FLOMORE®

Different By Design

Product Summary

5.2021.21.aa

1300 Series

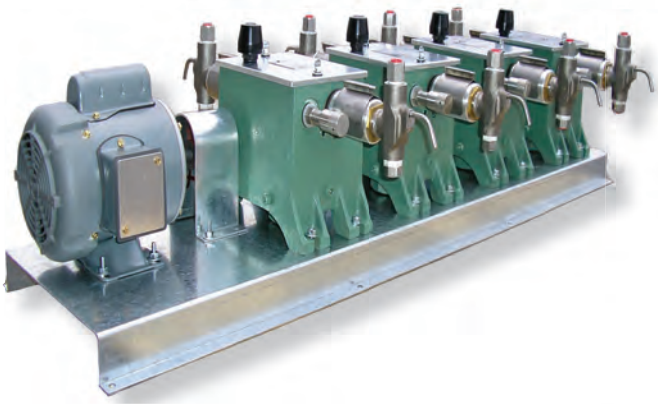
The 1300 Series injectors are designed to utilize the motion of the walking beam of a pumping unit and inject small amounts of chemicals per day (less than a pint to a few quarts with injection pressures up to 1500 lbs). This injector may be double headed with different size plungers.

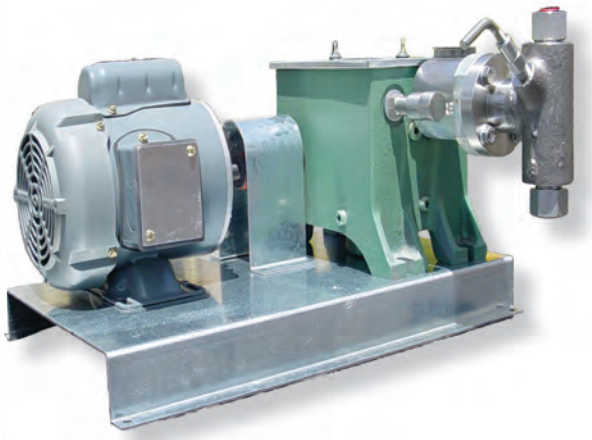
3800 Series

The design for the 3800 Series is probably the oldest pneumatically (air or gas) driven injector. It can be double headed with different or same size plungers in order to handle different chemicals at different rates and pressures.

4400 Series

Our 4400 Series is an electric driven injector that can utilize any of the four plunger sizes or three gear ratios with a single head or up to eight heads for a combination of pressure and volume requirements. The volume pumped can be changed with a simple turn of a micrometer knob from 0-100% of capacity. Availiable in corrosion resistant trim.



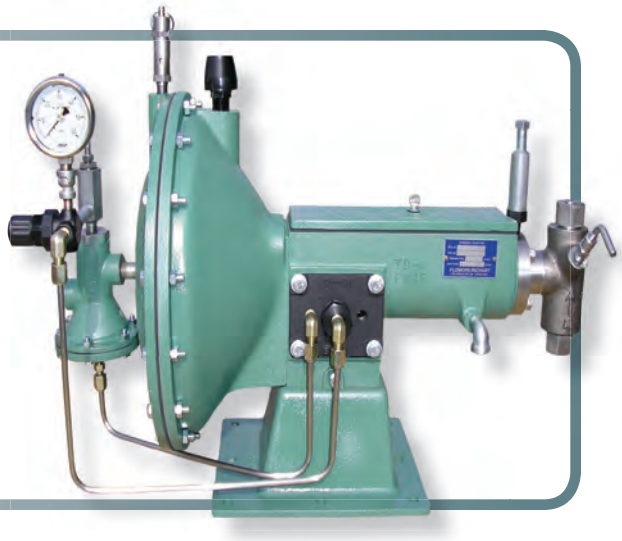


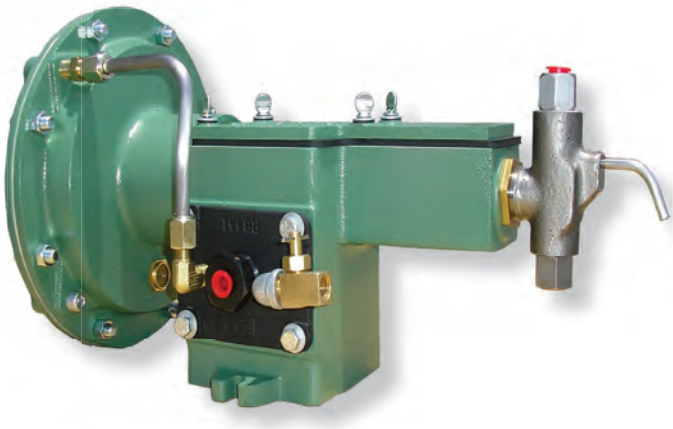
4500 Series

The Flomore 4500 Series injector features ¾" and 1" plungers, and can be dual headed. These electric driven injectors can handle pressures up to 300 lbs. with volumes up to 1300 GPD. Plunger material is 17-4 with Armaloy surface or ceramic coated.

5020 Series

The 5020 Series model is one of two diaphragm, gas driven injectors we offer. This injector is typically used to inject methanol in larger quantities and higher pressures (up to 20,000psi) at the christmas tree and at lower pressures in gas processing and pipeline applications. Also used to deliver corrosion inhibitor where needed.





5200 Series

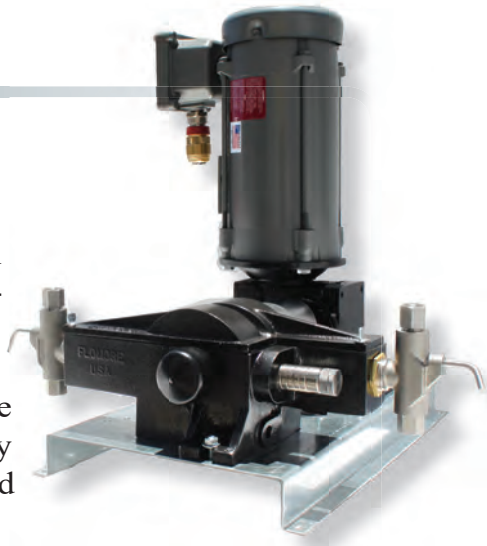
The 5200 Series injector is our other diaphragm, gas driven, plunger pump. It is designed to handle less volume and lower pressures (up to 6,000 lbs). This injector has the least amount of moving parts of any other comparable pump. Stainless steel, o'ring type, bottom and upper seating arrangements are offered as well as metal-to-metal seats.

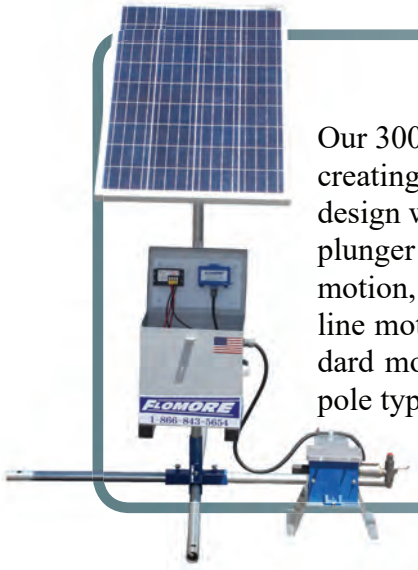
6200 Series

The 6200 Series pump consists of a series of basic pump options all developed from a modular power unit. All units are pneumatically driven, positive displacement, single or double acting, reciprocation pumps.

3500 Wolf Series Simplex and Duplex

The Flomore 3500 series chemical injection pumps are electric driven, positive displacement pumps utilizing C-faced motors and common gear reducers. The gear reducers are available in 30 and 60 strokes per minute configurations. The 3500 Series can fill many application requirements of different flow and pressures.



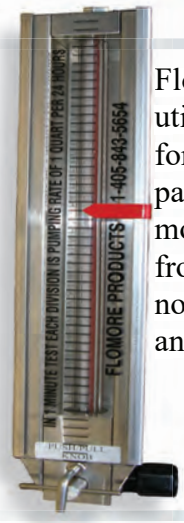


3000 Solar Series

Our 3000 Series is a positive displacement solar pump powered by Solar Panels creating environmentally friendly energy. Our 3000 Series includes a crosshead design with plunger stroke adjustment easily changing the distance traveled by the plunger with a plunger pin. Also maximizing efficiency with perfect straight linear motion, the Flomore Bottom Adjustment Bar with two sealed bearings creates a straight line motion for the crosshead to travel saving energy usage from the battery. Our standard model includes a 100 watt panel, 12/12 regulator, battery box, deep cell battery, pole type stand, on/off timer and a correctly sized pump to meet your requirements.

3400 Series

The Flomore 3400 Series is electric driven and can have 1 to 4 heads run by a single motor and gear reducer (30 SPM or 60 SPM). This injector is available in 5 different plunger sizes that will pump between 18 GPD and 580 GPD, from 500 PSI up to 7500 PSI. The 3400 Series comes standard with stainless steel heads with ductile iron available on request.

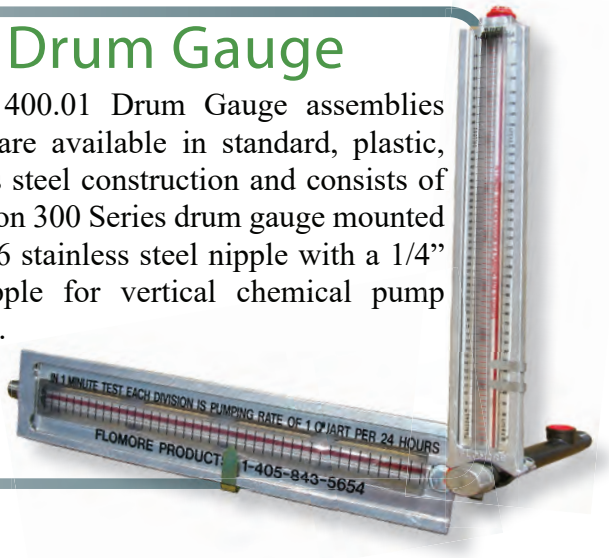


Flomore's Model 2000 Tank Gauge utilizes a simple push-pull operation for test (push) run (pull). All metal parts are 303 or 304 stainless steel. The movable level indicator is also made from stainless steel, which means it will not be affected by sunlight or break like an o'ring.

Tank Gauge

Drum Gauge

Flomore's 400.01 Drum Gauge assemblies (pictured) are available in standard, plastic, or stainless steel construction and consists of our 55 gallon 300 Series drum gauge mounted on a 9" 316 stainless steel nipple with a 1/4" female nipple for vertical chemical pump installation.

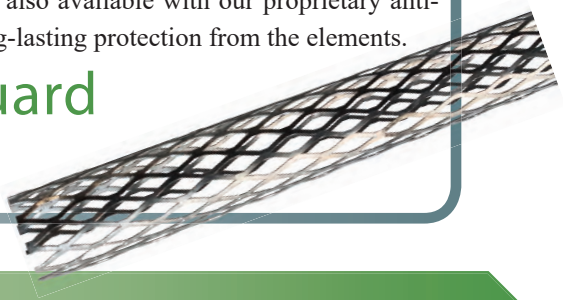


Gauge Glass

Our "Unified" Gauge Glass is manufactured for fluid sight level work in a wide range of applications. They are manufactured from highly chemical and corrosion resistant borosilicate glass, noted for its clarity and mechanical strength properties.

Flomore glass guards are made of pliable 18-gauge aluminum for maximum impact protection combined with minimum weight. These guards are available in standard 24", 36", 48" and 72" lengths with other sizes available upon request. Flomore glass guards are designed to fit all commercially available gauge configurations you are likely to find on your tank systems or other combinations. Flomore glass guards are also available with our proprietary anti-rust coating to ensure long-lasting protection from the elements.

Glass Guard



Line Checks

Inline Check Valves are available in brass, 303, 304, or 321stainless steel, and inconel. Several types of seating material are available including, buna N, Viton, Aflas, Kalrez or metal-to-metal. Pressures up to 15,000 psi. Multiple sizes are also available.

Atomizing Nozzles

The stainless steel atomizing nozzle does a great job of putting the methanol or scale inhibitor into the gas stream as a mist, which is the most effective and least costly method of delivering the product into the flow.

Swing Checks

The Flomore ductile and steel threaded end swing check valves meet MR-01-77 NACE standards. The standard seal material is buna N (180° F). We can also trim with Flomore's "Coldseal" to -50° F and to 400° F with Viton. Standard clapper material is carbon steel and we also offer 17-4 stainless steel. Pressure range is from 300-5,000 psi WOG.

Ball Checks

The Flomore ductile iron, carbon steel, and stainless steel ball checks can be trimmed with a Viton seat seal assembly for elevated temperatures and chemical resistance. Standard trim is stainless steel ball, buna N seal with stainless support member. Availiable in 1/2", 3/4", 1" and 2" sizes and pressures of up to 2000 pounds in ductile and up to 5000 pounds in WBC Carbon Steel.

S2003-2000-1
2000#

S3003-3000-1
3000#

S3603-3600-1
3600#

S1503-1440-1
1440#

S5003-5000-1
5000#

Carbon Steel Swing Checks

Flomore Products has added Investment Cast Carbon Steel Swing Checks to our product line. These valves have threaded ends, material specification ASTM A-216 WBC Carbon Steel avaliable in working pressures from 720 to 5,000 pounds in 1" and 2" sizes. Buna-N seals are standard (180 degrees F. Max) Optional Viton seals available (400 degrees F Max). Standard Clappers are ASTM A-216 WCB with 316 SS clappers optional.

Distributors / Representatives/ Pump Service Dealers

Cardon Sales Company, LLC

www.cardonsales.com

Main Sales Office
Factory Warehouse
213 Cummings Road
Broussard, LA 70518
337-839-1704
Fax: 337-839-1706
Bruce Cardon - Sales Rep.
Cell Phone: 337-280-3157
bcardon@cardonsales.com

Sales Office
Kilgore Warehouse
820 South Commerce
Kilgore, TX 75662
903-984-3070
Tammy Hunt - Sales Rep.
Cell Phone: 903-985-0435
THunt@cardonsales.com

Sales Office
Houston Sales Office
4903B W. Sam Houston Pkwy N.
Houston, TX 77041
713-870-8765

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
432-332-3345 Fax: 432-332-3348
Chad Patterson - Sales Rep.
chad@pattersonequipsalesinc.com

Sales Representatives

Rocky Mountain Oilfield Services

Rock Springs Location
Kevin Wright
2901 Killpecker Drive
Rock Springs, WY 82901
304-382-2076
Kevinw@rmow.com

Fort Morgan Location
Jack Horton
731 Burlington Ave.
Fort Morgan, CO 80701
970-867-2778
Jackh@rmow.com

Casper Location
Phillip Cooper
414 South Elm Street
Casper, WY 82601
307-266-2260
sales@rmow.com

REP Sales, Inc.

Olney Location
Jim Mowrey
1124 S. Whittle Ave.
Olney, IL 62450
1-800-274-2003
jim@repsales.net

Midvale Lovation
Nadine Liggett
3545 Brightwood Rd. SE
Midvale, OH 44653
740-922-1557

MCM Industrial Solutions, LLC.

Mike Maresh - Owner
25112 167th Ave. SE
Covington, WA 98042
256-350-4878
mike@mcmindustrialsolutions.com

Pump Service Dealers

M&M Equipment Company
Mike Johnson
P.O. Box 1293
Great Bend, KS 67530
620-792-3162
mkj@mandmequipment.com

Moores Pump & Services, Inc.
Scotty Roy
P.O. Box 746
Broussard, LA 70518
373-837-2794
sroy@moorespump.com

Pump Service Dealers

Precision Pump & Valve Inc.

Lake Charles Location
406 Wesley Street
Lake Charles, LA 70615
337-491-1103
saleslc@precisionpv.com

Odessa Location
6409 Stevenson Ave.
Odessa, TX 79762
432-332-0932
salesod@precisionpv.com

Floresville Location
13 East Cardinal
Floresville, TX 78114
830-393-1919
salesfv@precisionpv.com

Predator Oil & Gas Services
Eric Holcomb
126 Country Road 204
Carthage, TX 75633
903-754-0675
Predatoroilgas@yahoo.com

Pruitt Production Service
Jay Pruitt
P.O. Box 808
Giddings, TX 78942
979-542-5104
jay.pruitt@pruittpsi.com

Pryor Sales & Service Inc.
901 E. Juan Linn Rd.
Victoria, TX 77901
361-575-6354
cmorris@pryorsales.com

RDM Equipment Co., Inc.
Joel Sanderson
P.O. Box 169
1141 Mechanicsburg Rd.
Wooster, OH 44691
330-264-8808
Joel@RDMEquipment.com

RKT Operating, LLC.
Keith Tidwell - Owner
Ty Stutchman - Pump Sales
2706 E. Marshall Ave.
Longview, TX 75601
903-686-0284
tstutchman.rktoperating@gmail.com

Speed Specialty
Dean Kyer
3010 Kermit Highway
Odessa, TX 79764
432-333-2711
Support@speedspecialtyodtx.com

Pump Service Dealers

T&J Valve
Johnny Fowler - Owner

Artesia Location
412 E. Main
Artesia, NM 88210
575-746-2287

Big Spring Location
700 E. 3rd
Big Spring, TX 79720
432-606-5090

Carlsbad Location
425 S. Main
Carlsbad, NM 88220
575-706-0013

Hobbs Location
1306 W. Broadway St.
Hobbs, NM 88240
575-393-8019

San Angelo Location
5798 Old Christoval Rd.
San Angelo, TX 76904
325-716-1506

Odessa Location
1313 W. 2nd St.
Odessa, TX 79763
325-812-5137

Vesco Supply Company
Brian Hogue - Owner
www.vesco-inc.com
vesco@reagan.com

Alva Location
419 E Maple
Alva, OK 73717
580-327-6996

Woodward Location
211 48th St.
Woodward, OK 73801
580-256-2569

Watonga Location
210 W. Russworm Dr.
Watonga, OK 73772
580-623-5547

Liberal Location
6501 North Hwy 83
Liberal, KS 67905
620-624-8318

Canadian Location
10919 U.S. Highway 60
Canadian, TX 79014
803-323-8323

Wyco Pump Repair & Sales
Rebecca Harris - Owner
P.O. Box 291
Wiley, CO 81092
719-740-0882
rebeccaharris@wycopump.com

Canadian Territory Pump Service Dealer

Zimco Instrumentation
Richard Hiebert
11141 15 Street NE
Calgary, AB T3K 0Z5
403-253-8320
Fax:403-253-9221
richard.hiebert@zimco.ca

International Master Distributor

Houma Valve Service
Richard Bergeron
1909 Coteau Road
Houma, LA 70364
985-879-3594
Houmavalve@teche.net
www.houmavalve.com

International Broker

AP Central
Imran Pishori - CEO
4903 Sam Houston Parkway
Houston, TX 77041
713-302-8831

CONTACT INFORMATION

Corporate Office

Richart Distributors, Incorporated
3415 South I-35 Service Road
Oklahoma City, OK 73129
405-843-5654 Fax: 405-619-3007
Toll Free 1-866-843-5654
www.flomore.com
Rex Haymaker - Executive Vice President
Cell Phone: 405-206-4807
Rex.Haymaker@flomore.com

Branch Office

Flomore @ North Dakota
533 East Villard Suite B
Dickinson, ND 58601
701-483-8267 Fax: 701-483-8268

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"With an eye to the future and a commitment to excellence, Richart Distributors proudly manufactures American made products." – Richard Pickens

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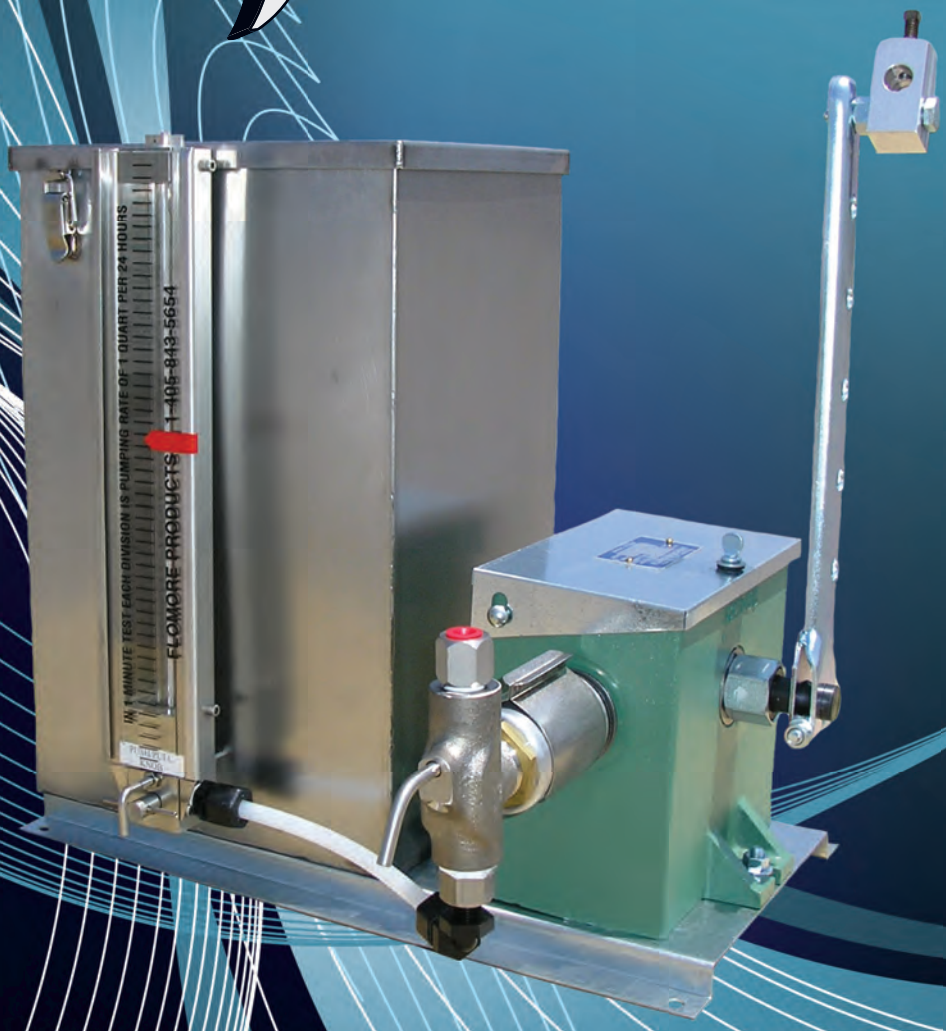
FLOMORE

Different By Design

1300 Series Injector



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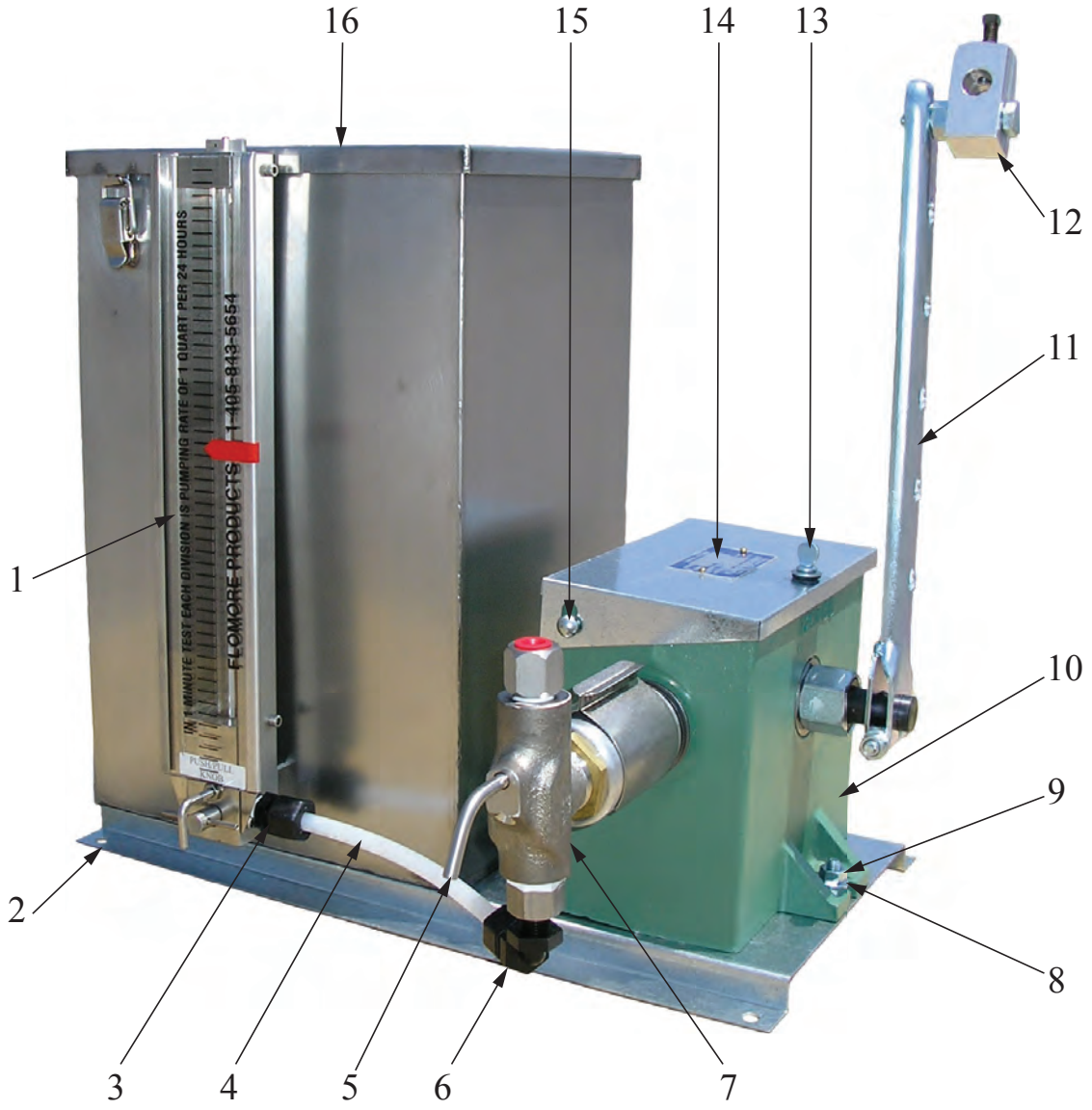
1300 Series Injector



Parts List

Item #	Part #	Description
1	F-0871	Stainless Steel Tank Gauge Assembly
2	A-0535	Base Assembly
3	A-3118	Connector Compression Nut Assembly
4	A-3117	Suction Line
5	A-1497	Priming Valve
6	A-3116	Elbow Compression Nut Assembly
7	See Page 6	Head Assembly
8	A-0163	Bolt

Item #	Part #	Description
9	A-0164	Nut
10	B-0091	Box Assembly
11	B-0067	Lever Arm
12	A-0538	Connecting Knuckle Assembly
13	A-2577	Lid Thumb Screw
14	A-0960	Lid
15	A-0528	Cover Rivets
16	A-0664	5 Gallon Reservoir Assembly 304SS

Installation and Operating Instructions

1. Install Item #5 priming valve (included with pump, but shipped loose in carton) on the pump head.
2. Connect the suction line to the pump head. If a reservoir is furnished with the pump, the suction line is already connected. Fill the reservoir and completely open the tank gauge valve.
3. Connect the discharge line (5/16" tubing will suffice). One A-0676 ¼" brass line check is provided. This valve should be installed as close to the point of injection as possible.

   NOTE: The arrow on the check valve indicates the flow. The top connection of the pump head is the outlet and has a ¼" female pipe thread connection.
4. Connect the lever arm to the power source as follows: (make sure the pumping unit cannot start automatically)
   - ⅜" OD rod or pipe (usually 10' to 12' is required for an oilfield walking beam pump). Attach an A-0701 Flomore beam clamp (included) to the power source, such as a walking beam. Insert rod or pipe in the beam clamp and the Item #12 connecting knuckle on the lever arm, tighten set screws to secure position of rod or pipe.
   - Wire line. Simply attach to walking beam and Item #12 connecting knuckle.
5. Fill the Item #10 box assembly with enough SAE-30 oil to cover the bearing. If low ambient temperatures are encountered a lighter oil such as SAE-10 should be used. Check oil level at regular intervals.
6. Adjust for desired volume by considering each of the following:
   - Number of strokes of lever arm. The fastest recommended operating speed is 50 strokes per minute. Refer to the volume chart (Page 7) to obtain desired setting of ratchet teeth engagement and stroke length at strokes per minute used.
   - Number of ratchet teeth engaged per stroke is dependent upon the travel of the B-0067 lever arm. With the Item #12 connecting knuckle in the outermost position, a travel of approximately 1" will engage one tooth. A maximum of 19" will engage twenty teeth.

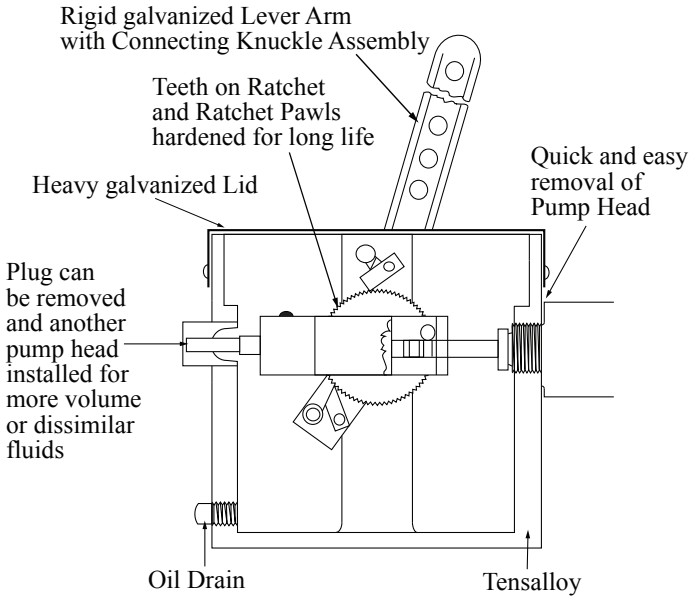
     NOTE: When the lever arm cannot travel below the level of the bottom of the base, the maximum teeth engagement will be 10.
   - Adjustment of stroke length to short, medium, or long is easily accomplished by positioning of the A-0290 cotter pin in the end of the plunger.

