

Replaces Bulletin 40210 (1052) Bulletin 51010

DESCRIPTION

Manzel Model 25 Force Feed Lubricators are economical, general-purpose units of double plunger design for precise metering of lubricants (either mineral oil base or synthetics). They provide lubrication to cylinder walls, bearings and other moving parts of equipment such as sugar mills, steam engines, presses and general machinery. They are furnished with Clear-Vue Pumping Units whose sight feeds, operating at atmospheric pressure, show the output of lubricant to individual points of lubrication. All working parts are totally enclosed away from dust, water and impurities—and self-lubricated at all times by the lubricant in the reservoir. Standard Lubricators may be had in 1 to 20 feeds for feeding the same type of lubricant. A choice of Drives and Mounting Arrangements facilitates designing Lubricators into Original Equipment or installation on existing machinery. These can be driven from rotating or reciprocating parts or machines or engines or by independent motors.



- GENERAL-PURPOSE LUBRICATION—automatic. precision metering for all types of machinery.
- PRESSURES—up to 1,000 psi.
- TYPE PUMPING UNIT—Clear-Vue. Sight Feed Chamber functions at atmospheric pressure. Shows amount of lubricant being pumped. Unitized construction-contains complete feed regulating mechanism. Equipped with inlet strainer.
- NUMBER OF FEEDS-1 to 20 per Lubricator, stan-
- DISPLACEMENT, OUTPUT-1/4 to 12 drops per stroke with 5/16" plunger; 1/6 to 6 drops per stroke with 3/16" plunger.
- AVAILABLE DRIVES—Direct Rotary (1:1), Ratchet, 37.5:1 and 75:1 internal gear reductions.
- RESERVOIRS-single compartment, sheet metal construction.
- FEED REGULATOR-external screw-type precisely adjustable while idle or in operation.
- REMOVABLE PUMPING UNIT-self contained. All units interchangeable-remove two pump screws and lift out.
- HAND CRANK-standard. Convenient for rapid priming of lines before start-up or for momentarily increasing supply of lubricant. Does not affect adjustment or individual pumping units. Replaces obsolete Kipp Model 50 Box Lubricators.





SPECIFICATIONS

RESERVOIR-heavy-gauge fabricated sheet steel. CYLINDER-cast iron.

PLUNGER-416 hardened SS, precision-ground.

VALVE-hardened stainless steel balls

ECCENTRICS-sintered metal, single throw on hexagon eccentric shaft.

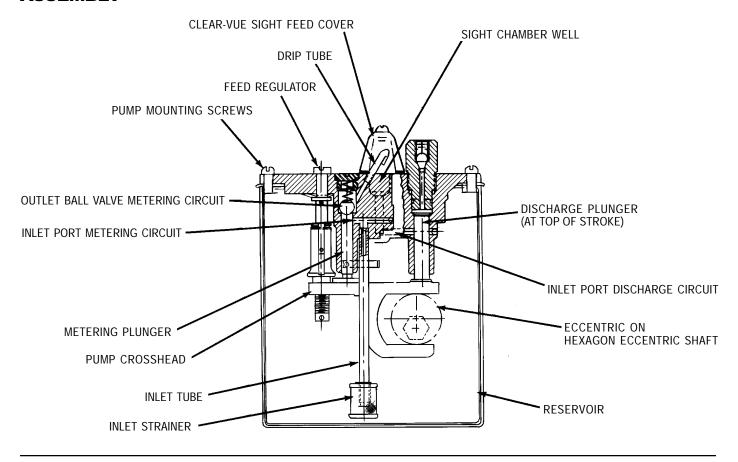
GASKETS, SEALS-standard for mineral oil base lubricants. Special materials available for synthetics.

FILLER CUP-round with vents and strainer.

DISCHARGE CHECK VALVE—Double ball discharge check valve assembly with 1/4" NPSF vertical outlet.

FINISH—all ferrous metal drive parts Parco-Lubrited. Exterior of reservoir, cover and pumps painted with durable hammertone gray enamel. Nickel plate, available.

