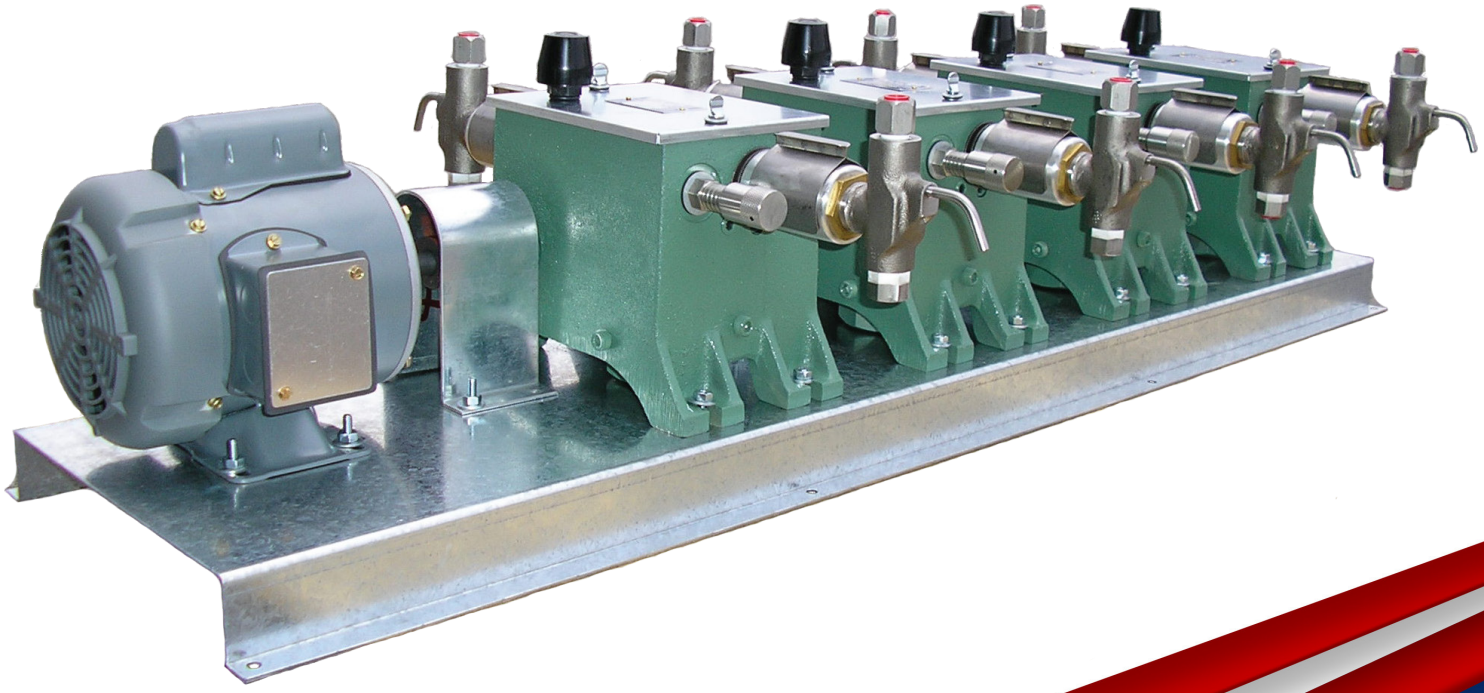
FLOMORE

Different By Design

4400 Series Injector



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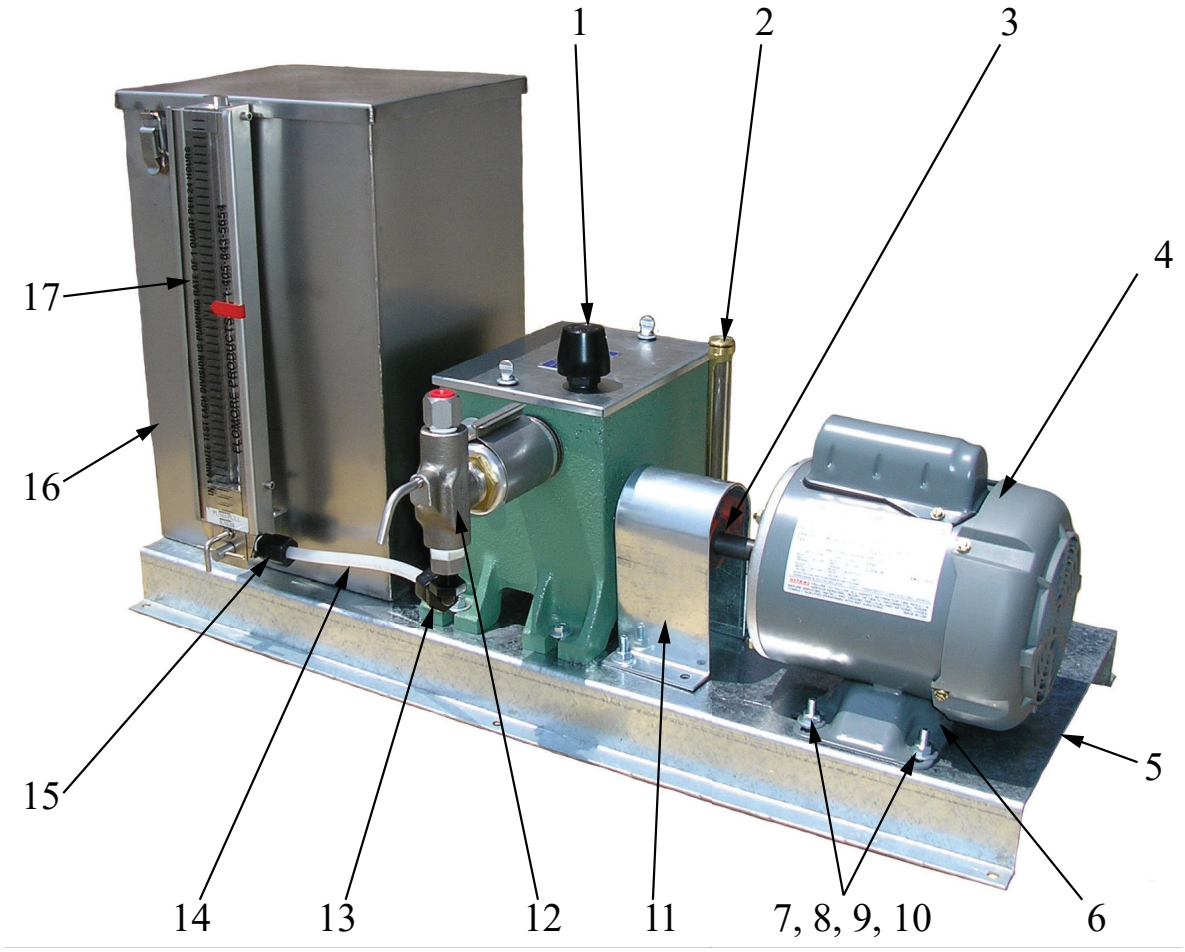
Maintenance Instructions to Inspect and Replace Plunger Packing

1. Turn off the pump. Isolate injection point from back flow or pressure.
2. Remove suction & discharge lines. (Caution: Pressure might be trapped inside head or lines.)
3. Loosen packing gland nut, then slide the nut back from the head.
4. Depending on pump model, loosen the brass jam nut from the yoke or body. You can now unscrew and remove the head body.
5. Remove packing gland from head if needed. This might remain on the plunger nut.
6. Inspect the plunger for wear. If the plunger needs to be replaced, remove the plunger pin and slide the plunger out. Insert the new plunger and reinstall the pin. (If plunger is good, move to step 7.)
7. Remove the plunger packing with a pick or small screwdriver. (Take note of packing orientation for reinstall.)
8. Inspect the throat of the head body for pitting and wear. Replace if needed.
9. Install new plunger packing one ring at a time, ensuring that each ring is seated flush.
10. Reinstall the packing gland. Insert the head onto the plunger and yoke. Thread the head back into the yoke until the jam nut touches. Align body into correct vertical position and tighten the jam nut securely. (Head should not be able to spin.)
11. Reinstall the packing gland nut until it makes contact with the packing. Apply an additional 1/4" turn into the packing.
12. Reinstall the suction and discharge lines. Open injection point valve and check for leaks.
13. Turn on the pump. Open the priming valve to bleed air from the suction lines and head. Confirm the pump is pumping and check for leaks.
14. Adjust the plunger packing as needed. Run the pump for 15 minutes and check for packing nut contact. If loose, tighten nut 1/4" at a time. (Make sure to bleed the head before making packing adjustments.)

