damage is found.
10. If foreign material is present, clean components and reassemble. Be sure to always replace gaskets (19) & (23) whenever vent valve is disassembled. Reverse the above procedure to reassemble. Torque check assembly to 100 ft.-lbs. (13.5 N-M).

Vent Valve Service (See Figures 3, 8 & 9 Pages 5 & 6)

1. Turn off and disconnect the hydraulic and electrical power supply to the pump assembly.
2. Standard tools required are a bench mounted vice, a set of open end wrenches ranging from 7/16" to 1-1/2", a large 24" (600 mm) adjustable wrench and a smaller 10" (254 mm) adjustable wrench.
3. Loosen Adapter Union (4) and Vent Hose (11).
4. Remove bolts and lock washers (37 & 36). Remove vent valve.
5. Hold base of vent valve in vice to remove elbows (8 & 13). Turn vent valve in vice so that vice jaws are gripping flats machined on base of vent valve.
6. Remove hydraulic cylinder (26). Remove piston and packing (27) from cylinder. If oil leakage was evident from side of hydraulic cylinder then replace packing.

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7. Remove packing assembly (29). If grease leakage was evident from side of hydraulic cylinder, then replace packing assembly.
8. Inspect needle (28) and valve seat (30). If foreign matter is lodged and is keeping the needle from sealing in valve seat, clean and inspect for damage. If seat appears damaged by nicks, grooves or scouring it should be replaced. Remove valve seat (30) from valve body (32) by placing a 3/4" open end wrench onto the flats and loosening the seat. The use of an adjustable wrench in place of the open end wrench may be necessary due to the accessibility of the seat.
9. Replace the valve seat (30) if damaged. Also be sure to remove and replace the gasket (31) below the seat.
10. Reassembly is the reverse of the above procedure. Needle (28) and hydraulic cylinder (26) inside diameter should be coated with oil or grease to assist in assembly.
NOTE: Elbow (13) must be facing down. Elbow (8) must be rotated approximately 30° toward vent hose to prevent excessive rubbing of hydraulic hose on pump.
11. Upon reassembly tighten valve seat (30) into body (32) using 25 ft.-lbs. (39 N-M). Tighten hydraulic cylinder (26) onto valve body (32) using 100 ft.-lbs. (135 N-M)

Follower (see Figures 4, 5 & 10 Pages 5 & 6)

If follower wiper appears to be damaged or does not wipe the sides of the container effectively service may be necessary.

1. Disconnect hydraulic supply from pump.
2. Remove the eight bolts (50) and lock washers (52) which attach the cover to the reservoir.
3. Lift the entire pump, vent valve, cover assembly and follower out of the reservoir.
4. Unscrew the low level indicator (59) from the follower plate (60).
5. Now remove the entire follower assembly from the pump tube. After removing the follower assembly from the pump tube wipe off the excess grease which will allow clean access to the eight bolts that must be removed.
6. Loosen and remove the eight nuts (65) on top of the follower.
7. Remove the follower weight (105) and the wiper (61).

- Replace the wiper with a new one.
8. Reassemble in the reverse of the above procedure making sure that the long bolts are staggered with the small ones and that they extend below the follower.

Low Level Indicator (see Figure 4 & 10 Pages 5 & 6)

If the indicator pin appears to drop prematurely or water is noticeable on top of the follower then the indicator seal (58) may be damaged.

1. Remove the eight bolts (50) and lockwashers (52) which hold the cover on to the reservoir.
2. Inspect the reservoir gasket seal (48) for damage. If damage is apparent then replace the gasket seal.
3. Remove the entire pump, vent valve and follower assembly from the reservoir.
4. Remove the retaining ring (56) from the indicator rod assembly (59).
5. Hold the indicator plug (55) with a wrench while removing the indicator nut (57).
6. Remove and replace the O-ring (58).
7. Reassemble in the reverse of the above procedure. Torque the indicator nut (57) to 20 ft.-lbs.

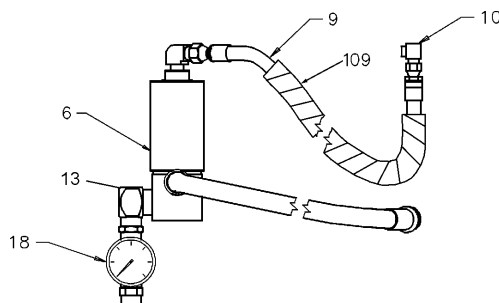
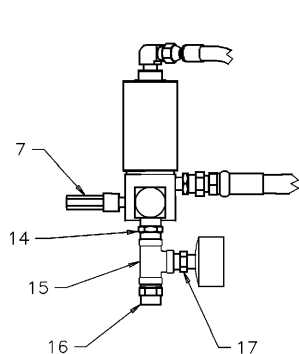
Safety Unloader Valve (See Figure 1 Below)

Safety unloader valve (7) is not serviceable and should be replaced if malfunction is apparent. Upon reassembly, tighten to 10 ft.-lbs. (13.5 N-M).

