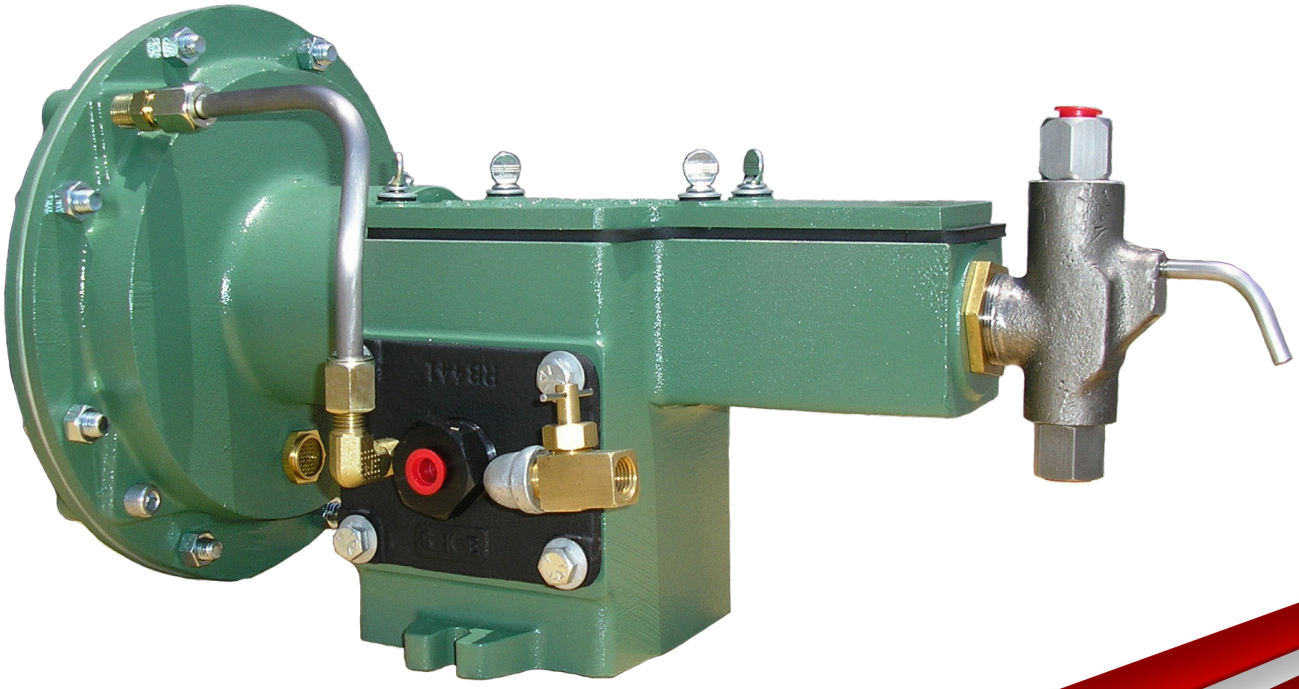
FLOMORE

Different By Design

5200 Series Injector



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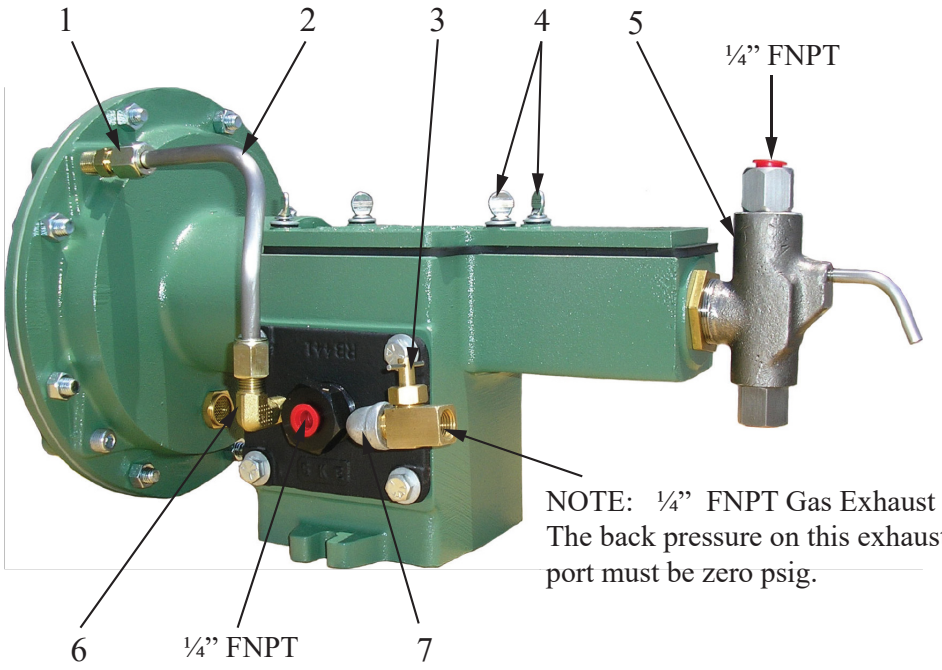
Maintenance Instructions to Inspect and Replace Plunger Packing

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.)