ASSEMBLY



OPERATION

CLEAR-VUE PUMPING UNIT—Model 25 Lubricators operate on a double plunger pump principle with a metering and a discharge plunger actuated through a yoke by an eccentric on the eccentric shaft. The metering plunger controls the amount of lubricant fed to the discharge plunger. This metered amount is adjusted by means of an external Feed Regulator Screw, which adjusts the stroke length. The lowermost position of the plunger is varied by the Feed Regulator Screw, however the uppermost position to which the plunger rises remains constant.

On the downstroke, the metering plunger draws lubricant up through the inlet tube, over the inlet valves and into the metering pump cylinder. On the upstroke, the metering plunger seats its inlet valves and opens its spring-loaded outlet valve forcing the metered amount of lubricant, at low pressure, out the drip tube into the Sight Chamber Well at atmospheric pressure. On the same downstroke, the discharge plunger opens the cross port

to the Well and draws the metered amount of lubricant into the discharge pump cylinder. This path is shown in light blue on the Assembly Drawing.

Finally, on the upstroke, the discharge plunger closes the cross port from the Sight Well and forces the metered amounts of lubricant over the discharge valves and into the line, as shown in solid blue on the Assembly Drawing.

CLEAR-VUE

Sight Feed Chamber contains no "sight feed fluid" and functions at atmospheric pressure. Molded glass sight cover and dust shield in various lengths for 1 to 8 pumping units. Drip tube for each line indicates amount of lubricant fed each point of lubrication.

NOTE: Due to design characteristics, the Model 25 pump can only be used in pump to point system. Components such as flow sensors and divider valves should not be used. Only check valves are permitted between the pump and the lube point.



OPERATING INSTRUCTIONS

LUBRICATOR INSTALLATION AND OPERATION

The Manzel Model 25 Lubricator consists of a metal reservoir which contains the drive mechanism, ratchet or rotary, the individual pump units and accessory equipment as ordered.

The Lubricator should be solidly mounted and aligned to connect the drive shaft to the proper stroking or rotary motion. This drive motion, through the Lubricator drive, should operate the Lubricator eccentric and hand crank shaft between 3 and 60 RPM. There is one pump stroke for every revolution of the hand crank shaft, which is an extension of the eccentric shaft. The proper eccentric shaft RPM should be determined from the required maximum and minimum pump feed rates. The RPM selected should be such that, when each pump is set at its required feed rate, the feed rate can still be increased or decreased by the feed regulator screw. In most cases, due to the wide adjustment of the pump units, there will be considerable allowance in the selection of the proper eccentric shaft speed. Note: this eccentric shaft speed will seldom be the same as the Input shaft speed, but will always be the same speed as the hand crank shaft extension.

The individual pumps operate on a double plunger principle with the metering and discharge plungers actuated through a yoke or crosshead by an eccentric on the eccentric shaft. The small or metering plunger draws a metered amount of oil from the reservoir over the inlet ball valves and forces it over the outlet ball valve through the drip tube and into the clear-vue sight well at atmospheric pressure. The discharge plunger draws the metered amount of oil along with air from the sight well over the inlet sleeve valve and forces this mixture over the ball discharge valves toward the point of lubrication. The stroke of the small metering plunger is varied to change the metered oil intake by means of the external feed regulator screw. The stroke of the discharge plunger is constant.

IMPORTANT-KEEP LUBRICATOR CLEAN

First, use only new or filtered lubricant. Periodic cleaning of the Lubricator is recommended, since lubricant is subject to fouling from atmospheric dusts and additives. To do this, remove all pumping units; clean them and the reservoir by dipping and brushing in a cleaning solvent. Clean all lubrication tubing and check valves thoroughly at the same time. Next, recharge Lubricator and bleed lubrication lines at terminal check valve to assure full lubrication before putting equipment back into operation.