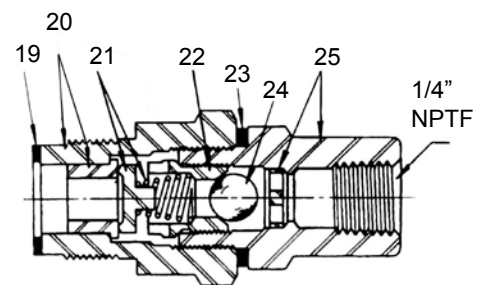
The Safety Unloader (7) is set to open at 3,750 to 4,250 PSI lubricant pressure. If pressure Switch fails to operate and shut off hydraulic supply to pump, the Safety Unloader will open at approximately 4,000 PSI to relieve lubricant supply line pressure (Safety Unloader is preset and cannot be adjusted.)

Bare Pump Assembly (See Figure 10 Page 6)

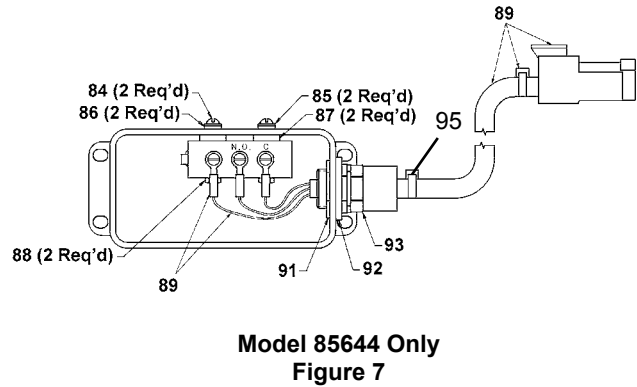
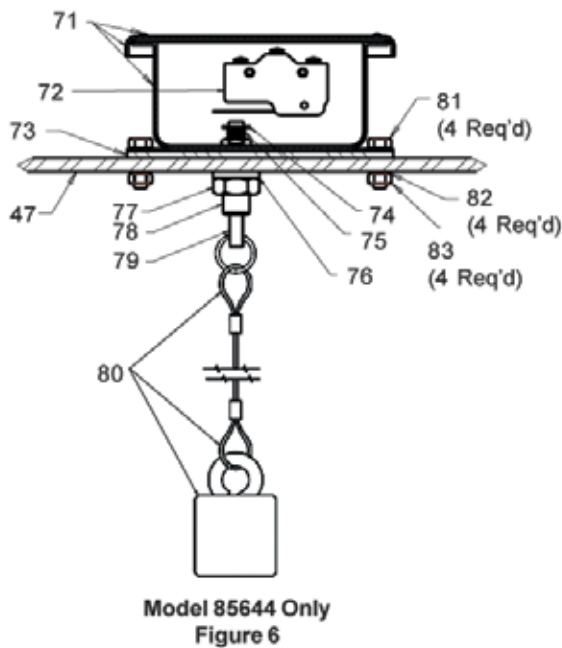
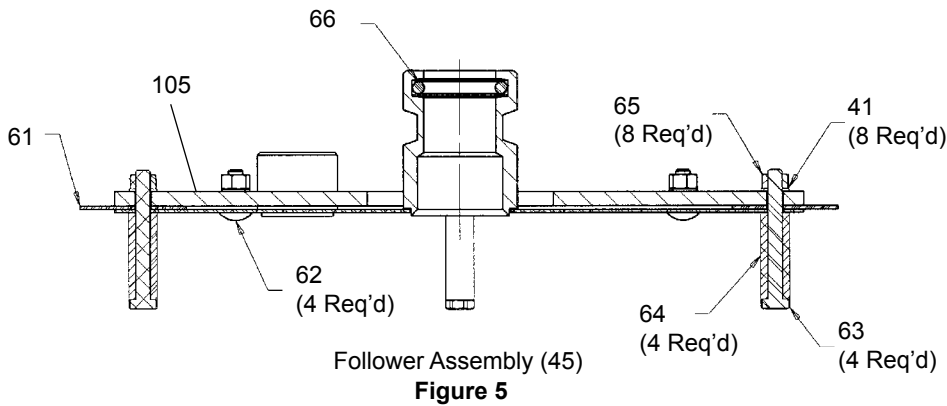
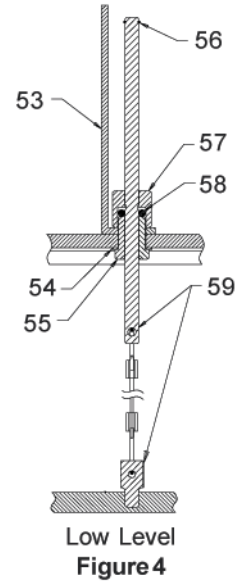
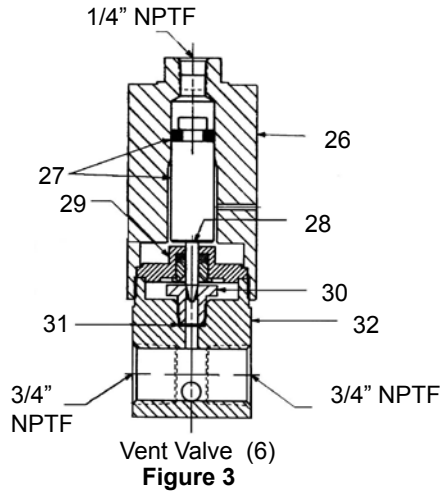
Please refer to the Operation Manual (C8, Page 269 series) for the bare pump assembly (38).