5200 Series Injector



NOTE: ¼" FNPT Gas Exhaust
The back pressure on this exhaust port must be zero psig.

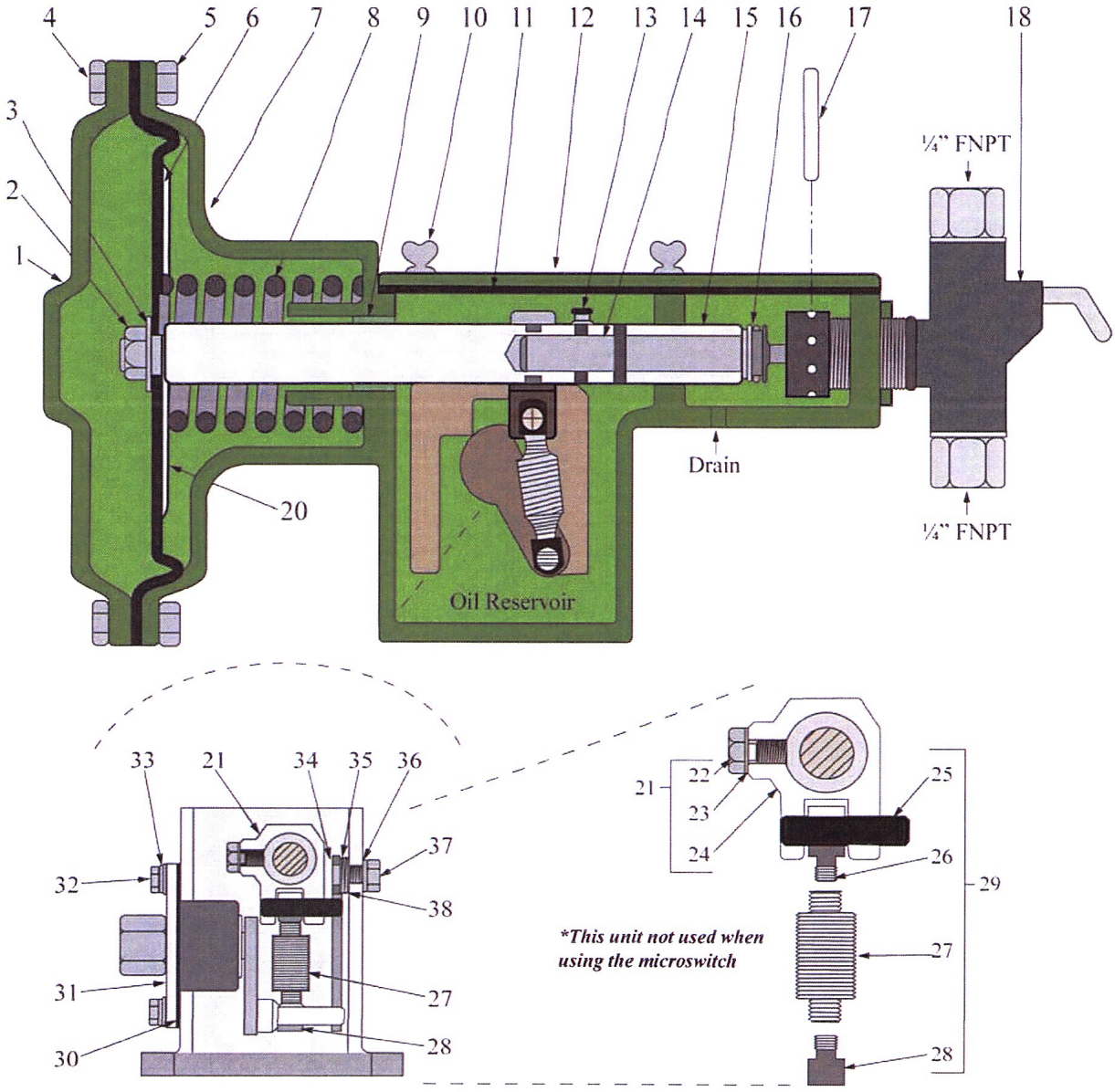
Parts List

Item #	Part #	# Req.	Description	Material
1	A-4015	1	Male Connector and Compression Nut Assembly	Cadmium Plated Carbon Steel
2	B-1193	1	Pilot Valve Line Assembly	303 Stainless Steel Tubing with Cadmium Plated Fittings
3	A-2489	1	Gas Exhaust Valve	Nickle Plated Brass
4	A-0136	4	Thumb Screw	Cadmium Plated Steel
5	See p. 7	1	Injector Head	See p.7
6	A-4016	1	Elbow Connector and Compression Nut Assembly	Cadmium Plated Carbon Steel
7	A-0075	1	Street Elbow	Cadmium Plated Carbon Steel
8	A-0664	1	5 Gallon Tank	304 Stainless Steel
	A-1539		10 Gallon Tank	
9	A-3118	1	Connector	Polypropylene
10	A-3116	1	Elbow	Polypropylene
11	A-0584	1	Base	▲
12	A-3117	▲	9" Poly Tube Suction Line	Polypropylene
13	A-0167	4	Flat Washer	Steel
14	A-0425	2	Split Lock Washer	Steel
15	A-0144	1	Hex Nut	Steel
16	A-0142	1	Hex Head Bolt	Cadmium Plated Steel
17	F-0871	1	5 Gallon Tank Gauge	▲
	F-1285		10 Gallon Tank Gauge	