STARTING INSTRUCTIONS

Fill Lubricator reservoir with new or filtered lubricant to top of reservoir gauge glass. For initial start-up, adjust pump for maximum delivery by turning feed regulator as indicated by directional arrow. Then, operate pumps at this setting and bleed lubrication lines at terminal check valve to assure full lubrication. The Lubricator is now ready for operation.

FEED RATE REGULATION

Each pumping unit is regulated independently by means of a feed regulator. To decrease the feed, turn the feed regulator clockwise. To increase the feed, turn counterclockwise. (Follow directional arrow.)

HAND CRANK OPERATION

The hand crank on the end of the Lubricator is for use before starting or for momentarily increasing lubricant supply while the Lubricator is in operation. It operates all feeds at once, but does not affect feed regulation.

PUMP REMOVAL AND REPLACEMENT

To remove a pump, stop the Lubricator. Remove the discharge line connection and the pump mounting screws. Next, loosen the adjacent pump mounting screws. Lift out front end of pump (end with feed regulator screw) pulling it forward and upward at the same time. This will allow the yoke or crosshead to clear the eccentric and the pump can be lifted out. Before replacing a pump, position yoke down as far as possible and then reverse the above procedure.

TROUBLESHOOTING OVERFLOWING SIGHTWELL

If the pump sight well fills and overflows into adjacent sight wells, the cause is dirty or inoperative pump discharge valves. To correct:

- 1. Flush discharge check valves.
 - a. Turn feed regulator to full open.
 - b. Operate hand crank rapidly.
- Remove discharge check valves if condition still exists.
 - a. Shut down unit or turn feed regulator to full closed.
 - b. Remove discharge line connections.
 - c. Remove outlet connection from pump unit.
 - d. Remove check valve. Clean and reseat, if necessary, (care must be exercised to prevent marking the bottom surfaces when reseating) or replace as conditions require.
 - f. Check top and bottom surfaces of the check valve. These must be free from radial nicks and scratches, as these surfaces seal against the discharge pressure. Any leakage around the threads of the outlet connection can be traced back to dirty or marked check valve cage, outlet connection, or cylinder sealing surfaces.
 - g. Install check in pump housing. Make sure the ball and spring side of the cage faces up.
 - h. Replace outlet connection.
 - i. Replace discharge line connection and put pump back in operation.

ERRATIC PERFORMANCE

Make sure the sight glass is open to atmospheric pressure through the felt gasket between the glass and reservoir. These pumps must be able to bring air into the sight chamber through this gasket. Make certain it is not contaminated with paint or dirt.

GAUGE GLASS LEAKAGE

Drain Lubricator, check for leaks, and replace level sight/gasket if necessary.

SYNTHETIC LUBRICANTS

In general, the use of synthetic lubricants will require that the standard neoprene and Buna N gaskets and seals for petroleum base lubricants be replaced with Butyl rubber gaskets and seals, Refer to Parts List for the part numbers of the gaskets for use with synthetic lubricants.



MODEL 25 PUMP SPECIFICATIONS

	NO. OF FIELDS	PLUN- GER	PUMP- ING UNITS				PUM		UNIT (CHARA(CTERIS	STICS	•			MINER	ICANTS IAL OILS IND ETICS ©	
FAMORE	NOMINAL DIAMES	TYPES AVALLAN.	MAX. OPERAT:	essure.ps/	DROPS/STROKE		CU. IN./STROKE		C.C./STROKE	DROPSION	DROPSIA	DRIDGE. IN.	Sec. C.	STROKES/MIN.		USCUSITY (SSU @ 1004F) 🕞		,
24	5/16 3/16	9	1000	12 MAX. 6 MAX.	1/4 MIN 1/6 MIN.	.0245 MAX. .0122 MAX.	.0005 MIN. .0003 MIN.	.399 MAX. .199 MAX.	.008 MIN. .005 MIN.	14.115	490 490	30	60 MAX.	3 MIN. 3 MIN.	5000 MAX.	80 Min.		