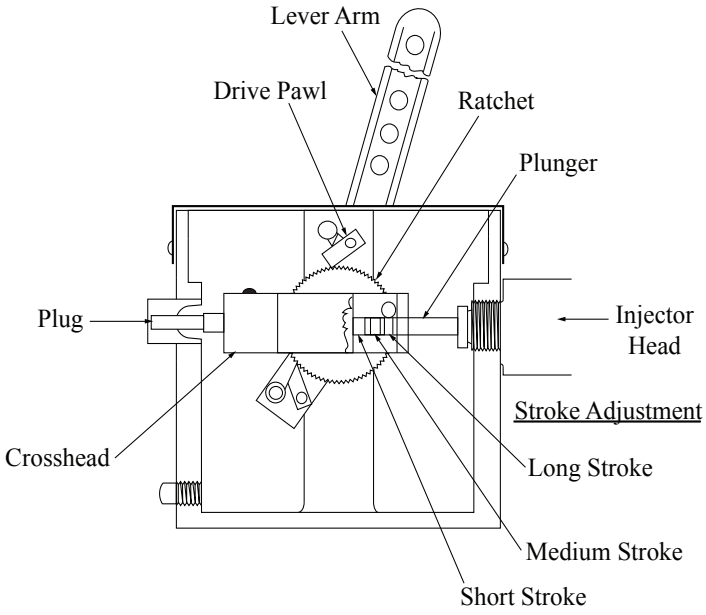
     NOTE: A quick calculation of (6A, 6B, and 6C) and using the performance data chart (Page 7) can predetermine the injection rate before the pump is placed in operation. If more volume is required, the pump head assembly can be changed or converted to a larger pump size. Or, an additional head can be installed on the opposite side of the B-0091 box by removing the A-0434 guide plug assembly. The A-0883 guide sleeve should also be removed and this can be accomplished with a vise to hold the cross-head and vise grips to turn and pull the guide sleeve.
7. Start pumping unit and prime pump head by opening the priming valve. After the pump discharges clear fluid without bubbles, close the priming valve for normal operation. At this point, make a visual check of the plunger drip, and using the gland wrench that is included in the package, slowly tighten the gland to prevent excess drippage and waste of chemicals. Do not overtighten plunger packing. Keep the gland wrench handy for future packing adjustment. It may be necessary to readjust the packing the next day. A slight leak during the break-in is beneficial. Sufficient time should be allowed to let the packing "seat in".

   NOTE: If low volumes are being pumped, the pump head, the fluid discharge line and all other fittings up to the line check should be thoroughly purged of all air bubbles. Check pump action by opening the priming valve.

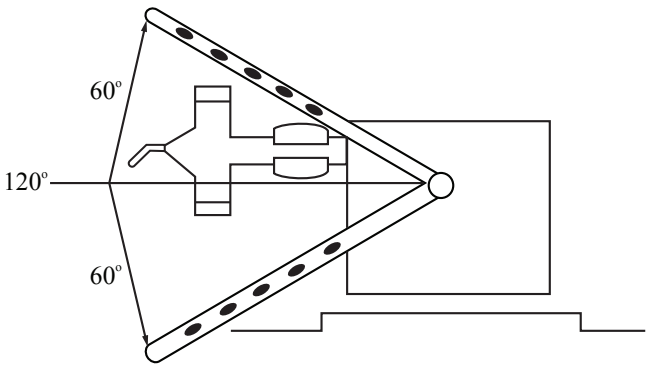
1300 Series Injector

1300 Series Components

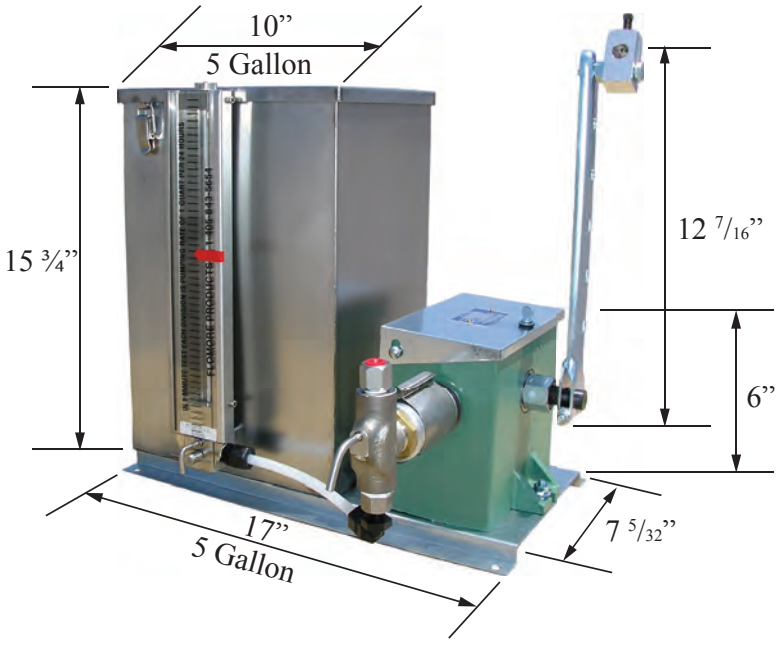




Handle Positions



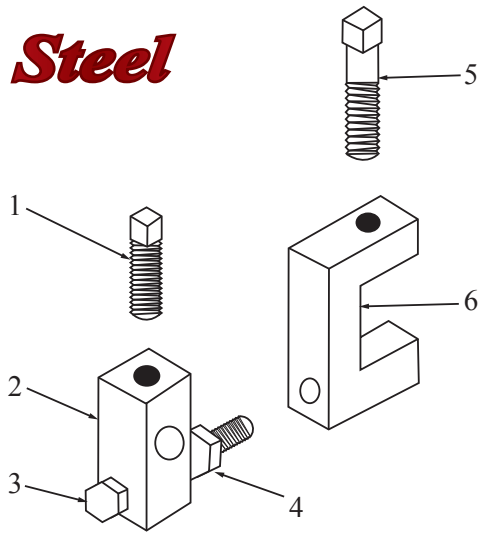
Dimensions



1300 Series Components

A-0701 Beam Clamp Assembly

Carbon Steel



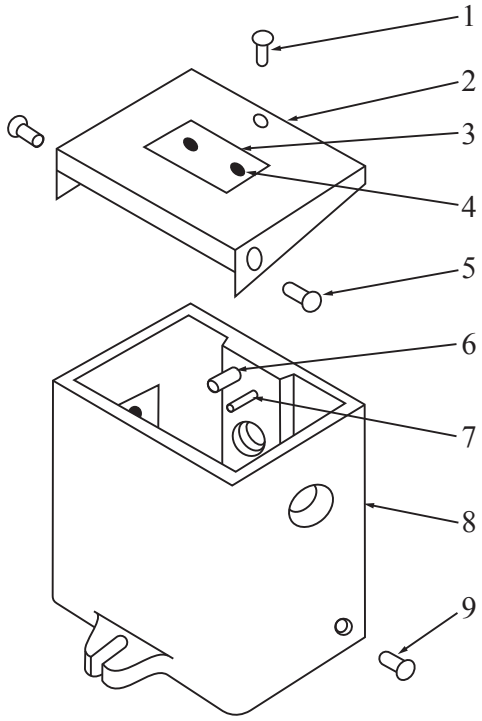
Parts List

Item #	Part #	Description	Material
1	A-0452	Set Screw	Steel
2	A-0409	Connecting Knuckle	Aluminum
3	A-0438	Cap Screw	Steel
4	A-0439	Hex Nut	Steel
5	A-0453	Set Screw	Steel
6	A-0423	Beam Clamp	Carbon Steel

Standard Box Assembly

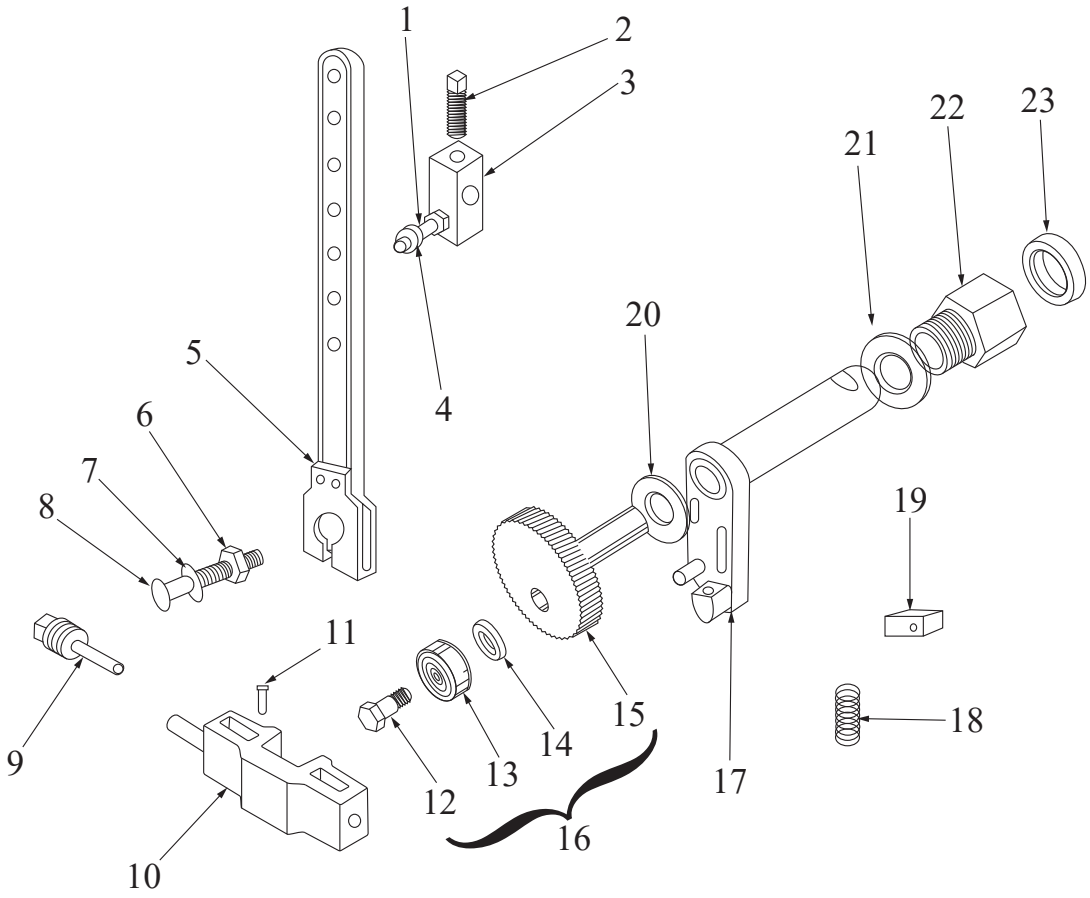
Parts List

Item #	Part #	Description	Material
1	A-2577	Thumb Screw	Steel
2	A-0960	Lid	Steel
3	A-0172	Name Plate	Aluminum
4	A-0171	Escutcheon Pin	Brass
5	A-0528	Rivet	Steel
6	A-0986	Check Pawl Spring Shaft	Steel
7	A-0985	Check Pawl Shaft	Steel
8	B-0091	Box Assembly	Aluminum
9	A-0138	Drain Plug	Iron



1300 Series Components

Injector Parts



Parts List

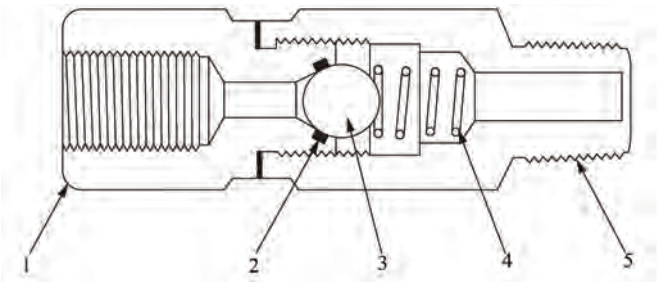
Item #	Part #	# Reqd.	Description	Material
1	A-0438	1	Cap Screw	Steel
2	A-0452	1	Set Screw	Steel
3	A-0409	1	Knuckle	Aluminum
4	A-0439	1	Nut	Steel
5	B-0067	1	Lever Arm	Steel
6	A-0144	1	Nut	Steel
7	A-0425	1	Lock Washer	Steel
8	A-0424	1	Lever Bolt	Steel
9	A-0434	1	Guide Plug Assembly	Steel
10	A-0536	1	Cross Head (Simplex)	Ductile Iron
	A-0451		Cross Head (Duplex)	Ductile Iron
11	A-0290	1	Plunger Pin	Steel

Not Required for Duplex Pump

Item #	Part #	# Reqd.	Description	Material
12	A-0433	1	Ratchet Bearing Bolt	Steel
13	A-0457	1	Ratchet Bearing	Steel
14	A-0458	1	Cut Washer	Steel
15	A-0420	1	Ratchet Subassembly	Steel
16	A-0537	1	Ratched Assembly	Steel
17	B-0066	1	Drive Shaft	Steel
18	A-0456	2	Pawl Spring	Stainless Steel
19	A-0455	2	Pawl	Steel
20	A-4251	1	Nylon Washer	Nylon
21	A-0410	1	Washer	Steel
22	A-5199	1	Shaft Bearing	Steel
23	A-5200	1	Seal	Neoprene

1300 Series Components

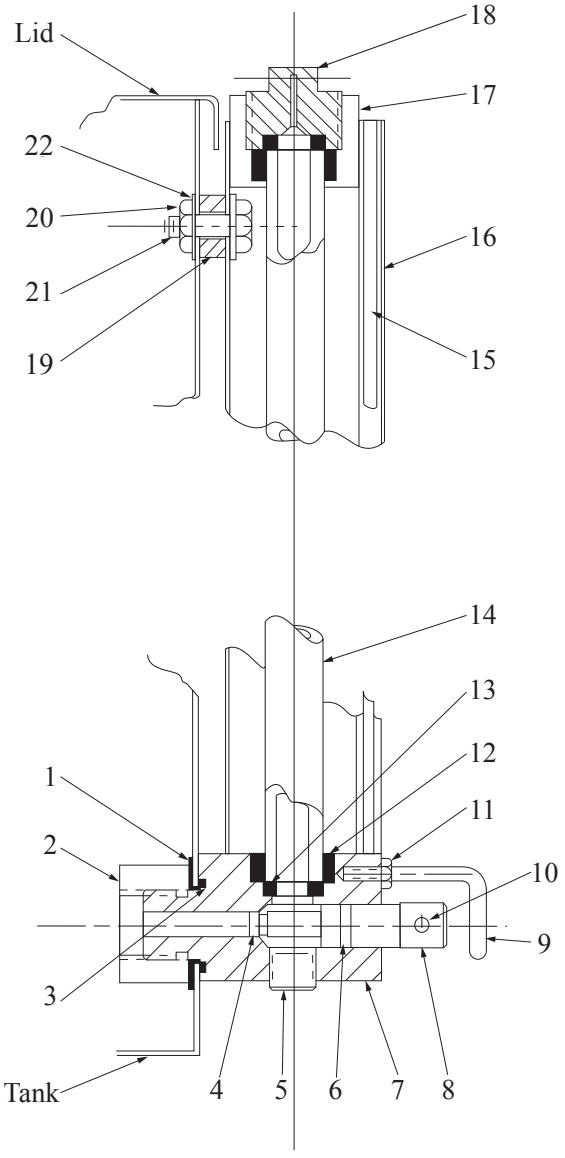
A-0676 Line Check



Parts List

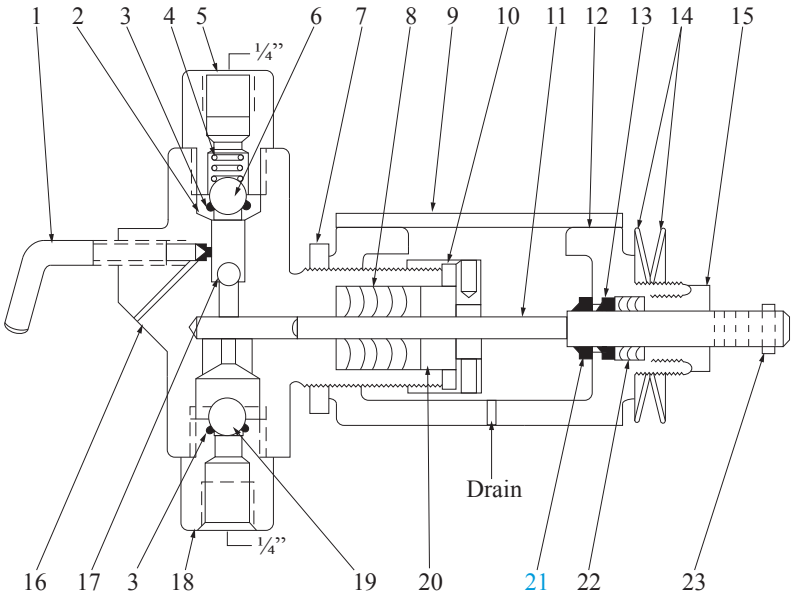
Item #	Part #	Description	Material
1	A-0678	Inlet Body	Bronze
2	A-0479	O-Ring	Buna-N
3	A-0054	Ball	Stainless Steel
4	A-0391	Spring	Stainless Steel
5	A-0677	Outlet Body	Bronze

F-0871 Tank Gauge



Item #	Part #	# Reqd.	Description	Material
1	A-0306	1	Washer	Teflon
2	F-0871.01	1	¾-16” Nut	Stainless Steel
3	F-0871.03	1	2-019 O-Ring	Viton
4	F-0871.04	1	2-006 O-Ring	Viton
5	A-0138	2	¼” NPT Pipe Plug	Steel
6	F-0871.06	1	2-011 O-Ring	Viton
7	F-0871.07	1	Valve Body	Stainless Steel
8	F-0871.08	1	Valve Stem	Stainless Steel
9	F-0871.11	1	Valve Stop	Stainless Steel
10	F-0871.09	1	⅛” x 2” Roll Pin	Stainless Steel
11	F-0871.10	1	Valve Stop Nut	Stainless Steel
12	15470	2	Tube Gasket	Buna-N
13	D-0013	2	Tube End Seal	Viton
14	A-3102	1	Glass Tube	Glass
15	F-0871.15	1	Scale	Acrylic
16	F-0871.16	1	Housing	Stainless Steel
17	F-0871.17	1	Top Block	Aluminum
18	F-0871.18	1	Vent Plug	Stainless Steel
19	A-4092	2	Stat-O-Seal/Spacer	Steel & Buna
20	F-0871.20	1	¼-20” Nut	Stainless Steel
21	F-0871.21	1	¼-20” x ¾” Bolt	Stainless Steel
22	A-0987	1	Washer	Teflon

Injector Heads



Note: Drip Ring moves with the Plunger.

Alternate Construction

Item #	Part #	Description	Material
2	A-0806	Top Seat Assembly (Metal-to-Metal)	303 Stainless Steel
3	A-2580	O'Ring	Viton
8	A-4102	¼" Plunger Packing	Viton
	A-1642		Teflon
	A-2295		Hard
	A-4101	⅜" Plunger Packing	Viton
	A-1234		Teflon
	A-1875		Hard
	A-4103	½" Plunger Packing	Viton
	A-1012		Teflon
	A-1874		Hard
18	A-0771	Bottom Seat Assembly (Metal-to-Metal)	303 Stainless Steel
19	A-0053	½" Ball	316 Stainless Steel

Parts List

Item #	Part # ¼"	Part # ⅜"	Part # ½"	# Reqd.	Description	Material
---	C-1578	C-1579	C-1580	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	C-1582	C-1583	C-1584			All Stainless Steel
1	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	⅜" Large Top Ball	316 Stainless Steel
7	A-0225			1	Yoke Lock Nut	Brass
*8	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	Plunger Packing Gland Nut	303 Stainless Steel
*11	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-0291	C-0425	C-0349			Stainless Steel
17	A-0126			1	¼" Small Top Ball	316 Stainless Steel
*18	B-0736			1	Bottom Seat Assembly- Buna	303 Stainless Steel
*19	A-0054			1	⅜" Suction Ball	316 Stainless Steel
20	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095			1	Plunger Drip Ring	Buna-N
22	A-4127			1	Yoke Packing Set	Buna-N
23	A-0290			1	Pin Plunger	Carbon Steel

**Recommended Spare Parts* **Alternate Components Availiable (see table above)*

Plastic Injector Heads

Parts List

Item numbers below correspond with drawing on page 8.

Item #	Part # ¼"	⅜"	½"	# Reqd.	Description	Material
---	C-1570	C-1571	C-1572	1	Head Assembly	PVC
1	A-1497PVC			1	Priming Valve	PVC
2	B-0737PVC			1	Top Seat Assembly	PVC
3	A-2580			1	O-Ring	Viton
4	A-0077			1	Ball Check Spring	316 Stainless Steel
5	A-1496PVC			1	Top Bushing	PVC
6	A-0054.01			1	⅜" Large Top Ball	Ceramic
7	A-0225			1	Yoke Lock Nut	Brass
8	A-2701	A-2801	A-2901.01	1	Plunger Packing Set	Buna-N
9	C-1604			1	Yoke Cover	303 Stainless Steel
10	A-4104PVC			1	Plunger Packing Gland Nut	PVC
11	B-1175-C	B-1176-C	B-1177-C	1	Plunger	Ceramic
12	B-1170			1	Yoke	PVC
13	A-4095			1	Plunger Wiper Ring	Buna-N
14	A-4256			2	Belleville Washer	302 Stainless Steel
15	A-4104PVC			1	Yoke Packing Nut	PVC
16	C-0271	C-0273	C-0274	1	Body	PVC
17	A-0126.01			1	¼" Small Top Ball	Ceramic
18	B-0736PVC			1	Bottom Seat	PVC
19	A-0054.01			1	⅜" Suction Ball	Ceramic
20	A-2702	A-2802	A-2902	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095			1	Plunger Drip Ring	Buna-N
22	A-4127			1	Yoke Packing Set	Buna-N
23	A-0290			1	Pin Plunger	Carbon Steel

**Recommended Spare Parts*

Performance Data

Pressure Volume Range

**NOTE: For double headed units, increase maximum volume by two.*

Plunger Size	Maximum Discharge Pressure	Model #	Pints per Day	
			Minimum Volume	Maximum Volume
¼"	1500	13-01	0.5	7.2
⅜"	1000	13-03	0.5	18.0
½"	500	13-05	1.0	30.0

Volume Output

**NOTE: For volumes with additional ratchet teeth engaged, multiply these values by the number of teeth engaged. Twenty teeth maximum pickup. Minimum values are theoretical only.*

Strokes Per Minute	*Ratchet Teeth Engaged	¼" Plunger			⅜" Plunger			½" Plunger		
		Short Stroke	Medium Stroke	Long Stroke	Short Stroke	Medium Stroke	Long Stroke	Short Stroke	Medium Stroke	Long Stroke
6	1	0.04	0.08	0.12	0.10	0.20	0.30	0.17	0.35	0.50
8	1	0.06	0.10	0.16	0.14	0.26	0.40	0.23	0.47	0.70
10	1	0.07	0.13	0.20	0.17	0.33	0.50	0.29	0.59	0.80
12	1	0.08	0.16	0.24	0.20	0.40	0.60	0.35	0.71	1.00
14	1	0.10	0.18	0.28	0.24	0.46	0.70	0.40	0.83	1.20
16	1	0.11	0.21	0.32	0.27	0.53	0.80	0.46	0.94	1.40
18	1	0.13	0.23	0.36	0.31	0.59	0.90	0.52	1.06	1.50

**Volume in Pints per Day*

Maintenance

To Remove B-0067, Page 4

Remove A-0414 lever bolt assembly. B-0067 lever can then be removed from the B-0066 drive shaft assembly. Upon re-assembly, be sure the bolt fits into the slot in the end of the drive shaft assembly.

To Remove A-0536 Crosshead, Page 4

It is not necessary to remove the pump head from a single-headed unit in order to remove the crosshead if the following steps are taken.

1. Hand operate B-0067 lever until plunger is at its full discharge position.
2. Pull A-0290 pin (disconnecting plunger from A-0536 crosshead).
3. Remove A-0434 guide plug assembly.
4. Hand operate lever until plunger is free of crosshead. Lift out crosshead. To remove crosshead from double-headed unit, it is necessary to remove one pump head from the gear box.

To Remove A-0537 Ratchet Sub-Assembly, Page 4

It is necessary to follow both procedures outlined above.

1. After crosshead is removed, A-0537 sub-assembly may be pulled toward center of gear box and lifted out.
2. To remove A-0457 bearing and A-0458 washer from A-0420 ratchet assembly, unscrew A-0433 bearing bolt.
3. To remove B-0066 drive shaft assembly, follow the procedure outlined above.
4. Unscrew the A-5199 shaft bearing. B-0066 drive shaft assembly can then be lifted out through the gear box.

Installing A-5200 Shaft Seal in A-5199 Shaft Bearing, Page 4

The A-5200 seal is pressed into the A-5199 bearing. When done correctly, the garter spring will not be visible on the assembly.

Replacing Ratchet Pawls A-0455 and Ratchet Pawl Springs A-0456, Page 4

It is necessary to remove A-0537 ratchet sub-assembly.

To Repack Fluid Pump Head, Page 4 and 6

1. Disconnect chemical suction line.
2. Pull A-0290 pin.
3. Entire fluid head can now be unscrewed from gear box.
4. Loosen gland nut.
5. Pull plunger from head.
6. Remove A-4094 packing nut. This gives access to the yoke packing.
7. Loosen A-0225 lock nut. Yoke can then be unscrewed from fluid head (while unscrewing the yoke, the gland nut must also be backed-off). At this point, wiper washer, gland nut, and packing gland nut can be removed. This gives access to the main plunger packing.

To Check Discharge Ball, Seat, Springs and O'Ring, Page 4

Remove A-1496 top bushing.

To Check Suction Ball, Page 4

Remove B-0736 bottom bushing (o'ring is integral part of B-0736 suction bushing).

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC
820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC
213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.
1610 S. Regal Avenue
Odessa, TX 79763
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Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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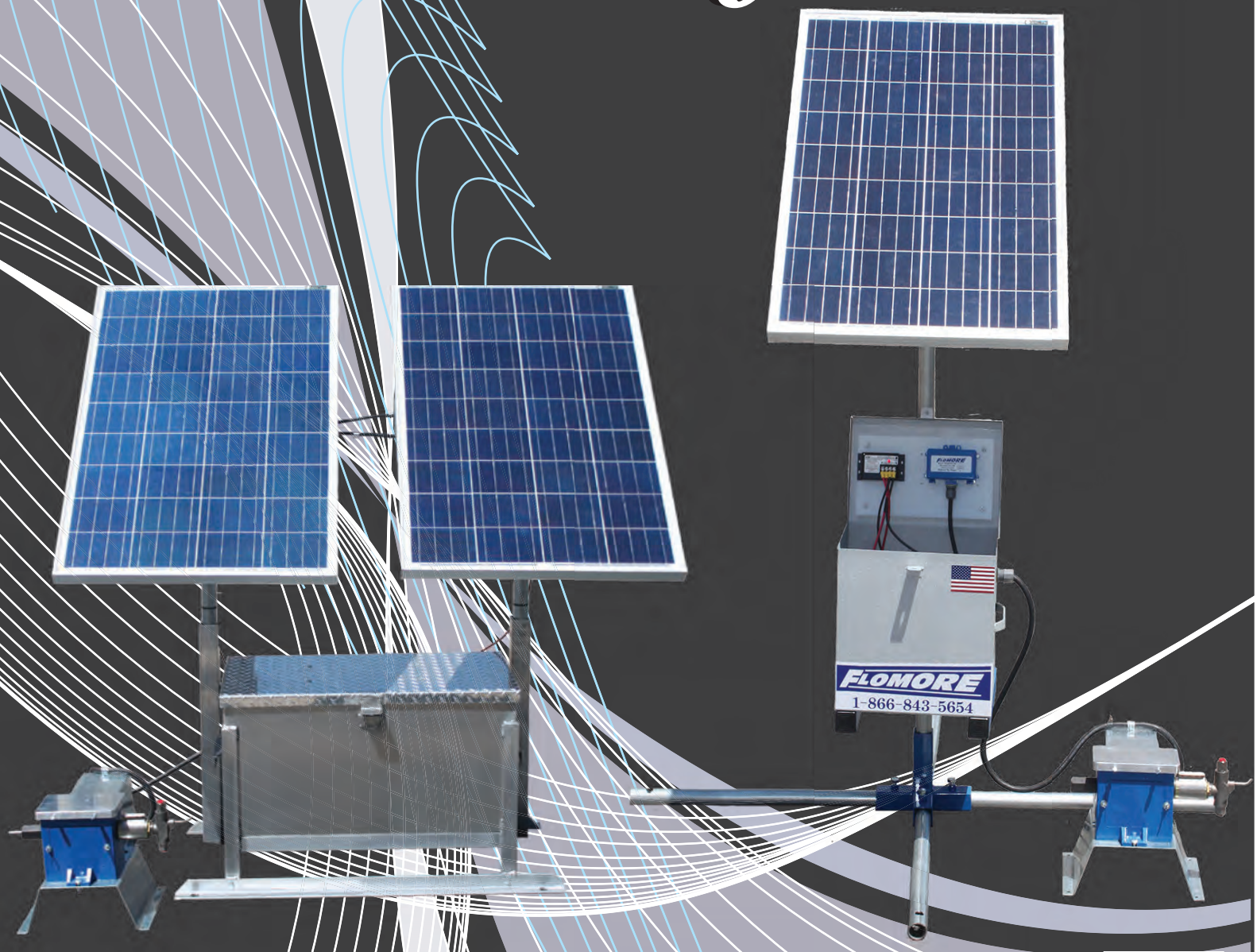
3000 Series Solar Power Injector