**Parts not pictured*

5200 Series Injector

Cross Section



5200 Series Injector

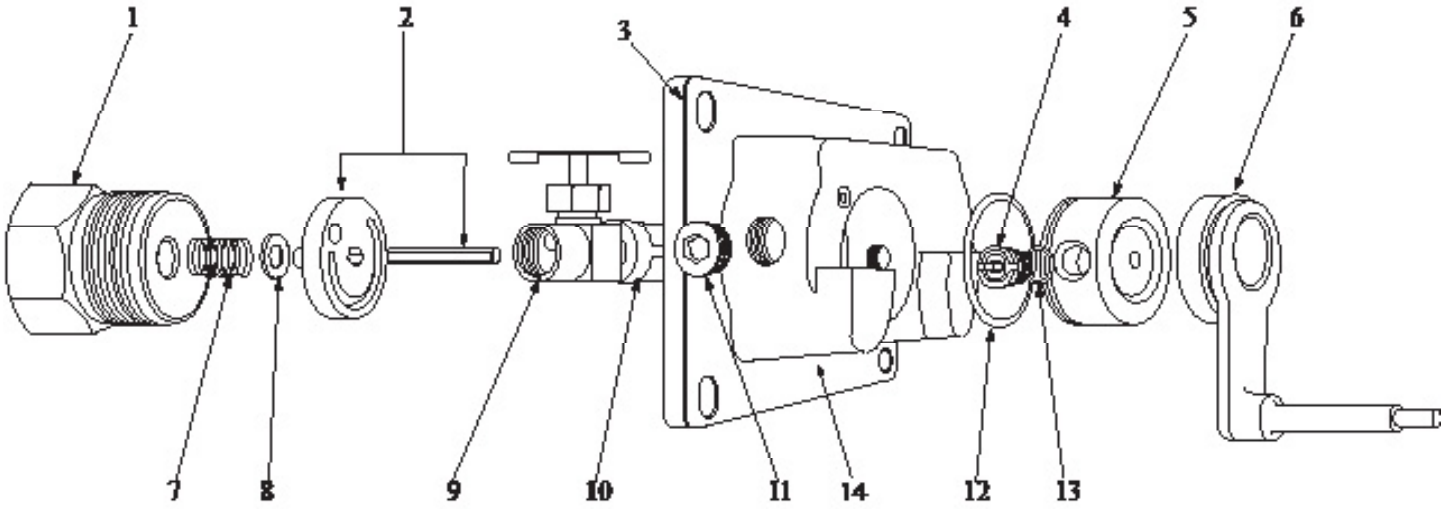
Parts List

Item #	Part #	# Req.	Description	Material
1	C-0252	1	Diaphragm Cover	Aluminum
2	A-3320	1	Nylon Lock Nut	Cadmium Plated Steel
3	A-3321	1	Flat Washer	Cadmium Plated Heavy Steel
4	A-0139	8	Hex Head Bolt	Steel
5	A-2207	8	Hex Nut	Steel
6	C-0290	1	Diaphragm	Buna-N, Nylon
7	D-0251	1	Housing	Aluminum
8	A-1821	1	Return Spring	Cadmium Plated Carbon Steel
9	B-0001	1	Bearing	Bronze
10	A-0136	4	Thumb Screw	Cadmium Plated Steel
11	A-1546	1	Cover Gasket	Buna-N
12	B-0548	1	Inspection Cover	Aluminum
13	A-1828	1	Adjusting Pin	Steel
14	B-0447-SS	1	Rod Adapter	303 Stainless Steel
15	B-0444S	1	Thrust Rod	303 Stainless Steel
16	A-0290	1	Plunger Pin	Steel
17	A-0315	1	Gland Wrench	Steel
18	See p. 7	1	Injector Head	See p.7
19	A-1835	1	Vent	Steel
20	B-0438	1	Diaphragm Plate	Steel
21	A-1832	1	Stirrup Sub-Assembly	Aluminum and Steel
22	A-1829	1	Lock Screw	Steel
23	A-3406	1	Lock Washer	Cadmium Plated Carbon Steel
24	B-0471	1	Trip Stirrup	Aluminum
25	A-2355	1	Roll Pin	Steel
26	A-1838	1	Spring Adapter (Top)	Steel
27	A-1820	1	Spring	Steel
28	A-1838	1	Spring Adapter (Bottom)	Steel
29	A-1831	1	Stirrup Assembly with Spring & Connector	▲
30	A-0058	1	Pilot Valve Gasket	Fiber
31	C-0446	1	Pilot Valve Assembly	▲
32	A-0141	4	Hex Head Bolt	Cadmium Plated Carbon Steel