4400 Series Injector



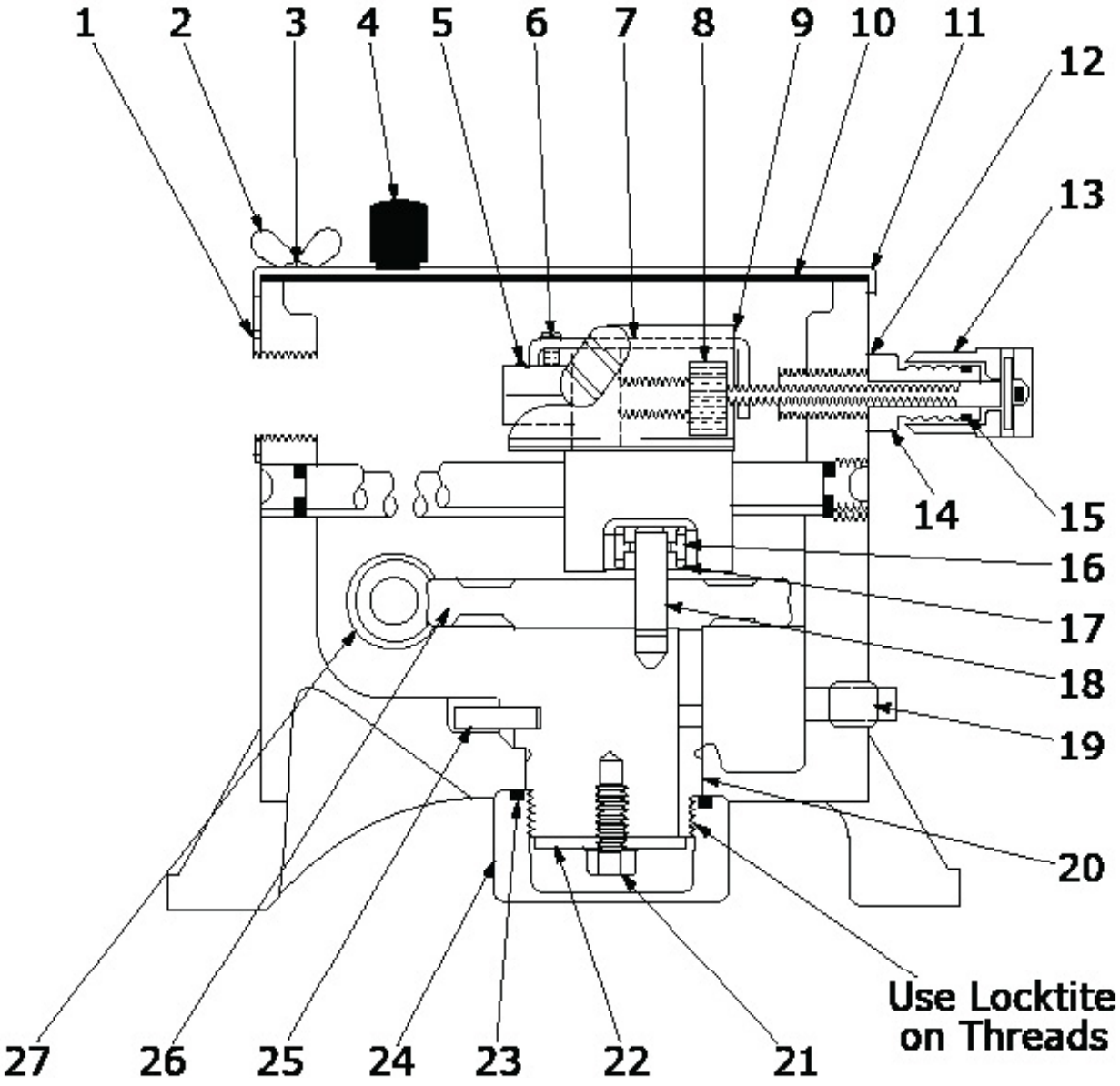
Parts List

Item #	Part #	Description
1	A-2600	Breather
2	A-4066	Oil Gauge Assembly
3	A-1653	1/2" X 5/8" Coupling
4	A-2264.3	1/3 HP, 1/115/230, TEFC
	A-2268	1/3 HP, 3 ph, 230/460, TEFC
	A-2265	1/3HP, 115/230, Explosion Proof
	A-2271	1/3 HP, 3 ph, 230/460, Explosion Proof
5	B-1135	Base for Two 5 Gallon Tanks and Pump
	C-0317	Base for One 5 Gallon Tank and Pump
	B-0437	Pump Base

Item #	Part #	Description
7	A-0164	Hex Nut
8	A-3303	1/4" Steel Lock Washer
9	A-0167	Cut Washer
10	A-0163	Cap Screw
11	B-1167	Coupling Guard
12	See p. 9	Head Assembly
13	A-3116	Elbow
14	A-3117	9" Poly Tube Suction Line
15	A-3118	Connector
16	A-0664	5 Gallon 430 Stainless Steel Tank
17	F-0871	Model 2000 Tank Gauge

Gear Box Assembly

Side View



Flow Rate Adjustment

Turn knob, Item #13, clockwise to decrease flow, counterclockwise to increase flow. Each complete turn of the knob results in a 10% change in stroke setting. Each groove on the spindle, Item #15 Page 4, is equal to 25% change in stroke setting. To adjust pump while stopped, make sure plunger is in the full forward position.