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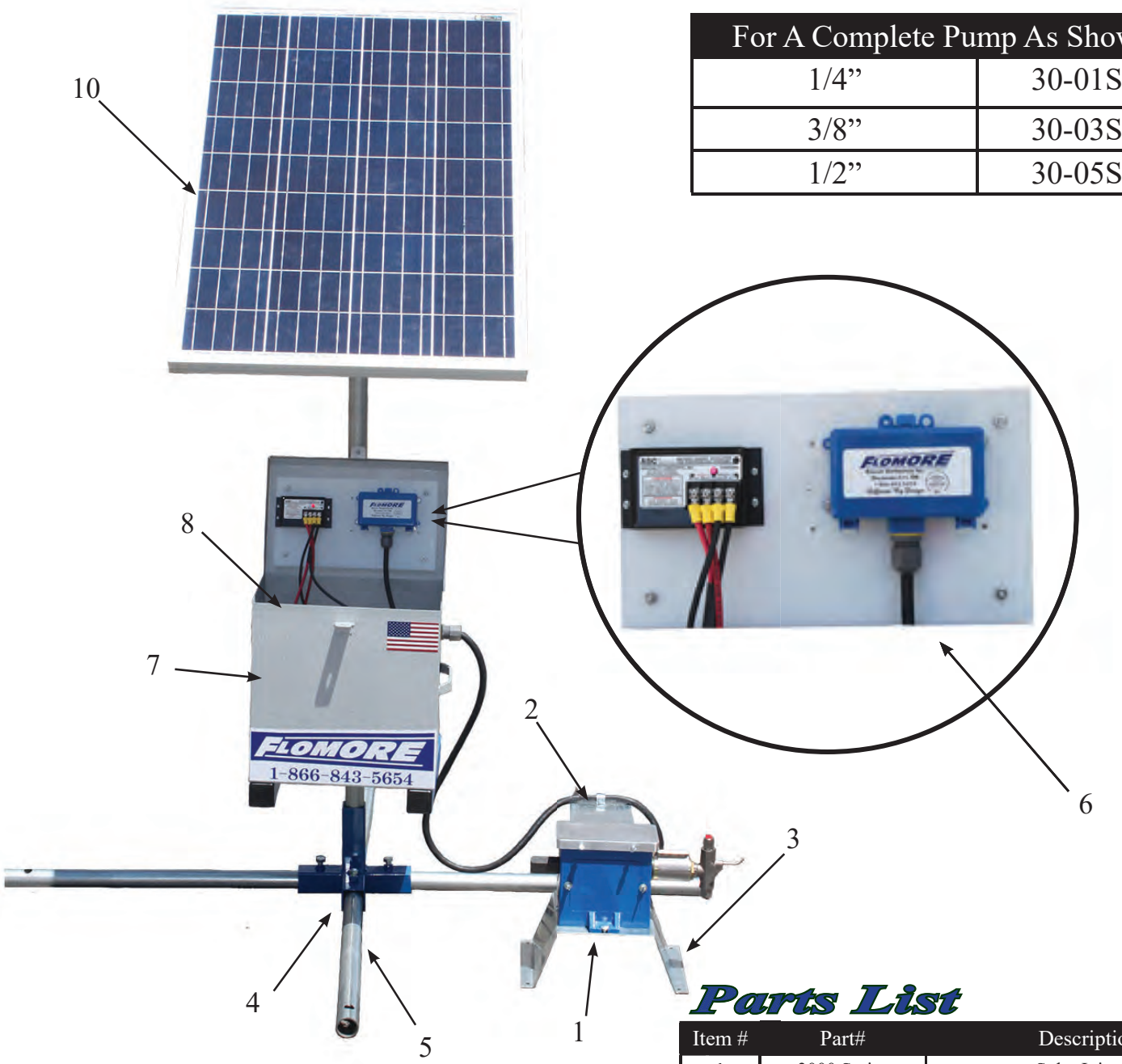
3000 Solar Power Injector

For A Complete Pump As Shown	
1/4”	30-01SS
3/8”	30-03SS
1/2”	30-05SS



Solar Power Injector with Stand

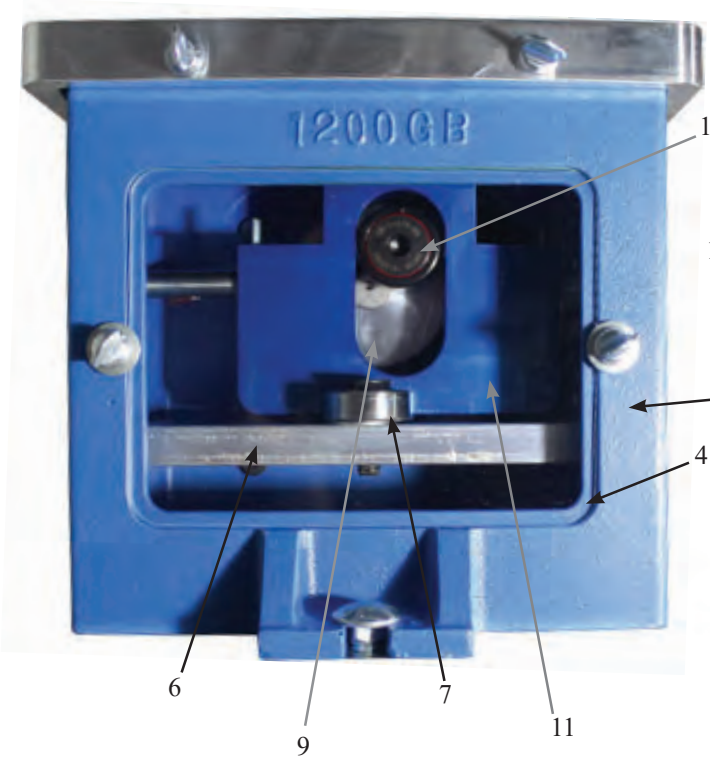
Parts List

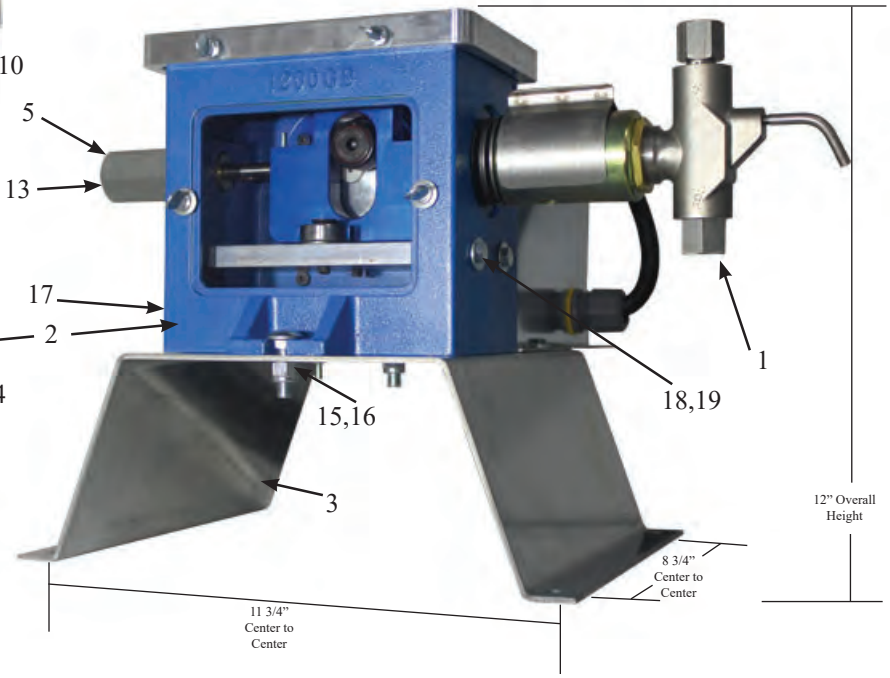
Item #	Part#	Description
1	3000 Series	Solar Injector
2	S-1212	Electric Motor
3	SP-0001B	Power Box Solar Base
4	SP-0005W	5 -Way Base
5	SP-0100	Solar Injector Stand
6	S-0004/ SP-0032	Electronics / Timer
7	S-0200	Solar Battery Box with Electronics
8	SP-0010	Battery (located inside battery box)
10	S-0079	100 Watt Industrial Solar Panel USA

** Flomore Does Not Warrant Batteries or Electric Motors*

Note: Solar Panel Must Always Face South

Solar Injector Pump Body





Parts List

Item #	Part # 3/16"	1/4"	3/8"	1/2"	3/4"	# Reqd.	Description	Material
◆	◆	301	303	305	◆	1	Solar Injector	Ductile Iron
		S-3001SS	S-3003SS	S-3005SS				Stainless Steel
1		C-1578	C-1579	C-1580		1	Head Assembly	Ductile Iron
		C-1582	C-1583	C-1584				Stainless Steel
2	SP-0091					1	Solar Pump Body	Aluminum
3	SP-0001B					1	Power Box Solar Base	Galv. Steel
4	SP-0001S					1	Power Box Viewing Shield	Acrylic
5	SP-0022					1	Solar Guide Body	1018 Nickel Plate
6	SP-0005					1	Aligment Bar	Aluminum
7	SP-0002B USA					2	Solar Power Hub Bearings	◆
8	SP-0002.02					1	Power Hub Set Screw	Steel
9	SP-0011					1	Power Hub Less Bearing	Aluminum
10	SP-0002CF USA					1	Power Hub Bearing	◆
11	SP-0008					1	Crosshead	1018 Carbon Steel
12	A-0290					2	Plunger Pin	Steel
13	SP-0021					1	Guide Rod	17-4 Stainless Steel
14	SP-0010.01					4	Motor Mounting Bolt	Steel
15	S-0038					2	Carriage Bolt	Steel
16	S-0037					2	Nylon Lock Nut	Steel
17	A-0138					1	Pipe Plug	Zinc Plated Steel
18	A-0163					4	Hex Head Bolt	Zinc Plated Steel
19	A-0167					4	Flat Washer	Zinc Plated Steel

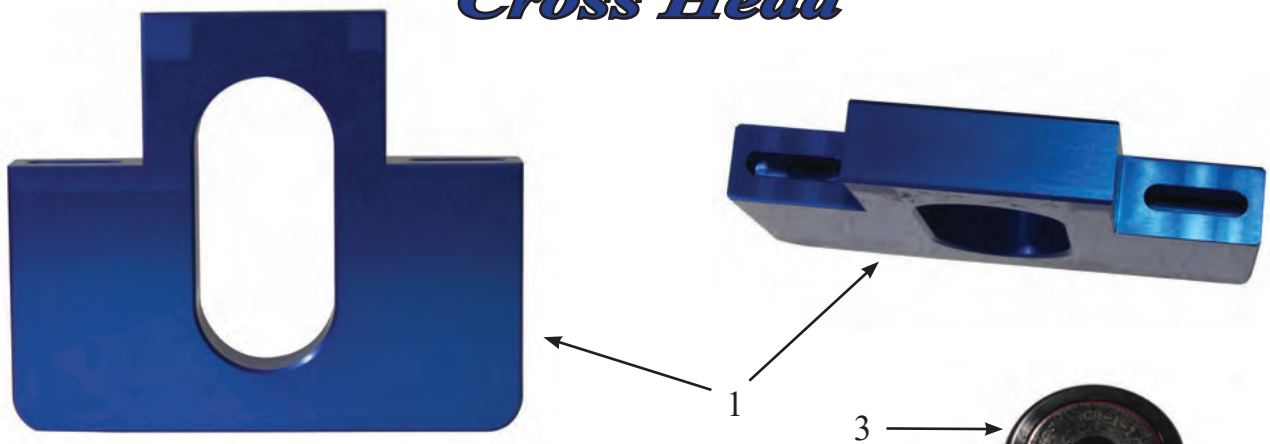
** Head Assembly comes with Buna-N Packing and Viton & Buna O'Rings*

Power End Components
"Smooth Operator"

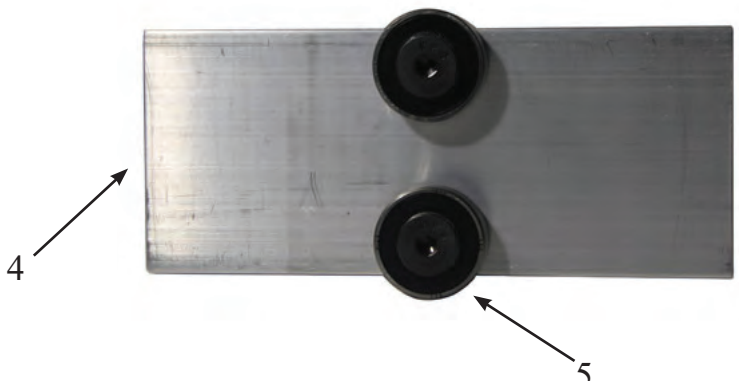
These three POWER END COMPONENTS create a back and fourth motion making the S3000 Solar Series Injector a POSITIVE DISPLACEMENT PUMP. As the plunger goes forward, fluid is discharged from the head assembly. The hub assembly is connected to the DC motor. As the motor turns the hub assembly, the bearing is placed eccentric causing a back and forth motion to the crosshead. The bottom bar assembly keeps the crosshead in a straight, linear motion, the straight motion on the crosshead creates less stress on the motor which has to draw less voltage from the battery. All bearings are sealed, needing no grease. The crosshead has three potential plunger pin placements, long stroke, middle stroke and short stroke, creating flexibility such as pumping 1 pint per day up to 45 gallons per day with a single head assembly.

Item #	Part#	Description	Material
1	SP-0008	Crosshead	Steel
2	SP-0011	Hub	Aluminum
3	SP-0002CF	Power Hub Cam Follower with Bolt	Steel
4	SP-0005	Bottom Alignment Bar	Aluminum
5	SP-0002B	Bearing - Sealed	Steel
6	SP-0002	Power Hub Less Bearing	Steel

Cross Head



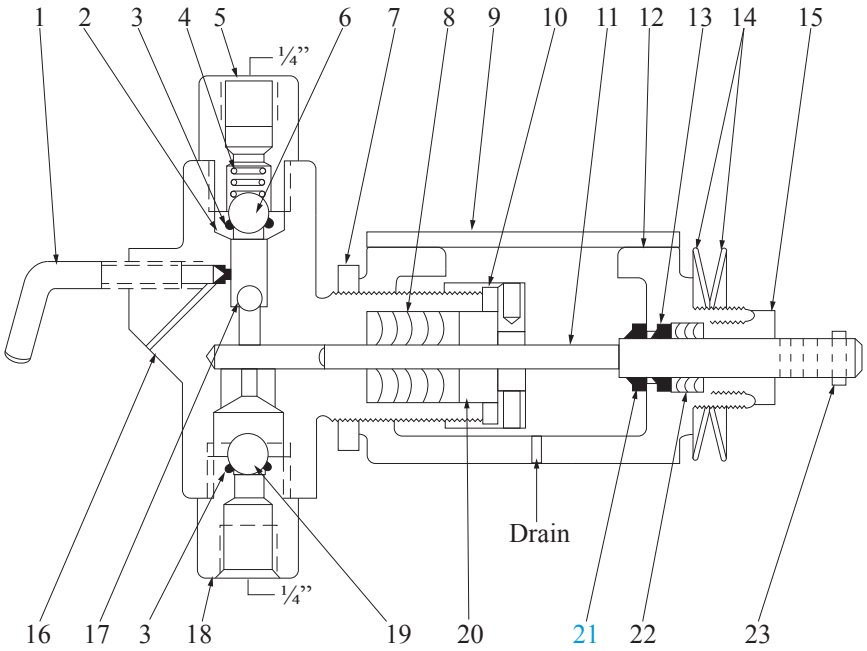
Bottom Alignment Bar with Bearings



Hub with Bearing

Injector Head

Alternate Construction



Item #	Part #	Description	Material
2	A-0806	Top Seat Assembly (Metal-to-Metal)	303 Stainless Steel
	B-0843	Top Seat Assembly (Viton)	
3	A-2580	O'Ring	Viton
8	A-3967	3/16" Plunger Packing	Viton
	A-3966		Teflon
	A-4102	¼" Plunger Packing	Viton
	A-1642		Teflon
	A-2295		Hard
	A-4101	⅜" Plunger Packing	Viton
	A-1234		Teflon
	A-1875		Hard
	A-4103	½" Plunger Packing	Viton
	A-1012		Teflon
	A-1874		Hard
11	B-1298-C	3/16" Ceramic Plunger	♦
	B-1175-C	¼" Ceramic Plunger	
	B-1176-C	⅜" Ceramic Plunger	
	B-1177-C	½" Ceramic Plunger	
18	A-0771	Bottom Seat Assembly (Metal-to-Metal)	303 Stainless Steel
	B-0844	Bottom Seat Assy. (Viton)	
19	A-0053	½" Ball	316 Stainless Steel

Note: Drip Ring moves with the Plunger.

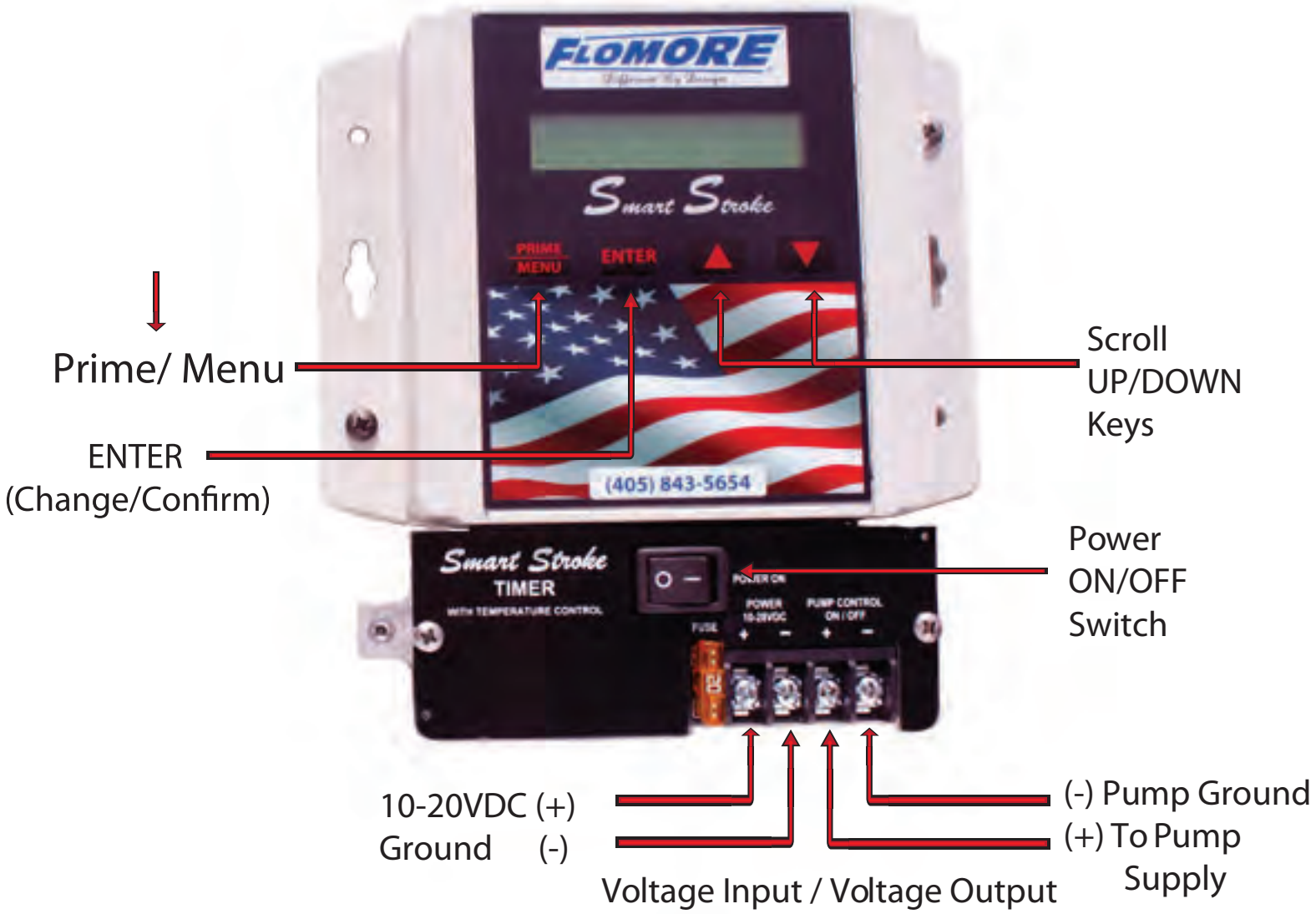
Standard Construction

Item #	Part # 3/16"	¼"	⅜"	½"	# Reqd.	Description	Material
♦	♦	C-1578	C-1579	C-1580	1	Head Assembly	Ductile Iron with Stainless Steel Trim
		C-1582	C-1583	C-1584	1		All Stainless Steel
1	A-1497				1	Priming Valve	303 Stainless Steel
*2	B-0737				1	Top Seat Assembly	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	⅜" Large Top Ball	316 Stainless Steel
7	A-0225				1	Yoke Lock Nut	Brass
*8	♦	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	Plunger Packing Gland Nut	303 Stainless Steel
*11	♦	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				3	Belleville Washer	302 Stainless Steel
15	A-4094				1	Yoke Packing Nut	Brass
16	♦				1	Body	Stainless Steel
17	♦	A-0126			1	¼" Small Top Ball	316 Stainless Steel
*18	♦	B-0736			1	Bottom Seat	303 Stainless Steel
*19	A-0054				1	⅜" Suction Ball	316 Stainless Steel
20	♦	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095				1	Plunger Wiping Ring	Buna-N
22	A-4127				1	Yoke Packing Set	Buna-N

Green Notes: Recommended Spare Parts (see table above)

*Alternate Components Availiable (see table above)

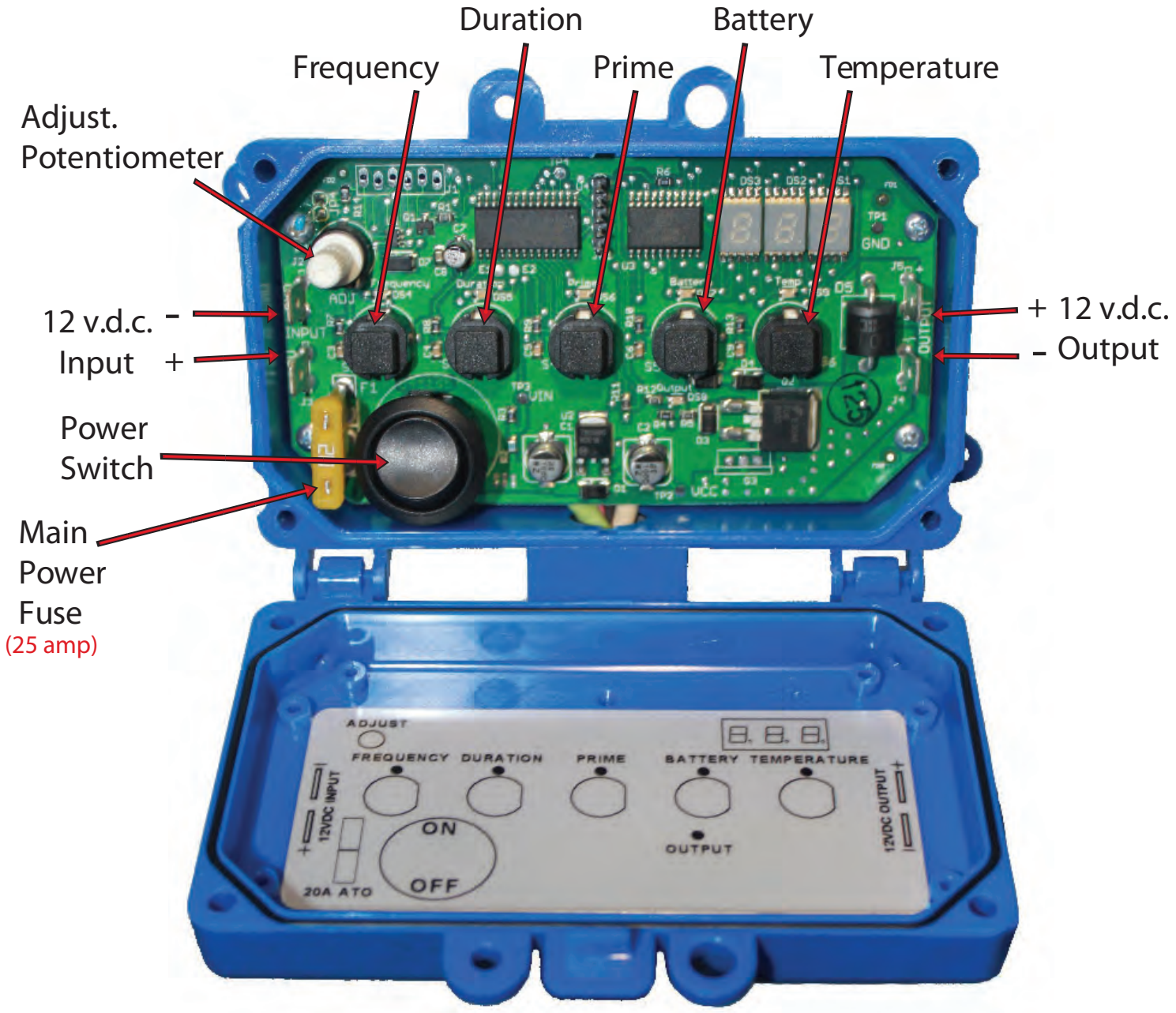
SS2 Smart Stroke Timer



This Smart Stroke Timer / Temperature controller is an easy to operate and reliable controller for the Flomore pump.

This timer is designed to automatically deactivate the pump in the event the supply of voltage drops below 9.5 VDC to prevent damage to the motor. The timer will record each deactivation and reactivate when voltage returns to appropriate level.

SS3 Basic Timer



Terms and Adjustments:

Frequency	- Adjustable from 1 to 10 ; measured in cycles per minute
Duration	- Adjustable from 1 to 5; measured in seconds
Prime	- Adjustable from 10 to 120; measure in seconds
Battery	- Adjustable from 9.0 to 12.5; measured in Volts
Temperature	- Adjustable from 0 to 50, measured in Degrees Fahrenheit
Low Level	- The point at which functionality will cease in order to preserve battery
High Temperature	- When the measured temp. is above this point the controller will not operate.

3000 Solar Pump
1/4" Head Performance Data

Chart Ratings listed below in Gallons Per Day for Single Head
Double Heads Assemblies available

PSI	Cycles Per Minute	Seconds On: 1 Stroke S	1 Stroke M	1 Stroke L	2 Stroke S	2 Stroke M	2 Stroke L	3 Stroke S	3 Stroke M	3 Stroke L	4 Stroke S	4 Stroke M	4 Stroke L	5 Stroke S	5 Stroke M	5 Stroke L
0	1	.25	.50	.75	.50	.75	1	.75	1	1.50	.75	1.25	1.75	1	1.75	2.25
1000		.25	.50	.75	.50	.75	1	.50	.75	1.50	.50	.50	1.50	.75	1.50	1.75
2000		.25	.50	.50	.25	.50	.75	.50	.75	1	.50	1	1.50	.75	1.25	1.75
3000		.25	.50	.75	.25	.50	.75	.50	.75	1	.50	1	1.50	.50	1.25	1.75
4000		.25	.25	.50	.25	.50	.75	.33	.63	1	.38	.75	1.25	.50	1	1.25
0	2	.50	.50	1	.50	1.25	1.75	1	2.25	2.50	1.25	2.25	3.25	1.50	3	4.25
1000		.25	.50	1	.50	1	1.50	.75	1.25	1.75	1	2	3	1.25	2.50	4
2000		.25	.50	1	.50	1	1.50	.75	1.25	2	.75	2	3	1.25	2.50	3.50
3000		.25	.50	1	.50	1	1.50	.75	1.25	2	.75	2	3	1.25	2.50	3.75
4000		.25	.50	1	.50	1	1.50	.75	1.25	2	.75	2	2.75	1.25	2.50	3.50
0	3	.75	1	1.50	1.25	2	2.75	2.75	3.75	4.25	2.50	4	5	3.25	5.25	7.25
1000		.50	1	1.50	1	1.50	2.75	1.50	2.75	4	2	3.50	5	2.50	4.25	7.50
2000		.50	.75	1.25	1	1.50	2.50	1.25	2.75	3.75	1.50	3.25	4.75	2	4	6
3000		.50	.75	1.25	.75	1.25	2.25	1	2	3.25	1	2.50	4.50	1.50	3.25	5
4000		.25	.75	1	.50	1.25	2.25	.75	1.75	3	1	2.50	4	1.50	2.25	5
0	4	.75	1	1.75	1.50	2.50	3.50	2	3.50	5.25	2.75	4.75	6.50	3.75	6	8.50
1000		.75	1	1.75	1.25	2	3.25	1.75	3.25	4.50	2.25	4.25	6	2.75	5.25	8
2000		.75	1	1.75	1	2	3	1.50	2.75	4.25	2	4	5.25	2.50	4.50	7
3000		.50	1	1.50	1	1.75	3	1.50	2.75	4	2	3.75	5.75	2.50	4.50	7
4000		.50	1	1.50	1	1.75	3	1.50	2.75	4	2	3.75	4	2	4	6

1 Battery + 1 Solar Panel 2 Batteries + 1 Solar Panel

Stroke Key: S = Short Stroke M = Medium Stroke L = Long Stroke

PLEASE NOTE

All test results were calculated in Oklahoma City in the month of October 2018.
All tests were performed with a constant 14.1 battery voltage.
Results may vary with higher or lower battery charge in field.

