

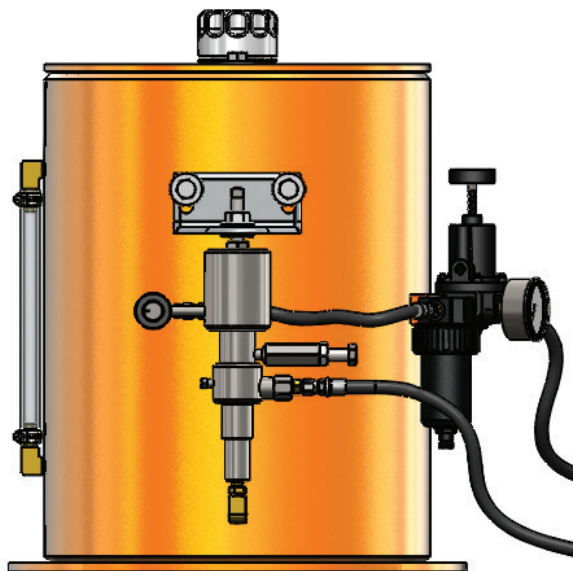


# POSITIVE DISPLACEMENT LUBRICATORS

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# OPERATIONS MANUAL

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- Do not discard this manual.
- Keep manual readily available for reference during operation or when servicing product.
- Before operation and maintenance, read and comprehend operations manual content.
  
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## WARRANTIES AND REMEDIES

### LIMITED WARRANTY

Numa warrants that the Product will be new and free from defects in material and workmanship under normal use as contemplated by this Contract for a period of one (1) month from the date of shipment.

Except for the foregoing warranty, Numa disclaims all warranties and representations wherever made, including warranties of merchantability, durability, length of service, or fitness for a particular purpose.

Any alteration or modification of the original product without the express written consent of Numa will void the warranty.

### REMEDY

If, during such warranty period, Buyer promptly notifies Numa in writing of any defect and establishes that the above warranty is not met, Numa shall either repair or replace the Product or credit the customer, as it deems necessary to meet the warranty.

Such repair, replacement, or credit of Product shall constitute complete fulfillment of Numa's obligation under this warranty, and upon the expiration of the original warranty period, all of Numa's obligations hereunder shall terminate.

### LIMITATION OF LIABILITY

Numa shall not be liable to Buyer whether in contract, in tort (including negligence and strict liability), under any warranty or otherwise, for any special, indirect, incidental or consequential loss or damage whatsoever, including (without limitation) loss arising from delay, cost or capital and loss of profits or revenues. The remedies set forth in this Contract are exclusive, and the total cumulative liability of Numa under this Contract or for any act or omission in connection therewith or related thereto, whether in contract, in tort (including negligence and strict liability), under any warranty or otherwise, is limited to the price paid by Buyer for the Product.

The *WARNINGS*, *CAUTIONS* and *NOTES* used throughout the text of this instruction book are defined as follows:

<b>WARNING</b>	A specific procedure or practice that must be strictly followed, or a specific condition that must be met, to prevent possible bodily harm.
<b>CAUTION</b>	A specific procedure or practice that must be strictly followed, or a specific condition that must be met, to prevent damage to the equipment.
<b>NOTE</b>	Important supplemental information.

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## **SECTION I DESCRIPTION**

### **GENERAL DESCRIPTION**

NUMA Pneumatic Lubricators are positive displacement air operated lubrication systems. They are offered in various capacities with 15 gallon (57 liter) and 45 gallon (170 liter) being the most common. Please contact your NUMA representative for other sizes or to discuss your custom requirements.

These Lubricators are designed to inject lubricants into airlines under positive pressure, to lubricate pneumatically operated tools. The design includes a lubricant tank, a pneumatically operated lubricant pump, a supply side air filter and regulator, fill level sight gage, and various connection lines, output lines and check valve.