- Standard maximums regularly in production. Where additional feeds are required, contact factory.
- All displacements based on SAE30 Oil (SSU @ 100°F) at room temperature.
- ▲ The capacities of reservoirs are originally determined by the number of feeds. Larger ones available on request.
- Special sight glass and gasket materials required. All surfaces in contact with lubricant must be free of paint.
- Approximate Viscosities--SAE 10 = 200 SSU @ 100°F; 600W = 2000 SSU @ 100°F
- ★ Manzel Lube Line Alert or Lube Sentry should not be used with the Model 25 Box Lubricator. Contact factory for complete details.

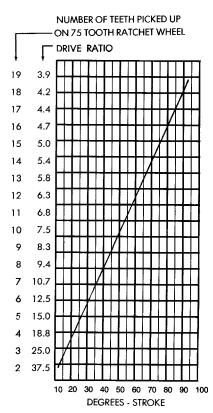
DRIVES

DIRECT ROTARY–(1:1) Shaft located either or both ends.

STANDARD RATCHET—(See Graph on Page 5 for drive ratio per degree stroke.) Two variations available: (a) Shaft located either end. The drive reduction ratio depends on the degree stroke taken on the input shaft from a minimum of 13° for a 37-1/2:1 ratio to a maximum of 90° for a 4-1/6:1 ratio. (b) Shaft located front or rear. The drive ratio depends on the degree stroke taken on the input shaft from a minimum of 13° for a 37-1/2:1 ratio to a maximum of 38° for a 9.4:1 ratio.

REDUCED ROTARY DRIVES–37.5: 1 or 75: 1 internal geared reducers. Available in right or left hand end drive configurations with primer hand on opposite end to drives.

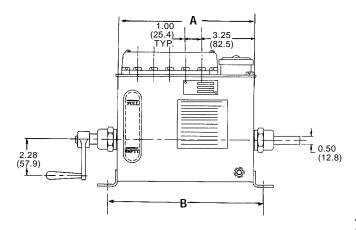
CHART: DRIVE RATIO PER DEGREE STROKE





DIMENSIONS

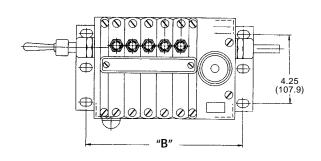
To establish installation requirements, determine the desired number of feeds, the corresponding reservoir length, the capacity, the center-to-center distance of mounting holes, and the drive shaft location.

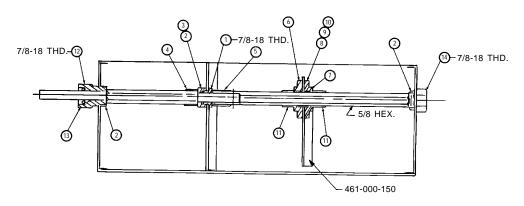


- Men	16.00 (406.4) 6.50 (165.1) 0.31 (7.8)	

NUMBER OF FEEDS	RESERVOIR LENGTH A	C. TO C. OF END LUGS B	*REQUIRED CENTER BEARING	APPROX. CAPACITY PINTS
1	4-19/32"	5-27/32"	0	4
2	5-19/32"	6-27/32"	0	4-3/4
3	6-19/32"	7-27/32"	0	5-1/2
4	7-19/32"	8-27/32"	0	6-1/4
5	8-19/32"	9-27/32"	0	7 :
6	9-19/32"	10-27/32"	0	7-3/4
7	10-19/32"	11-27/32"	0	8-1/2
8	11-19/32"	12-27/32"	0	9-1/4
9	13-19/32"	14-27/32"	1	10-3/4
10	14-19/32"	15-27/32"	1	11-1/2
11	15-19/32"	16-27/32"	1	12-1/4
12	16-19/32"	17-27/32"	1	13
13	17-19/32"	18-27/32"	1	13-3/4
14	18-19/32"	19-27/32"	1	14-1/2
15	19-19/32"	20-27/32"	1	15-1/4
16	20-19/32"	21-27/32"	1	16
17	22-19/32"	23-27/32"	2	17-1/2
18	23-19/32"	24-27/32"	2	18-1/4
19	24-19/32"	25-27/32"	2	19 .
20	25-19/32"	26-27/32"	2	19-3/4

Table makes dimensional allowance of 1" for each Center Bearing, evenly spaced between pumping unit groups of 8.