3000 Solar Pump
3/8" Head Performance Data

Chart Ratings listed below in Gallons Per Day for Single Head
Double Heads Assemblies available

PSI	Cycles Per Minute	Seconds On														
		1			2			3			4			5		
		Stroke			Stroke			Stroke			Stroke			Stroke		
		S	M	L	S	M	L	S	M	L	S	M	L	S	M	L
0	1	1	1	1.50	1.50	2	2.50	2	3	3.75	2.25	3	4.75	3	4	5.5
500		.75	1	1.50	1	1.75	2.25	1.75	2.75	3.50	2.25	3	4.50	3	3.50	5.5
1000		.75	1	1.50	1	1.75	2.25	1.75	2.50	3.25	1.75	2.50	3	2.75	3.50	5
1500		.75	1	1.25	1	1.75	2	1.50	2.25	3	1.50	2.25	3	2.50	3.50	5
2000		.50	1	1	1	1.50	2	1.50	2	2.75	1.75	2.75	3.75	2.25	3.50	5
3000		.25	1	1	1	1.50	2	1	2	2.75	1.50	2.50	3	2	3	4.25
0	2	1.50	2	2.50	2.50	3.75	5	3.75	5.50	7.75	5	7	8	6	9	12.50
500		1.50	2	2.50	2.50	3.25	5	3.50	5	7	5	7	8	6	9	11
1000		1.25	2	2.50	2	3	4.25	3.25	4.50	6.50	4	6.50	8	5	8	10.50
1500		1.25	2	2.50	2	3	4.25	3.25	4.50	6.50	4	6.50	8	5	8	10
2000		1.25	2	2.50	2	3	4.25	3.25	4.50	6.50	4	6	8	5	7	10
3000		1.25	2	2	2	3	4.25	3	4.50	6	3.75	6	8	4.75	7.75	10
0	3	2.25	3	4.75	4	6	8.75	5.50	7.50	11.50	7.50	10.50	13.75	9	12.75	16
500		2	3	4.50	4	5	7	5	7.50	11	7	10	13	9	12	16
1000		1.50	3	4.25	3.50	4.75	6.75	5	7.50	10	6.25	9.75	13	8	11.50	16
1500		1.50	3	4	3	4.75	6.50	5	7.50	10	6.25	9.50	13	8	11	16
2000		1.50	3	3.75	3	4.75	6.25	5	7.50	9.75	6.25	9.50	13	8	11	16
3000		1.50	3	3.50	2.75	4.50	6.25	4.50	6.50	9	5.75	9.25	12	7	10	15
0	4	3.25	4.75	6.25	5.75	10.25	11.75	7.75	11.50	15	10	17	20	12.50	20	25
500		3	4	6	5	9	10	7	11	14	10	15	19	12	17	23
1000		2.75	4.25	5.50	4.75	6.25	8.50	7	9.50	13	9	12.25	18	11	15	22
1500		2.75	4.25	5	4.75	6.25	8.50	7	9.50	13	9	12	18	11	15	21
2000		2.75	4.25	5	4.50	6.25	8.50	6.50	9.50	12.50	8.25	12	18	10.50	15	20
3000		2.25	3.25	4.50	3.75	5.75	8.50	5.75	8.50	11	7.50	12	15.50	8.75	14.25	19.50

1 Battery + 1 Solar Panel 2 Batteries + 1 Solar Panel

Stroke Key: S = Short Stroke M = Medium Stroke L = Long Stroke

PLEASE NOTE

All test results were calculated in Oklahoma City in the month of October 2018.
All tests were performed with a constant 14.1 battery voltage.
Results may vary with higher or lower battery charge in field.

3000 Solar Pump
1/2" Head Performance Data

Chart Ratings listed below in Gallons Per Day for Single Head
Double Heads Assemblies available

PSI	Cycles Per Minute	Seconds On: 1			2			3			4			5		
		Stroke			Stroke			Stroke			Stroke			Stroke		
		S	M	L	S	M	L	S	M	L	S	M	L	S	M	L
0	1	1.50	2	2.75	2.75	4.25	5.25	3.75	5.25	7	5	6.50	8.75	6.25	9	11
500		1.50	2	2.75	2.50	3	4	3	4	6	4.50	6.25	8.50	5	7.25	9.75
1000		1.25	1.75	2	2	2.75	4	2.50	4	5	3.75	5	6.50	4	6	8
1500		1.25	1.50	2	2	3	4	3.25	5	6.50	4.50	5.75	7.50	4	5.75	7.50
2000		1	1.50	1.75	1.50	2	2.50	2.50	3.75	4	3	4.75	6	4	5.50	7
0	2	2.50	4	5.50	4	7.25	8	5.75	10.25	14	7.75	12	16.50	10	14	20
500		2.50	4	5.50	4	6	8	5.50	9	12	7.75	11	16	10	14	19
1000		2.25	3.75	5.25	3.75	5.50	8	5.50	8.50	10.75	7.75	10.50	16	9.50	13.50	18.50
1500		2.25	3	4	3.75	5.50	8	5.50	8	10.50	7.25	10.50	14.50	9	13	18
2000		2.25	2.75	3.75	3.50	5.50	7.50	5.50	7.50	10.50	7.25	10.25	13	8.50	13	17
0	3	5	6.25	8	7.75	11	14.25	10.50	14.50	20	13.50	18	25	16	24	33
500		4.25	6	7	6	9.50	13	9.50	13	17	12	18	23	15	22	30
1000		3.75	5.25	5.75	5.75	8.75	12	8.75	12.50	15.75	11.25	17.25	21	14	20	27
1500		3.75	5	5.25	5.50	8	12	8	12	15.50	11	17	21	13	19	27
2000		3.75	4.50	5.25	5.50	8	11.50	7.75	11.25	15.50	11	16	21	13	19	27
0	4	5.50	8	11	8.75	14	19.50	13	19	27	17	25	35	20	32	45
500		5	8	10	8	13	18	12	18	25	16	24	33	20	29	41
1000		5	7	9	8	12	16	11	18	22	15	23	32	20	27	37
1500		5	6	8	8	11.50	15	11	16	21	14	22	29	18	26	36
2000		4.25	5.75	7.50	7.50	11.50	15	10.50	15	20	14	21	26	17	26	36

1 Battery + 1 Solar Panel 2 Batteries + 1 Solar Panel

Stroke Key: S = Short Stroke M = Medium Stroke L = Long Stroke

PLEASE NOTE

All test results were calculated in Oklahoma City in the month of October 2018.
All tests were performed with a constant 14.1 battery voltage.
Results may vary with higher or lower battery charge in field.

Maintenance and Troubleshooting

Installation

1. Plan ahead for proper mounting, pump location is very important. Position it to provide efficient routing of suction, discharge lines and electric service.
   - Avoid long suction lines and provide for a flooded suction line whenever possible.
2. Pump fluid line connections operate best when there is a minimum restriction to the medium flow.
3. Install the proper electrical starters and disconnect switches
   - It is recommended that a solid mounting support be used.
   - Take advantage of factory installed holes in the base plate for securing the pump

Fluid End

3. All fluid connections both suction and discharge, should be sealed tight.
   - Fluid end connections are 1/4” NPT
   - The suction connection is at the bottom of the fluid end, and the discharge connection is at the top.

Start Up

4. Open the priming valve on the fluid end assembly and start the pump motor
5. Allow the pump to run until a clear, stream with NO bubbles comes out of the priming valve
6. Close the priming valve
7. Check the packing for proper sealing. If it leaks, stop the pump and make necessary adjustments.

Installation

8. Check periodically (min once per month) and apply small amount of grease to the cam bearing and to the crosshead areas that cycle through the linear bearings
   - Check the packing regularly. If leakage is observed, stop the pump.
   - Make small adjustments by turning the gland nut.
   - Restart the pump but do not over tighten the packing as this will reduce the packing life and

** For further assistance please call our Oklahoma City Facitlity at 866-843-5654

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC

820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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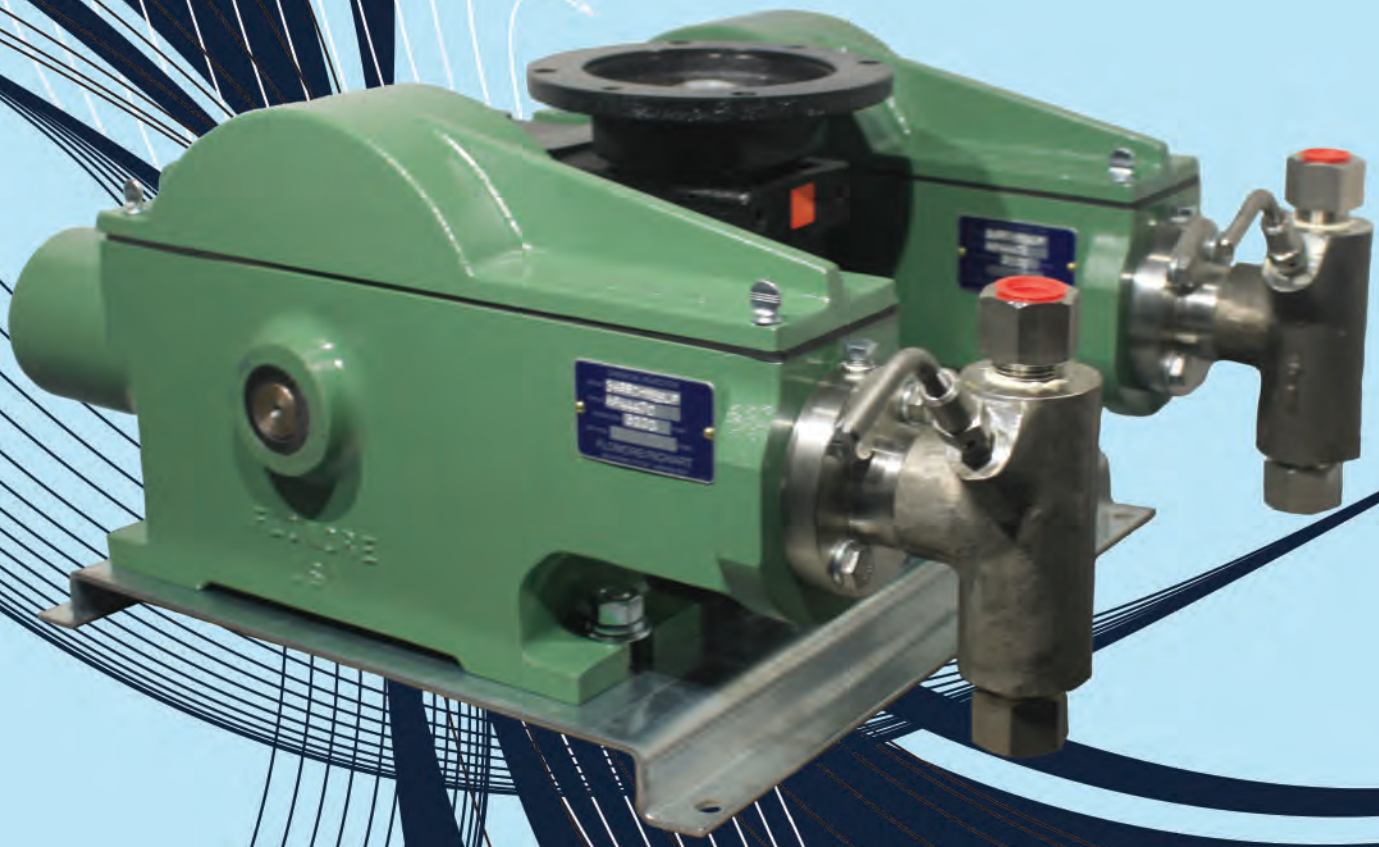
Different By Design

3400 Series Injector



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3400 Series Injector

3400 Series Features

Oil Less Drive Unit
1 Horsepower Motor Standard
(2 HP Optional, 1 or 3 phase, TEFC or Explosion Proof)
Available in 2 stroke rates; 30 or 60 Strokes Per Minute
Multiple plunger sizes available; 3/8", 1/2", 3/4", 1", 1 1/4"
Adjustable while Running
Maximum Discharge Pressure; 7000 psi with 3/8" Plunger
Max Volume; 880 GPD with a 1 1/4" Plunger

Installation and Operating Instructions

Operating Instructions

1. Location of pump is important:
   - Long suction lines should be avoided
   - Flooded suction must be provided as much as possible
   - Line check should be installed at pump discharge connection and injection point
   - Electrical starters and disconnect switches should be installed properly
   - It is reccommended that the pump be mounted to a solid surface
   - Minimize restrictions to media flow in all connecting lines
2. Ensure suction and discharge connections are seal tight.
   ("suction" connection is located at the bottom of the fluid, "discharge" is located at the top.)
3. Using proper electrical service, connect electrical to the provided conduit.
4. Verify stroke adjustment screws for maximum stroke length.
5. Evacuate any air in suction lines by opening the priming valve on each head assembly.
6. Turn power on. Turn off immediately if you hear any abnormal sounds, this may cause damage to the pump. Correct any problems before turning power back on.
7. While priming the fluid end, watch pump operation for any problems or issues. Pump operation should be smooth.
8. Close priming valve once all air has been cleared from the suction line.
9. Stop the pump if packing does not have proper sealing. Adjust packing and start pump once again.
10. Set the stroke adjustment screws for desired flow rate tightening the lock nut to set in place.

Preventive Maintenance

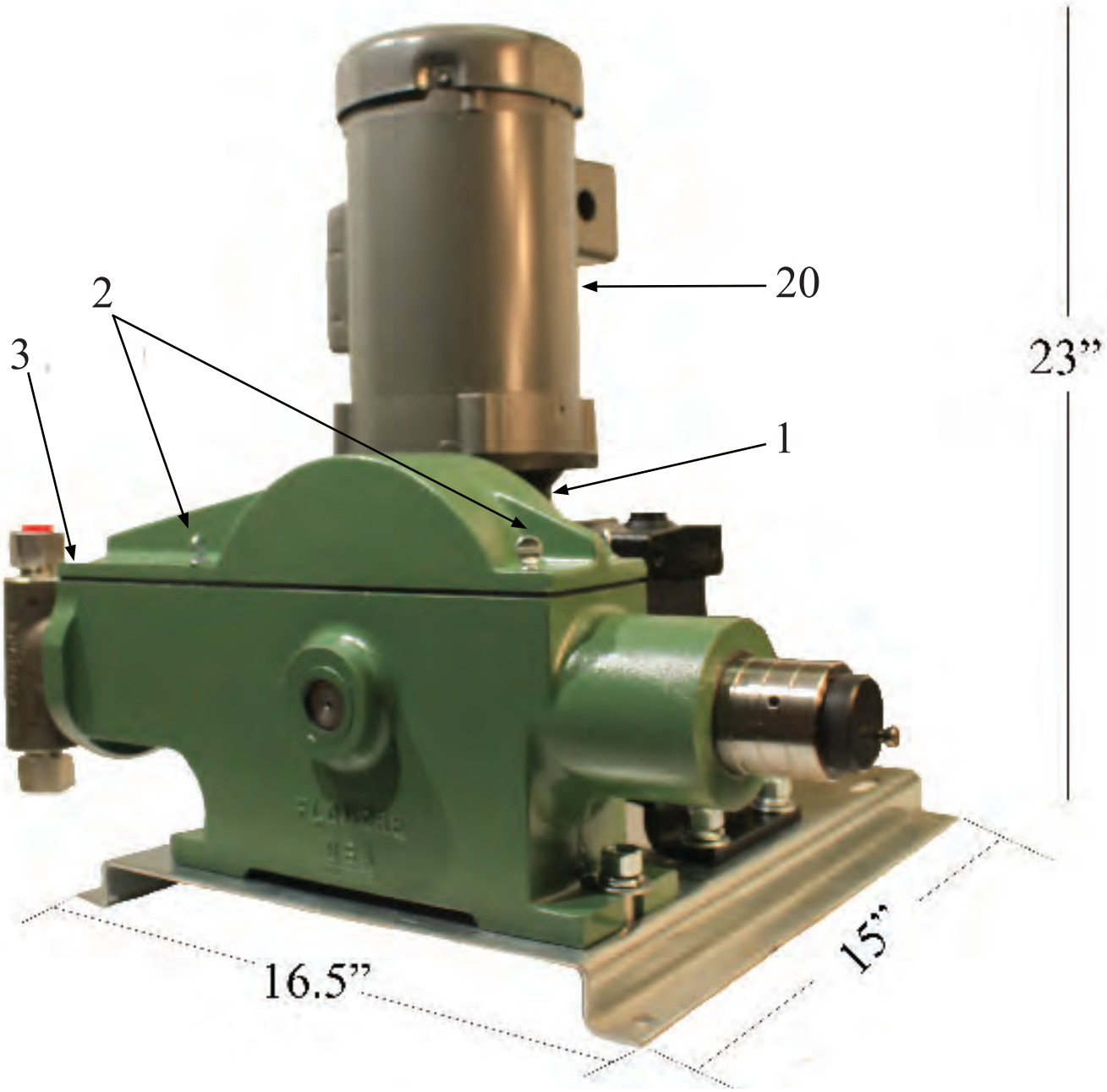
1. Examine pump operation periodically, applying a small amount of grease to the cam bearing and crosshead areas that cycle through linear bearings.
2. Packing should be checked for leaking regularly. If leaking, turn pump off and slightly tighten the gland nut making sure to not overtighten. This will shorten the life of the packing.

Troubleshooting

1. Motor is not running
   - Is the motor stalled? Was the max discharge pressure reached?
   - Is the circuit breaker or fuse in working condition?
   - Has the motor overheated?
2. Pump Not Stroking
   - Stroke adjustment screw has backed out
   - Broken Drive clip, plunger not fastened into crosshead
   - Cam not engaged on the drive shaft
   - Crosshead in a bind - stroke adjuster
3. No fluid movement
   - Packing leak
   - Discharge valve seats not seating
   - Suction Valves not seating - Flow gauge moving back and forth at the same level.
   - Air trapped in fluid Injection head. Reprime the pump using the priming valve.
   - Blockage in suction or discharge line.

3400 Series Power End

Injector Dimensions (Simplex and Duplex)



***Total Length of Quadplex Injector is 32”*

3400 Series Power End

Performance Data

Model #	Plunger Size	Strokes Per Minute	Discharge Pressure	Gallons Per Day	
			Maximum	Minimum	Maximum
34-33SS	3/8”	30	7500	2	18
34-63SS		60		3.5	35
34-35SS	1/2”	30	4000	7	70
34-65SS		60		14	138
34-36SS	3/4”	30	3200	16.5	165
34-66SS		60		33	330
34-37SS	1”	30	1000	28	280
34-67SS		60		56	560
34-38SS	1 1/4”	30	500	44	440
34-68SS		60		88	800

Injector Weight

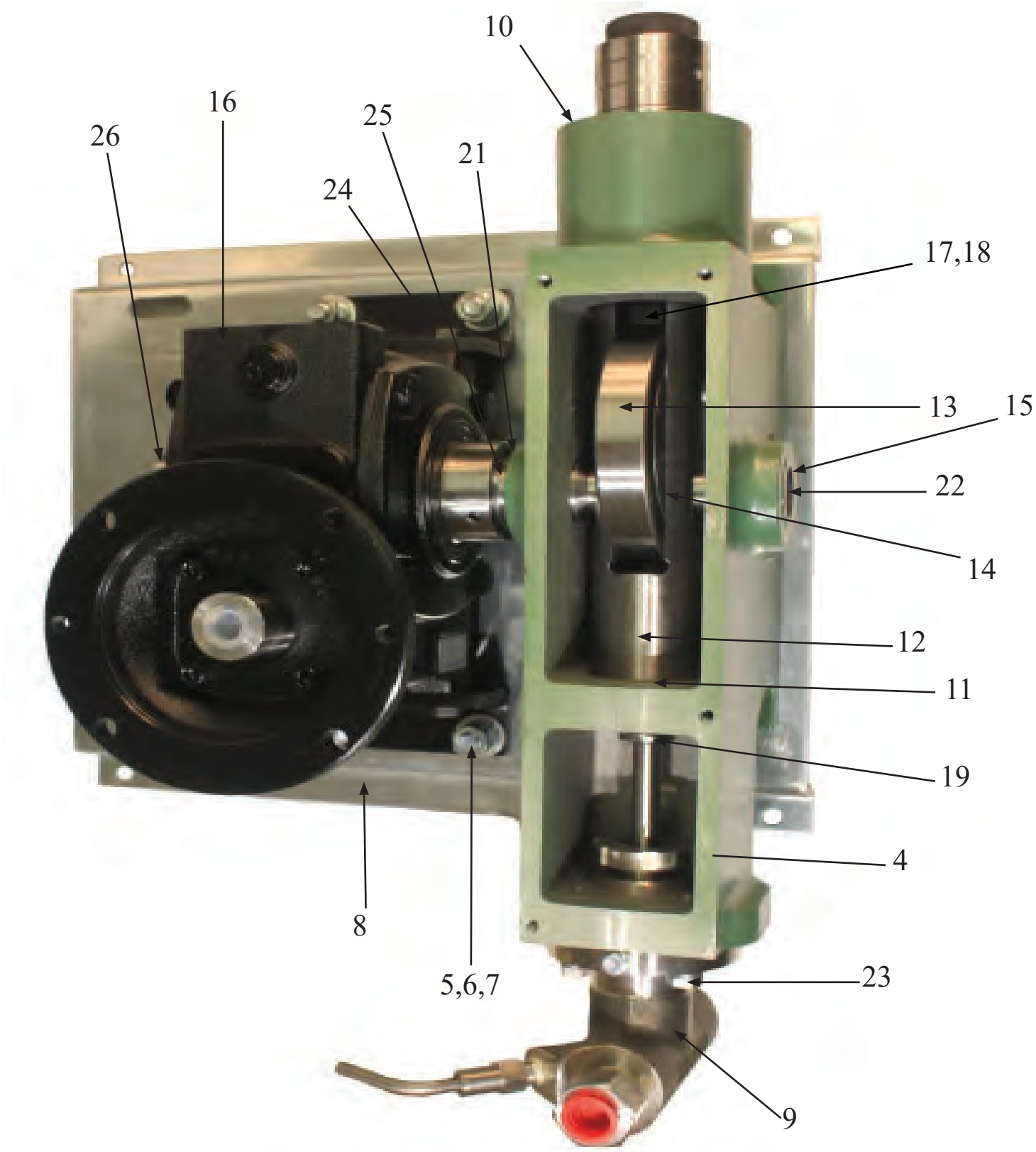
Injector Type	Weight (lbs.)
Simplex	80
Simplex with Motor	130
Duplex	120
Duplex with Motor	175

Parts List

Item #	Part #	# Reqd.	Description	Material
1	C-2150	1	Cover	Aluminum
2	A-0136	4	Thumb Screw	Plated Steel
3	B-1647	1	Cover Gasket	Nitrile
20	A-6766	1	Electric Motor	♦

See Page 7 for complete Parts List

3400 Series Injector



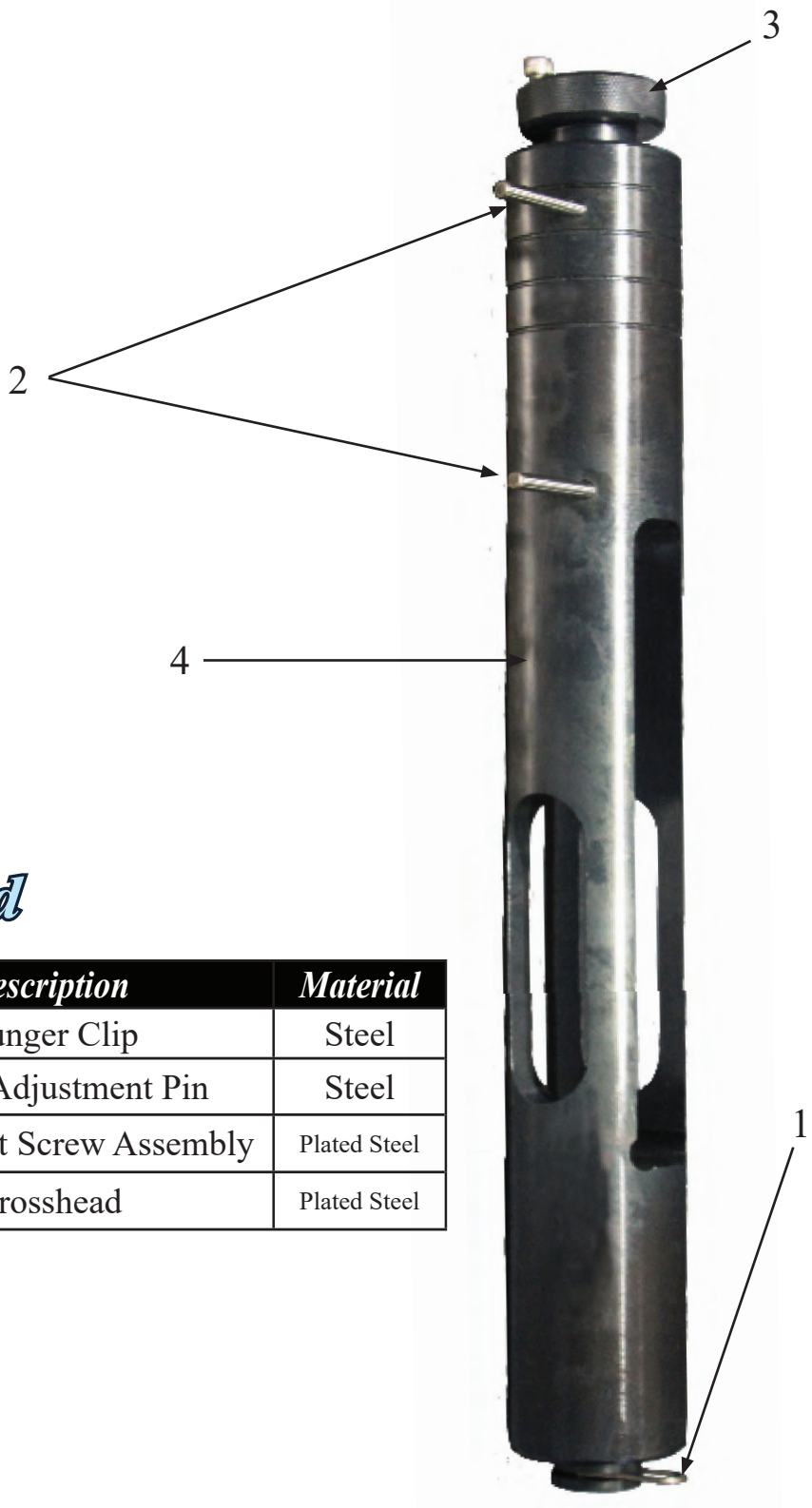
3400 Series Injector

Part Numbers

Item #	Part #	# Reqd.	Description	Material
1	C-2150	1	Cover	Aluminum
2	A-0136	4	Thumb Screw	Plated Steel
3	B-1647	1	Cover Gasket	Nitrile
4	D-0528	1	Pump Housing	Aluminum
5	A-6440	6	Hex Bolt	Plated Steel
6	S-0010F.3	6	Hex Nut	Plated Steel
7	B-0316-5	16	Flat Washer	Plated Steel
8	C-2165	1	Base Plate	Plated Steel
9	See page 11	1	Head Assembly	Various
10	A-6474	1	Sleeve Bearing	◆
11	A-6473	1	Sleeve Bearing	◆
12	C-2152	1	Crosshead	Plated Steel
13	B-1646	1	Cam Assembly	Steel
14	A-6470	1	Drive Shaft Key	Steel
15	A-6476	1	Drive Shaft Bearing	♦
16	B-1648	1	Gear Reducer 30 spm	◆
	B-1649	1	Gear Reducer 60 spm	◆
17	A-6471	1	Stroke Adjusment Shaft	Plated Steel
18	A-6477	1	Stroke Adjustment Screw	Steel
19	A-6573	1	Drive Clip	Steel
20	A-6766	1	Electric Motor	◆
21	A-6475	1	Drive Shaft Bearing	♦
22	C-2172	1	Driveshaft - Duplex	Steel
	C-2173	1	Driveshaft - Simplex	Steel
23	A-4456	4	Hex Bolt	Stainless Steel
24	A-6442	4	Hex Bolt	Plated Steel
25	A-6443	1	Snap Ring	304 Stainless Steel
26	A-6494	1	Shaft Key for Gear Reducer	Plated Steel

Recommended Spare Parts in Green

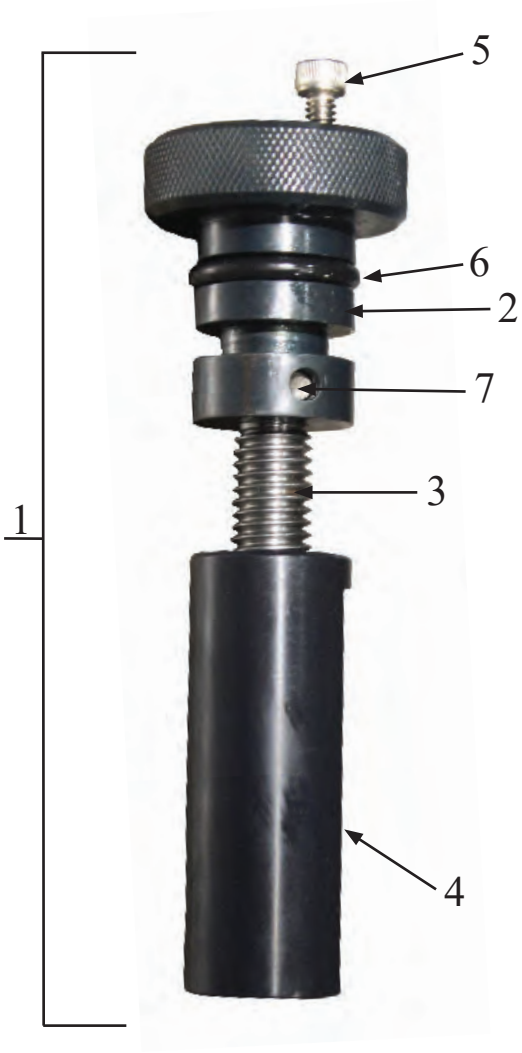
3400 Series Components



C-2152 Crosshead

Item #	Part #	Description	Material
1	A-6573	Plunger Clip	Steel
2	A-6479	Stroke Adjustment Pin	Steel
3	A-7158	Adjustment Screw Assembly	Plated Steel
4	C-2152	Crosshead	Plated Steel