Single pump Lubricators are capable of pumping up to 16 quarts (11.4 liters) per hour @1500 psi (103 Bar). They are adjustable for output pressures from 265 psi (18 Bar) to 1500 psi (103 Bar), and output volumes from .25 to 16 quarts per hour (.24 to 11.4 liters per hour). Required supply air pressure is from 15 to 75 psi (1 to 5 Bar). The supply to output pressure ratio is 17.6:1. The pump is adjustable for stroke length, and the number of strokes per minute.

## SECTION I

### STARTUP CHECK LIST

- ☐ Fill Tank. This should be done at the beginning of each shift and checked periodically throughout the day.
- ☐ Turn the knob on the pressure regulator counter clockwise two full turns.
- ☐ Connect air hose from regulator to compressed air supply. Connect fluid outlet hose to the line supplying compressed air to the hammer. The fluid outlet hose must be plumbed in after air supply to pump. Make sure to install proper whip checks. Turn on air supply at compressor(s).
- ☐ Slowly open air supply valve located on the manifold if equipped.
- ☐ Turn the pressure regulator clockwise until the pressure gage registers between 65 psi min and 75 psi max. This controls the pressure being supplied to the lubricator pump.
- ☐ Open bleeder valve on left side of pump to prime it. Allow pump to operate until fluid without bubbles is discharged. Close bleeder valve.
- ☐ Check that the supply line regulator is set at 75 psi max. This will feed the air into the pump.
- ☐ Reference the rock drill oil consumption chart located on top of the lubricator. Match the hammer size to proper injection rate. Adjust if needed.
- ☐ As all down hole hammers require a continuous supply of rock drill oil, place a piece of plywood below the surface of the bit face until lubricant is visible on the plywood surface. The pump should be checked multiple times per shift to insure that it is operating properly. If the pump is not operating properly, immediately cease hammer operation. Failure to lubricate the hammer can cause piston failure.
- ☐ Periodically check that all fittings are tight and hoses are in proper working condition with no visible defects.
- ☐ To keep the pump properly lubricated, periodically tighten the grease jack assembly. It is located on the right hand side of the pump. Refill as necessary.

## SECTION II

# FUNCTIONAL DESCRIPTION

### Lubricator Tank

The Lubricator Tank is a welded fabrication. The tank is manufactured from ASTM A36 grade steel. All joints are machine finished and MIG fillet welded.

### Sight Gage

A lubricant level Sight Gage is provided on the side of the tank. This gage is a reinforced flexible tube designed to prevent breakage. Care should be taken to prevent cutting or puncturing this tube with sharp objects, as this would cause the lubricant to leak from the tank.

### Regulator

A pressure regulator is fitted at the upstream end of the assembly. This regulator must be set between 65 psi (4 Bar) and 75 psi (5 Bar). The regulator protects the lubrication pump and filter from damage due to over pressurization.

### Filter

The filter is fitted downstream from the regulator. This filter removes moisture and particulate that can damage the pump. The filter is provided with a drain to eliminate moisture and particulate filtered out of the supply air.

### Filler Cap / Breather

The Filler Cap also contains the tank breather to prevent vapor lock. The filler also comes supplied with a strainer to prevent foreign materials from getting into the lubricant tank.

### Lubricator Pump

The Lubricator Pump is a pneumatically operated positive displacement fluid pump. It is manufactured from 300 series stainless steel, and is adjustable for stroke length and strokes per minute. Output pressure is directly proportional to supply pressure at a ratio of 17.6:1. [Supply pressure of 75 psi (5 Bar) gives an actual output pressure of 75 psi (5 Bar) X 17.6 = 1320 psi (91 Bar)].

## SECTION III OPERATION

### Start Up

Once the tank has been filled with Lubricant, open the bleeder valve on the pump to prime it. Allow the pump to operate until clear fluid, without bubbles, is discharged, and then close the bleeder valve for normal operation.