Vent Assembly
Figure 1



Outlet Check Assembly (3)
Figure 2



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 Model 85645 Without High Level Indicator**

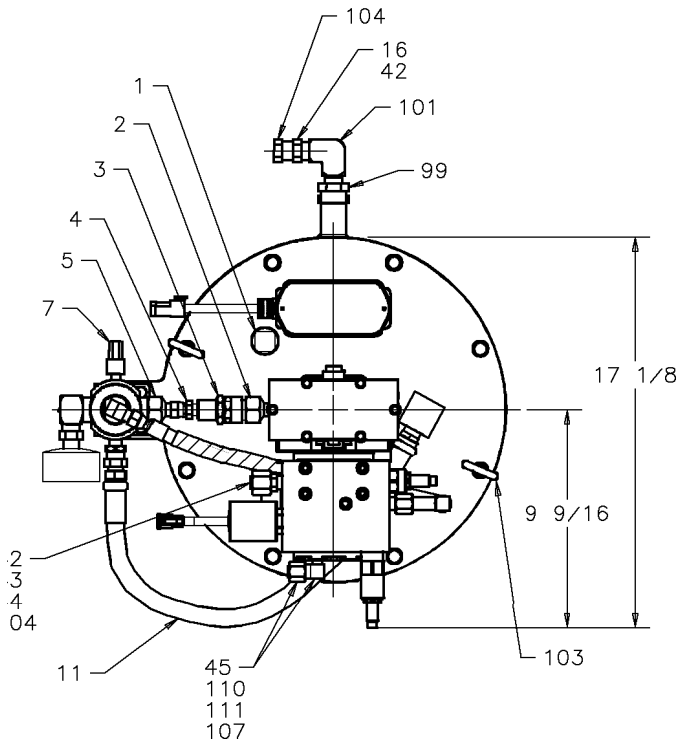
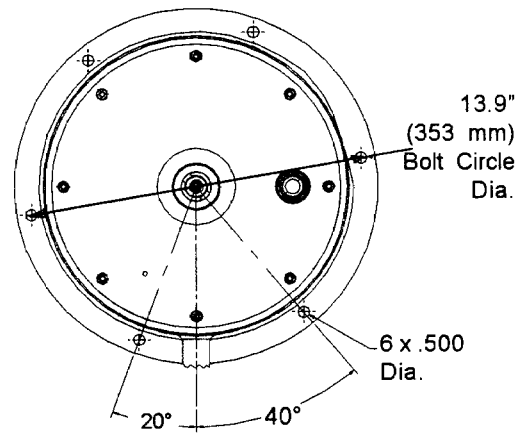