33	A-0425	4	Split Lock Washer	Cadmium Plated Steel
34	A-1827	1	Bumper Plate Bolt	Steel
35	A-1823	1	Bumper Plate	Steel
36	A-0459	1	Split Lock Washer	Cadmium Plated Steel
37	A-3323	1	Hex Nut	Cadmium Plated Semi-Finish Steel
38	A-0746	5	Flat Washer	Steel

**Recommended Spare Parts*

***Parts packaged separately*

5200 Series Replaceable Seat



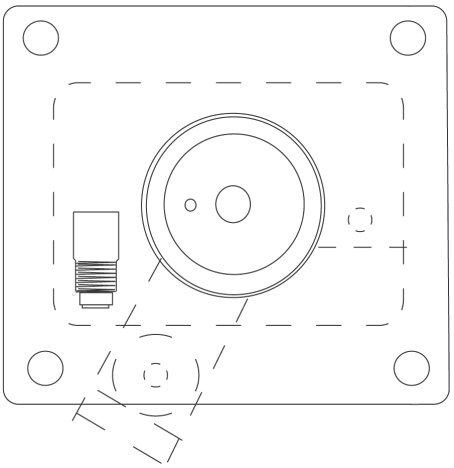
Parts List

NOTE: Using a small amount of grease, lubricate Items #11 and #13 before and after installation on Item #5. This will keep the o-rings in place and facilitate the pressing of the valve seat into position

Item #	Part #	# Req.	Description	Material
1	C-0495	1	Disc Retainer	Steel
2	C-4147	1	Valve Disc and Pin Assembly	Stainless Steel
3	C-0441	1	Pilot Valve Body	Ductile Iron
*4	C-0463	2	Seat Seal Screw	Steel
5	C-0451	1	Pilot Valve Seat	Steel
6	B-0440	1	Flipper Arm Assembly	Steel
7	A-0077	1	Ball Check Valve Spring	Steel
8	A-0579	1	Washer	Stainless Steel
9	A-2489	1	Brass Valve	Brass
10	A-0075	1	Street Elbow	Steel
11	C-3386	1	1/4" Flush Seal Pipe Plug	Steel
12	C-0485	1	Seat Seal O-Ring	Buna-N
*13	C-0474	2	Seat Seal Screw O-Ring	Buna-N

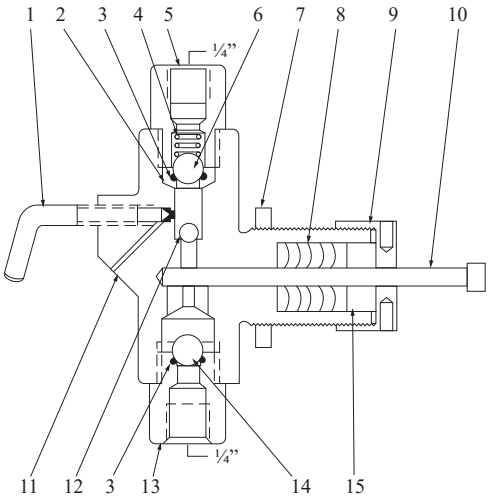
**Recommended Spare Parts* ***Items make up a C-0500 Pilot Valve Seat and Disc Assembly*

Pilot Valve Assembly



Time the disc with hole at left or 9 o'clock and the flipper arm to the left.

