



# Manzel® 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.

SPECIFICATIONS	
Plunger Diameter	1/4 in
Max Operating Pressure	
HP-50	50,000 psi
HP-60	60,000 psi
Max Pumping Rate	0.133 cc/stroke, base on SAE 40 oil (approx 4 drops) @ max pressure*
Reservoir Heating (Optional)	Steam or Electric

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

## OPERATING INSTRUCTIONS

- 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.
- 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.

- 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.

- 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.

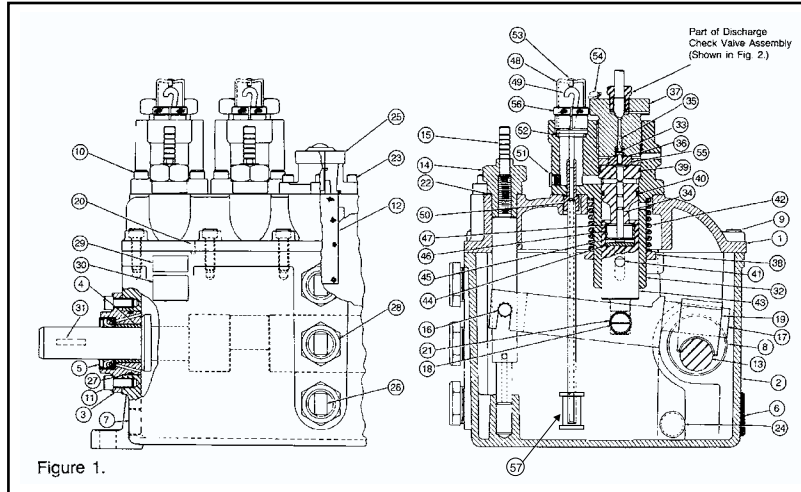


Figure 1.

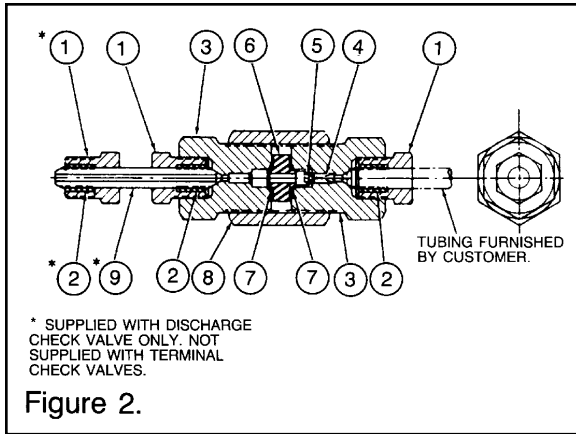


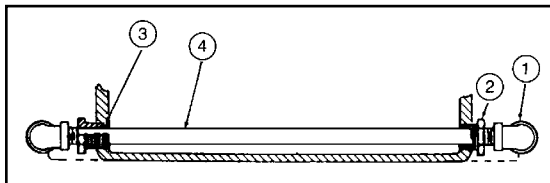
Figure 2.

**CHECK VALVE PARTS LIST**

Figure & Index No.	Part No.	Old Part No.	Description	Quantity Required	Usage Code
2-	564336	463-280-071	Terminal Check Valve, HP-50, 3/8 in O.D. Tube	1	D
2-	564335	463-280-021	Discharge Check Valve, HP-50, 3/8 in O.D. Tube	1	E
-1	556783	446-010-010	Nut, Gland	2	D
-1	556783	446-010-010	Nut, Gland	3	E
-2	556781	446-000-010	Collar	2	D
-2	556781	466-000-010	Collar	3	E
-3	560161	410-700-750	Bonnet, Check Valve	2	
-4	556936	458-005-140	Spring, Valve	1	
-5	560343	463-920-010	Valve	1	
-6	560339	463-910-010	Seat, Valve	1	
-7	556747	439-077-080	Gasket, Valve	2	
-8	561354	463-860-860	Body, Check Valve	1	
-9	558823	446-055-000	Nipple, Check Valve	1	E

Note: Check Valve for 3/8 in tube, other sizes available, refer to factory for parts list details

Figure 2



**STEAM HEATER COMPONENTS**

Figure & Index No.	Part No.	Old Part No.	Description	Quantity Required
3-1	-	412-010-020	Elbow, 1/4 NPT Steam Pipe	2
-2	561335	412-700-040	Seal Plug, Steam Pipe	2
-3	558693	422-051-140	Seal, Steam Pipe	2
-4	560179	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.