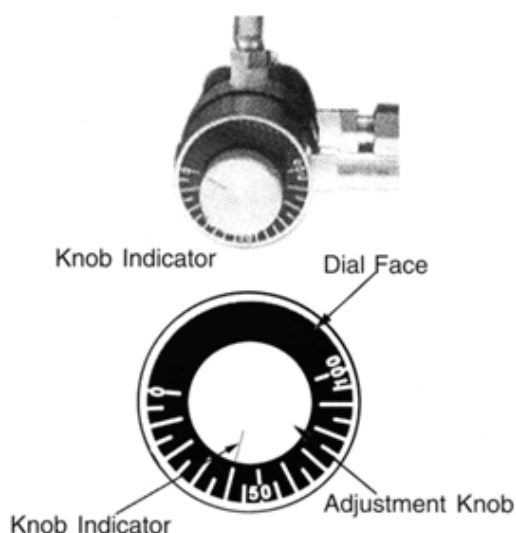
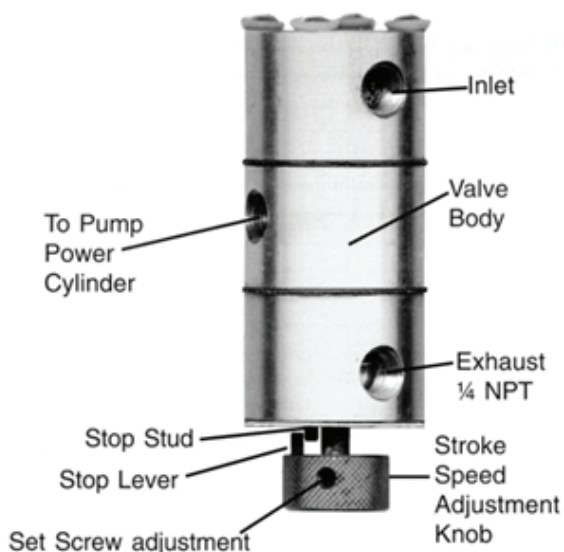
The pump can be primed sooner if the bleeder valve is loosened one turn before starting the pump. An oil can may be used to force some of the same fluid that to be pumped into the bleeder valve hole. Tighten the bleeder valve and prime the pump as above.

Refer to the STROKES / QUARTS chart for the injection rate required, and adjust the rate per minutes knob to the desired strokes per minute, by turning the knob counterclockwise to increase, and clockwise to decrease. The stroke length adjustment screw can also be used to control the amount of fluid injected.

The pump parts are subject to normal wear, and should be inspected and replaced as needed. The exploded view of the pump shows the relationship of the parts, and how they fit together.

### TIMER ADJUSTMENT

Timer adjustment may be necessary in the field to allow for actual temperature or pressure differences. The adjustment can be done easily by loosening the set screw of the adjustment knob and removing it from the needle valve shaft. With the supply pressure plumbed to the inlet, and the bleeding of the fluid side of the pump complete, turn the needle valve shaft counterclockwise with your fingers to the desired strokes per minute. Once you are satisfied with the strokes per minute, reinstall the adjustment knob on the needle shaft.