Injector Heads



Plunger Packing Chart

Material	Maximum Discharge Pressure (PSIG)			
	3/16"	1/4"	3/8"	1/2"
Buna-N	▲	1500	1500	1500
Viton	▲	3500	3500	3500
Hard	▲	6000	6000	3500
Teflon	▲	1500	1500	1500

Alternate Construction

Item #	Part #	Description	Material
2	A-0806	Top Seat Assembly (Metal to Metal)	303 Stainless Steel
2	B-0843	Top Seat with Viton O-Ring	303 Stainless Steel
3	A-2580	Viton O-Ring	Viton
8	▲	3/16" Plunger Packing	Hard
	A-3967		Viton
	A-3966		Teflon
	A-2295	1/4" Plunger Packing	Hard
	A-4102		Viton
	A-1642		Teflon
	A-1875	3/8" Plunger Packing	Hard
	A-4101		Viton
	A-1234		Teflon
	A-1874	1/2" Plunger Packing	Hard
	A-4103		Viton
	A-1012		Teflon
*13	A-0771	Bottom Suction Bushing (Metal to Metal)	316 Stainless Steel
13	B-0844	Suction Bushing with Viton O-Ring	303 Stainless Steel
*14	A-0053	!/2" Bottom Ball	316 Stainless Steel

*Recommended Spare Parts

**Items Must Be Used Together

Parts List

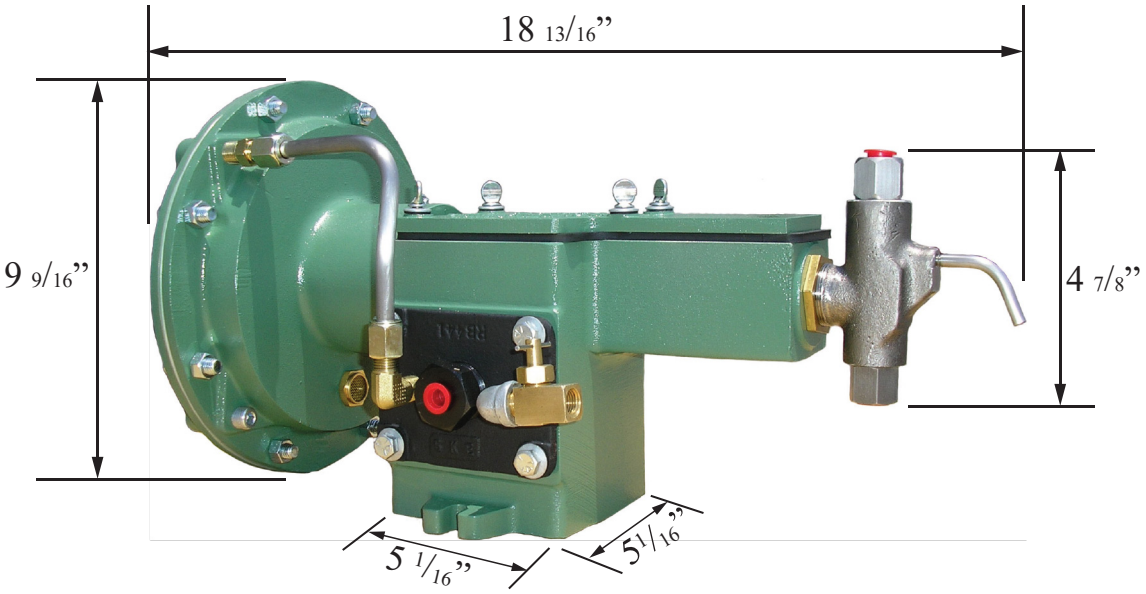
Item #	Part # 3/16"	1/4"	3/8"	1/2"	# Req.	Description	Material
▲	▲	B-0166	B-0203	B-0496	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	B-1299	B-0755	B-0756	B-0732			Stainless Steel
1	A-4027	A-1497			1	Priming Valve	303 Stainless Steel
*2	B-0737				1	Top Seat Assembly - Buna	303 Stainless Steel
*3	A-0479				1	O-Ring	Buna
4	A-0077				1	Ball Check Valve Spring	316 Stainless Steel
5	A-1496				1	Top Bushing	303 Stainless Steel
6	A-0054				1	3/8" Large Top Ball	316 Stainless Steel
7	A-0225				1	Injector Head Lock Nut	Brass
*8	A-3969	A-1461	A-1456	A-0959	1	Packing	Buna-N
9	A-4104				1	Packing Gland Nut	303 Stainless Steel
10	A-4747	A-1312	A-1745	A-1876	1	Plunger	17-4 pH Stainless Steel
11	▲	C-0275	C-0276	C-0272	1	Body	Ductile Iron
	C-2040	C-0291	C-0425	C-0349	1		Stainless Steel
12	▲	A-0126			1	1/4" Small Top Ball	316 Stainless Steel
*13	B-1216	B-0736			1	Suction Bushing Assembly	303 Stainless Steel
*14	A-0054				1	3/8" Large Top Ball	316 Stainless Steel
15	A-4332	A-1463	A-0957	A-1219	1	Packing Gland	303 Stainless Steel
16	A-0126	▲			1	1/4" Small Top Ball	316 Stainless Steel
17	A-4394	▲			1	Gasket	304 Stainless Steel