Figure 8



**A-A
 Figure 11**

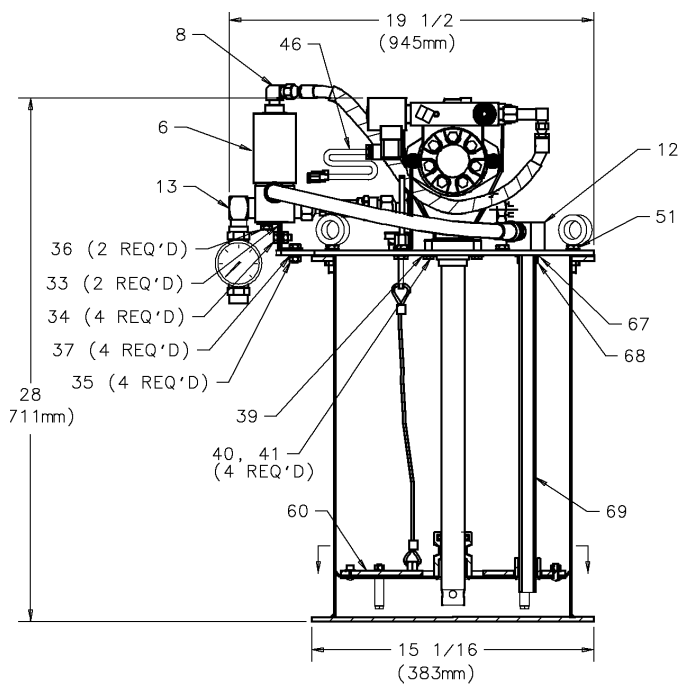


Figure 9

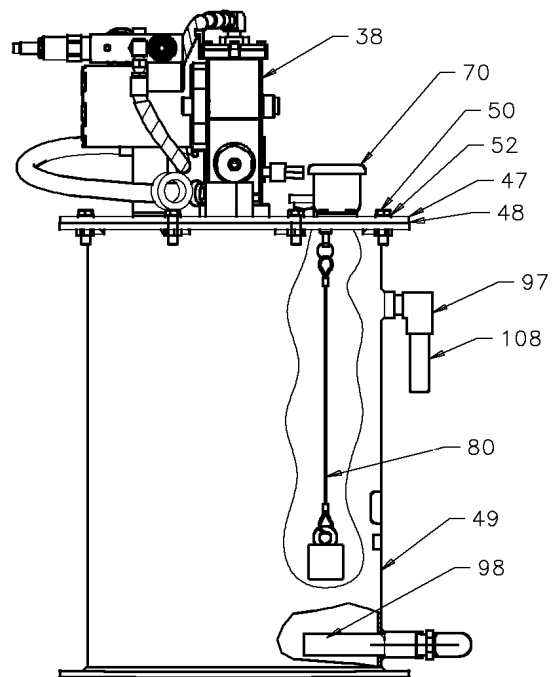


Figure 10



**FlowMaster™ Rotary Driven Hydraulic Pump
Model 85644 With High Level Indicator
Model 85645 Without High Level Indicator**