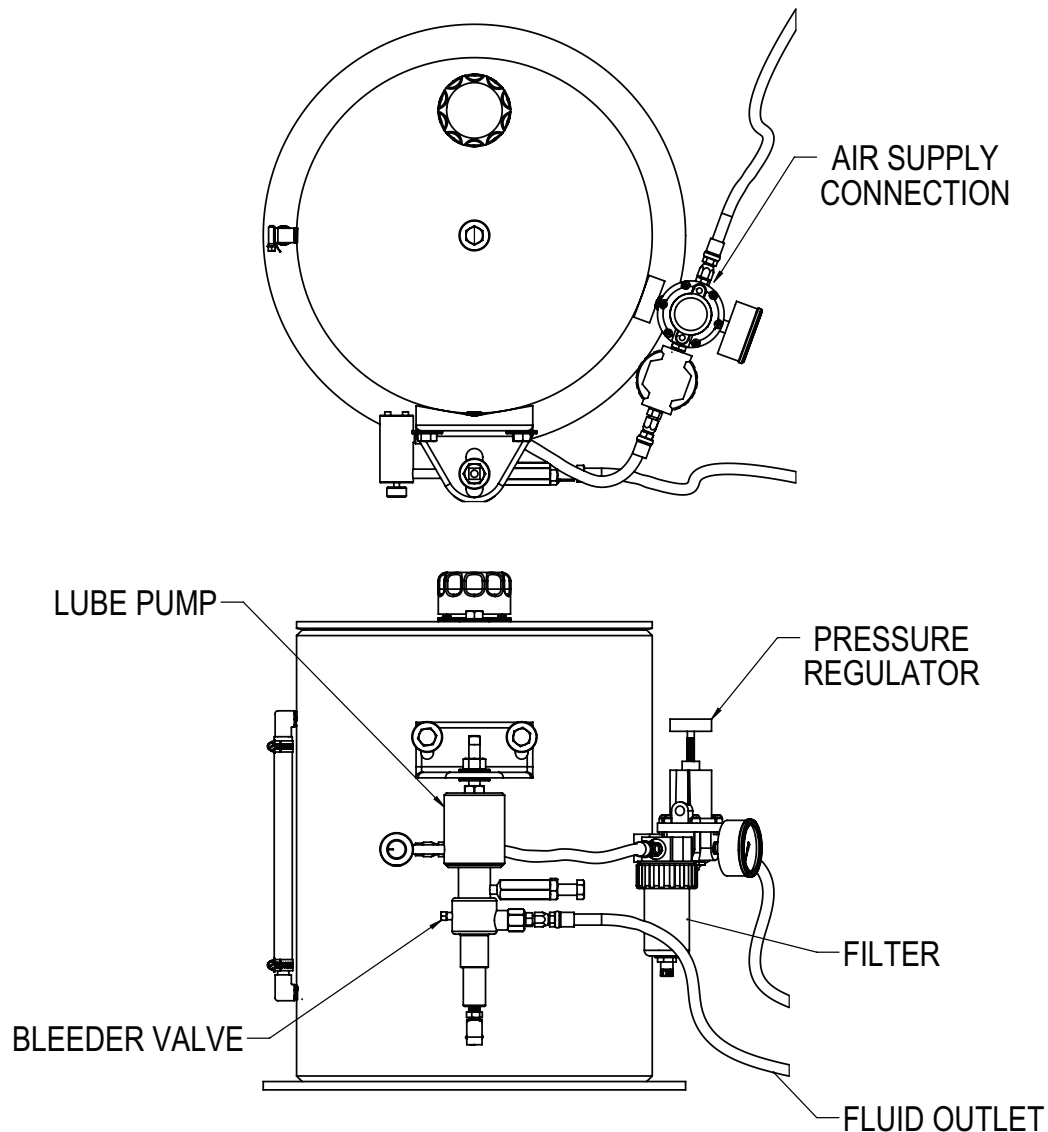
## SECTION III OPERATION

### Connections

The NUMA Lubricator comes completely connected internally. Only the supply air inlet and outlet need to be connected in the field. The inlet connection of the Regulator (supply air inlet) is 1/4 NPT. Connect the Regulator to the available supply air via a standard air hose with -4 JIC female connectors. The fluid outlet connection at the pump is 1/4 NPT. Connect the fluid output hose with -4 JIC female connectors to the line supplying compressed air to the hammer.