*Recommended Spare Parts

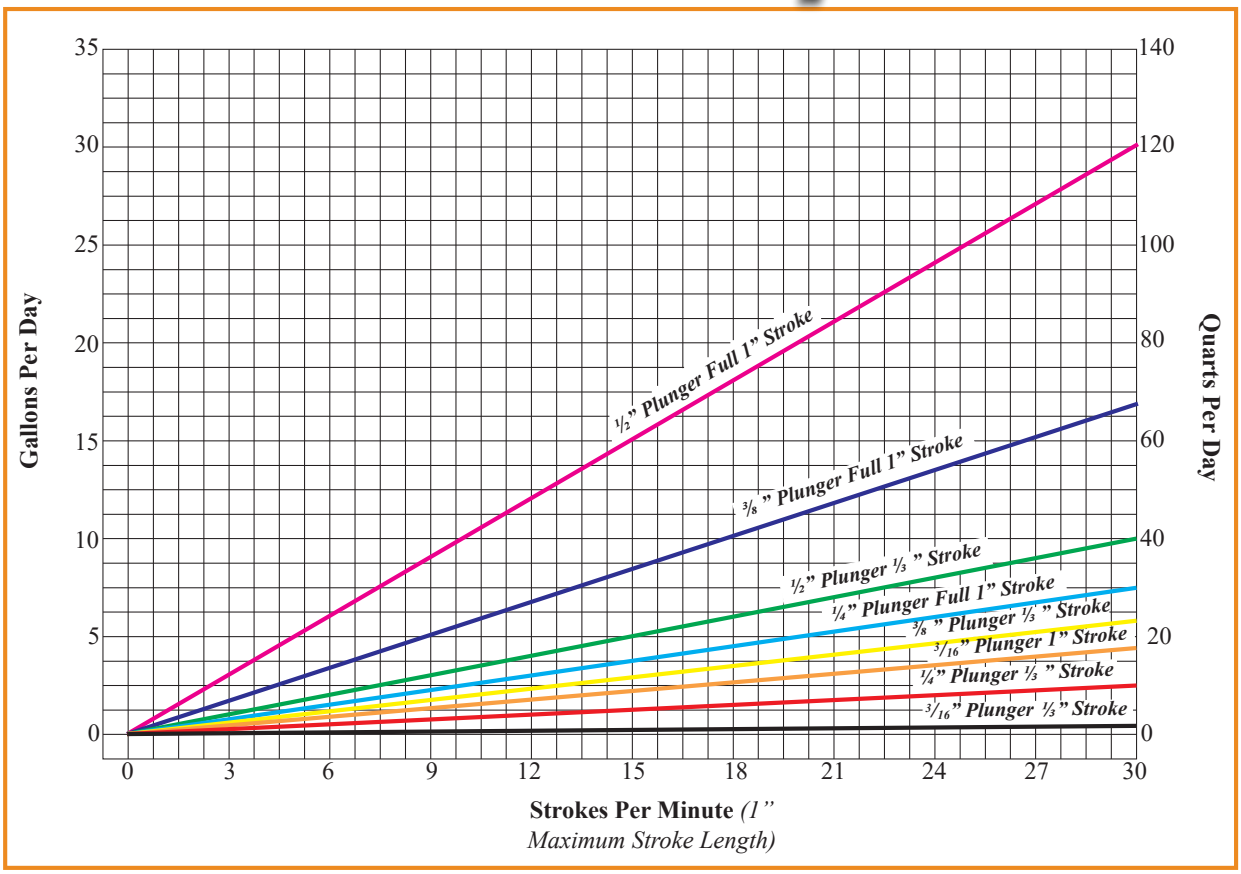
**Alternate Construction Available See Chart Above