SEALED COMPT. OPTION

- 402-080-020-BRG 1)
- 410-700-050-NUT
- 2) 3) 439-079-230-PACKING
- 4) 424-050-180-SPACER
- 424-050-200-SPACER ASSY.

BRG. SUPPORT OPTION

- 402-060-000-BRG
- 402-060-010-BUSHING 7)
- 8) 402-060-070-BRG.
- 9) 415-020-020-SCR.
- 10) 421-060-080-L'WASHER
- 11) 424-050-180-SPACER

END BRG

- 12) 402-040-000-BRG.
- 13) 423-010-180-OIL SEAL
- 14) 402-000-040-BRG.



MODEL 25 BOX LUBRICATOR PART NUMBER CONVERSION CHART

OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION	OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION
60050-B 60050-S4B	321-410-015 321-210-015	5/16" DIA. COMPLETE PUMP 3/16" DIA. COMPLETE PUMP	1948-5	439-071-060	GSKT-SIGHT FEED TO MATCH 1949-5 (438-028-110)
6056-B 6061-B	428-165-021 463-920-580	FRICTION PLUG SPRING ASSEMBLY DISCHARGE VALVE ASSEMBLY (CAGE)	1948-6	439-071-070	GSKT-SIGHT FEED TO MATCH 1949-6 (438-028-120)
6064	418-700-240	REGULATING FORK RING	1948-7	439-071-080	GSKT-SIGHT FEED TO MATCH 1949-7 (438-028-130)
6065 6066 6067	453-030-010 435-030-020 421-700-230	REGULATING FORK SCREW REGULATING STEM REGULATING STEM WASHER	1948-8	439-071-090	GSKT-SIGHT FEED TO MATCH 1949-8 (438-028-140)
6068	458-165-030	REGULATING STEM SPRING	1949-1	438-028-070	SIGHT FEED GLASS
6075	480-000-180	VERTICAL OUTLET 1/8" NPTF	1949-2 1949-3	438-028-080 438-028-090	SIGHT FEED GLASS SIGHT FEED GLASS
6401	428-005-310	SPRING - OUTLET VALVE	1949-4	438-028-100	SIGHT FEED GLASS
60051 60052	437-700-400 439-075-190	CYLINDER PLUG CYLINDER PLUG WASHER	1949-5	438-028-110	SIGHT FEED GLASS
60058-S1B	463-920-091	SUCTION VALVE ASSEMBLY	1949-6	438-028-120	SIGHT FEED GLASS
82-1086-8	473-020-091	STRAINER	1949-7	438-028-130	SIGHT FEED GLASS
1V12	410 010 020	2/14" DIA DALI	1949-8	438-028-140	SIGHT FEED GLASS
1X13 1X16	410-010-030 401-010-060	3/16" DIA. BALL 9/32" DIA. BALL	6001		RESERVOIR) ITEMS DEPEND UPON
60058-S1B	433-700-520	DRIP TUBE	6003		COVER) LENGTH OF RESERVOIR
1X19	401-010-090	3/8" DIA. BALL - OUTLET VALVE	6200		ECCENTRIC SHAFT) AND NUMBER OF
11X340	411-030-400	GROOVE PIN REGULATING FORK	6204		ECCENTRIC SHAFT) FEEDS
82-1017	435-090-040	FLARELESS 1/8-NPTF 1/4" OD STR. CONN.	6079	461-000-110	SIGHT GLASS FASTENING STRIP
	435-090-070	FLARELESS 1/8-NPTF 5/16" OD STR. CONN.	6080	461-000-130	PUMP BLANK OFF PLATE
	435-090-030 435-090-090	FLARELESS 1/8-NPTF 3/16" OD STR. CONN. FLARELESS 1/8-NPTF 3/8" OD STR. CONN.	6080-S1 6081-B	461-000-140 438-028-171	CENTER SIGHT GLASS FASTENING STRIP GAUGE GLASS ASSEMBLY