3400 Series Components



A-7158 (See Left) Adjuster Assembly

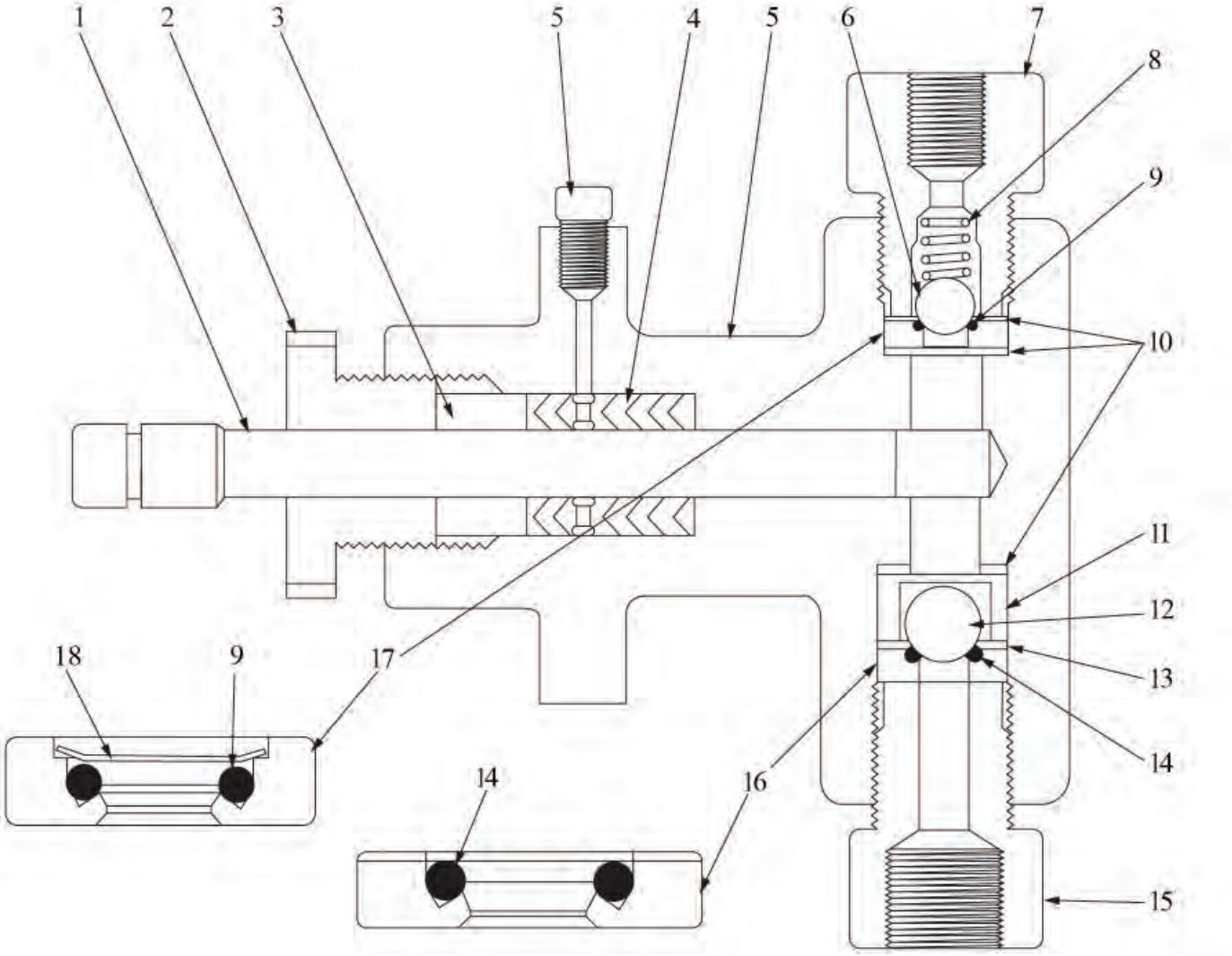
Item #	Part #	Description	Material
1	A-7158	Adjustment Screw Assembly	Plated Steel
2	A-6477	Stroke Adjustment Knob	Plated Steel
3	A-6472	Stroke Adjustment Screw	Steel
4	A-6471	Stroke Adjustment Shaft	Plated Steel
5	A-6480	Adjustment Knob Set Screw	Stainless Steel
6	A-7204	Adjustment Screw O'Ring	Buna
7	A-6478	Adjustment Screw Pin	Steel

B-1646 (See Right) Cam Assembly

Item #	Part #	Description	Material
1	B-1645	Drive Cam	Steel
2	A-6463	Cam Bearing	♦

Injector Head

(For ⅜”, ½”, ¾”, 1”, and 1 ¼” Heads)



Packing Options

Size	Material						
	Buna	Viton	Teflon	Tef/Bun	Tef/Vit	Hard	Super Duty
3/8”	A-1456	A-4101	A-1234	A-1455	A-1643	A-1875	A-7172
1/2”	A-0959	A-4103	A-1012	A-0958	A-0961	A-1876	A-7173
3/4”	A-2771	A-4657	A-2988	A-2888	A-2989	A-2772	A-7174
1”	A-0050	A-4658	A-1013	A-1017	A-4659	A-4135	A-7175
1 1/4”	A-0405	A-4480	A-1014	A-1015	A-4409	A-4133	A-7176

Injector Head

Ductile Iron Head Parts List

Item #	Part #					# Reqd.	Description	Material
	⅜"	½"	¾"	1"	1 1/4"			
♦	C-2161	C-2162	C-2146	C-2147	C-2148	1	Head Assembly	Stainless Steel with Stainless Steel Trim
1	A-6498	A-6499	A-6459	A-6460	A-6461	1	Plunger	Armaloy - 17.4 pH Stainless Steel
2	D-0375	D-0500	D-0750	D-1000	A-0403	1	Packing Gland Nut	304 Stainless Steel / Plated Steel
3	A-0957	A-1219	A-2769	A-0043	A-0404	1	Packing Gland	304 Stainless Steel
*4	A-1456	A-0959	A-2771	A-0050	A-0405	1	Plunger Packing (STD)	Buna-N
5	C-0147	C-0140	C-0340	C-0138	C-0135	1	Head Body	Stainless Steel
6	A-0054					1	Discharge Check Ball	316 Stainless Steel
7	A-2456					1	Discharge Bushing	304 Stainless Steel
8	A-0077					1	Check Ball Spring	316 Stainless Steel
*9	A-2097					1	Discharge O'Ring	Buna-N
10	A-2350					3	Gasket	304 Stainless Steel
11	A-0444					1	Ball Cage	17.4 pH Stainless Steel
12	A-0054	A-0053				1	Suction Check Ball	316 Stainless Steel
13	A-2350	A-2338				1	Gasket	304 Stainless Steel
*14	A-2097	A-0612				1	Suction O'Ring	Buna-N
15	A-2455					1	Suction Bushing	304 Stainless Steel
16	B-0698					1	Suction Seat Assembly	304 Stainless Steel
17	B-0368					1	Discharge Seat Assembly	304 Stainless Steel
18	A-3523					1	Retaining Ring	304 Stainless Steel

Recommended Spare Parts in Green **Alternate Components Available*

Alternate Components

Item #	Part #	Description	Material
9	A-2336	O'Ring	Viton
	A-7115-110	O'Ring	SDP
14	A-2184	O'Ring (1/2" - 1 1/ 4")	Viton
	A-2336	O'Ring (1/4" & 3/8")	
	A-7115-111	O'Ring	SDP

Product Suggestion: Hard packing for 3000PSI and above service

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC
820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC
213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.
1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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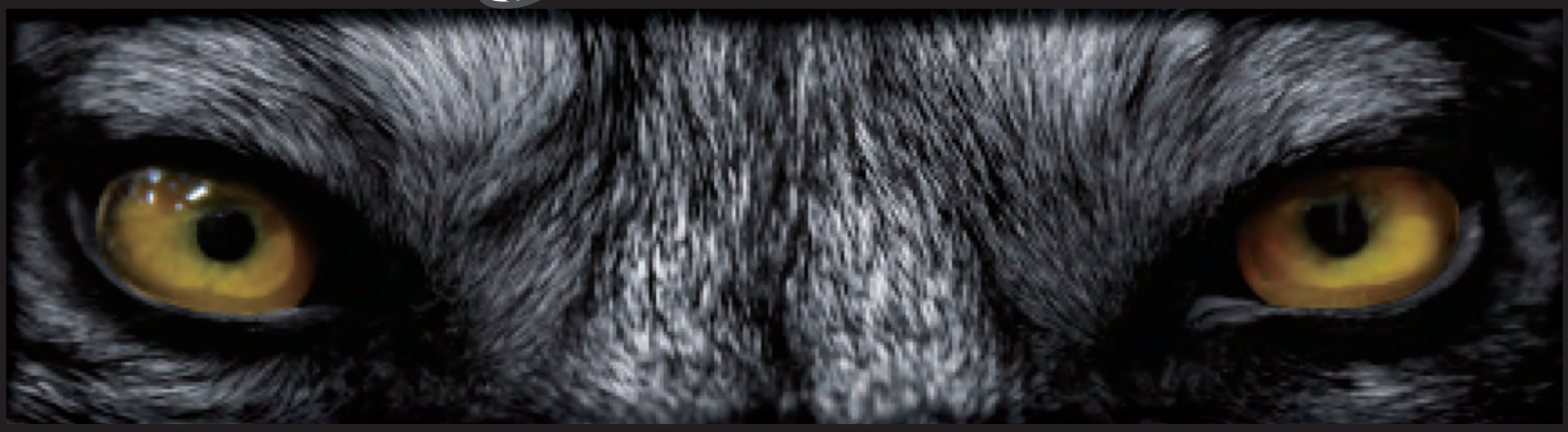
Different By Design

3500 Wolf Series



SIMPLEX

5.2021.23.j

3500 Simplex

*The Flomore 3500 series chemical injection pumps are electric driven, positive displacement pumps utilizing C-faced motors and common gear reducers. The gear reducers are available in 15, 30, 60, and 120 strokes per minute configurations. By utilizing even further flexibility of a wide variety of plunger sizes, the 3500 Series can fill many application requirements of different flow and pressures.

Additional Information

- Maximum discharge pressure:
  6000 PSI (413 bar) with 3/16" plunger
- Maximum volume 139 gallons per day (528 liters per day) w/1/2" plunger
- Head is adjustable while running
- Availiable Simplex and Duplex
- Availiable in four stroke rates:
  15,30,60, or 120 strokes per minute
- 1/2 horsepower motor standard; 1 or 3 phase, TFC or explosion proof; 50 or 60 hertz
- Available with 3/16",1/4" , 3/8", or 1/2" plunger

Model Designation

35 - 6 3

- 3500 Series
- Stroke Speed
  - 6 - 60 SPM
  - 3 - 30 SPM
- Plunger Size
  - 1-1/4"
  - 3-3/8"
  - 4-3/16"
  - 5-1/2"

3500 Simplex Performance Data

Model #	Plunger Size	Strokes Per Minute	Maximum Discharge Press(PSI)	Gallons Per Day (per head) Maximum	Minimum
35-34SS	3/16”	30	6000	4.9	0.5
35-64SS		60	6000	9.8	1
35-31SS	1/4”	30	4000	8.6	0.9
35-61SS		60	4000	17.3	1.7
35-33SS	3/8”	30	1800	19.6	2
35-63SS		60	1700	39.2	3.9
35-35SS	1/2”	30	1025	34.8	3.5
35-65SS		60	1000	69.7	7

**Note, Performance Data Complies with both Simplex and Duplex Pumps.*

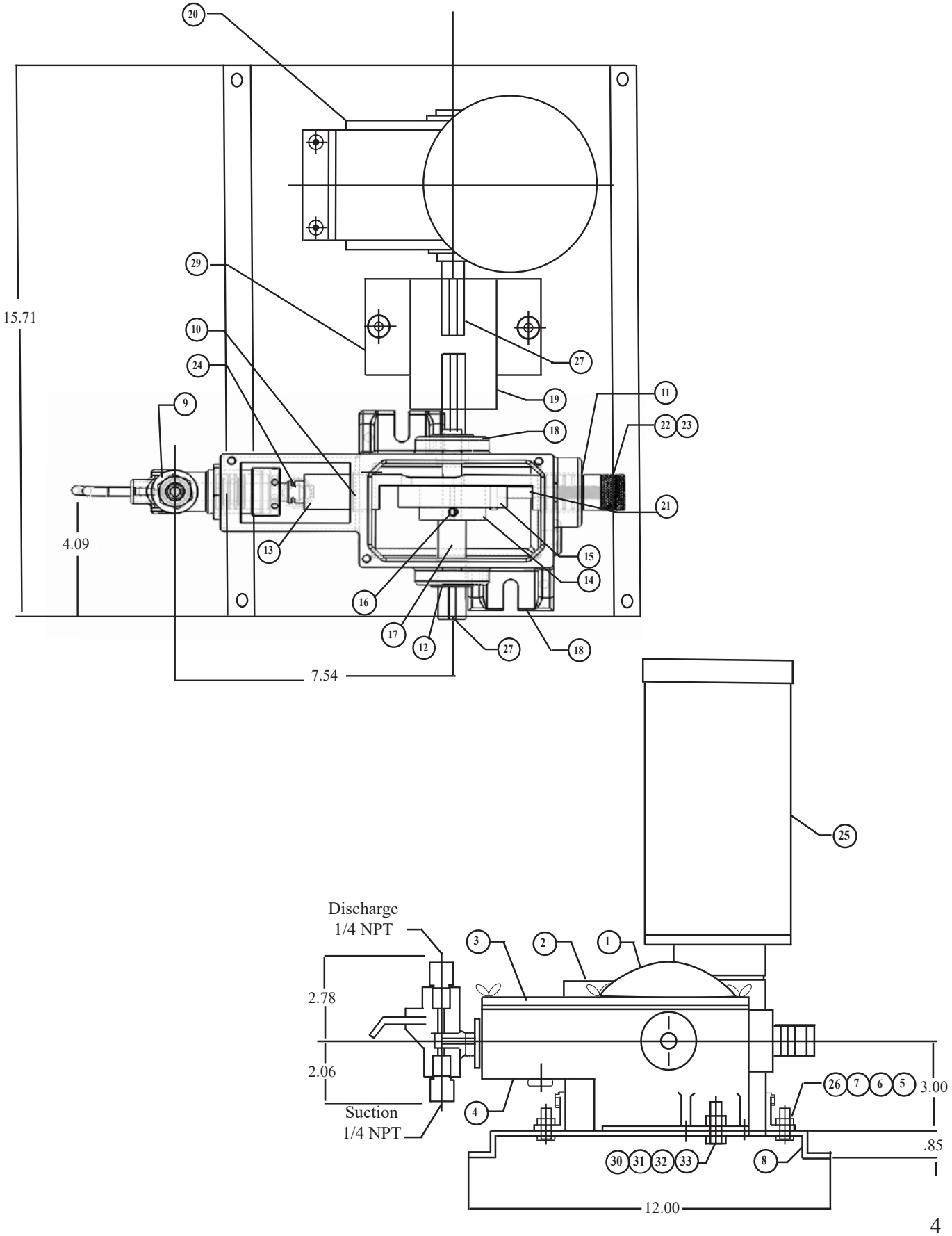
3500 Simplex Parts

Parts List

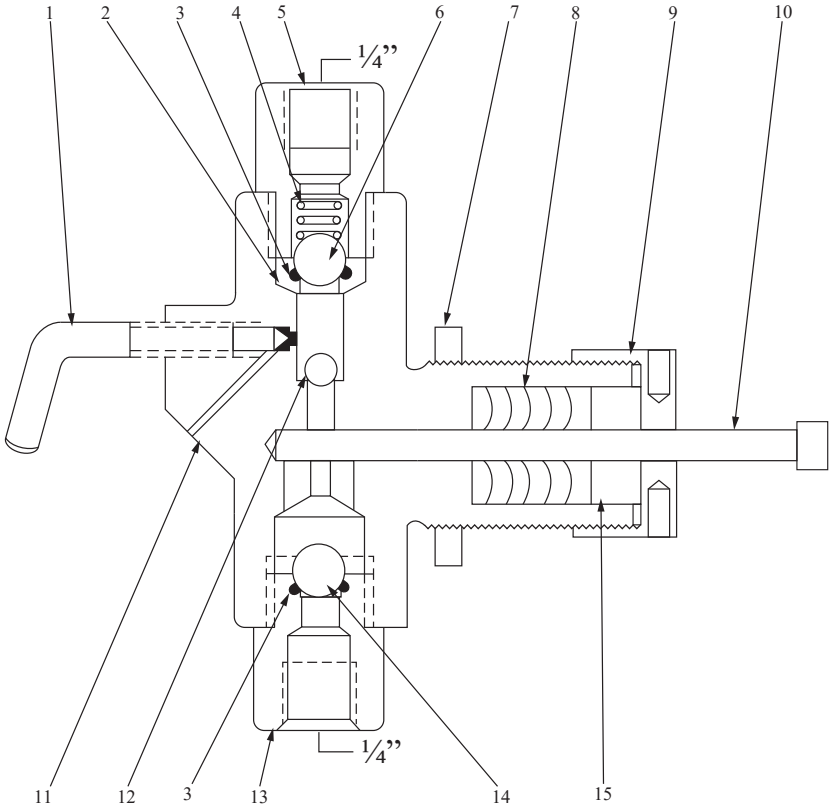
Item	Flomore Part #	Pcs Required	Description	Material
1	B-1483	1	Cover	363F Aluminum
2	A-0136	3	Thumbscrew	Gr 5 Zinc
3	A-5963	1	Cover Gasket	Nitrile
4	C-2048	1	Housing	356T6 Aluminum
5	A-0141	4	HHCS 5/16-18	Gr 5 Zinc
6	A-0144	4	Nut Hex 5/16-18	Gr 5 Zinc
7	A-0167	8	Cut Washer 5/16	Gr 5 Zinc
8	C-2197	1	Base Plate	Galv Steel
9	N/A	1	Head Assembly	316 SS
10	D-5964	1	Cross Head Bearing	Nylon
11	D-5965	1	Cross Head Bearing	Nylon
12	A-6935	1	Sleeve Bearing	Nylon
13	B-1542	1	Cross Head	316 SS
14	A-5823	1	Eccentric Cam	C1018 Steel
15	A-5830	1	Roller Bearing	Steel
16	A-5831	1	Set Screw	Steel
17	A-6386	1	Key	Steel
18	A-6936	1	Sleeve Bearing	Nylon
19	A-6714	1	Coupling	Steel
20	Gear Reducer	1	Reducer	N/A
21	A-5822	1	Stroke Adjustor	C1213 C.R.S
22	A-5824	1	Lock Nut , Stroke Adj.	416 SS
23	A-5825	1	Adjusting Screw	416 SS
24	A-5953	1	Drive Clip	Steel
25	N/A	1	Motor	N/A
26	A-0425	4	Lockwasher 5/16	GR 5 ZINC
27	B-1726	1	Drive Shaft	Steel
28	A-6720	1	Drive Shaft Key	Steel
29	B-1700	1	Coupling Guard	Steel
30	A-0139	2	HHCS 3/8-16x1.25	Gr 5 Zinc
31	A-2207	2	Hex Nut 3/8-16	Gr 5 Zinc
32	A-0746	4	Flatwasher 3/8	Gr 5 Zinc
33	A-0459	2	Lockwasher SPG 3/8	Gr 5 Zinc

**** For Installation and Operating Instructions See page 7.***

Parts Drawing



Injector Head



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	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 Seat Assembly (Metal-to-Metal)	316 Stainless Steel
13	B-0844	Suction Bushing with Viton O'Ring	303 Stainless Steel
* 14	A-0053	1/2" Suction Ball	316 Stainless Steel

*Recommended Spare Parts **Items must be used together

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
Super Duty	6000	4000	1800	1025

Parts List

Item #	Part # 3/16"	1/4"	3/8"	1/2"	# Reqd.	Description	Material
♦	♦	B-0166-0	B-0203-0	B-0496-0	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	B-1560-0	B-1557-0	B-1558-0	B-1559-0			All 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	Suction & Discharge O'Ring	Buna-N
4	A-0077				1	Ball Check 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	Locknut	Brass
* 8	A-3969	A-1461	A-1456	A-0959	1	Plunger Packing	Buna-N
9	A-4104				1	Plunger Packing Gland Nut	303 Stainless Steel
10	A-7001	A-7004	A-7002	A-7003	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			Stainless Steel
12	♦	A-0126			1	1/4" Small Top Ball	316 Stainless Steel
* 13	B-1216	B-0736			1	Bottom Seat Assembly-Buna	303 Stainless Steel
* 14	A-0054				1	3/8" Suction Ball	316 Stainless Steel
15	A-4332	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
16	A-0126	♦			1	1/4" Ball	316 Stainless Steel
17	A-4394	♦			1	Suction Bushing Sealing Washer	304 Stainless Steel

*Recommended Spare Parts ** Alternate construction availiable see chart above

Installation and Operating Instructions

Installation

1.Plan Ahead for proper mounting, pump location is very important. position it to provide efficient routing of suction, discharge lines and electric service.

- Avoid long suction lines and provide for a flooded suction line whenever possible.

2.Pump fluid lines, connections operate best when there is a minimum restriction to the medium flow.

3.Install the proper electical starters and disconnect switches

- It is recommended that a solid mounting support be provided--
- take advantage of factory installed holes in the base plate for securing the pump

Fluid End

4.All fluid connections both suction and discharge, should be sealed tight.

- Fluid end connections are 1/4” NPT
- The suction connection is at the bottom of the fluid end, and the discharge connection is at the top.

Motor

5.A conduit connection is provided at the motor for electrical connectons.

- Assure the proper electrical service has been provided.
- Assure all connections are tight, in their proper location, properly grounded and fused

Gear Reducer

6.Check the oil level of the gear reducer

- If the oil level is below the output shaft oil plug, refill to the plug with API approved oil

Start Up

7.Open the priming valve on the fluid end assembly and start the pump motor

8.Allow the pump to run until a clear bubbleless stream of media comes out of the priming valve

9.Close the priming valve

10.Check the packing for proper sealing.

- If it leaks, stop the pump and make necessary adjustments.Adjust the stroke adjustment knob to obtain the desired flow rate

Preventive Maintenance

11.Check periodically (min once per month) and apply small amout of grease to the cam bearing and to the crosshead areas that cycle through the linear bearings

- Check the packing regularly. If leakage is observed, stop the pump.
- Make small adjustments by turning the gland nut.
- Restart the pump but do not over tighten the packing as this will reduce the packing life and possibly damage the plunger.

*****It is always important to assure the packing material is compatible with the media being pumped, check for swollen or deteriorated seals.***

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC

820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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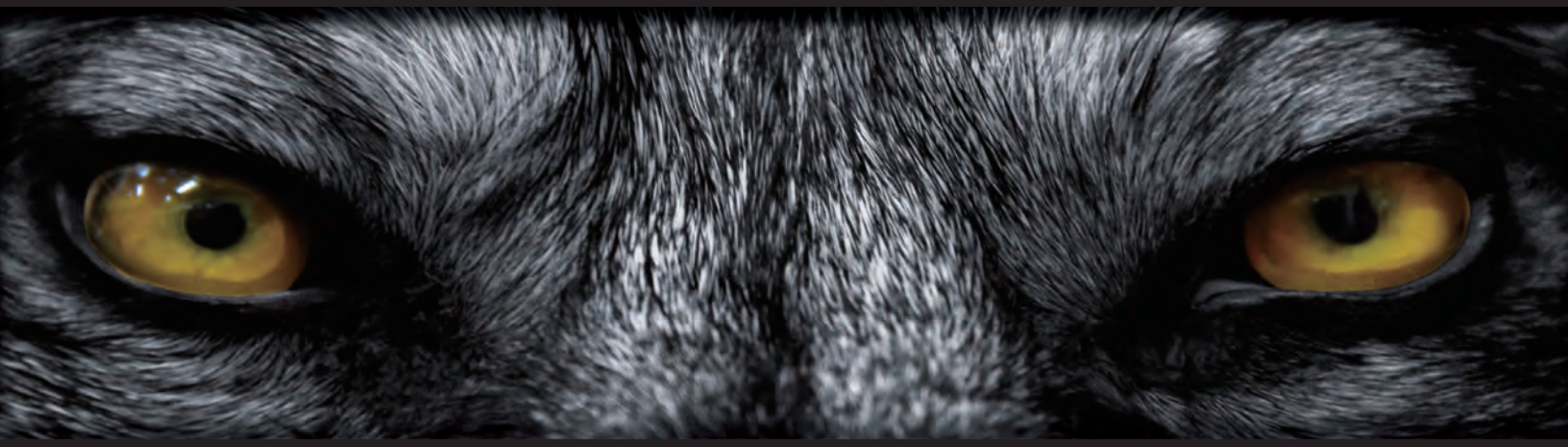
Different By Design

3500 Wolf Series



DUPLEX

5.2021.24.k

3500 Duplex

*The Flomore 3500 series chemical injection pumps are electric driven, positive displacement pumps utilizing C-faced motors and common gear reducers. The gear reducers are available in 15, 30, 60, and 120 strokes per minute configurations. By utilizing even further flexibility of a wide variety of plunger sizes, the 3500 Series can fill many application requirements of different flow and pressures.

Additional Information

- Maximum discharge pressure:
  6000 PSI (413 bar) with 3/16" plunger
- Maximum volume 139 gallons per day (528 liters per day) w/1/2" plunger
- Head is adjustable while running
- Availiable Simplex and Duplex
- Availiable in four stroke rates:
  15,30,60, or 120 strokes per minute
- 1/2 horsepower motor standard; 1 or 3 phase, TFC or explosion proof; 50 or 60 hertz
- Available with 3/16",1/4" , 3/8", or 1/2" plunger

Model Designation

35 6 3

3500 Series

Stroke Speed
6 - 60 SPM
3 - 30 SPM

Plunger Size
1-1/4"
3-3/8"
4-3/16"
5-1/2"

3500 Duplex Performance Data

**Patent Pending*

Model #	Plunger Size	Strokes Per Minute	Maximum Discharge Press(PSI)	Gallons Per Day (per head) Maximum	Minimum
35-34SS	3/16”	30	6000	4.9	0.5
35-64SS		60	6000	9.8	1
35-31SS	1/4”	30	4000	8.6	0.9
35-61SS		60	4000	17.3	1.7
35-33SS	3/8”	30	1800	19.6	2
35-63SS		60	1700	39.2	3.9
35-35SS	1/2”	30	1025	34.8	3.5
35-65SS		60	1000	69.7	7

**Note, Performance Data Complies with both Simplex and Duplex Pumps.*

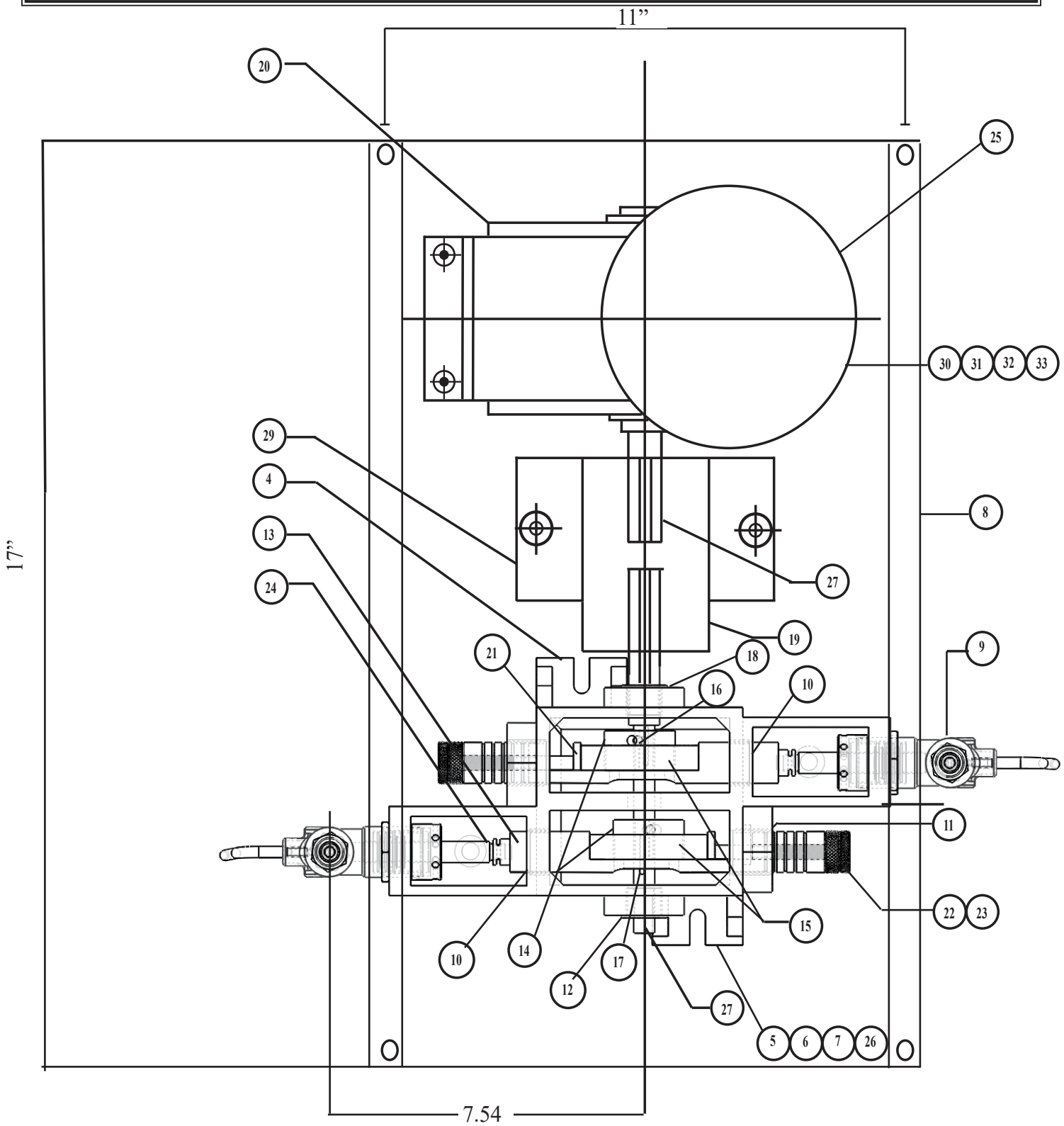
3500 Duplex Parts

Parts List

Item	Flomore Part #	Pcs Required	Description	Material
1	B-1483-DH	1	Cover	363F Aluminum
2	A-0136	3	Thumbscrew	Gr 5 Zinc
3	A-5963	1	Cover Gasket	Nitrile
4	C-2048-DH	1	Housing	356T6 Aluminum
5	A-0141	4	HHCS 5/16-18	Gr 5 Zinc
6	A-0144	4	Nut Hex 5/16-18	Gr 5 Zinc
7	A-0167	8	Cut Washer 5/16	Gr 5 Zinc
8	C-2197DH	1	Base Plate	Galv Steel
9	N/A	1	Head Assembly	316 SS
10	D-5964	2	Cross Head Bearing	Nylon
11	D-5965	2	Cross Head Bearing	Nylon
12	A-6935	1	Sleeve Bearing	Nylon
13	B-1542	2	Cross Head	316 SS
14	A-5823	2	Eccentric Cam	C1018 Steel
15	A-5830	2	Roller Bearing	Steel
16	A-5831	2	Set Screw	Steel
17	A-6386	2	Key	Steel
18	A-6936	1	Sleeve Bearing	Nylon
19	A-6714	1	Coupling	Steel
20	Gear Reducer	1	Reducer	N/A
21	A-5822	2	Stroke Adjustor	C1213 C.R.S
22	A-5824	2	Lock Nut , Stroke Adj.	416 SS
23	A-5825	2	Adjusting Screw	416 SS
24	A-5953	2	Drive Clip	Steel
25	N/A	1	Motor	N/A
26	A-0425	4	Lockwasher 5/16	GR 5 ZINC
27	B-1726.2	1	Drive Shaft	Steel
28	A-6720	1	Drive Shaft Key	Steel
29	B-1700	1	Coupling Guard	Steel
30	A-0139	2	HHCS 3/8-16x1.25	Gr 5 Zinc
31	A-2207	2	Hex Nut 3/8-16	Gr 5 Zinc
32	A-0746	4	Flatwasher 3/8	Gr 5 Zinc
33	A-0459	2	Lockwasher SPG 3/8	Gr 5 Zinc