Gear Box Assembly Parts List

Item #	Part #	# Req.	Description	Material
1	A-4256	2	Belleville Washer	302 Stainless Steel
*2	A-2970	2	Thumb Screw	Cadmium Plated Carbon Steel
3	A-4092	2	1/4" Stat-O-Seal	Buna-N
4	A-2600	1	Breather	N/A
*5	A-0290	1	Plunger Pin	Carbon Steel
*6	A-3312	1	Lock Washer	Cadmium Steel Plated
	A-4753	1	Round Head Slotted Screw	
7	A-4756	1	Guide Bar	Carbon Steel
8	A-4757	1	Stroke Adjustment Gear	Steel
9	A-4758	1	Stroke Adjustment Drive Gear	Steel
10	A-4814	1	Cover Gasket	Neoprene
11	C-1576	1	Cover	Galvanized Carbon Steel
12	A-4759	1	Gasket	Buna-N
13	A-4805-A	1	Stroke Adjustment Knob & Screw Assembly	Steel
14	A-4761	1	Stroke Adjustment Spindle	303 Stainless Steel
15	A-1957	1	O-Ring	Buna-N
16	A-4065	1	Crosshead Bearing	Carbon Steel
17	A-0458	1	Washer	Carbon Steel
18	A-4064	1	Bearing Stud	Carbon Steel
19	A-0138	1	Pipe Plug	Galvanized Malleable Iron
*20	B-0619	1	Lower Bearing	Ductile Iron
*21	A-2501	1	Machine Screw	Carbon Steel
	A-0459	1	3/8" Spring Lock Washer	
*22	A-1930	1	Bottom Thrust Washer	Carbon Steel
*23	A-2457	1	O-Ring	Buna-N
*24	A-1921	1	Cap	Carbon Steel
*25	A-2337	1	Roll Pin	Cadmium Plated Carbon Steel
*26	B-0621	1	Worm Gear (25:1 Ratio)	Cast Iron
	B-0616		Worm Gear (50:1 Ratio)	
	B-0623		Worm Gear (100:1 Ratio)	
*27	A-1871	1	Worm & Shaft Assembly (25:1 Ratio)	Carbon Steel
	A-2250		Worm & Shaft Assembly (50:1 Ratio)	
	A-1755		Worm & Shaft Assembly (100:1 Ratio)	
▲	B-0270	1	Thru Shaft Assembly (25:1 Ratio)	Carbon Steel
	B-0469		Thru Shaft Assembly (50:1 Ratio)	
	B-0452		Thru Shaft Assembly (100:1 Ratio)	

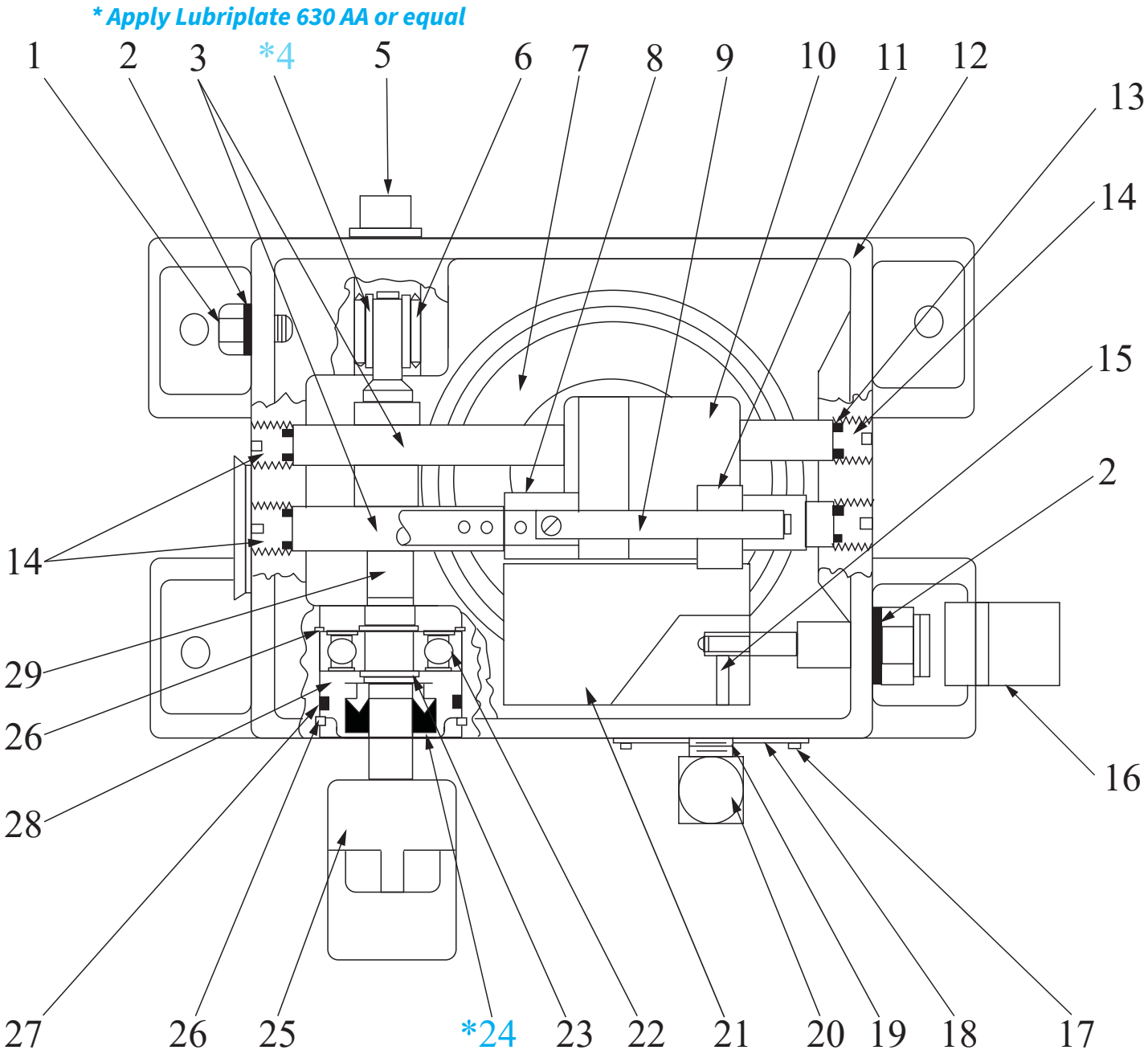
*Recommended Spare Parts

*Parts are directly interchangeable with 4500 Series.