SERVICE PARTS

Item No.	Qty.	Description	Part No.	Item No.	Qty.	Description	Part No.	Item No.	Qty.	Description	Part No.
1	1	Vent Fitting	249354	38	1	Hydraulic Pump Assembly	#85717©	74	1	E-Ring	66765
2	1	Adapter	12213	39	1	Gasket, Sqr 2-7/16i	33152	75	1	Spring	55302
3	1	Check Assembly	81938	40	4	Screw, Hex Head Mach.	50169	76	1	Lock Washer	69181
4	1	Adapter Union	66645	41	12	Lock Washer	66186	77	1	Nut	51039
5	1	Reducer Nipple	14727	42	2	O-Ring Seal	273127	78	1	Stud 5/8 Hex	271654
6	1	Vent Valve	84980	43	1	Connector	273129	79	1	Rod	14259
7	1	Unloader	90942	44	1	O-Ring Seal	273130	80	1	Cable Assembly	273947
8	1	Elbow	20012	45	1	Elbow Ass'y	273100	81	4	Screw	50088
9	1	Hose Assembly	271598	46	1	Solenoid Cable Ass'y	273502	82	4	Lockwasher	68991
10	1	Adaptor Elbow	271599	47	1	Top Plate (85644)	272206	83	4	Nut	51100
11	1	Hose Assembly, 1/2	270726			Top Plate (85645)	274161	84	2	Screw, Rnd. Hd. Mach.	50618
12	1	Elbow	249533	48	1	Gasket	*249355	85	2	Washer, Flat #6 Nar	48350
13	1	Street Elbow	10160	49	1	Reservoir Assembly	274160	86	2	Gasket	34748
14	1	Hex. Pipe Nipple	273080	50	6	Screws	50015	87	2	Packing	34413-15
15	1	Pipe Tee	273086	51	2	Hex Nut	51005	88	2	Hex Machine Nut	51080
16	2	Connector Ass'y	273081	52	8	Lock Washer	66220	89		Cable Assembly	274954
17	1	Reducing Bushing	12080	53	1	Indicator Brkt	361020	90		Not Used	
18	1	Gage	273078	54	1	Washer	48548	91	1	1/2 Conduit Lock Nu	68020
19	1	Gasket 9/16 Id X	*31029	55	1	Indicator Plug	249357	92	1	1/2" Npt Sealing O-Ring	271911
20	1	Check Bushing Assy.	+*90204	56	1	Retaining Ring	*68888	93	1	Straight Male Cord Conn	271656
21	1	Pump Check Disc Assy.	+*80206	57	1	Indicator Nut	16352	94		Not Used	
22	1	Seat, Ball Check	*10313	58	1	O-Ring (.215 X 1.25 Id)	*249532	95	2	Nylon Cable Tie 1	236911
23	1	Gasket 1 Od X .77id	*31001	59	1	Cable Assembly	249762	96	1	Not Used	
24	1	Steel Ball	*66001	60	1	Follower Ass'y	85489	97	1	90 Deg Pipe Elbow	273079
25	1	Connector, Outlet	90860	61	1	Wiper	*249331	98	1	Extension Tube	249356
26	1	Cylinder	241807	62	4	Bolt	249332	99	1	Reducing Pipe Bushing	12106
27	1	Piston& U-Cup Ass'y	+*244673	63	4	Cap Screw	50084	100		Not Used	
28	1	Needle	*14722	64	4	Spacer (Alum Tubing)	249833	101	1	90° Elbow	274356
29	1	Packing Assembly	+*239330	65	8	Lock Nut	51304	102	1	Not Used	
30	1	Valve Seat	*14723	66	1	O-Ring (.215 X 1.25 Id)	270720	103	2	Eyebolt	276300
31	1	Gasket (7/16 Od X .316 Id)	*31047	67	1	Body Gasket	*31010	104	1	Cap	273141
32	1	Valve Body	239336	68	1	Nut	12538	105	1	Follower Weight	249334
33	2	Bracket	270723	69	1	Vent Pipe	67420	106	1	Not Used	
34	4	Screws	50016	70	1	Conduit Box Assembly	272884S	107	1	Close Off Fitting	273978
35	4	Nut	51026	71	1	Conduit Box	272883	108	1	Nipple	272171
36	2	Hex Head Mach Screw	50034	72	1	Micro-Switch	+274153	109	1	Spiral Wrap	274031
37	6	Lock Washer	66246	73	1	Conduit Box Gasket	271657	110	1	O-Ring Seal	274059
								111	1	O-Ring Seal	274060

* Suggested service replacement component
 + Sold as an assembly. Individual parts not available.
 # See service page C8-341© series for pump details.

© Indicates change

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MODELS 85219 TROUBLESHOOTING		
CONDITION	POSSIBLE CAUSE	CORRECTIVE ACTION
Pump does not operate.	No hydraulic power to pump.	Turn on or connect hydraulic supply to pump.
	No pressure on gauge: - Closed Supply line shut off valve. - No power to solenoid valve. - Faulty Solenoid. - Pressure Reducing Valve is set too low. - Insufficient Hydraulic Fluid supply.	Open shut-off valve. Correct electrical fault. Replace solenoid. Reset Pressure Reducing Valve. Check hydraulic supply for proper pressure and flow.
	Pressure is shown on gauge on pump manifold. - Closed Fluid outlet line. - Flow Control Valve is fully closed. - Pump is stalled due to grease backpressure. Pump is seized or damaged.	Check outlet line and clear obstructions. Readjust flow control valve to 1 turn open. Check vent valve in system. Dismantle the pump and repair defective or seized component. See pump service page.
Pump runs excessively.	Pump tube malfunction.	Refer to pump service page.
	Outlet check damage or contamination.	Repair check or remove contamination.
	Vent valve damage or contamination.	Repair vent valve or remove contamination.
	System component leaking.	Repair leaks.
	Vent valve not relieving proper pressure to keep it closed.	Orifice fitting plugged.
	Injector bypassing.	Repair injectors.
Pump speeds up or runs erratically.	Low level of grease or reservoir is empty.	Refill reservoir.
	Follower plate is stuck and separated from grease.	Check follower plate and container for damage.
	Pump piston or checks are worn.	Refer to pump service sheet.
Pump runs, but output is low.	Insufficient hydraulic fluid supply.	Check hydraulic supply and adjust flow.
	Inlet pressure too low.	Increase pressure at pressure control valve.
	Faulty inlet or discharge check valve in pump.	Replace faulty components. See pump service page.
Lubricant leaking from safety unloader valve.	Pressure of system set too high.	Adjust pressure switch setting.
	Safety unloader damaged or contaminated.	Replace safety unloader.
Lubricant leaking from weep hole in vent valve.	Vent valve lubricant seal damaged.	Replace lubricant seal.

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