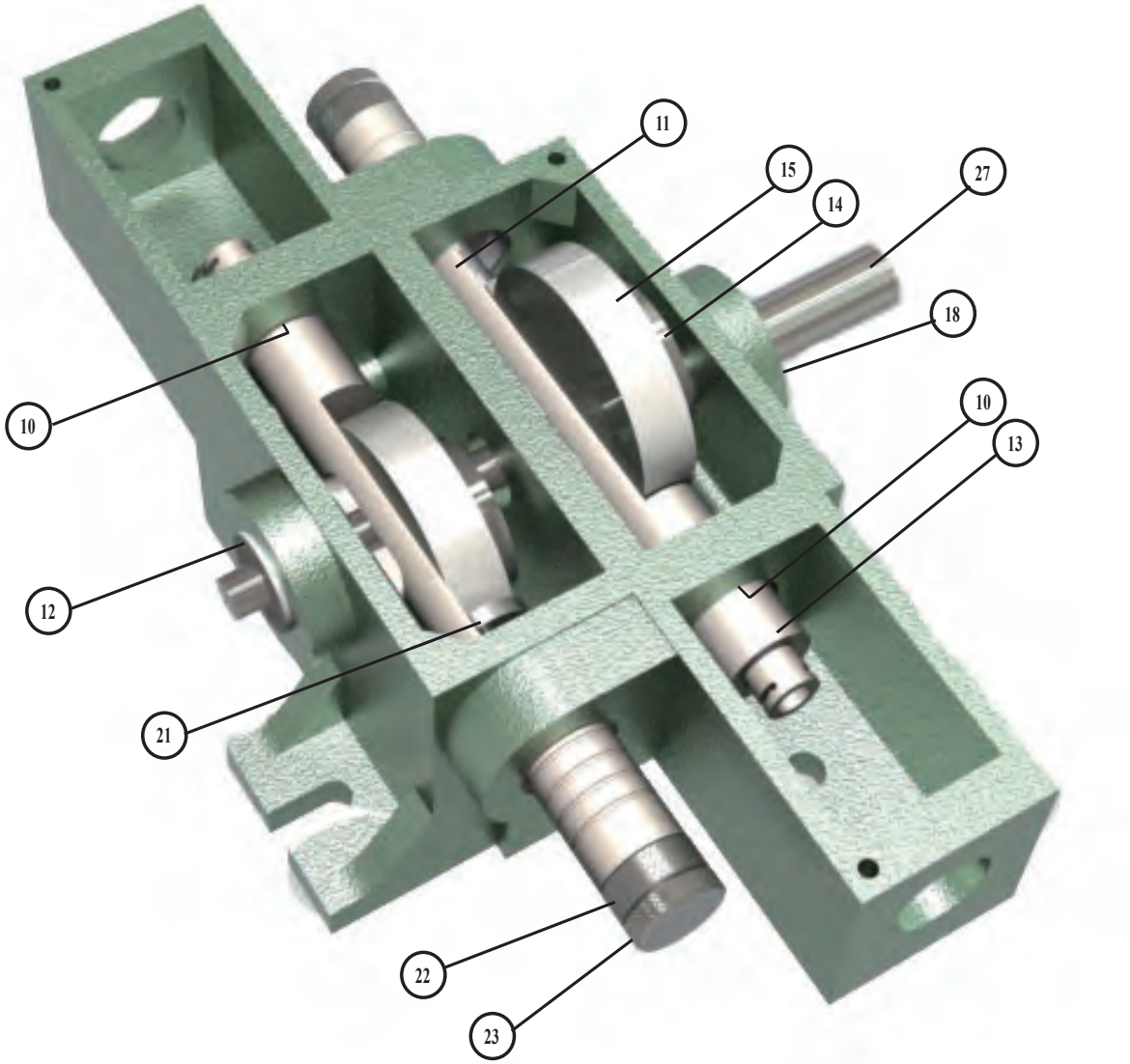
**** Items 1, 2 and 3 Indicate Pump Cover Components (not displayed in drawing)***

Parts Drawing



** For Installation and Operating Instructions See page 10*

Internal View

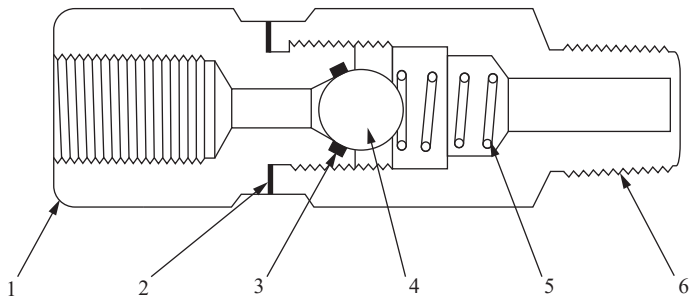


Item	Flomore Part #	Pcs Required	Description	Material
10	D-5964	2	Cross Head Bearing	Nylon
11	D-5965	2	Cross Head Bearing	Nylon
12	A-6935	1	Sleeve Bearing	Nylon
13	B-1542	2	Cross Head	316 SS
14	A-5823	2	Eccentric Cam	C1018 Steel
15	A-5830	2	Roller Bearing	Steel
18	A-6936	1	Sleeve Bearing	Nylon
21	A-5822	2	Stroke Adjustor	C1213 C.R.S
22	A-5824	2	Lock Nut,Stroke Adj.	416 SS
23	A-5825	2	Adjusting Screw	416 SS
27	B-1726.2	1	Drive Shaft	Steel

**** This table corresponds with parts list table on page 4***

3500 Duplex Components

A-0675 & A0676 Line Check



Parts List

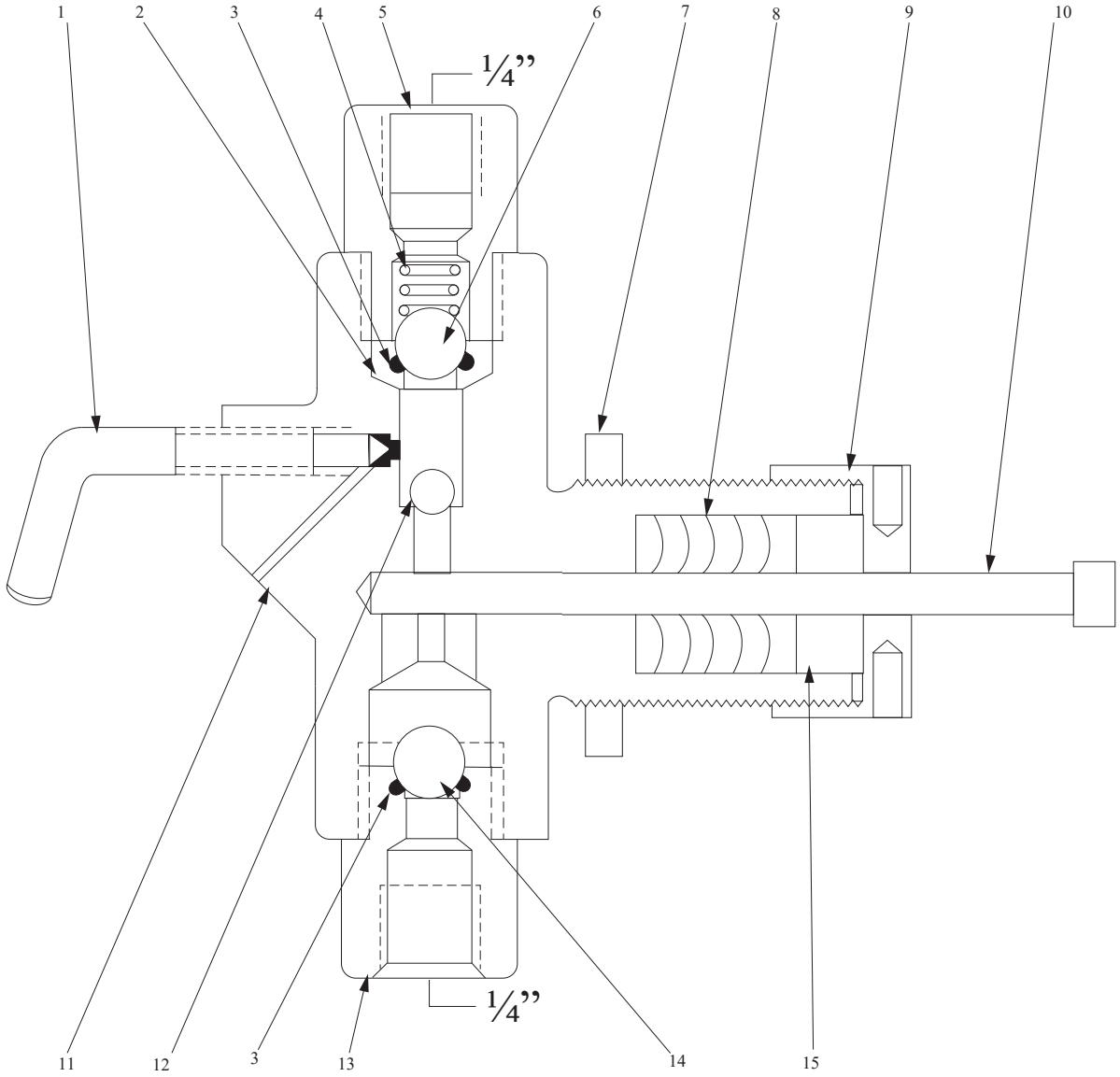
Item #	Part #	# Reqd.	Description	Material
1	A-0678	1	Inlet Body	Brass
	A-1297	1	Inlet Body	303 Stainless Steel
2	A-1574	1	Washer	304 Stainless Steel
3	A-0479	1	O-Ring	Buna-N
	A-2580	1	O-Ring	Viton
4	A-0054	1	⅜" Ball	316 Stainless Steel
5	A-0391	1	Spring	Steel
6	A-0679	1	Outlet Body	Brass
	A-1296	1	Outlet Body	303 Stainless Steel

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

Electric Motors

Flomore Part #	Horse Power	Enclosure Type	Phase	Voltage	Frequency
A-5896	.5	TEFC	1	115/230	60 hz
A-5897	.5	Explosion Proof	1	115-230	60hz
A-5898	.5	TEFC	3	230-460	60hz
A-5899	.5	Explosion Proof	3	230 1/460	60hz

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
Super Duty	6000	4000	1800	1025

Injector Heads

Parts List

Item #	Part # 3/16"	Part # 1/4"	Part # 3/8"	Part # 1/2"	# Reqd.	Description	Material
♦	♦	B-0166-0	B-0203-0	B-0496-0	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	B-1560-0	B-1557-0	B-1558-0	B-1559-0			All 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	Suction & Discharge O'Ring	Buna-N
4	A-0077				1	Ball Check 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	Locknut	Brass
* 8	A-3969	A-1461	A-1456	A-0959	1	Plunger Packing	Buna-N
9	A-4104				1	Plunger Packing Gland Nut	303 Stainless Steel
10	A-7001	A-7004	A-7002	A-7003	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			Stainless Steel
12	♦	A-0126			1	1/4" Small Top Ball	316 Stainless Steel
* 13	B-1216	B-0736			1	Bottom Seat Assembly-Buna	303 Stainless Steel
* 14	A-0054				1	3/8" Suction Ball	316 Stainless Steel
15	A-4332	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
16	A-0126	♦			1	1/4" Ball	316 Stainless Steel
17	A-4394	♦			1	Suction Bushing Sealing Washer	304 Stainless Steel

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	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 Seat Assembly (Metal-to-Metal)	316 Stainless Steel
13	B-0844	Suction Bushing with Viton O'Ring	303 Stainless Steel
* 14	A-0053	1/2" Suction Ball	316 Stainless Steel

*Recommended Spare Parts

**Items must be used together

Installation and Operating Instructions

Installation

1.Plan Ahead for proper mounting, pump location is very important. position it to provide efficient routing of suction, discharge lines and electric service.

- Avoid long suction lines and provide for a flooded suction line whenever possible.

2.Pump fluid lines, connections operate best when there is a minimum restriction to the medium flow.

3.Install the proper electical starters and disconnect switches

- It is recommended that a solid mounting support be provided--
- take advantage of factory installed holes in the base plate for securing the pump

Fluid End

4.All fluid connections both suction and discharge, should be sealed tight.

- Fluid end connections are 1/4" NPT
- The suction connection is at the bottom of the fluid end, and the discharge connection is at the top.

Motor

5.A conduit connection is provided at the motor for electrical connectons.

- Assure the proper electrical service has been provided.
- Assure all connections are tight, in their proper location, properly grounded and fused

Gear Reducer

6.Check the oil level of the gear reducer

- If the oil level is below the output shaft oil plug, refill to the plug with API approved oil

Start Up

7.Open the priming valve on the fluid end assembly and start the pump motor

8.Allow the pump to run until a clear bubbleless stream of media comes out of the priming valve

9.Close the priming valve

10.Check the packing for proper sealing.

- If it leaks, stop the pump and make necessary adjustments.Adjust the stroke adjustment knob to obtain the desired flow rate

Preventive Maintenance

11.Check periodically (min once per month) and apply small amout of grease to the cam bearing and to the crosshead areas that cycle through the linear bearings

- Check the packing regularly. If leakage is observed, stop the pump.
- Make small adjustments by turning the gland nut.
- Restart the pump but do not over tighten the packing as this will reduce the packing life and possibly damage the plunger.

*****It is always important to assure the packing material is compatible with the media being pumped, check for swollen or deteriorated seals.***

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FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC

820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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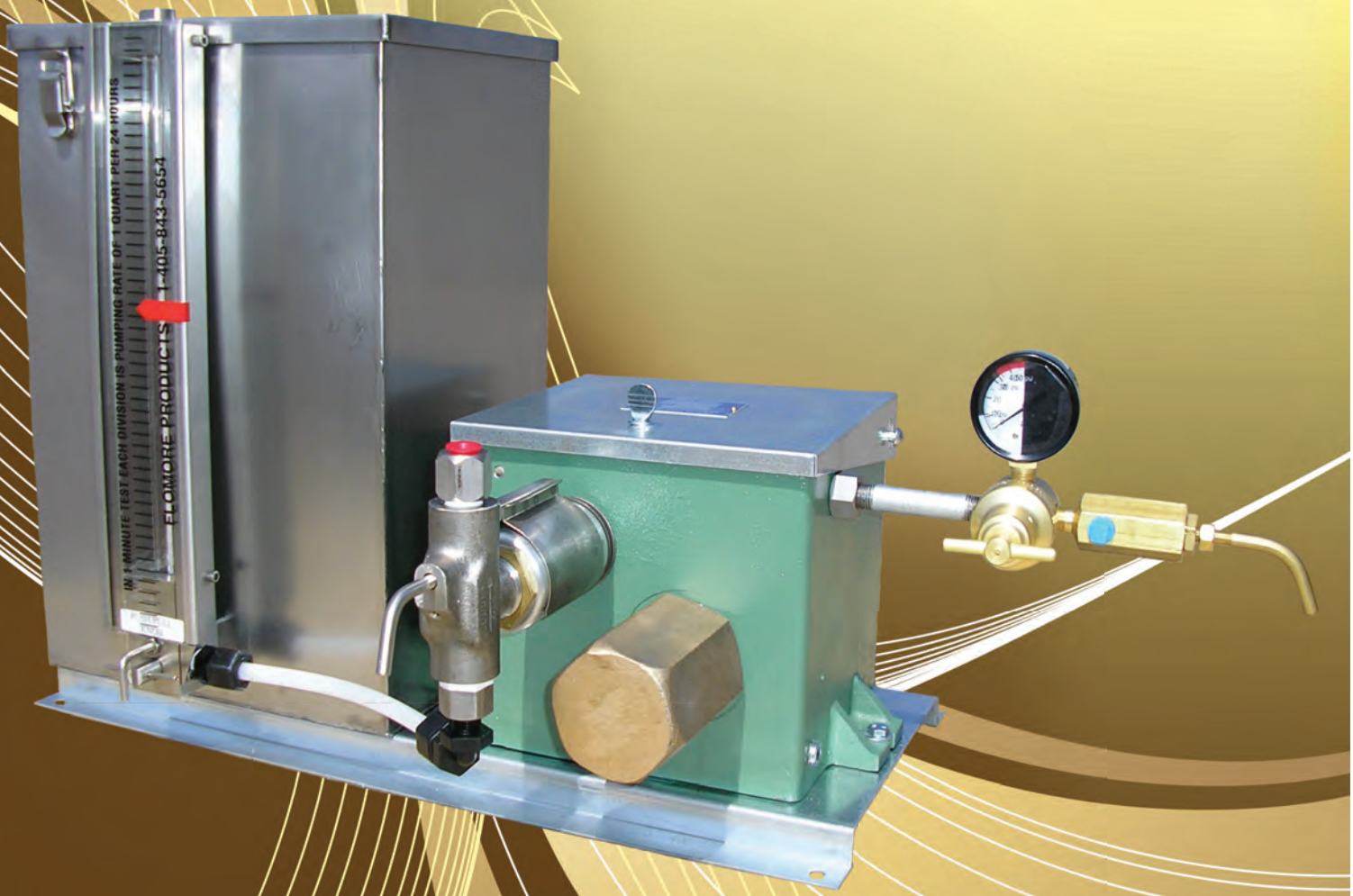
3800 Series Injector



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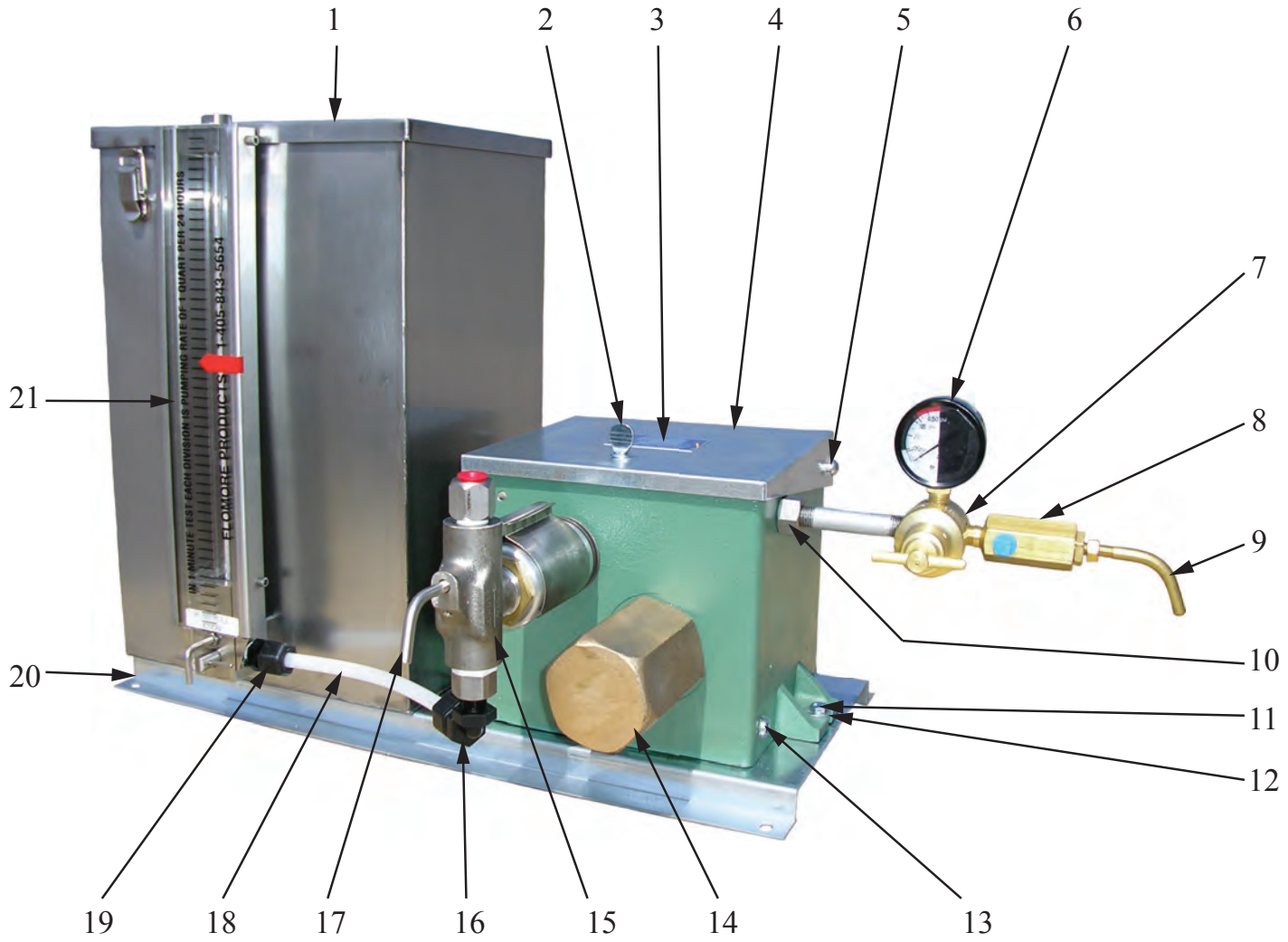
3800 Series Injector



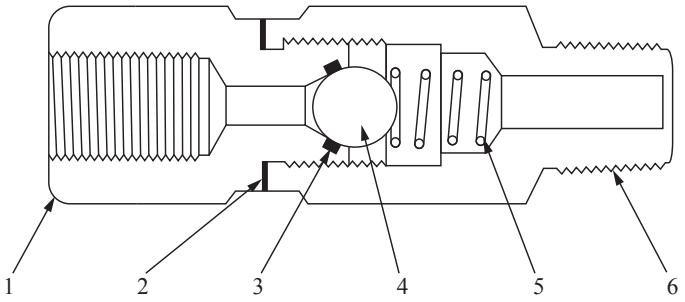
Parts List

Item #	Part #	# Reqd.	Description
1	A-0664	1	5 Gallon 430 Stainless Steel Reservoir
2	A-0575	1	Thumb Screw
3	A-0172	1	Nameplate
4	B-0206	1	Injector Box Cover
5	A-0528	2	Cover Rivets
6	A-1295	1	Pressure Gauge 0-100 PSIG
7	B-0040.01	1	Pressure Regulator
8	A-0193	1	Needle Valve & Stem Assembly
9	A-0013	1	Stem
10	A-0866	1	Inlet Bushing

Item #	Part #	# Reqd.	Description
11	A-0144	2	Hex Nut
12	A-0142	1	Hex Bolt
13	A-0138	2	Drain Plug
14	A-0390	1	Cylinder Shell
15	See Page 6	1	Injector Heads
16	A-3116	1	Elbow & Comp. Nut
17	A-1497	1	Priming Valve
18	A-3117	1	Supply Line
19	A-3118	1	Connector Half & Comp. Nut
20	A-0584	1	Single Tank Base
21	F-0871	1	Model 2000 Tank Gauge

3800 Series Components

A-0675 & A-0676 Line Check

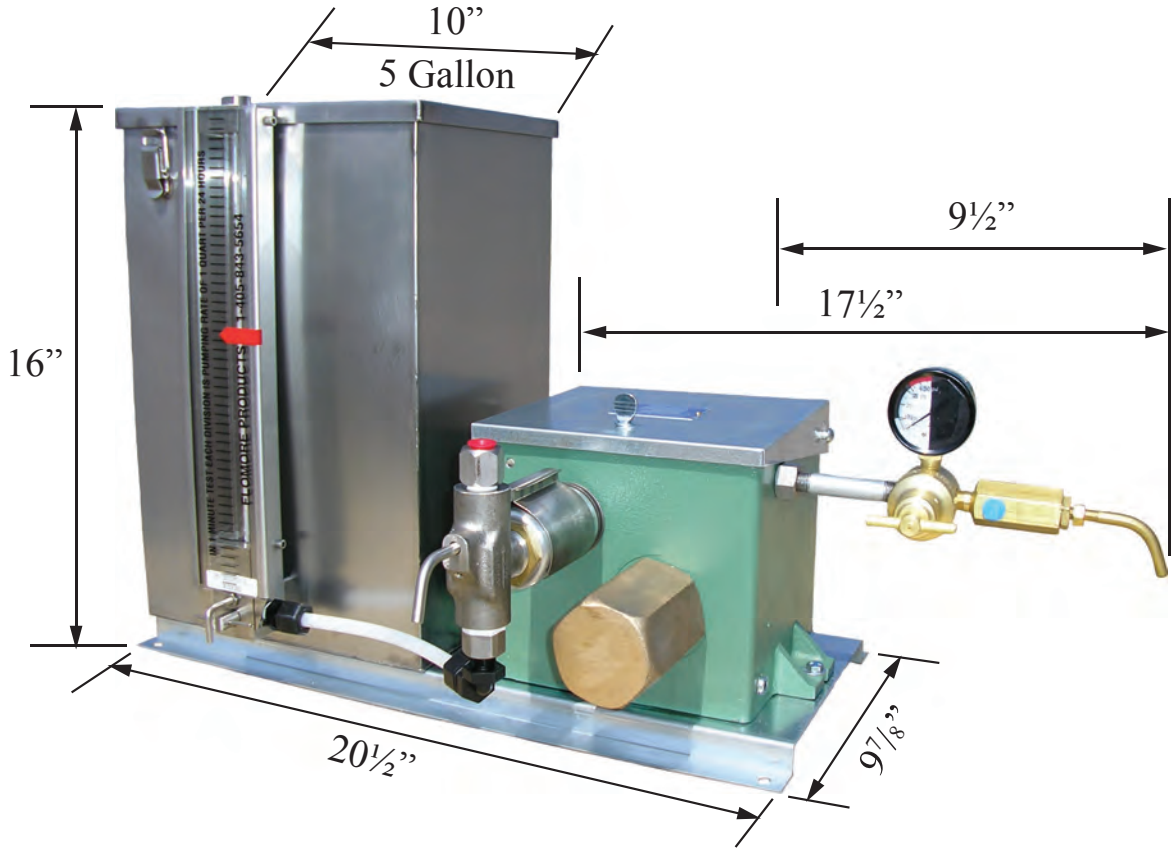


Parts List

Item #	Part #	# Reqd.	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	⅜" Ball	316 Stainless Steel
5	A-0391	1	Spring	Steel
6	A-0679	1	Outlet Body	Brass
	A-1296	1	Outlet Body	303 Stainless Steel

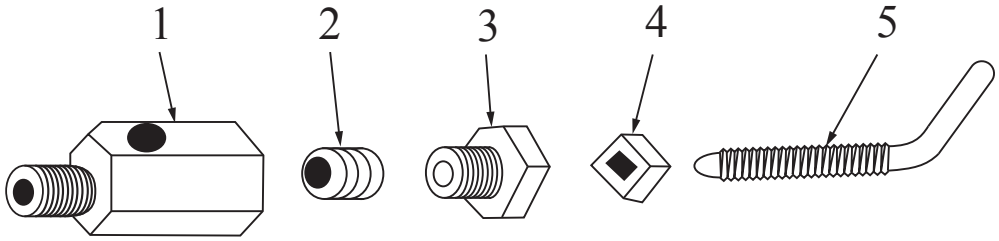
** Recommended Spare Parts* ***A-0675 Only* ****A-0676 Only*

3800 Dimensions



3800 Series Components

A-0193 Needle Valve & Stem

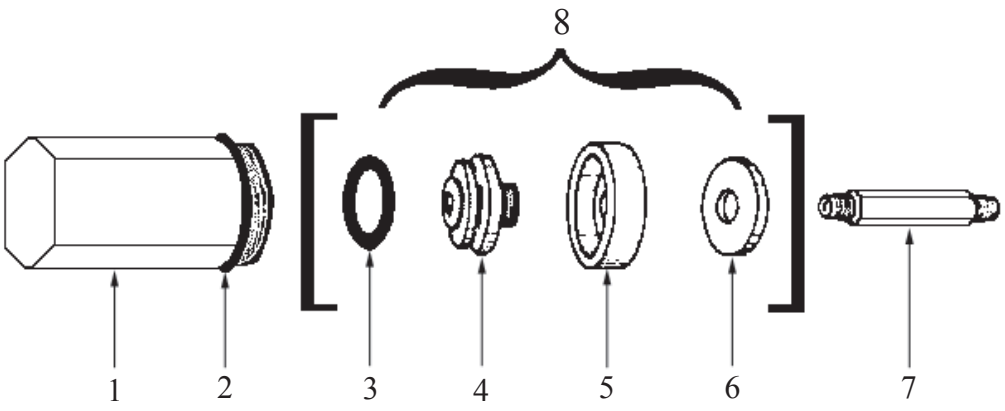


Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0010	1	Needle Valve Body	Brass
2	A-0023	1	Packing	Graphite
3	A-0011	1	Gland Nut	Brass
4	A-0195	1	Needle Valve Nut	Brass
5	A-0013	1	Stem	Brass