Dimensions and Performance Data

Dimensions



5200 Series Gallons per Stroke



Performance Data

Gas Consumption Chart

Stroke Length	Piston Size	*Cubic Feet of Gas Required per Gallon per Day						Injection Pressure (PSI)					
		100	200	500	1000	1500	2000	3000	3500	4000	5000	6000
1/3 Stroke	3/16"	1371	1374	1386	1407	1428	1590	1635	1665	1680	1725	1776
	1/4"	732	735	744	810	864	924	1020	1065	1107	1215	1491
	3/8"	360	378	444	492	531	555	729	834	942	1065	1122
	1/2"	159	162	171	186	213	228	252	285	▲	▲	▲
Full Stroke	3/16"	457	458	462	469	476	530	545	555	560	575	589
	1/4"	244	245	248	270	288	308	340	355	369	405	497
	3/8"	120	126	148	164	177	185	243	278	314	355	374
	1/2"	53	54	57	62	71	76	84	95	▲	▲	▲

Maximum Recommended Speed Above 1500 PSI Injection Pressure

Plunger Size	Strokes per Minute
3/16"	28
1/4"	26
3/8"	14
1/2"	14

Power End to Fluid End Ratio

Plunger Size	Operating Ratio Fluid/Gas
3/16"	1200/1
1/4"	750/1
3/8"	300/1
1/2"	180/1

Pressure/Volume Chart

Series	Plunger Size	Maximum Discharge Pressure (PSI)	For Operation Off of Air or Gas Pressure 35 PSI (Constant)			
			Power Unit*		Chemical Injector**	
			Model #	Max. Vol. (GPD)	Model #	Max. Vol. (GPD)
5200 Standard	3/16"	1500	52-04	4.2	52-04T	4.2
	1/4"	1500	52-01	7.5	52-01T	7.5
	3/8"	1500	52-03	16.8	52-03T	16.8
	1/2"	1500	52-05	32	52-05T	32
5210 High Pressure	3/16"	6000	52-14	3.65	52-14T	3.65
	1/4"	6000	52-11	6.5	52-11T	6.5
	3/8"	6000	52-13	7.9	52-13T	7.9
	1/2"	3500	52-15	14	52-15T	14

** Basic pump no tank, base, regulator or gauge (Shipping weight: 22lbs)*

*** Furnished with 5 gallon stainless steel tank mounted on heavy galvanized steel base with level gauge and suction line, no regulator or gauge (Shipping weight: 32lbs)*

Installation and Operating Instructions

Check for the following items (packaged together but not installed on the pump): (1) 1/4" male x female line check, (1) A-0315 packing gland wrench, and (1) A-1497 priming valve.

1. Blow or clean dirt or other objects from the gas supply line. If pressure exceeds 35 PSI, reduce with the regulator at the pump. Do not connect to the small 1/4" valve (A-2489), this is the gas exhaust.
2. Install the furnished line check at the point of injection noting the flow arrow on the valve. Connect the discharge line into the 1/4" FNPT in both the line check and the top discharge bushing (A-1496) of the head assembly. (Make sure this line is clear of debris.)
3. If pumping from a liquid source other than our 5 gallon reservoir (A-0664), we recommend the use of our liquid level drum gauge (F-0871). This will allow you to conserve costly chemicals by accurately setting the pumping rate desired. It gives you a visual check that the pump is functioning properly. Connect the suction line to the drum gauge and to the bottom suction bushing. It is important that this line be clear of any foreign material.
4. Install the "L" shaped priming valve (A-1497) into the small threaded hole in the injection head. Leave it partially open.
5. Add a lightweight SAE 5 oil to the portion of the reservoir that contains the (A-1820) spring. You can see this after removing the top cover (B-0548) and gasket (A-1546). Pour oil on top of the thrust rod and fill to the bottom of the rod.
6. Open the main gas shut-off valve and the small gas exhaust (A-2489). The pump will start automatically. Keep hands and fingers away from the moving parts.
7. Check the priming valve (A-1497) opening for air bubbles in the liquid being pumped. As soon as the bubbles stop, close the priming valve and adjust the pump for desired SPM and pumping rate. Make a quick check of the packing gland nut (A-4104) to see if there is packing leakage. If so, tighten slightly with the furnished wrench. Do not overtighten because it may stall the pump and/or cause excessive packing wear.
8. Replace cover and gasket with thumb screws.