▲ Parts used when a common motor is used to drive more than one gear box assembly

Gear Box Assembly

Top View



* Apply Lubriplate 630 AA or equal between shaft and seal lips

*Assembly oil seal flush with end of cartridge

Gear Box Assembly Parts List

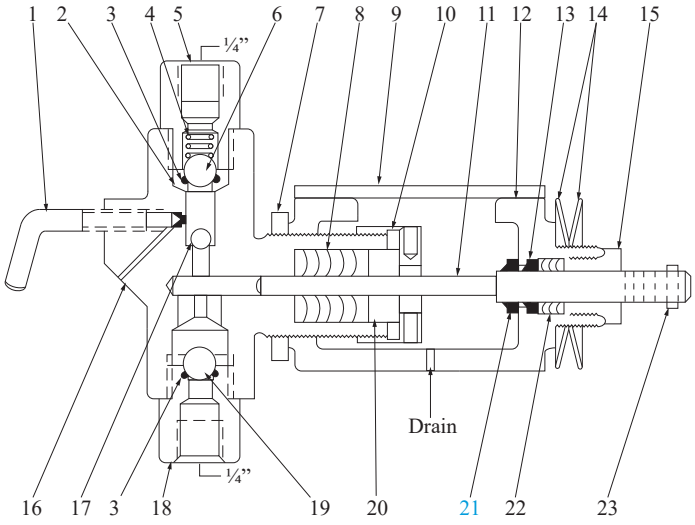
Item #	Part #	# Req.	Description	Material
1	A-4795	1	Bolt	Cadmium Plated Steel
2	A-4759	1	Gasket	Buna-N
3	A-4229	2	Crosshead Guide Bar	Carbon Steel
*4	A-2287	1	Inner Race Bearing	Carbon Steel
5	A-3309	1	Pipe Plug	Galvanized Malleable Iron
*6	A-2286	1	Needle Bearing	Carbon Steel
7	B-0621	1	Worm Gear (25:1 Ratio)	Cast Iron
	B-0616		Worm Gear (50:1 Ratio)	
	B-0623		Worm Gear (100:1 Ratio)	
8	A-4755	1	Adjustment Bolt	Carbon Steel
9	A-4756	1	Guide Bar	304 Stainless Steel
10	B-1333	1	Crosshead	Cast Iron
11	A-4757	1	Stroke Adjustment Gear	Steel
12	D-0492	1	Housing	Cast Iron
13	A-3849	4	O-Ring	Buna-N
14	A-4228	4	Rod Retainer	Carbon Steel
15	A-4894	1	Set Screw	Steel
16	A-4805-A	1	Stroke Adjustment Knob & Screw Assembly	Steel
17	A-0171	2	Brass Pin	Brass
18	A-0172	1	Name Plate	Aluminum
19	A-0075	1	1/4" Street Elbow	Galvanized Malleable Iron
20	A-4066	1	Oil Gauge Assembly	Brass with Glass Tube
21	A-4758	1	Stroke Adjustment Drive Gear	Steel
*22	A-2285	1	Bearing	Carbon Steel
*23	A-3310	2	Truarc Ring	Carbon Steel
▲ *24	A-2064	1	Oil Seal	Buna-N
*25	A-1653	1	1/2" X 5/8" Coupling	Carbon Steel
▲	A-1836	1	1/2" X 1/2" Coupling	Carbon Steel
*26	A-3311	2	Truarc Ring	Carbon Steel
27	A-1961	1	O-Ring	Buna-N
28	A-4045	1	Seal Cartridge	Carbon Steel
▲	A-2036A	1	Bearing	Brass
▲	C-0485	1	O-Ring	Buna-N
*29	A-1871	1	Worm & Shaft Assembly (25:1 Ratio)	Carbon Steel
	A-2250		Worm & Shaft Assembly (50:1 Ratio)	
	A-1755		Worm & Shaft Assembly (100:1 Ratio)	
▲	B-0270	1	Thru Shaft Assembly (25:1 Ratio)	Carbon Steel
	B-0469		Thru Shaft Assembly (50:1 Ratio)	
	B-0452		Thru Shaft Assembly (100:1 Ratio)	