** Recommended Spare Parts*

Cylinder & Piston



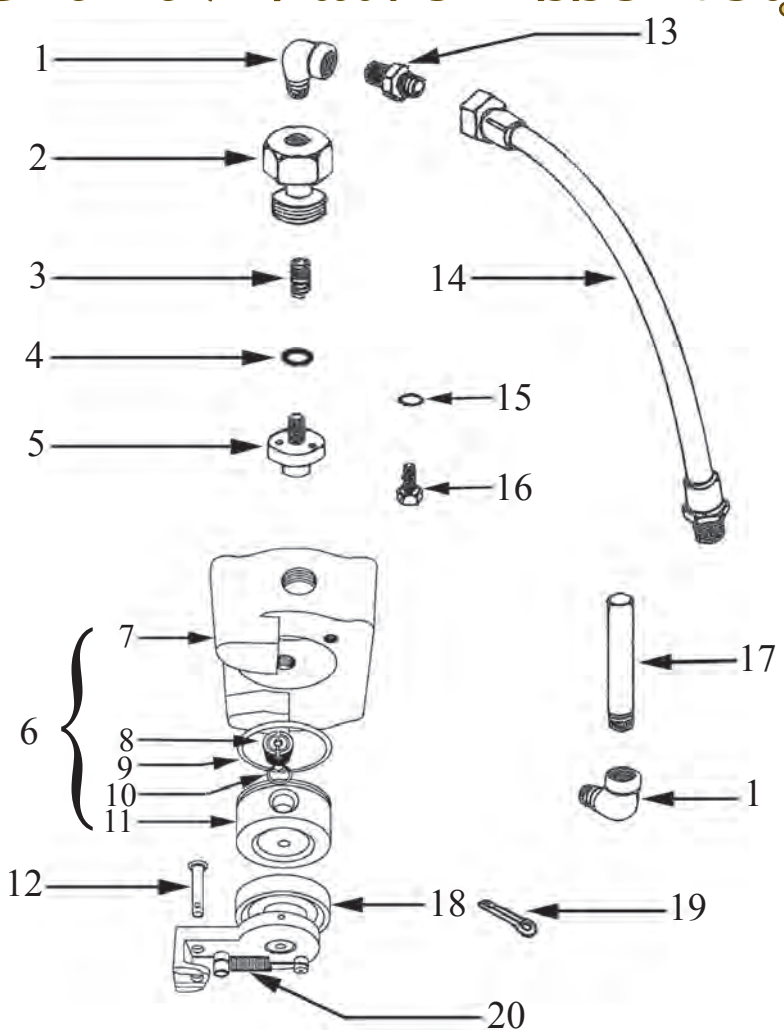
Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0390	1	Cylinder Shell	Aluminum
2	A-2457	1	O'Ring	Buna-N
3	A-0808	1	Cup Spring	Steel
4	A-1211	1	Cup Retainer	Aluminum
5	A-0867	1	Piston Cup	Leather
6	A-0890	1	Tapped Washer	Steel
7	A-0881	1	Piston Rod	Steel
8	A-0597	1	Piston Assembly	♦

** Recommended Spare Parts*

3800 Series Components

C-0107 Valve Assembly



Parts List

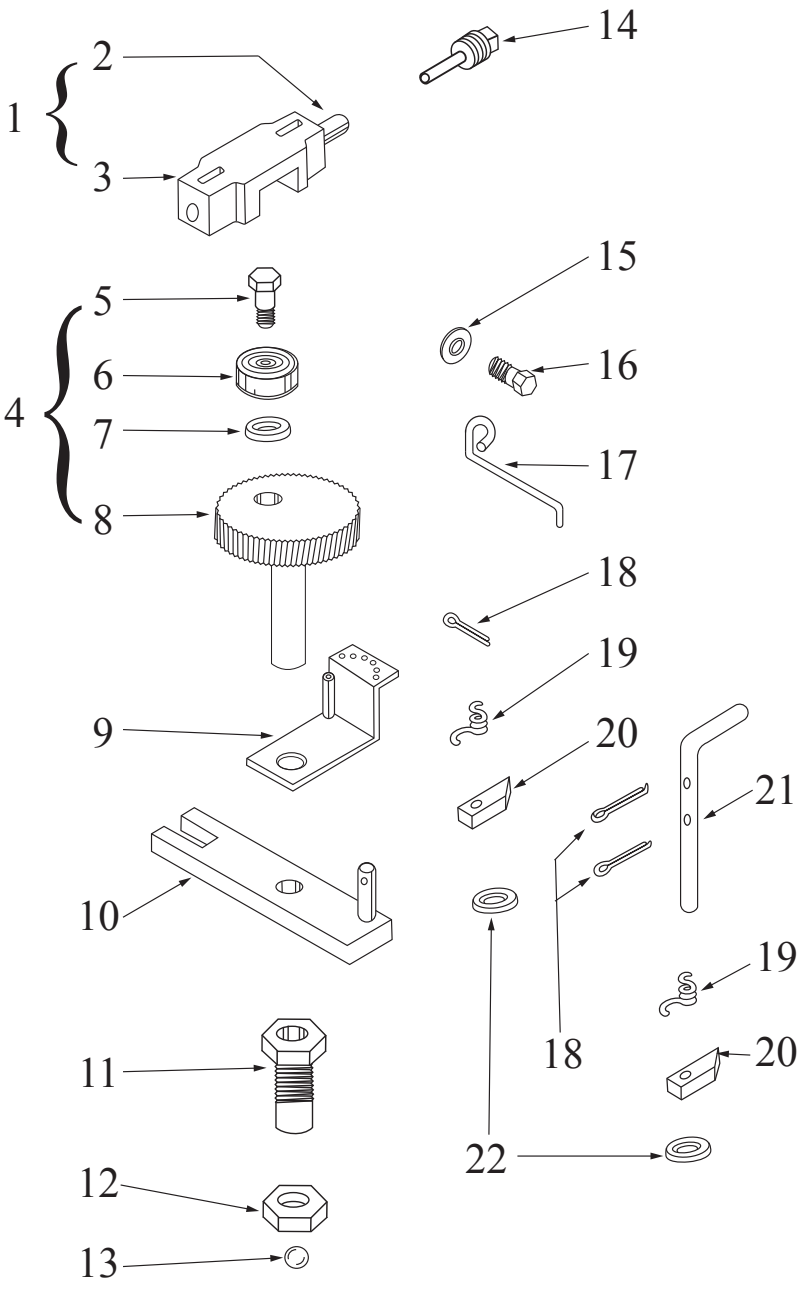
Item #	Part #	# Reqd.	Description	Material
1	A-0578	1	Street Elbow	Galvanized Steel
2	C-0028.03	1	Bushing	Steel
3	A-0077	1	Spring	316 Stainless Steel
4	A-0579	1	Washer	Stainless Steel
5	A-4669	1	Valve Disc & Pin Assembly	Steel
6	C-0028	1	Pilot Valve Sub Assembly	♦
7	C-0028.02	1	Pilot Valve Body	Ductile Iron
8	C-0463	2	Seat Seal Screw	Steel
9	C-0485	1	Seat Seal O'Ring	Buna-N

Item #	Part #	# Reqd.	Description	Material
10	C-0474	2	Seat Seal Screw O'Ring	Buna-N
11	C-0028.04	1	Valve Seat	Steel
12	A-0170	1	Clevis Pin	Steel
*13	A-0137	1	Half Union	Brass
*14	B-0047	1	Gas Inlet Hose	♦
15	A-0167	1	Washer	Steel
16	A-3387	1	Cap Screw	Steel
17	A-0761	1	Exhaust Nipple	Steel
18	A-0065	1	Flipper Arm Assembly	♦
19	A-0168	1	Cotter Pin	Steel
20	A-0508	1	Flipper Spring Assembly	Steel

** Recommended Spare Parts* **Items Sold Separately*

3800 Series Components

Ratchet Drive



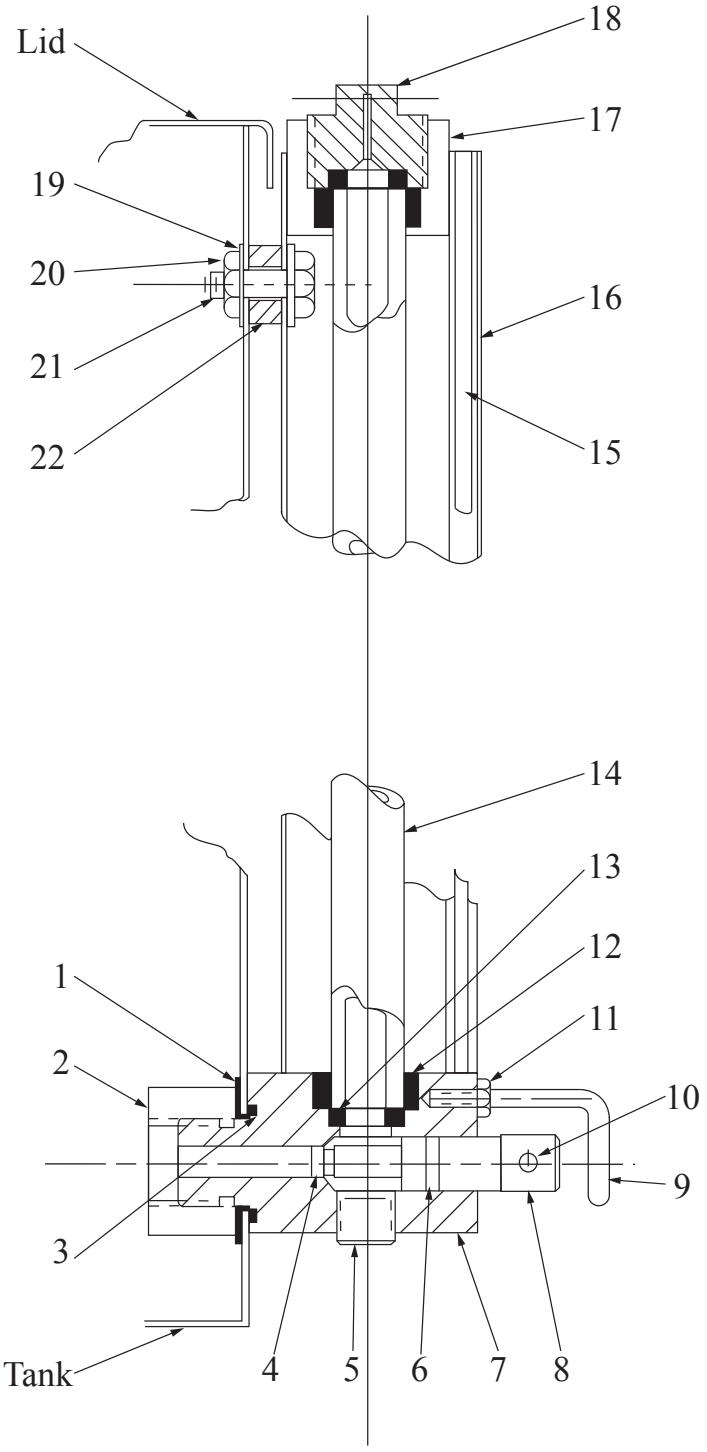
Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0585	1	Cross Head Assembly	Steel
2	A-0883	1	Guide Sleeve	Brass
3	A-0939	1	Cross Head	Steel
4	A-0586	1	Ratchet Sub-Assembly	Steel
5	A-0433	1	Bearing Bolt	Steel
6	A-0457	1	Ratchet Bearing	Steel
7	A-0458	1	Washer	Steel
8	B-0139	1	Ratchet Assembly	Steel
9	A-0948	1	Ratchet Control	Steel
10	A-0312	1	Cross Arm Assembly	Steel
11	A-0947	1	Bearing Insert	Steel
12	A-0107	1	Lock Nut	Brass
13	A-0126	1	Ball	316 Stainless Steel
14	A-0434	1	Guide Plug Assembly	Brass & Steel
15	A-0167	1	Washer	Steel
16	A-0574	1	Latch Bolt	Steel
17	A-0949	1	Ratchet Latch	Steel
18	A-2598	1	Cotter Pin	Steel
19	A-0955	1	Pawl Spring	Steel
20	A-0455	1	Ratchet Pawl	Heat Treated Steel
21	A-0956	1	Check Pawl Stud	Steel
22	A-0577	1	Washer	Steel

** Recommended Spare Parts*

3800 Series Components

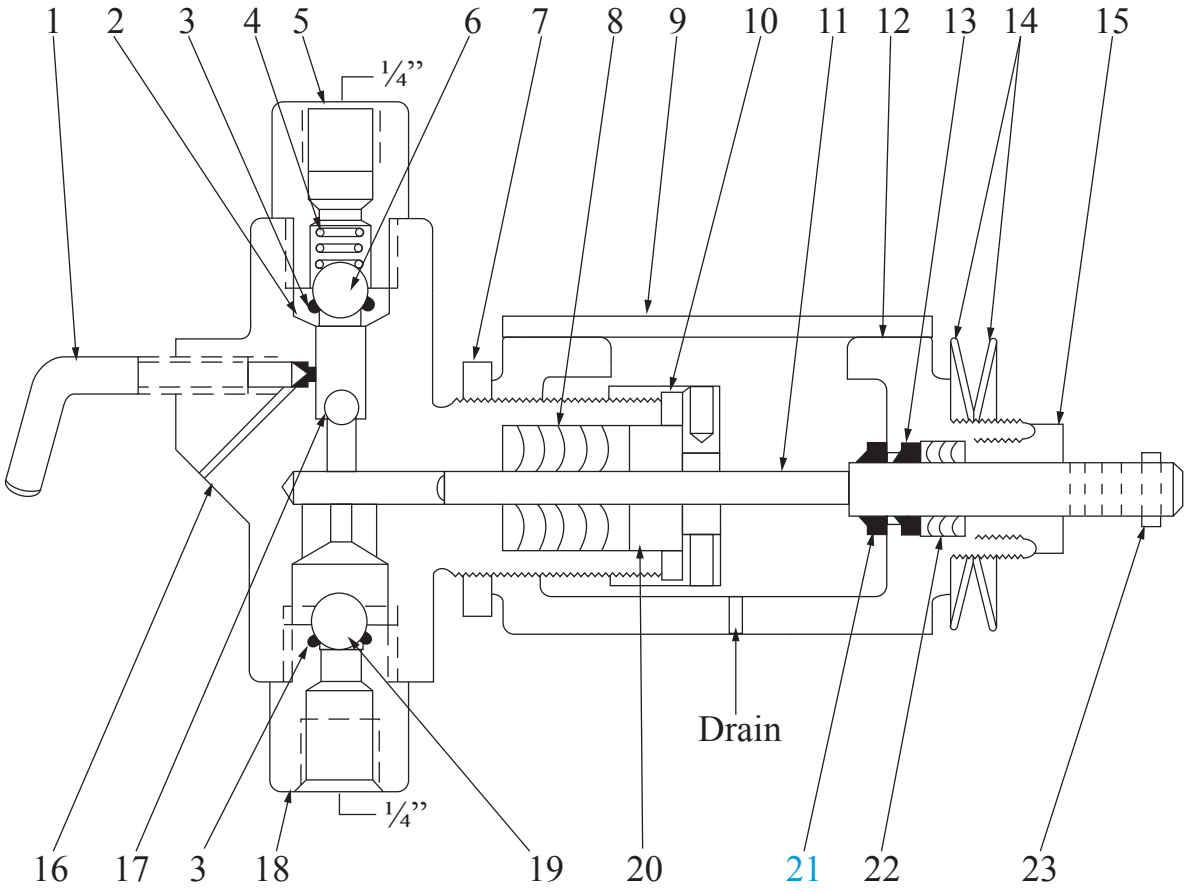
F-0871 Tank Gauge



Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0306	1	Washer	Teflon
2	F-0871.01	1	¾-16” Nut	Stainless Steel
3	F-0871.03	1	2-019 O’Ring	Viton
4	F-0871.04	1	2-006 O’Ring	Viton
5	A-0138	2	¼” NPT Pipe Plug	Steel
6	F-0871.06	1	2-011 O’Ring	Viton
7	F-0871.07	1	Valve Body	Stainless Steel
8	F-0871.08	1	Valve Stem	Stainless Steel
9	F-0871.11	1	Valve Stop	Stainless Steel
10	F-0871.09	1	⅛” x 2” Roll Pin	Stainless Steel
11	F-0871.10	1	Valve Stop Nut	Stainless Steel
12	15470	2	Tube Gasket	Buna-N
13	D-0013	2	Tube End Seal	Viton
14	A-3102	1	Glass Tube	Glass
15	F-0871.15	1	Scale	Acrylic
16	F-0871.16	1	Housing	Stainless Steel
17	F-0871.17	1	Top Block	Aluminum
18	F-0871.18	1	Vent Plug	Stainless Steel
19	A-4092	2	Stat-O-Seal	Steel
20	F-0871.20	1	¼-20” Nut	Stainless Steel
21	F-0871.21	1	¼-20” x ¾” Bolt	Stainless Steel
22	A-0987	1	Spacer	Stainless Steel

Injector Heads



Note: Drip Ring moves with the Plunger.

Alternate Construction

Item #	Part #	Description	Material
2	A-0806	Top Seat Assembly (Metal-to-Metal)	303 Stainless Steel
	A-0843	Top Seat with Viton O'Ring	
3	A-2580	O'Ring	Viton
8	A-4102	¼" Plunger Packing	Viton
	A-1642		Teflon
	A-2295		Hard
	A-4101	⅜" Plunger Packing	Viton
	A-1234		Teflon
	A-1875		Hard
	A-4103	½" Plunger Packing	Viton
	A-1012		Teflon
	A-1874		Hard
11	B-1175-C	¼" Ceramic Plunger	◆
	B-1176-C	⅜" Ceramic Plunger	
	B-1177-C	½" Ceramic Plunger	
18	A-0771	Bottom Seat Assembly (Metal-to-Metal)	303 Stainless Steel
	B-0844	Bottom Seat Assy. (Viton)	
19	A-0053	½" Ball	316 Stainless Steel

Injector Heads

Parts List

Item #	Part # ¼"	Part # ⅜"	Part # ½"	# Reqd.	Description	Material
♦	C-1578	C-1579	C-1580	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	C-1582	C-1583	C-1584			All Stainless Steel
1	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	⅜" Large Top Ball	316 Stainless Steel
7	A-0225			1	Yoke Lock Nut	Brass
*8	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	Plunger Packing Gland Nut	303 Stainless Steel
*11	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-0291	C-0425	C-0349			Stainless Steel
17	A-0126			1	¼" Small Top Ball	316 Stainless Steel
*18	B-0736			1	Bottom Seat Assembly- Buna	303 Stainless Steel
*19	A-0054			1	⅜" Suction Ball	316 Stainless Steel
20	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095			1	Plunger Drip Ring	Buna-N
22	A-4127			1	Yoke Packing Set	Buna-N
23	A-0290			1	Pin Plunger	Carbon Steel

*Recommended Spare Parts

*Alternate Components Availiable (see table above)

Plastic Injector Heads

Parts List

Item numbers below correspond with drawing on page 8.

Item #	Part # ¼"	⅜"	½"	# Reqd.	Description	Material
---	C-1570	C-1571	C-1572	1	Head Assembly	PVC
1	A-1497PVC			1	Priming Valve	PVC
2	B-0737PVC			1	Top Seat Assembly	PVC
3	A-2580			1	O'Ring	Viton
4	A-0077			1	Ball Check Spring	316 Stainless Steel
5	A-1496PVC			1	Top Bushing	PVC
6	A-0054.01			1	⅜" Large Top Ball	Ceramic
7	A-0225			1	Yoke Lock Nut	Brass
8	A-2701	A-2801	A-2901.01	1	Plunger Packing Set	Buna-N
9	C-1604			1	Yoke Cover	303 Stainless Steel
10	A-4104PVC			1	Plunger Packing Gland Nut	PVC
11	B-1175-C	B-1176-C	B-1177-C	1	Plunger	Ceramic
12	B-1170			1	Yoke	PVC
13	A-4095			1	Plunger Wiper Ring	Buna-N
14	A-4256			2	Belleville Washer	302 Stainless Steel
15	A-4104PVC			1	Yoke Packing Nut	PVC
16	C-0271	C-0273	C-0274	1	Body	PVC
17	A-0126.01			1	¼" Small Top Ball	Ceramic
18	B-0736PVC			1	Bottom Seat	PVC
19	A-0054.01			1	⅜" Suction Ball	Ceramic
20	A-2702	A-2802	A-2902	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095			1	Plunger Drip Ring	Buna-N
22	A-4127			1	Yoke Packing Set	Buna-N
23	A-0290			1	Pin Plunger	Carbon Steel

**Recommended Spare Parts*

Performance Data

Volume Output

*NOTE: Multiply volume by number of ratchet teeth engaged. Maximum number of teeth is six.

Cycles Per Min. Air Motor	*Ratchet Teeth Engaged	¼" Plunger			⅜" Plunger			½" Plunger		
		Short Stroke	Medium Stroke	Long Stroke	Short Stroke	Medium Stroke	Long Stroke	Short Stroke	Medium Stroke	Long Stroke
10	1	◆	◆	◆	◆	◆	◆	◆	◆	◆
20	2	◆	◆	◆	0.5	0.7	1.0	1.0	1.5	2.0
40	1	◆	◆	◆	0.8	1.5	3.0	1.2	3.0	5.3
60	1	0.5	1.0	1.8	1.1	2.6	4.5	2.3	5.0	8.2
80	1	0.7	1.4	2.6	1.7	3.7	6.0	3.2	6.7	10.5
100	1	1.0	2.0	3.4	2.3	4.8	7.7	4.3	8.7	14.0

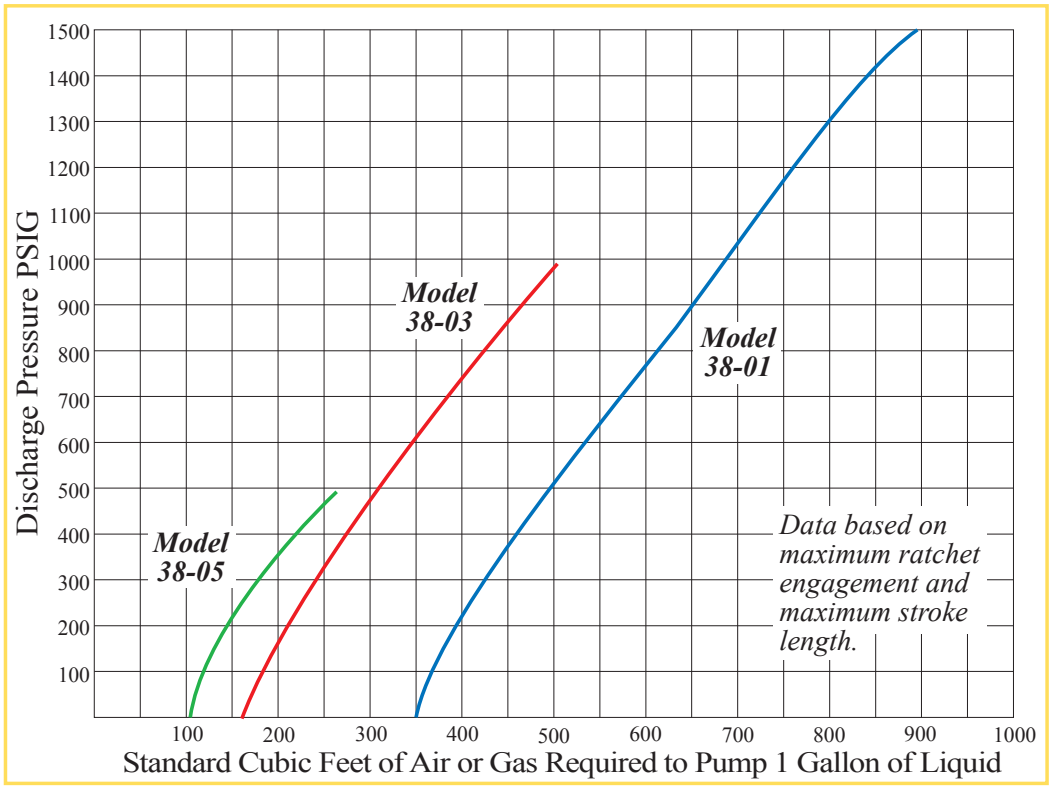
Volume in Pints per Day

Pressure Volume Range

*NOTE: For double headed units, increase maximum volume by two.

Plunger Size	Maximum Discharge Pressure	Model #	Pints per Day	
			Minimum Volume	Maximum Volume
¼"	1500	38-01	0.5	16
⅜"	1000	38-03	0.5	40
½"	500	38-05	1.0	70

Air/Gas Consumption



Volume Adjustment

Volume Adjustment

There are three principal adjustments involved in controlling injector volumes on the 3800 Series chemical injector. They are pointed out in the diagram at the right under the headings of Adjustments A, B and C.

Adjustment A:

1. Gas valve to control speed or number of strokes per minute of motor.

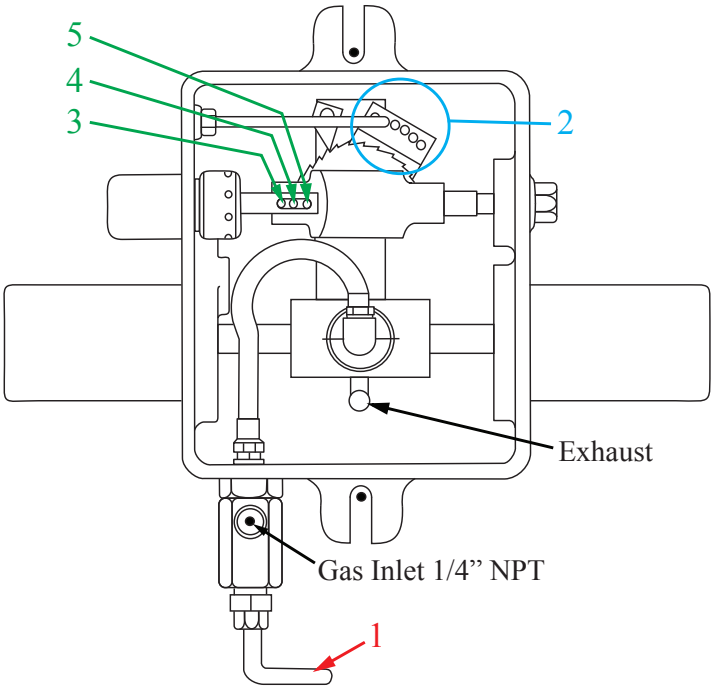
Adjustment B:

2. Ratchet control determines number of teeth drive pawl will engage each stroke of motor. Place ratchet latch A-0949 in the hole on the left to engage maximum number of teeth to pump maximum volume.

Adjustment C:

3. First position, long stroke (most volume).
4. Second position, medium stroke.
5. Third position, short stroke (least volume).

For maximum efficiency at any desired discharge rate, make adjustments in order A-B-C.



Installation and Operating Instructions

1. Remove pump from carton and inspect for possible damage in transit from factory. The cardboard carton was designed especially for this pump. If the pump has been damaged in transit, file a claim with the carrier.
2. Bolt holes are provided for a permanent mounting (see drawing for dimensions on page3).
3. Install the A-1497 priming valve (included with pump, but shipped loose in carton) on the pump head.
4. Connect the suction line to pump head.
    a. If a reservoir is furnished with the pump, the suction line is already connected. Fill the reservoir and open (all the way) the B-0871 shut-off assembly. A strainer is furnished as a part of this unit.
    b. If a power unit model was purchased, a strainer should be piped into the suction line to prevent sand, rust or other particles which will injure the plunger and foul the check valves.
5. Connect the discharge line (5/16" copper tubing will suffice). An A-0676 ¼" brass line check is provided with most models. This valve should be installed as close to the point of injection as possible. Note the arrow on the check valve indicating the direction of flow. The top connection on the pump head is the outlet and has a ¼" female pipe thread connection.
6. Connect the power gas line.
    a. First blow power gas line clean to remove any loose rust particles, slag, sand, etc.
    b. Consider the pressure requirements of the pump. If the gas supply exceeds 50 PSI (consider erratic pres sures), the pump should be equipped with a regulator to reduce the gas pressure to 50 PSI or below. The B-0040 regulator is capable of handling upstream pressures to 1500 PSI.
    c. Tie-in the gas line to the A-0193 needle valve or A-0866 inlet bushing.
7. Fill the A-0583 box assembly with enough SAE-30 oil to cover the A-0457 bearing (approximately 6¼ pts.) If low ambient temperatures are encountered, a lighter oil such as SAE-10 should be used. Check oil level at regular intervals with A-0946 oil gauge stick.
8. Adjust for desired volumes by considering Performance Data (page 11 & 12). If more volume is required, the pump head assembly can be changed or converted to a larger plunger size. Or, an additional head can be installed on the opposite side of the A-0583 box assembly by removing the A-0434 guide plug assembly. The A-0883 guide sleeve should also be removed and this can be accomplished with a drift and hammer.
9. Start the pump by slowly opening the A-0193 needle valve. Prime the pump head by opening the A-1497 priming valve. After the pump discharges clear fluid without bubbles, close the priming valve for normal operations. At this point make a visual check of the plunger drip, and using the A-0315 gland wrench that is included in the package, slowly tighten the gland to prevent excess drippage and waste of chemicals. **Do not overtighten plunger packing. Do not tighten with pressure on head.** Keep A-0315 gland wrench handy for future packing adjustment. It may be necessary to readjust the packing the next day. A slight leak during the break-in is beneficial. Sufficient time should be allowed to let the packing "seat-in".

    If low volumes are being pumped, the pump head, the fluid discharge line and all other fittings up to the line check should be thoroughly purged of all air bubbles.

    Check pump action by opening A-1497 priming valve.

Maintenance Instructions

To Inspect or Replace Power Cylinder or Piston Parts

Shut off the power gas pressure. Unscrew A-0390 cylinder shell. This will expose A-0597 piston assembly and A-0881 piston rod. To replace piston cup A-0867 or tapped washer A-0890, unscrew A-1211 piston cup retainer. A-0881 piston rod is hex material and is easily removed from C-0028 valve body.

To Inspect Pump Head Parts

Suction and discharge balls and seats can be inspected or replaced without removing pump head from the power unit. To do this it is necessary to disconnect suction and discharge lines at the head and unscrew A-1496 top bushing and B-0736 bottom bushing.

To Remove Pump Head From Gear Box

1. Disconnect suction and discharge line.
2. Pull A-0290 pin.
3. Entire fluid head can now be unscrewed from gear box.
4. Loosen gland nut.
5. Pull chemical plunger from head.
6. Remove A-0810 packing nut. This gives access to the yoke packing.
7. Loosen A-0225 lock nut. Yoke can then be unscrewed from fluid head (while unscrewing the upke the gland nut must also be backed-off). At this point, wiper washer, gland nut and packing gland nut can be removed. This gives access to the main plunger packing.

To Replace A-0065 Flipper Arm Assembly and Bearing

Temove both A-0166 cap screws and S-0167 washer from the underside of C-0028 valve body. To remove A-0947 bearing insert, loosen A-0107 lock nut. A-0126 valve ball should be inspected and replaced if necessary.

To Inspect or Replace A-0457 Ratchet Bearing

1. First remove A-0434 guide plug assembly.
2. Then remove the pump head from the gear box (in case of double headed pumps, both heads should be removed).
3. A-0585 cross head assembly can then be lifted out. A-0457 ratches bearing and A-0458 washer can now be inspected or replaced by removing A-0433 bearing bolt. B-0139 ratchet assembly can now be lifted out.
4. A-0948 ratchet control can be disconnected from A-0949 ratchet latch and lifted out.
5. A-0312 cross arm assembly can be slipped from under the A-0793 bushing and lifted out. A-0455 ratchet pawl, A-0955 pawl spring, A-0576 cotter key and A-0577 washer can now be inspected or replaced.
6. A-0793 bushing can be removed exposing A-0077 ball check spring, A-0579 washer and B-0136 valve disc for inspection.

