



Model HP-50, HP-60 High Pressure Lubricators

INTRODUCTION

This manual provides operation and service instructions and a parts list for the “Manzel” Model HP-50 and HP-60 High Pressure Lubricators, Discharge and Terminal Check Valves.

The high pressure lubricator comprises one to four integral sight and pump assemblies in a cast iron reservoir. The unit is designed for direct connection to an electric motor/speed reducer power source. A “Manzel” terminal check valve is recommended in the lubrication system. When required to maintain proper oil viscosity, the reservoir can be fitted with an optional steam or electric heater.

SPECIFICATION DATA

Plunger Diameter	¼ Inch
Maximum Operating Pressure	
HP-50	50,000 psi
HP-60	60,000 psi
Maximum Pumping Rate	0.133 cc per stroke
Based on SAE 40 Oil	(approx. 4 drops)
	at max. pressure *
Reservoir Heating	Steam or Electric (Optional)

*Greater pumping rates may be obtained when operating pressure is below maximum. Increased viscosity results in a slightly lower pumping rate.

OPERATING INSTRUCTIONS

1. Oil Level —

When necessary, completely fill the lubricator reservoir with clean filtered lubricant. Three sight glasses, provided in the reservoir at various levels, permit observation of fluid level. Oil level should not be allowed to drop below the bottom sight glass. During the initial filling, the vent plugs at the top of the pump sight glasses should be removed. This allows lubricant to rise in the drip tube up to the level of the oil in the reservoir and reduces the priming required at start up.

2. Pump Priming —

If the sight well on the pump does not contain oil, the pump should be primed. Pumps may be primed while the lubricator shaft is rotating as follows:

- Adjust the pumping rate to the maximum setting by turning the adjustment nut on the indicator stem as far as possible in a clockwise direction.
- Remove the vent plug on top of the sight glass and fill the housing sight well with oil to 3/8 inch below the discharge of the drip tube.
- Replace the vent plug. Check the sight glass to insure that it is properly seated against the O-ring to prevent air leakage into the sight well.
- Readjust the pumping rate to the desired delivery.

3. Pumping Rate —

The pumping rate is indicated at the drip tube inside the sight glass. During the pump suction stroke, fluid is drawn into the pump from the sight well. This creates a partial vacuum in the sight well, permitting atmospheric pressure in the lubricator reservoir to force an amount of oil equal to the pump displacement through the drip tube into the sight well. The rate is adjustable for each pump assembly by means of the pump regulator which varies the stroke of the positive displacement, reciprocating pump assembly.

Caution: The drip tube flow rate is accurate after the pump has operated long enough to stabilize the pressure inside the sight well. There is a time lag at start-up, low pumping rates, and during pump rate changes. Allow sufficient time to insure an accurate rate indication.

4. Regulating Pump Rate —

The pumping rate can be varied infinitely within the range of minimum to maximum by means of the graduated pump regulators which project through the reservoir cover. The regulators are easily adjusted by hand during the pump suction stroke. Maximum pumping rate is achieved when the adjustment nut on the sight indicator stem is turned in a clockwise direction as far as it can go. In this position the sight indicator stem projects the maximum distance indicating maximum pumping stroke. When the adjusting nut is turned in a counter-clockwise direction, delivery reduces, because of a reduction in pump stroke, until minimum delivery is obtained.

Note: To retain the hydraulic seal between the plunger and the cylinder walls, minimum delivery must not go below 1/2 drop (0.017 cc) per pump stroke.