Applications

- The introduction of demulsifiers, solvents , corrosion inhibitors, and descaling agents and oxygen scavengers
- Water Treatment
- Injection of methanol in gas pipelines
- Injection of surfactant (soap) into low pressure gas wells with high water content

Accessories & Optionals

- Teflon or Viton Packing
- Slow Speed Controller
- Microswitch Valve Controller
- C x C Non-packing Head Assembly

5200 Series Injectors are furnished with sour gas trim as standard.

Maintenance and Troubleshooting

Oil Thrust Rod

Put oil on top of the thrust rod occasionally, then replace the cover.

Packing Leakage

Check for packing leakage. Tighten or replace as needed. Overtightening the packing will shorten the packing life and may score the plunger, which will need to be replaced.

Use Correct O-Rings

Any Flomore pump used to pump methanol or alcohol to prevent freezing must be equipped with Buna-N o-rings. Pumps used to pump chemicals should be equipped with Viton o-rings. These are located in the top seat (B-0737) and the suction bushing (B-0736).

Pump Stopped Running and Gas is Escaping

Should the pump stop running but you can hear gas escaping from the vent (A-1835), remove the diaphragm cover (C-0252) and inspect the diaphragm for a hole or tear. Replace as needed. At this time, visually inspect the larger turning spring (A-1821) for breakage. When installing a new diaphragm, put a sealant like Permatex "Form a Gasket" around the center hole on both sides of the diaphragm. This will prevent gas leaks in that area. Reinstall the diaphragm, making sure the small hole on the outer edge of the diaphragm and the diaphragm cover line up with the pilot valve gas line that brings gas to the diaphragm chamber.

No Gas is Venting from Gas Exhaust Valve

If you do not hear gas venting, check the gas supply and pressure (35 PSI Max). Improper pressure can cause the pump to stall.

Pump Stalls in Forward Discharge Position

Turn off the gas supply. Check the flipper arm spring (A-1820). If it is intact, loosen the packing gland nut to check to see if the packing may be too tight. If the pump still does not make the return stroke, suspect a broken return spring (A-1821). (See Pump Stopped Running and Gas is Escaping)

Pump Still Stalled

Check the oil reservoir for gas bubbles. A small amount of leakage can be tolerated, however larger amounts of leakage can cause the pump to stall. Check the supply pressure(35 PSI Max). If pressure is within the limits, the pilot valve (C-0442) may have to be replaced. However, with our replaceable seat and disc assembly (Page 6) only the disc (C-4147) or seat assembly (C-0500) may have to be replaced.

Pump is Running but Not Pumping

Check for air in the injection head. Open the priming valve (A-1497) until air bubbles in the fluid subside. If it is still not pumping, it is probably the o-ring in the suction bushing is not the correct material (See Use Correct O-Rings).

Flipper Arm Spring (A-1820) is Broken

Drain oil into a suitable container and save to replace in the reservoir. Remove the (C-0446) pilot valve assembly, then remove the broken spring from the flipper arm (B-0440). Loosen the (A-1829) hex screw on the (A-1832) stirrup assembly. Rotate the assembly and remove the (A-2355) roll pin. Install the new (A-1820) spring slide pilot valve assembly partially in and reattach the (A-1838) spring adapter. Retighten the (A-1829) hex screw making sure it is in the groove on the thrust rod. Rebolt the pilot valve assembly, replace the oil and restart the pump. (See Pump Stalls in Forward Discharge Position and Pump Still Stalled)

FLOMORE

Different By Design

Corporate Office

Richart Distributors, Inc.
3415 S. I-35 Service Rd.
Oklahoma City, OK 73129
(405) 843-5654

Rex Haymaker - Executive VP
Cell: (405) 206-4807
Rex.Haymaker@flomore.com

North Dakota

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267

Robert Olson
(701) 226-7814
roberto@rmow.com

Contact Us

Byron Guinn
Senior Sales Consultant
(405) 843-5654
byron.guinn@flomore.com

Matt Duncan
Production Manager
(405) 843-5654
matt.duncan@flomore.com

Scott "Coach" Mick
Outside Sales/Business Development
Office: (405) 843-5654
Cell: (405) 343-7322
scott.mick@flomore.com

Chris Smith
Purchasing Manager/Inventory Control
(405) 843-5654
chris.smith@flomore.com

www.flomore.com

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