### WARNING

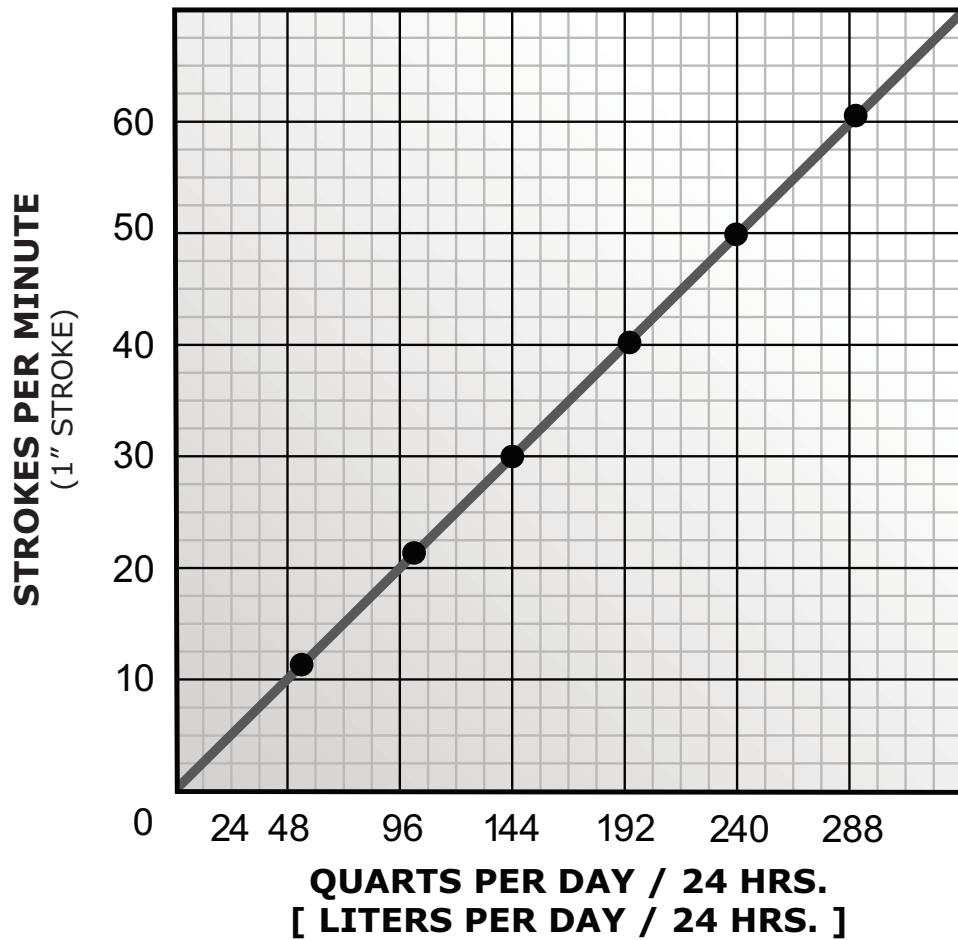
All connections made after the pump outlet, must have at least a 1500 psi (103 Bar) pressure capacity.