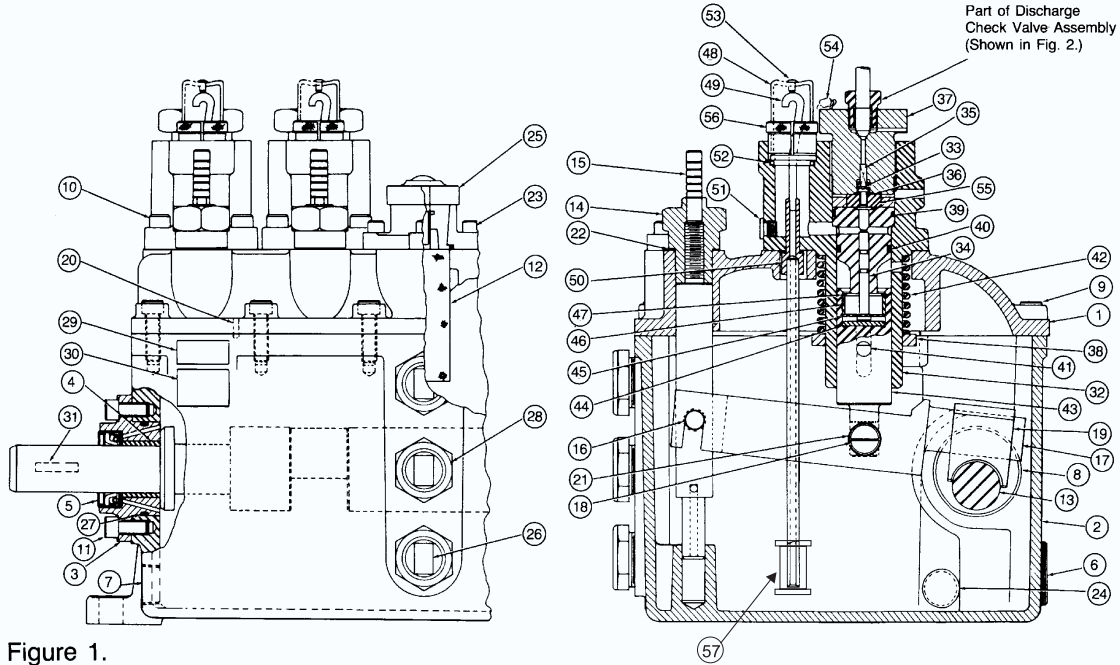
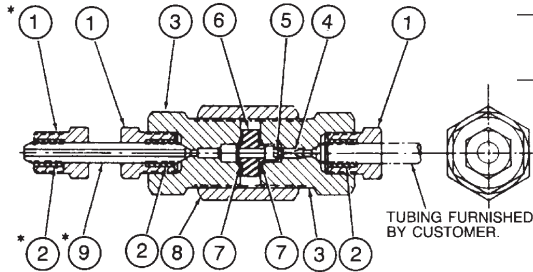


Figure 1.

Check Valve Parts List (Figure 2.)



* SUPPLIED WITH DISCHARGE CHECK VALVE ONLY. NOT SUPPLIED WITH TERMINAL CHECK VALVES.

Figure 2.

Figure & Index No.	Part Number	Description	Quantity Required	Usage Code
2-	463-280-071	Terminal Check Valve, HP-50, 3/8" O.D. Tube	1	D
2-	463-280-021	Discharge Check Valve, HP-50, 3/8" O.D. Tube	1	E
-1	446-010-010	· Nut, Gland	2	D
-1	446-010-010	· Nut, Gland	3	E
-2	446-000-010	· Collar	2	D
-2	446-000-010	· Collar	3	E
-3	410-700-470	· Bonnet, Check Valve	2	
-4	458-005-140	· Spring, Valve	1	
-5	463-920-010	· Valve	1	
-6	463-910-010	· Seat, Valve	1	
-7	439-007-020	· Gasket, Valve	2	
-8	463-860-860	· Body, Check Valve	1	
-9	446-055-000	· Nipple, Check Valve	1	E

NOTE: This check valve for 3/8" tube. Other sizes available. Refer to factory for parts list details.

Steam Heater Components (Figure 3.)