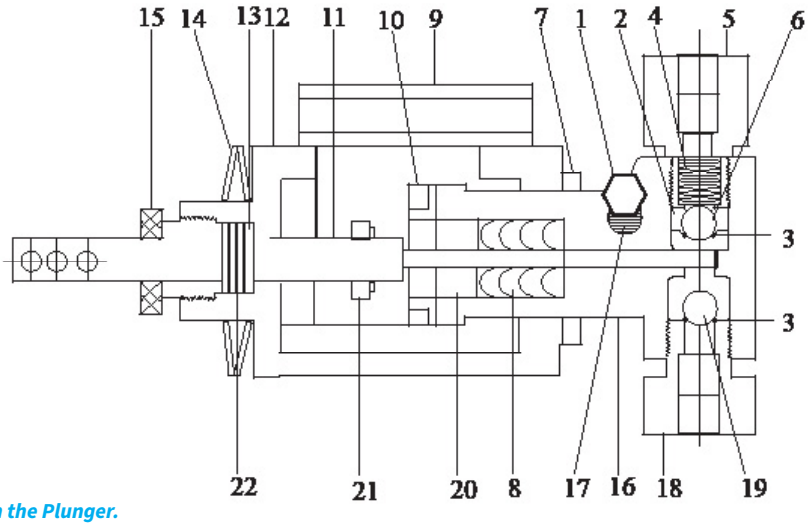
*Recommended Spare Parts

*Parts are directly interchangeable with 4500 Series

▲ Parts used when a common motor is used to drive more than one gear box assembly

Injector Heads





Note: Drip Ring moves with the Plunger.

Parts List

Item #	Part # 3/16"	1/4"	3/8"	1/2"	# Req.	Description	Material
▲	▲	C-1578	C-1579	C-1580	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	C-2041	C-1582	C-1583	C-1584			Stainless Steel
1	A-4027	A-1497			1	Priming Valve	303 Stainless Steel
*2	B-0737				1	Top Seat Assembly - Buna	303 Stainless Steel
*3	A-0479				1	O-Ring	Buna-N
4	A-0077				1	Ball Check Spring	316 Stainless Steel
5	A-1496				1	Top Bushing	302 Stainless Steel
6	A-0054				1	3/8" Large Top Ball	316 Stainless Steel
7	A-0225				1	Yoke Lock Nut	Brass
*8	A-3969	A-1461	A-1456	A-0959	1	Plunger Packing Set	Buna-N
9	C-1604				1	Yoke Cover	303 Stainless Steel
10	A-4104				1	Plunge Packing Gland Nut	303 Stainless Steel
*11	B-1298	B-1175	B-1176	B-1177	1	Plunger	17-4 pH Stainless Steel
12	B-1173				1	Yoke	Malleable Iron
13	A-4095				1	Plunger Wiper Ring	Buna-N
14	A-4256				2	Belleville Washer	302 Stainless Steel
15	A-4094				1	Yoke Packing Nut	Brass
16	▲	C-0275	C-0276	C-0272	1	Body	Ductile Iron
	C-2040	C-0291	C-0425	C-0349			Stainless Steel
17	▲	A-0126			1	1/4" Small Top Ball	316 Stainless Steel
*18	B-1216	B-0736			1	Bottom Seat Assembly - Buna	303 Stainless Steel
*19	A-0054				1	3/8" Suction Ball	316 Stainless Steel
20	A-4332	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095				1	Plunger Wiper Ring	Buna-N
22	A-4127				1	Yoke Packing Set	Buna-N
23	A-0290				1	Plunger Pin	Carbon Steel