82-1018	435-130-040	FLARELESS 1/8-NPTF 1/4" OD ELBOW CONN.	6081	438-028-020	GAUGE GLASS
82-1018-S1		FLARELESS 1/8-NPTF 5/16" OD ELBOW CONN.	530-S1	437-700-030	PLUG CAR DI LIC
82-1018-S2 82-1018-S3	435-130-030 435-130-080	FLARELESS 1/8-NPTF 3/16" OD ELBOW CONN. FLARELESS 1/8-NPTF 3/8" OD ELBOW CONN.	2144 2234	437-700-100 439-060-020	CAP PLUG WASHER
1226-S5B	402-040-271	OIL SEAL BEARING ASSEMBLY	2349-S1	484-040-000	WASHER GUIDE
1226-S5	402-040-000	OIL SEAL BEARING	6081-S1B	438-028-181	GAUGE GLASS ASSY. FOR SYNTHETICS
23X110 1229	423-010-210 410-700-040	OIL SEAL JAM NUT	2234-S2 6083-B	439-060-050 473-040-091	WASHER FOR SYNTHETICS FILLING CUP & COVER ASSY. (OBSOLETE)
1229 1226-S12B	410-700-040	OIL SEAL BEARING ASSY. FOR SYNTHETICS	6083	473-040-091	FILLING CUP & COVER ASST. (OBSOLETE)
23X118	423-010-180	OIL SEAL (SYNTHETIC USE)	6084	471-680-020	FILLING CUP COVER
1705	454-006-000	ECCENTRIC	6086	411-700-100	FILLING CUP PIN
1864	402-080-020	BEARING	6087-B	473-020-061	FILLING CUP STRAINER - 1-3/4" DEEP
1865	410-700-050	NUT	2898-B	473-020-041	FILLING CUP STRAINER - 3/4" DEEP
CH-110-S1 1948-1	439-079-230 439-071-020	PACKING GSKT-SIGHT FEED TO MATCH 1949-1	6092-S2B	426-011-191	HAND CRANK ASSEMBLY
		(438-028-070)	6092-S2	426-011-010	
1948-2	439-071-030	GSKT-SIGHT FEED TO MATCH 1949-2	2074	426-011-191	HANDLE
1948-3	439-071-040	(438-028-080) GSKT-SIGHT FEED TO MATCH 1949-3	3064 11X344	458-005-300 411-030-440	SPRING GROOVE PIN
	.0, 0, 1 0 10	(438-028-090)	6093	424-050-150	SPACER BETWEEN FEEDS
1948-4	439-071-050	GSKT-SIGHT FEED TO MATCH 1949-4	6094		SPACER ENDS
		(438-028-100)	6094-3 6090	424-050-190 415-640-040	SPACER BETWEEN CENTER BRG. & FEEDS PUMP FASTENING SCREW
			6097-B	402-060-070	CENTER BEARING ASSEMBLY
			6414		RES. COVER GSKT-SIZE BASED ON LENGTH OF RES.



MODEL 25 BOX LUBRICATOR PART NUMBER CONVERSION CHART (CONTINUED)

OLD PART NUMBER	NEW PART NUMBER	DESCRIPTION
	439-075-170 412-130-140 416-470-030	WASHER-SIGHT FEED GLASS DRAIN PLUG-1/4" NPTF SCREW - COVER 10-32 X 5/16" LG. ROUND HEAD
16X4706 16X4713	416-470-060 416-470-130	SCRSIGHT GL. FASTN. STRIP 10-32 x 1/2" RND. SCRSIGHT FEED GLASS 10-32 x 1-1/2" RND. HD.
16X5123 1229 1725		SCRPUMP 1/4-28 x 3/4" LG. FILLISTER HD.
6103-BLH	459-158-070 453-000-021 453-000-031 453-020-150 415-700-050	BRAKE ASSEMBLY BRAKE ASSEMBLY
6107-S2C	459-218-010 458-185-020 411-700-120 453-020-150 453-020-031	SPRING PIN
10X22 6108 6119-B 6116	410-020-020 402-020-050 465-020-061 454-006-020	PAWL PIN NUT 5/16-18 BEARING DRIVE SHAFT ASSY. FOR 37-1/2:1 RATIO CAM