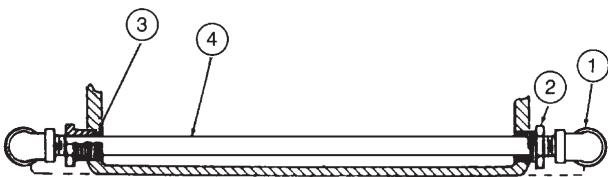


Figure & Index No.	Part Number	Description	Quantity Required
3-1	412-010-020	Elbow, 1/4 NPT Steam Pipe	2
-2	412-700-040	Seal Plug, Steam Pipe	2
-3	422-051-140	Seal, Steam Pipe	2
-4	412-700-050	Steam Pipe	1

NOTE: Steam and electric heaters available for all lubricators. Refer to the factory for detail parts other than those shown above.

HP-50, HP-60
Lubricator Assembly
Parts List (Figure 1.)

Figure & Index No.	Part Number	Description	Quantity Required	Usage Code
1-	469-838-021	Reservoir Assembly, HP-20-1	1	
-1	471-638-000	· Cover, Reservoir	1	
-2	469-838-000	· Body, Reservoir	1	
-3	402-020-020	· Bearing, Shaft	2	
-4	402-110-000	· Bushing, Bearing	2	
-5	423-700-000	· Seal, Shaft	2	
-6	412-140-060	· Plug, Heater Opening	1	
-7	412-130-150	· Plug, Drain Hole	1	
-8	402-110-010	· Bushing, Reservoir	2	
-9	419-170-060	· Screws, Reservoir, Cover and Pump Housing	12	
-10	419-170-150	· Screws, Pump Housing End	4	
-11	419-170-030	· Screws, Bearing	4	
-12	473-020-031	· Strainer	1	
-13	465-920-000	· Shaft, Eccentric	1	
-14	410-700-440	· Nut, Feed Adjusting	4	
-15	453-030-000	· Rod, Feed Adjusting	4	
-16	411-700-050	· Pin, Feed Rod	4	
-17	453-040-000	· Lever, Pump Actuating	4	
-18	411-700-030	· Pin, Lever	4	
-19	484-110-000	· Shoe, Pump Actuating	4	
-20	411-700-040	· Pin, Dowel	2	
-21	418-010-230	· Ring, Lever Pin	8	
-22	421-700-060	· Washer, Friction	4	
-23	419-150-040	· Screw, Reservoir Oil Filler	4	
-24	412-150-060	· Plug, Steam Heater Opening	2	
-25	471-638-021	· Plate, Oil Filler	1	
-26	438-028-050	· Reflector, Sight Glass	3	
-27	422-012-280	· "O" Ring, Bearing	2	
-28	438-010-040	· Sight Glass, Reservoir	3	
-29	457-002-000	· Plate, Operating Instructions	1	
-30	457-008-000	· Nameplate	1	
-31	409-010-290	· Key, Woodruff	1	
1-	362-390-505	Pump Unit, HP-50	4	B
1-	362-390-605	Pump Unit, HP-60	4	C
-32	477-140-280	· Housing, Pump	1	
-33	463-160-011	· Valve Assembly	1	
-34	477-020-011	· Cylinder Assembly	1	B
-34	477-020-021	· Cylinder Assembly	1	C
-35	458-005-140	· Spring, Pump Valve	1	
-36	439-077-080	· Gasket Valve	2	
-37	410-700-770	· Nut, Housing	1	B
-37	410-700-420	· Nut, Housing	1	C
-38	418-700-000	· Retainer, Spring	1	
-39	422-041-270	· "O" Ring, Cylinder	1	
-40	422-042-170	· "O" Ring, Cylinder	1	
-41	411-700-060	· Pin, Spring Retainer	1	
-42	458-005-150	· Spring, Plunger	1	
-43	475-120-000	· Pusher, Plunger	1	
-44	421-700-050	· Washer, Thrust	1	
-45	484-170-000	· Collar, Plunger	1	
-46	424-150-240	· Spacer, Plunger	1	
-47	418-050-210	· Retainer, Snap Ring	1	
*-48	438-036-070	· Sight, Vacuum	1	
-49	433-700-020	· Tube, Oil Drip	1	
-50	433-700-701	· Tube Assembly, Suction	1	
-51	435-060-010	· Plug, Sight Well	1	
-52	422-042-130	· "O" Ring, Vacuum Sight	1	
-53	437-700-770	· Plug, Vent	1	
-54	439-079-020	· Seal, Wire	1	
-55	484-170-030	· Collar, Valve Seat	1	
-56	410-701-840	· Nut, Hold Down	1	
-57	473-020-471	· Suction Strainer	1	