*Recommended Spare Parts

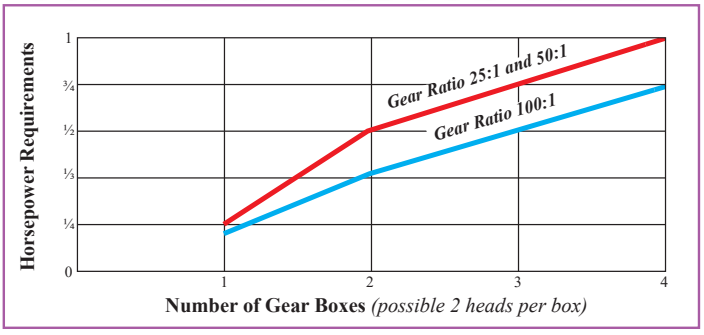
*Alternate Components Available

Performance Data and Dimensions

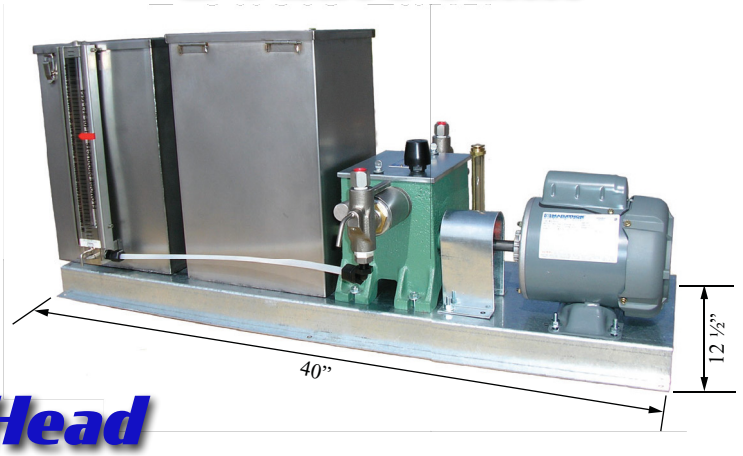
# of Heads	Plunger Size	Maximum Discharge Pressure (PSI)	100:1 Ratio (17.5 SPM)				50:1 Ratio (35 RPM)				25:1 Ratio (70 SPM)			
			Model #	Min. Both Motors	Max. 60 Hz Motor	Max. 50HZ Motor	Model #	Min. Both Motors	Max. 60Hz Motor	Max. 50 Hz Motor	Model #	Min. Both Motors	Max. 60 Hz Motor	Max. 50 Hz Motor
Single Head Units	3/16"	5000	44-24	0.063	2.5	2.07	44-04	0.13	5	4.15	44-34	0.25	10	9.13
	1/4"	2400	44-21	0.50	5.0	4.15	44-01	1.0	10	8.30	44-31	2.0	20	16.60
	3/8"	1200	44-23	1.2	12	9.96	44-03	2.3	23	19.09	44-33	4.6	46	38.18
	1/2"	600	44-25	2.1	21	17.43	44-05	4.0	40	33.20	44-35	8.0	80	66.40
Double Head Units	3/16"	5000	44-24DH	0.13	5.0	4.14	44-04DH	0.26	10	8.3	44-34DH	0.5	22	18.20
	1/4"	2400	44-21DH	1.0	10	8.30	44-01DH	2.0	20	16.60	44-31DH	4.0	40	33.20
	3/8"	1200	44-23DH	2.4	24	19.90	44-03DH	4.6	46	38.18	44-33DH	9.2	92	76.40
	1/2"	600	44-25DH	4.2	42	34.86	44-05DH	8.0	80	66.40	44-35DH	16.0	160	132.80

*Volume expressed in U.S. Gallons per Day

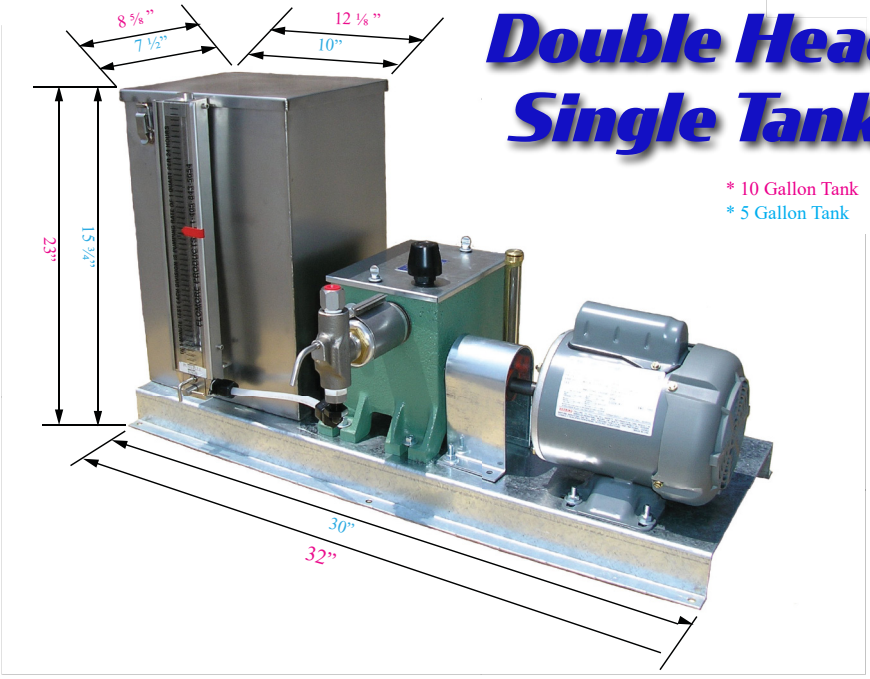
Horsepower Requirements for Multi-Headed Units