Figure 3

HP-50, HP-60 LUBRICATOR ASSEMBLY PARTS LIST					
Figure & Index No.	Part No.	Old Part No.	Description	Quantity Required	Usage Code
1-	-	469-838-021	Reservoir Assembly, HP-20-1	1	
-1	560398	471-638-000	Cover, Reservoir	1	
-2	15M340	469-838-000	Body, Reservoir	1	
-3	556340	402-020-020	Bearing, Shaft	2	
-4	556343	402-110-000	Bushing, Bearing	2	
-5	556579	423-700-000	Seal, Shaft	2	
-6	556401	412-140-060	Plug, Heater Opening	1	
-7	555444	412-130-150	Plug, Drain Hole	1	
-8	560148	402-110-010	Bushing, Reservoir	2	
-9	555605	419-170-060	Screws, Reservoir, Cover & Pump Housing	12	
-10	555606	419-170-150	Screws, Pump Housing End	4	
-11	555603	419-170-030	Screws, Bearing	4	
-12	557148	473-020-031	Strainer	1	
-13	557062	465-920-000	Shaft, Eccentric	1	
-14	560157	410-700-440	Nut, Feed Adjusting	4	
-15	560281	453-030-000	Rod, Feed Adjusting	4	
-16	560171	411-700-050	Pin, Feed Rod	4	
-17	560284	453-040-000	Lever, Pump Actuating	4	
-18	560169	411-700-030	Pin, Lever	4	
-19	560483	484-110-000	Shoe, Pump Actuating	4	
-20	560170	411-700-040	Pin, Dowel	2	
-21	555552	418-010-230	Ring, Lever Pin	8	
-22	556523	421-700-060	Washer, Friction	4	
-23	558673	419-150-040	Screw, Reservoir Oil Filler	4	
-24	555450	412-150-060	Plug, Steam Heater Opening	2	
-25	563087	471-638-021	Plate, Oil Filler	1	
-26	556685	438-028-050	Reflector, Sight Glass	3	
-27	555664	422-012-280	O-Ring, Bearing	2	
-28	556683	438-010-040	Sight Glass, Reservoir	3	
-29	-	457-002-000	Plate, Operating Instructions	1	

Figure & Index No.	Part No.	Old Part No.	Description	Quantity Required	Usage Code
-30	-	457-008-000	Nameplate	1	
-31	555379	409-010-290	Key, Woodruff	1	
1-	562952	362-390-505	Pump Unit, HP-50	4	B
-32	560443	477-140-280	Housing, Pump	1	
-33	563062	463-160-011	Valve Assembly	1	
-34	563111	477-020-011	Cylinder Assembly	1	B
-34	563112	477-020-021	Cylinder Assembly	1	C
-35	556936	458-005-140	Spring, Pump Valve	1	
-36	556747	439-077-080	Gasket Valve	2	
-37	560162	410-700-770	Nut, Housing	1	B
-37	560156	410-700-420	Nut, Housing	1	C
-38	560195	418-700-000	Retainer, Spring	1	
-39	555691	422-041-270	O-Ring, Cylinder	1	
-40	555694	422-042-170	O-Ring, Cylinder	1	
-41	560172	411-700-060	Pin, Spring Retainer	1	
-42	556937	458-005-150	Spring, Plunger	1	
-43	560425	475-120-000	Pusher, Plunger	1	
-44	556522	421-700-050	Washer, Thrust	1	
-45	557191	484-170-000	Collar, Plunger	1	
-46	560233	424-150-240	Spacer, Plunger	1	
-47	555564	418-050-210	Retainer, Snap Ring	1	
-48*	556700	438-036-070	Sight, Vacuum	1	
-49	560235	433-700-020	Tube, Oil Drip	1	
-50	562989	433-700-701	Tube Assembly, Suction	1	
-51	555724	435-060-010	Plug, Sight Well	1	
-52	556563	422-042-130	O-Ring, Vacuum Sight	1	
-53	555733	437-700-770	Plug, Vent	1	
-54	555746	439-079-020	Seal, Wire	1	
-55	560492	484-170-030	Collar, Valve Seat	1	
-56	560165	410-701-840	Nut, Hold Down	1	
-57	557155	473-020-471	Suction Strainer (added to pumps made after 1/98)	1	

\*Site Glass Kit - 564151 (438-036-061).  
 Order this kit if your present pumps have plastic site feeds.

Figure 1

## 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.
  - Check the vent plug for proper sealing. Any nicks or cracks in the rubber plug will cause an air leak into the sight glass.
  - Check shaft rotation. If the lubricator shaft is not rotating, determine the cause and repair as necessary.
  - 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.
  - Check pump priming. If necessary, prime the pump in accordance with the "Operating Instructions".
  - Check the feed adjustment and readjust if the pumping rate is too low.
  - 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.
  - 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.
  - 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:
  - Remove the vent plug and allow the lubricant to pump down to the proper level. Replace the vent plug. The pump should operate normally.
  - 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.
  - 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 1/4inch 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:
  - 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.
  - If external leakage is observed, determine the cause (loose bolts, defective gaskets, or seals) and repair as required.

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