*Site Glass Kit - 438-036-061.
Order this kit if your present
pumps have plastic site feeds.

(Added to pumps made after 1/98)

SERVICE INSTRUCTIONS

1. Lubricator operation can be checked by observing the drip tube. If the correct pumping rate is maintained, no servicing is required other than periodic replenishment of the reservoir. If the sight glass well pumps dry or no flow is observed, check the following points until the cause is determined and corrected.

- a. Check the vent plug for proper sealing. Any nicks or cracks in the rubber plug will cause an air leak into the sight glass.
- b. Check shaft rotation. If the lubricator shaft is not rotating, determine the cause and repair as necessary.
- c. Check oil level and viscosity. Be sure the reservoir is filled with oil, and if necessary heat the reservoir to maintain viscosity at the correct level for the desired flow.
- d. Check pump priming. If necessary, prime the pump in accordance with the "Operating Instructions".
- e. Check the feed adjustment and readjust if the pumping rate is too low.
- f. Check the actuating linkage for proper operation. If defective, isolate the broken part and repair or replace as required.

2. If none of the above steps isolate the malfunction, the cause is in the pump assembly. The following items should be checked before removing the pump assembly from the cover.

- a. Check the sight for inward leakage due to a crack in the sight glass, improper sight glass seating, or a defective O-ring. Repair as required.
- b. Check for an obstruction in the drip tube and remove if found.

3. If the above steps do not isolate the malfunction, disconnect the discharge tubing and remove the pump assembly which is attached to the cover with four screws. It is not necessary to stop the equipment on which the lubricator is installed or to empty the reservoir. Faulty pumps should be returned to the factory for repair as they contain a selectively fitted cylinder and plunger. A spare pump should be on hand for use during emergencies when a pump is being repaired.

4. If the sight glass fills with lubricant proceed as follows:

- a. Remove the vent plug and allow the lubricant to pump down to the proper level. Replace the vent plug. The pump should operate normally.
- b. If the sight glass continues to fill with lubricant check all terminal check valves for proper operation. If the valves are operating properly, remove and clean the pump assembly, then reinstall the pump in the system and check operation.
- c. If the sight glass still fills with lubricant it may be caused by temperature variation.
 - 1). When the unit is not operating, remove the vent plug and allow the lubricant to pump down to the proper level. Replace the vent plug. The pump will now function properly. The sight glass may fill with fluid without affecting the operation of the lubricator as long as the drip tube remains above the lubricant level to show the rate of pumping.
 - 2). When the unit is operating, the sight level will vary depending on temperature variations. If the level falls to less than 1/4 inch above sight glass flange, add lubricant to the proper level (3/8 inch below the discharge of the drip tube) through the vent hole. If the level is too high, remove the vent plug and allow the unit to pump down before replacing the vent plug.

5. Other servicing that may be required is listed below:

- a. Periodic cleaning of the lubricator is desirable to eliminate contamination that may have occurred in the oil. To accomplish this, remove all pumping units and clean the pumps and reservoir by brushing loose all foreign matter, dipping in solvent and blowing dry with compressed air.
- b. If external leakage is observed, determine the cause (loose bolts, defective gaskets, or seals) and repair as required.

All written and visual data contained in this document are based on the latest product information available at the time of publication. Graco reserves the right to make changes at any time without notice

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