## SECTION III OPERATION

### Performance Specifications

### STROKES vs QUARTS

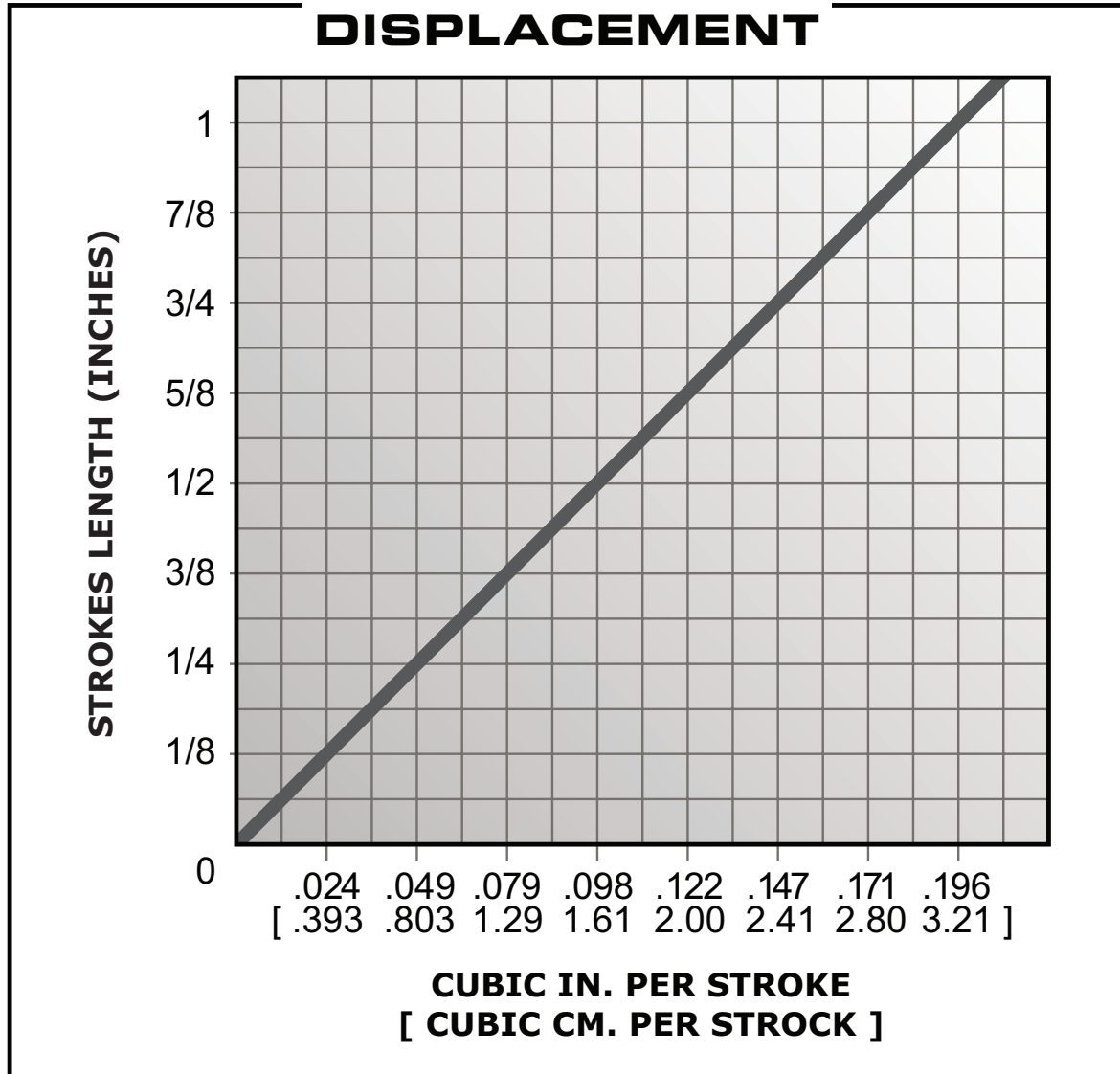


SUPPLY PRESSURE	DISCHARGE PRESSURE	RATIO
15-75 PSI (1-5 BAR)	1500 PSI (103 BAR) MAX	17.6:1

## SECTION III OPERATION

### Performance Specifications

### VOLUMETRIC DISPLACEMENT



## SECTION III OPERATION

### FLUID OUTPUT TABLE FLUID OUTPUT AT VARIOUS STROKES PER MINUTE

**@ 75 PSI (5 BAR) SUPPLY PRESSURE**

<b>STROKES PER MINUTE @ 1 INCH STROKE</b>	<b>QUARTS / HOUR</b>	<b>LITERS / HOUR</b>
<b>10</b>	<b>2</b>	<b>1.9</b>
<b>20</b>	<b>4</b>	<b>3.8</b>
<b>30</b>	<b>6</b>	<b>5.7</b>
<b>40</b>	<b>8</b>	<b>7.5</b>
<b>50</b>	<b>10</b>	<b>9.5</b>
<b>60</b>	<b>12</b>	<b>11.4</b>
<b>70</b>	<b>14</b>	<b>13.2</b>
<b>80</b>	<b>16</b>	<b>15.2</b>

## **SECTION IV MAINTENANCE**

The lubricator should be inspected on a regular basis, for damage, leaks, and normal wear. Leaks in the system should be fixed immediately, as they not only cause the loss of lubricant, they can also allow foreign materials to enter the tank. Leaks in the fittings or hoses can be repaired either by checking that the fittings are tightened to the proper torque, or replacing the leaking component(s).