OLD PART Number	NEW PART NUMBER	DESCRIPTION
6119		SHAFT - DEPENDS ON LENGTH
6116-S3	411-040-290 465-020-321 454-006-180 465-002-010 454-006-150	DDIVE SHAFT ASSV FOD 18 3/A-1 DATIO
6120 15X21 28X11	465-020-051 421-700-250 415-020-010 439-071-000 459-158-070	CAP SCREW - 5/16-18 x 1/2" LG. FELT SLUG - 1/2 OD x 5/16" LG.
6103-B 1886 6101 6102 6103 6105		BRAKE ASSEMBLY BRAKE PAWL TORSION SPRING TORSION SPRING BRAKE PAWL PIN BOLT
	453-004-151 453-004-161 411-700-520 453-004-140 416-110-430	ROCKER ARM ASSEMBLY SPRING PIN
21X12 6188 9X19 1204-B 1204	421-010-020 465-001-830 409-010-090 453-004-111 480-000-020	LOCKER WASHER 5/16" RATCHET SHAFT No. 3 WOODRUFF KEY ROCKER ARM ASSEMBLY OUTSIDE ROCKER ARM
1203-B 1202 1203 1243 15X4903	480-000-031 480-000-000 480-000-010 415-700-000 415-490-030	ADJUSTABLE CONNECTION ASSY. ENGINE CONNECTION ADJUSTABLE CONNECTION PIN SET SCREW 5/16-18 X 1/2" CUP POINT
6070 87-1 15X35 15X4902		STRAINER ASSY. 3/8" ROD 6" LG. CAP SCREW 3/8-16 x 1" LG. SET SCREW 5/16-18 x 5/8" LG. CUP POINT DRAIN COCK
	453-020-150 454-000-240 465-020-071 439-071-000	INSIDE RATCHET ARM) CAM) DRIVE SHAFT) LONG STROKE RATCHET WASHER)
	453-004-140	ROCKER ARM



ORDERING INFORMATION

M25 - XX - XX - XX - XX - X Reservoir- — R1-1-3 Pump Station Reservoir R2-4-6 Pump Station Reservoir R3-7-9 Pump Station Reservoir R4-10-12 Pump Station Reservoir R5-13-16 Pump Station Reservoir R6-17-20 Pump Station Reservoir Pump Size--P1-3/16" Dia. Plunger, 1,000 PSI Maximum Operating Pressure P2-5/16" Dia. Plunger, 1,000 PSI Maximum Operating Pressure Pump Quantity- — 1-20 Pumps **Drive Options--**D1-Direct Rotary (1:1) D2-Standard Ratchet (Less Ratchet Arm) D3-37.5:1 Ratio D4-75:1 Ratio

Drive Locations- -L-Left Hand End R-Right Hand End

NOTE: Additional Model 25 Lubricators may be available upon request. Please supply serial number, complete application information and number of units required when requesting quotation.

Model 25 Components & Accessories

Description	Part Number
3/16" Replacement Pump	321-210-015
5/16" Replacement Pump	321-410-015
Ratchet Arm Assembly	453-004-111

Model 25 Dome Sight Glasses (requires gasket sold separately)

NUMBER	SIGHT GLASS	GASKET
OF FEEDS	PART NUMBER	PART NUMBER
1	438-028-070	439-071-020
2	438-028-080	439-071-030
3	438-028-090	439-071-040
4	438-028-100	439-071-050
5	438-028-110	439-071-060
6	438-028-120	439-071-070
7	438-028-130	439-071-080
8	438-028-140	439-071-090