Double Head Double Tank

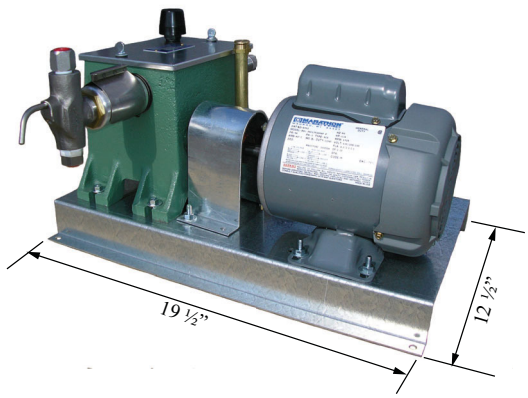


Double Head Single Tank



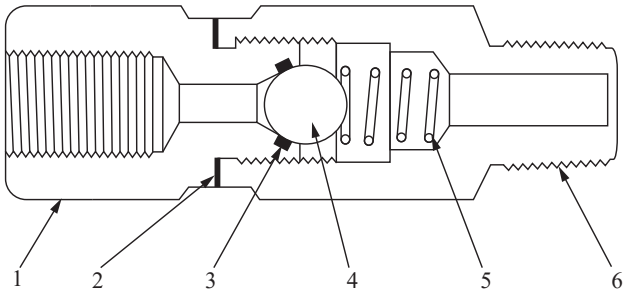
* 10 Gallon Tank
* 5 Gallon Tank

Single Head



Components and Operating Instructions

A-0675 & A-0676 Line Checks



Parts List

Item #	Part #	#Req	Description	Material
1	A-0678	1	Inlet Body	Brass
	A-1297	1	Inlet Body	303 Stainless Steel
2	A-1574	1	Washer	304 Stainless Steel
3	A-0479	1	O-Ring	Buna-N
	A-2580	1	O-Ring	Viton
4	A-0054	1	3/8" Ball	316 Stainless Steel
5	A-0391	1	Spring	316 Stainless Steel
6	A-0677	1	Outlet Body	Brass
	A-1296	1	Outlet Body	303 Stainless Steel

*Recommended Spare Parts **A-0675 Only ***A-0676 Only

Operating Instructions

Note: The motor needs to be wired to turn the shaft of the pump clockwise.

1. Check the oil level in the gear box regularly. Observe the oil level indicator (Item #21, p.6).

2. Check for excess chemical leakage around the packing gland. If it is impossible to tighten, replace the packing. If the plunger is badly scored, replace the plunger and packing. If excessive packing failure is experienced, contact your Flomore representative.

3. Each Flomore 4400 Series pump has an adjustment for the required stroke length. To adjust the stroke length, see the Flow Rate Adjustment instruction note on page 4.

Maintenance

Replacing the Stroke Adjustment Gears

1. When replacing the steel stroke adjustment gears, they have to be correctly positioned relative to the crosshead, the stroke adjustment knob, and each other. Rotate the motor coupling by hand until the crosshead is moved forward as far as it will go toward the side of the housing in which the head is mounted.
2. Assemble the small and large gears in place. Leave the set screw in the large gear loose for the time being.
3. Turn the large gear in the direction that causes the small gear to move forward toward the crosshead. Continue this turning motion until the small gear is flush up against the crosshead (no lost motion).
4. Turn the stroke adjustment knob clockwise until it covers the last groove on the spindle. Tighten the set screw in the large steel gear using a 5/64" allen wrench. The pump is now set in full discharge stroke position and all parts are in their correct relative positions. To make further adjustment in the flow rate, see the Flow Rate Adjustment instructions on page 4.

Disassembly of the Power Mechanism

1. Disconnect and remove the pump head from the power unit.
2. Remove the large steel gear drive by loosening the set screw with a 5/64" allen wrench.
3. Remove the rod retainers and o-rings from each end of the bearing rods.
4. Using the proper size punch, push the bearing rods through the crosshead and out the opposite side of the gear box.

Remove Worm Gear and Bearing from Gear Box

1. Remove the cap from the bottom of the pump.
2. Remove the hex head machine screw, spring washer, and the bottom thrust washer. You can now remove the worm gear and bearing through the top of the housing.
3. Upon replacing, be certain the gear roll pin is located in its proper place, holding the bearing in proper alignment.

To Remove Crosshead Bearing from Worm Gear

Remove the crosshead and lift the bearing off of the bearing stud.

To Remove the Worm Gear and Shaft, Shaft End Bearing , and/or Oil Stem

It is not necessary to remove the crosshead, guide rods, or worm gear in order to remove the drive shaft and its component parts.

1. Disconnect the flexible coupling and remove the motor from the base. If the unit is equipped with a container on the base, it is best to remove the entire gear box from the base:
   - Remove the truarc ring.
   - Remove the pipe plug.
2. Insert the proper size punch into the recess on the small end of the shaft. Carefully drive the shaft out through the opposite side of the housing. Punch size should be small enough to not drive against the inner race or the needle bearing.
3. As the shaft is being driven out, care should be taken to see that the large worm gear turns. This will "walk" or disengage the gear teeth.
4. As the shaft emerges from the side of the housing, it will force out the oil seal, seal cartridge, and the ball bearing.
5. Withdraw the shaft from the pump housing.
6. In order to remove the ball bearing from the shaft, it is necessary to remove on or both of the truarc rings.
7. Upon replacing, care should be taken to "walk" the two worm gears back together.
8. Be sure the two truarc rings are in place. The seal and seal housing must be installed properly (the seal lips and seal expander spring should face into the pump). Make sure the o-ring is in its proper place.
9. The shaft assembly should be inserted into the pump until the shaft bearing shoulders against the truarc ring. located near the inner edge of the hole into which the shaft is inserted.

Apply Lubriplate 630 SS to Wear Surfaces of the Following Items

- Guide and crosshead bearing rod surfaces in contact with the crosshead.
- Worm teeth and gear teeth.
- Seal cartridge.
- Worm gear in contact with the lower bearing.
- Thrust washer.
- Surface in contact with the lower bearing.

FLOMORE®

Different By Design

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