Leaks in the tank itself or the pump, should be referred to NUMA for evaluation and possible repair. Seals and o-rings will need to be replaced at a regular interval, as they wear.

Regularly check that the supply line regulator is set for a maximum of 75 psi (5 Bar), and that the gage is operating properly.



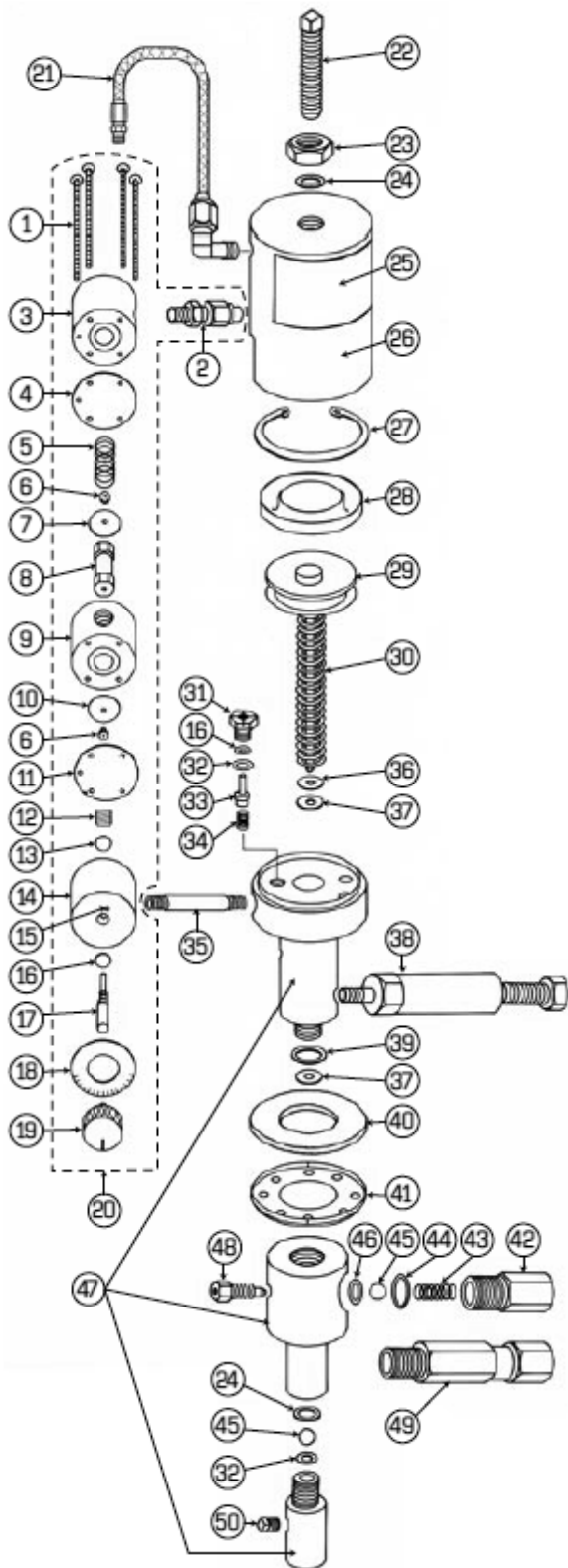
## SECTION V PARTS IDENTIFICATION

PART NUMBER	DESCRIPTION	QTY.
002490	NIPPLE HEX 1/4 NPT SS	3
002527	REDUCING BUSHING 3/8 NPT MALE X 1/4 NPT FEMALE SS	1
002528	NIPPLE LONG 1/4 NPT X 2-1/2" SS	1
002529	ELBOW 90° 1/4 NPT FEMALE X 1/4 NPT FEMALE SS	1
002814	PRESSURE GAGE 0-500 PSI	1
003214	AIR FILTER 1/4 NPT	1
003429	PUMP TIMER ASSEMBLY	1
003431	AIR PRESSURE REGULATOR	1
003580	HEX NUT 1/2 - 20 UNF GR5	1
003581	HOSE CLAMP 3/4"	2
003724	FLAT WASHER 1/2"	5
003725	HEX BOLT 1/2 - 13 UNC X 3/4 GR5	3
003750	CONNECTOR -4 JIC MALE X 1/4 NPT MALE BRASS	3
003752	CONNECTOR -4 JIC MALE X 1/8 NPT MALE BRASS	1
003753	HIGH PRESSURE HOSE -4 JIC FEMALE X 72"	2
003754	HIGH PRESSURE HOSE -4 JIC FEMALE X 12"	1
003758	ELBOW 90° 3/8 NPT MALE X 1/2 HOSE BARB	2
003759	15 GALLON PVC TUBING CLEAR BRAIDED 1/2 ID	10-1/4"
003759	45 GALLON PVC TUBING CLEAR BRAIDED 1/2 ID	45-1/8"
003791	HOLLOW HEX PIPE PLUG 1/2 NPTF	1
003793	TANK FILLER/BREATHER	1
003796	POSITIVE DISPLACEMENT PUMP	1
007681	HEX NUT 1/2 - 13 UNC GR5	1
012617	TANK BODY - 15 GALLON	1
012690	TANK BODY - 45 GALLON	1
013267	PUMP BRACKET	1

## SECTION V

### PARTS IDENTIFICATION

#### LUBRICATOR PUMP EXPLODED VIEW



REF	DESCRIPTION	PART NUMBER
1	Capscrew	ASA-5008-BA
2	Connector	ASA-5011-BA
3	Upper Housing	ASA-5033-BA
4	Gasket	ASA-5020-BA
5	Spring, Spool Valve	ASA-5005-BA
6	Screw	ASA-5045-BA
7	Spool Valve End Plate	ASA-5040-BA
8	Spool Valve Body	ASA-5038-BA
9	Center Housing	ASA-5036-BA
10	Spool Valve End-Dia	ASA-5039-BA
11	Diaphragm	ASA-5003-BA
12	Set Screw	ASA-5037-1A-BA
13	O-Ring	ASA-5010-BA
14	Needle Valve Hsg w/ Needle	ASA-5037-A-BA-A
15	Roll Pin	41A-1/8X3/8
16	O-Ring	ASA-5013-BA
17	Needle Valve NSS	ASA-5041-A-BA
18	Dial face	ASA-5043-BA
19	Knob	ASA-5042-BA
20	Timer Assembly	ASA-5076-BA
21	Cyl. Timer Hose	ASA-5112-BA
22	Screw, Stroke Adjustment	ASA-5022-BA
23	Jam Nut	ASA-5023-BA
24	O-Ring	ASA-2184
25	Front Name Plate	ASA-DECAL
26	Cylinder	ASA-5025-BA
27	Retaining Ring	11A-N5002-244
28	U-Cup	ASA-5000-BA
29	Piston & Plunger Assembly	ASA-5063-BA
30	Piston Spring	ASA-5062-BA
31	Exhaust Valve Body	ASA-5030-BA
32	O-Ring	ASA-5014-BA
33	Exhaust Valve Actuator	ASA-5031-BA
34	Exhaust Valve Spring	ASA-5004-BA
35	Pipe Nipple 1/8 x 2	ASA-5009-BA
36	Packing Retainer	ASA-5061-BA
37	O-Ring w/ Polypak	ASA-5065-BA
38	Grease Jack Assembly	ASA-558
39	O-Ring	ASA-5060-BA
40	Filter	ASA-5057-BA
41	Filter Cap	ASA-5056-BA
42	Check Vlv Body, Discharge	ASA-5027-BA
43	Check Valve Spring	ASA-5006-BA
44	O-Ring	ASA-5016-BA
45	SS Ball, 3/8	ASA-54
46	O-Ring	ASA-5018-BA
47	Center Lower Hsg Assembly	ASA-5064-BA
48	Bleeder Valve	ASA-5032-BA
49	SS Line Check	ASA-675
50	Pipe Plug	ASA-5053-BA



## NOTES