To Remove B-0107 Switching Valve

Remove both A-0390 cylinder shells. Unscrew both A-0881 piston rods (A-0597 piston assemblies may be left on the A-0881 piston rod). At this point B-0107 valve and A-0065 flipper arm assembly can be lifted from gear box. A-0508 flipper spring sub-assembly can be replaced by removing A-0168 cotter pin and A-0170 clevis pin.

To Replace B-0047 Gas Hose

Unscrew the hex nut (attached to hose) from A-0137 half union. Then unscrew B-0047 hose from A-0866 inlet bushing.

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FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC

820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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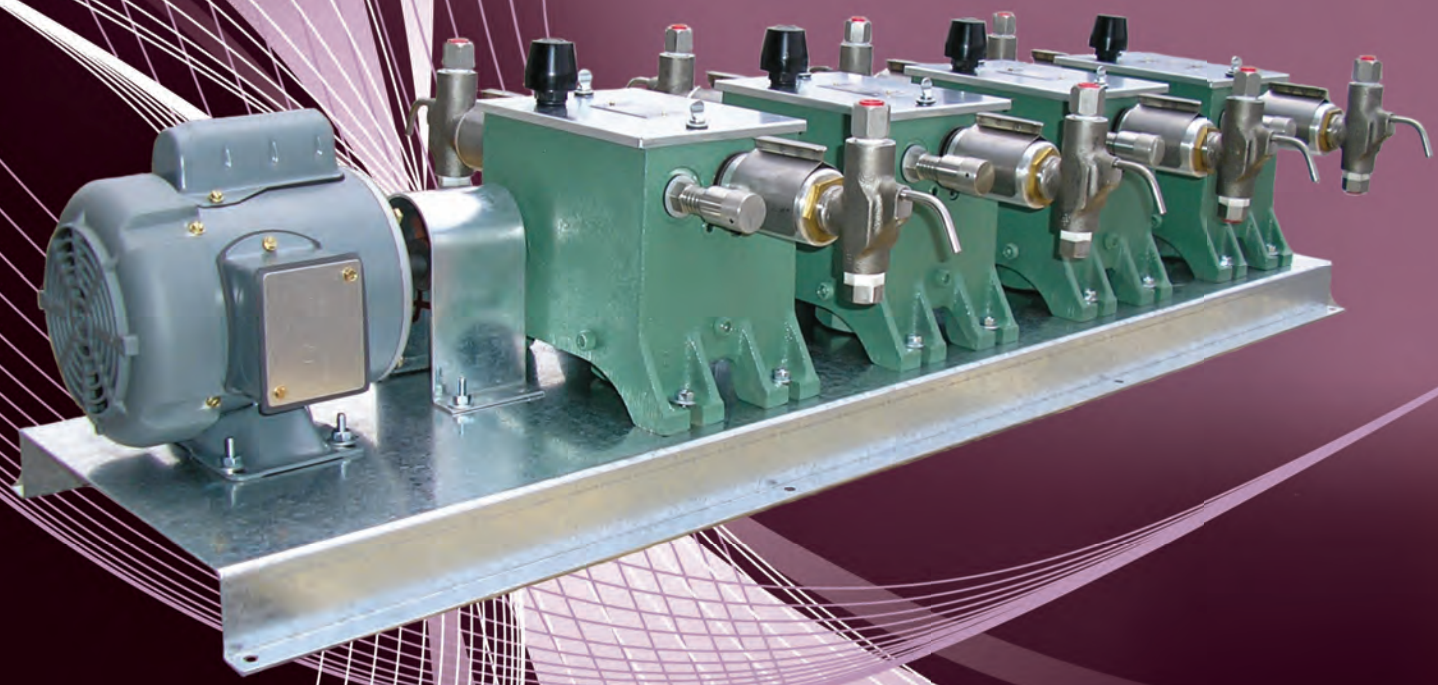
Different By Design

4400 Series Injector



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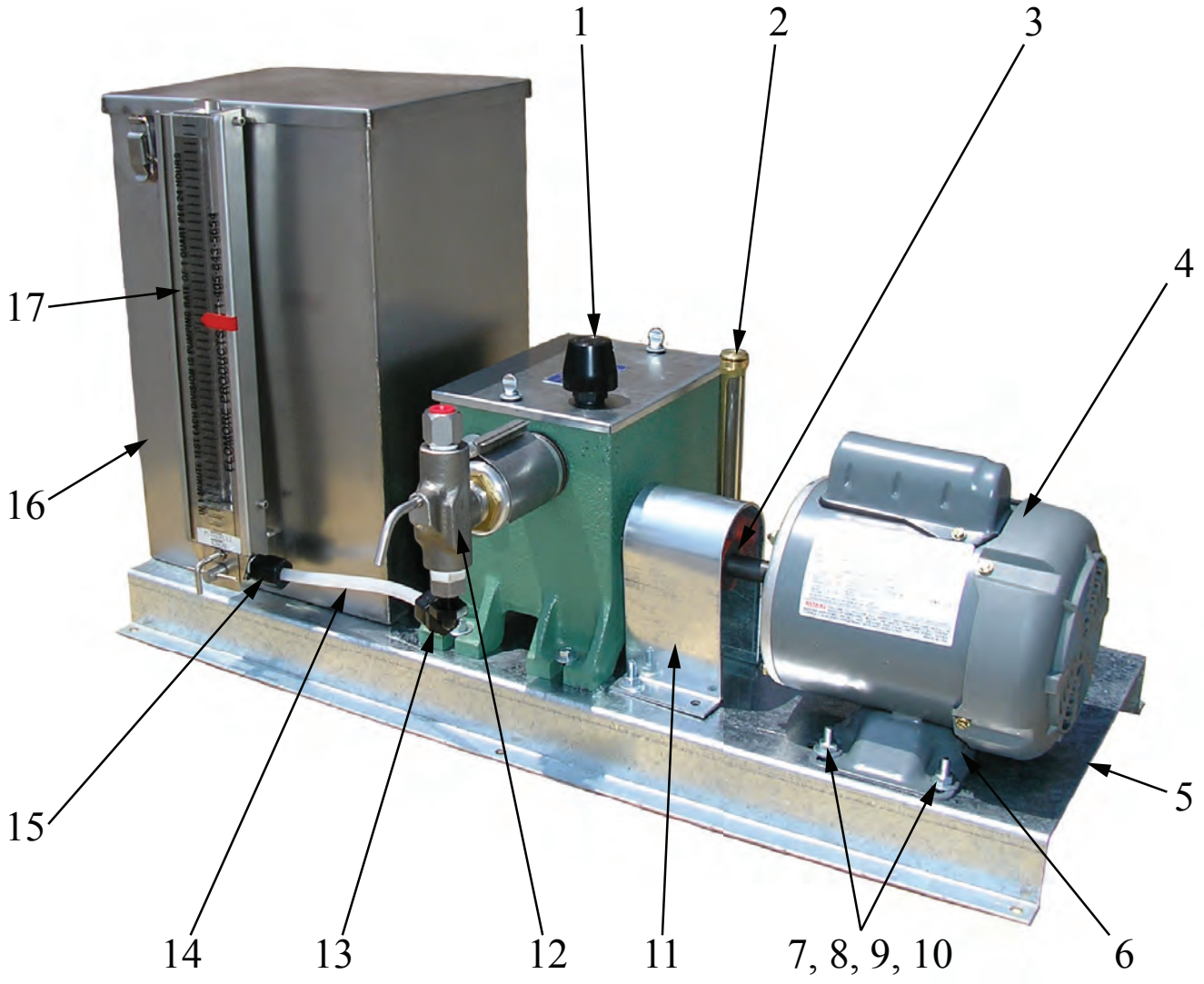
4400 Series Injector



Parts List

Item #	Part #	Description
1	A-2600	Breather
2	A-4066	Oil Gauge Assembly
3	A-1653	½" x ⅝" Coupling
4	A-2264	¼ HP, 1ph, 60 Hz, 115/230 Volt, TEFC
	A-2268	¼ HP, 3ph, 60 Hz, 230/460 Volt, TEFC
	A-2265	¼ HP, 1ph, 60 Hz, 115/230 Volt, Ex. Proof
	A-2271	¼ HP, 3ph, 60 Hz, 230/460 Volt, Ex. Proof
5	B-0431	Base for Two 5 Gallon Tanks and Pump
	B-0436	Base for One 5 Gallon Tank and Pump
	B-0437	Base for Pump
6	A-1741	Spacer for 48 Frame Motor Only

Item #	Part #	Description
7	A-0164	Hex Nut
8	A-3303	¼" Steel Lockwasher
9	A-0167	Cut Washer
10	A-0163	Cap Screw
11	B-1167	Coupling Guard
12	See Page 9	Head Assembly
13	A-3116	Elbow
14	A-3117	Polypropylene Tube
15	A-3118	Connector
16	A-0664	5 Gallon 430 Stainless Steel Chemical Tank
17	F-0871	Tank Gauge Assembly for 5 Gallon Tank

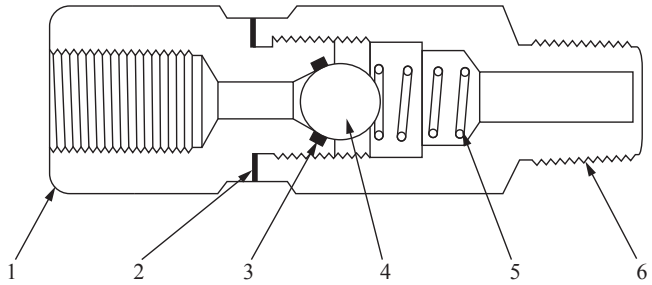
Operating Instructions and Components

Operating Instructions

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

1. Check oil level in gear box regularly. Observe oil level indicator Item #21 Page 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, consult your Flomore representative.
3. Each Flomore Series 4400 Pump has an adjustment for the required stroke length. To adjust stroke length see the ***Flow Rate Adjustment*** instruction note on page 4.

A-0675 & A-0676 Line Check

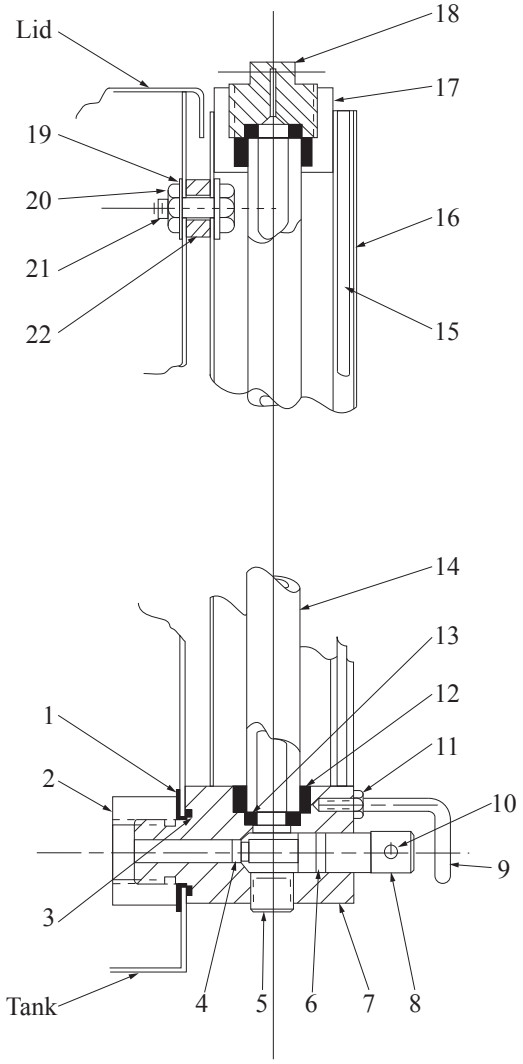


Parts List

Item #	Part #	# Reqd.	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	⅜" Ball	316 Stainless Steel
5	A-0391	1	Spring	Steel
6	A-0679	1	Outlet Body	Brass
	A-1296	1	Outlet Body	303 Stainless Steel

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

F-0871 Tank Gauge

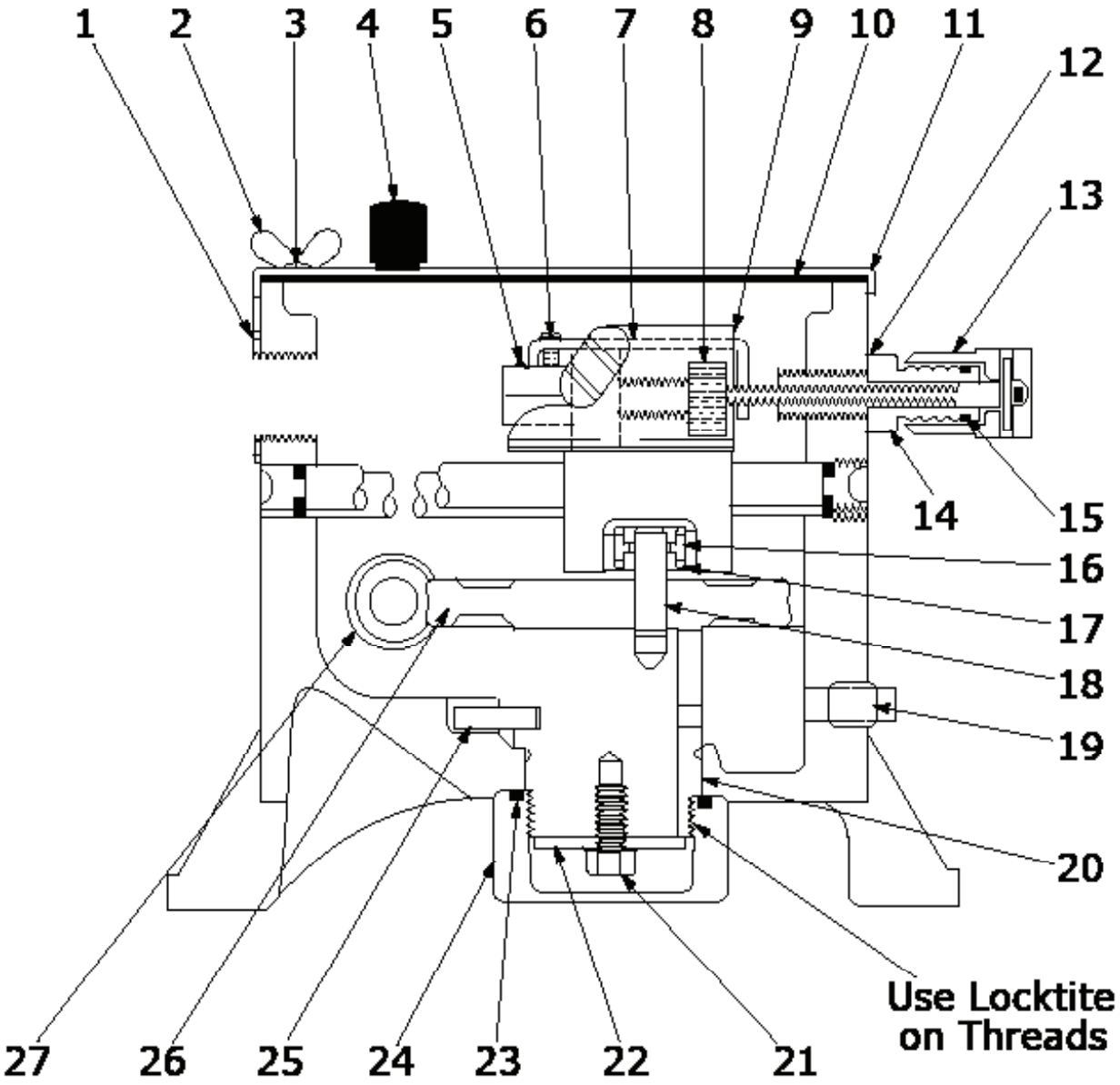


Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0306	1	Washer	Teflon
2	F-0871.01	1	¾-16" Nut	Stainless Steel
3	F-0871.03	1	2-019 O'Ring	Viton
4	F-0871.04	1	2-006 O'Ring	Viton
5	A-0138	2	¼" NPT Pipe Plug	Steel
6	F-0871.06	1	2-011 O'Ring	Viton
7	F-0871.07	1	Valve Body	Stainless Steel
8	F-0871.08	1	Valve Stem	Stainless Steel
9	F-0871.11	1	Valve Stop	Stainless Steel
10	F-0871.09	1	⅛" x 2" Roll Pin	Stainless Steel
11	F-0871.10	1	Valve Stop Nut	Stainless Steel
12	15470	2	Tube Gasket	Buna-N
13	D-0013	2	Tube End Seal	Viton
14	A-3102	1	Glass Tube	Glass
15	F-0871.15	1	Scale	Acrylic
16	F-0871.16	1	Housing	Stainless Steel
17	F-0871.17	1	Top Block	Aluminum
18	F-0871.18	1	Vent Plug	Stainless Steel
19	A-4092	2	Stat-O-Seal	Steel
20	F-0871.20	1	¼-20" Nut	Stainless Steel
21	F-0871.21	1	¼-20" x ¾" Bolt	Stainless Steel
22	A-0987	1	Spacer	Stainless Steel

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 #	# Reqd.	Description	Material
1	A-4256	2	Belleville Washer	302 Stainless Steel
* 2	A-2970	2	Wing Screw	Cadmium Plated Carbon Steel
3	A-4092	2	¼" Stat-O-Seal	Buna-N
4	A-2600	1	Breather	♦
* 5	A-0290	1	Plunger Pin	Carbon Steel
* 6	A-3312	1	Lockwasher	Cadmium Plated Steel
	A-4753		Round Head 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		⅜" Spring Lockwasher	
* 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)	

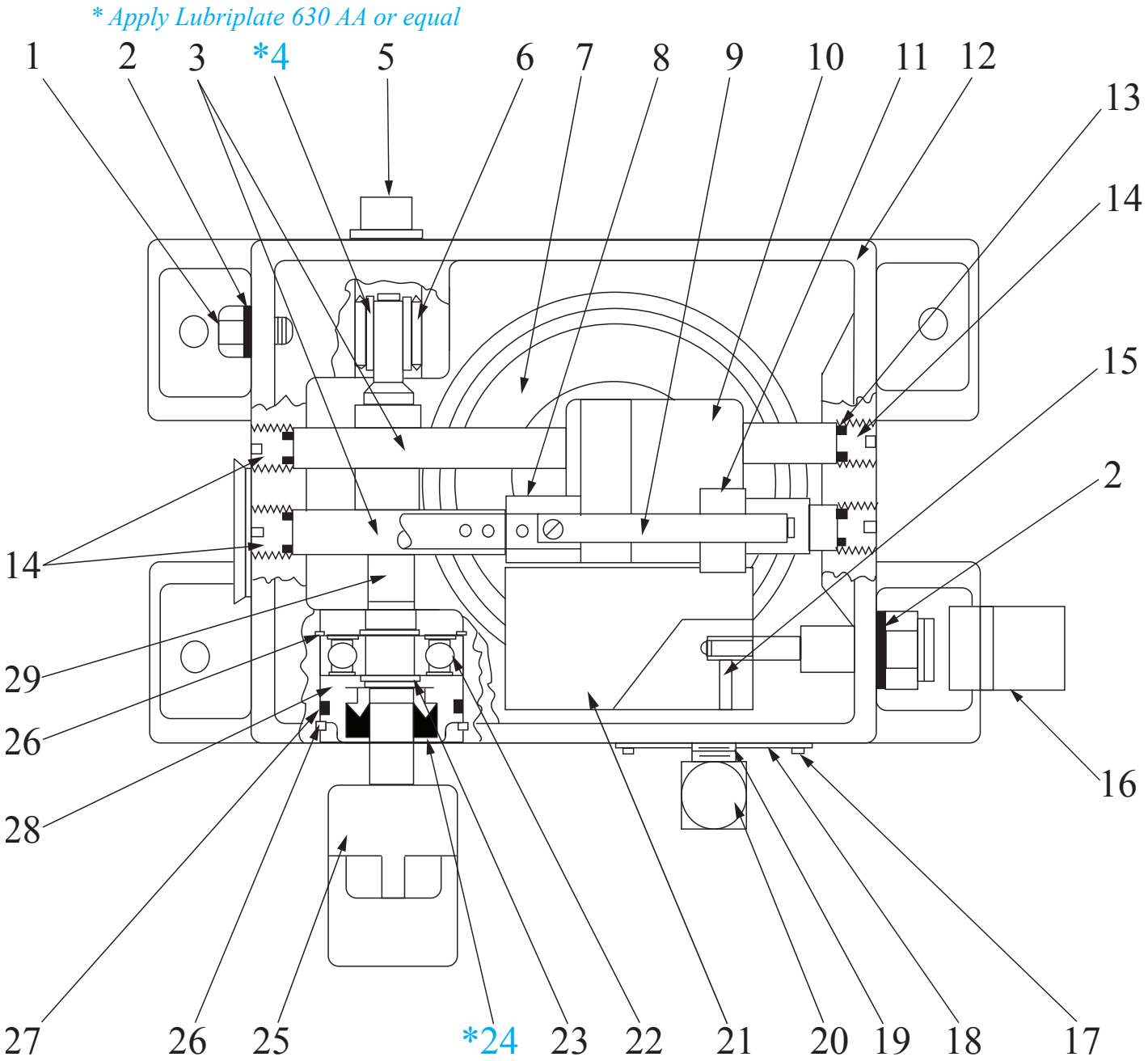
** Recommended Spare Parts*

** Parts are directly interchangable with Series 4100, 4200 and 4300 Pumps*

♢ 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

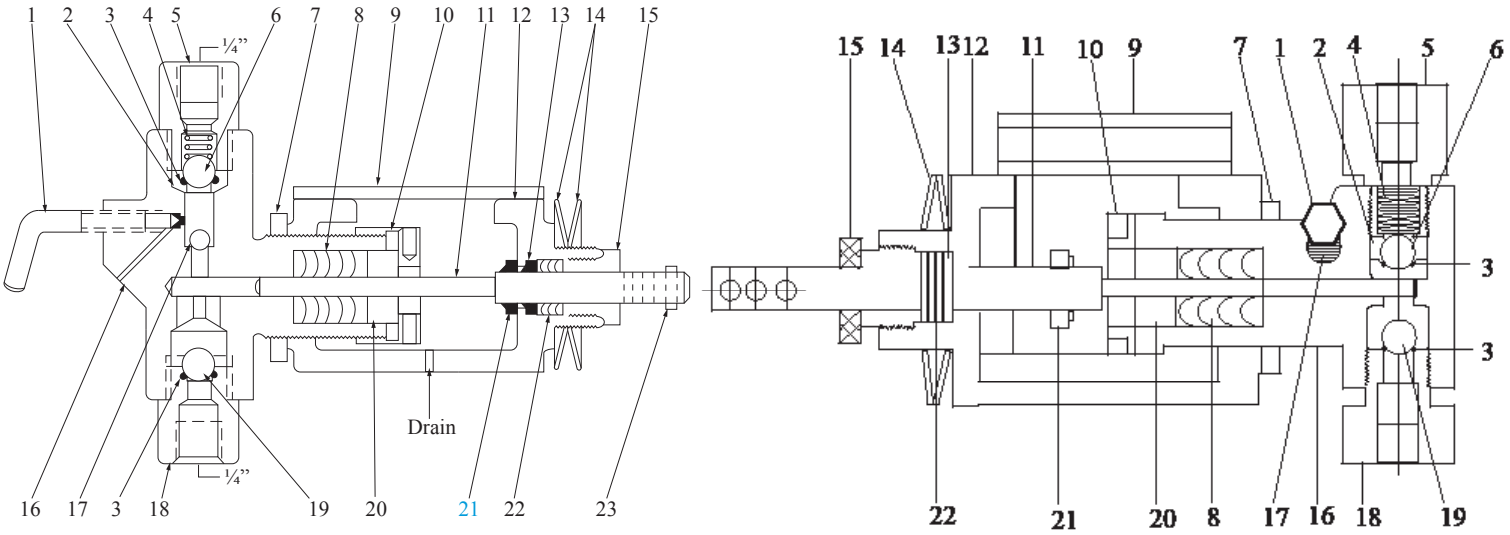
Item #	Part #	# Reqd.	Description	Material
1	A-4795	1	Bolt	Cadmium Plated Steel
2	A-4759	1	Gasket	Buna-N
3	A-4229	2	Crosshead Guide Bar	Carbon Steel
* 4	A-2287	1	Inner Race Bearing	Carbon Steel
5	A-3309	1	Pipe Plug	Galvanized Malleable Iron
* 6	A-2286	1	Bearing Needle	Carbon Steel
7	B-0621	1	Worm Gear (25:1 Ratio)	Cast Iron
	B-0616		Worm Gear (50:1 Ratio)	Cast Iron
	B-0623		Worm Gear (100:1 Ratio)	Cast Iron
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	Escutcheon Pin	Brass
18	A-0172	1	Name Plate	Aluminum
19	A-0075	1	¼" 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	Ball Bearing	Carbon Steel
* 23	A-3310	2	Truarc Ring	Carbon Steel
♁ * 24	A-2064	1	Seal	Buna-N
* 25	A-1653	1	½" x ⅝" Coupling (56 Frame Motor)	Carbon Steel
♁	A-1836	1	½" x ½" Coupling (48 Frame Motor)	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-2036	1	Bearing	Brass
* 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 interchangable with Series 4100, 4200 and 4300 Pumps*

♁ 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"	¼"	⅜"	½"	# Reqd.	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			All 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	⅜" 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	Plunger 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	¼" Small Top Ball	316 Stainless Steel
*18	B-1216	B-0736			1	Bottom Seat Assembly-Buna	303 Stainless Steel
*19	A-0054				1	⅜" 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 Drip Ring	Buna-N
22	A-4127				1	Yoke Packing Set	Buna-N
23	A-0290				1	Pin Plunger	Carbon Steel

*Recommended Spare Parts

*Alternate Components Availiable (see table above)

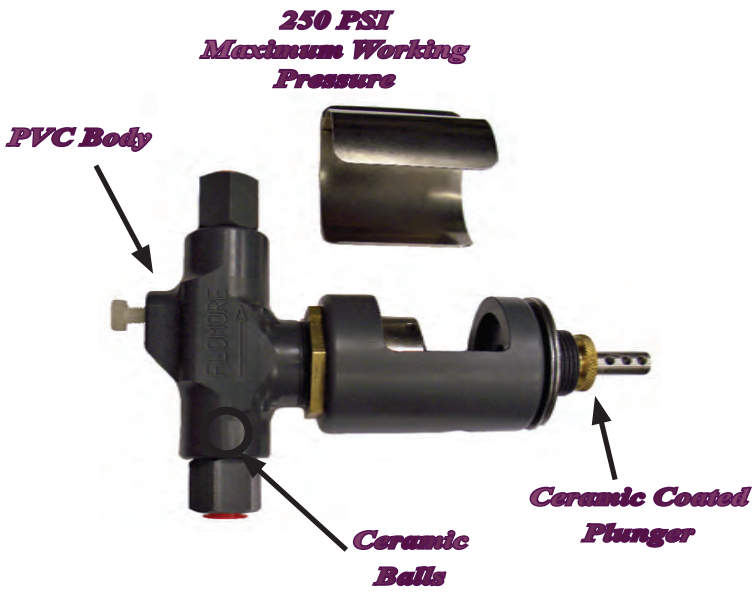
Injector Heads

Alternate Construction

Item #	Part #	Description	Material
2	A-0806	Top Seat Assembly (Metal-to-Metal)	303 Stainless Steel
	B-0843	Top Seat with Viton O'Ring	
3	A-2580	O-Ring	Viton
8	A-3967	3/16" Plunger Packing	Viton
	A-3966		Teflon
	A-4102	¼" Plunger Packing	Viton
	A-1642		Teflon
	A-2295		Hard
	A-4101	⅜" Plunger Packing	Viton
	A-1234		Teflon
	A-1875		Hard
	A-4103	½" Plunger Packing	Viton
	A-1012		Teflon
	A-1874		Hard
11	B-1175-C	¼" Ceramic Plunger	◆
	B-1176-C	⅜" Ceramic Plunger	
	B-1177-C	½" Ceramic Plunger	
18	A-0771	Bottom Seat Assembly (Metal-to-Metal)	303 Stainless Steel
	B-0844	Bottom Seat Assy. (Viton)	
19	A-0053	½" Ball	316 Stainless Steel

Item numbers in this chart correspond with drawing on page 8.

Plastic Injector Heads



Plastic Injector Head Parts List

Item #	Part # ¼"	Part # ⅜"	Part # ½"	# Reqd.	Description	Material
---	C-1570	C-1571	C-1572	1	Head Assembly	PVC
1	A-1497PVC			1	Priming Valve	PVC
2	B-0737PVC			1	Top Seat Assembly	PVC
3	A-2580			1	O-Ring	Viton
4	A-0077			1	Ball Check Spring	316 Stainless Steel
5	A-1496PVC			1	Top Bushing	PVC
6	A-0054.01			1	⅜" Large Top Ball	Ceramic
7	A-0225			1	Yoke Lock Nut	Brass
8	A-2701	A-2801	A-2901.01	1	Plunger Packing Set	Buna-N
9	C-1604			1	Yoke Cover	303 Stainless Steel
10	A-4104PVC			1	Plunger Packing Gland Nut	PVC
11	B-1175-C	B-1176-C	B-1177-C	1	Plunger	Ceramic
12	B-1170			1	Yoke	PVC
13	A-4095			1	Plunger Wiper Ring	Buna-N
14	A-4256			2	Belleville Washer	302 Stainless Steel
15	A-4104PVC			1	Yoke Packing Nut	PVC
16	C-0271	C-0273	C-0274	1	Body	PVC
17	A-0126.01			1	¼" Small Top Ball	Ceramic
18	B-0736PVC			1	Bottom Seat	PVC
19	A-0054.01			1	⅜" Suction Ball	Ceramic
20	A-2702	A-2802	A-2902	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095			1	Plunger Drip Ring	Buna-N
22	A-4127			1	Yoke Packing Set	Buna-N
23	A-0290			1	Pin Plunger	Carbon Steel

**Recommended Spare Parts*

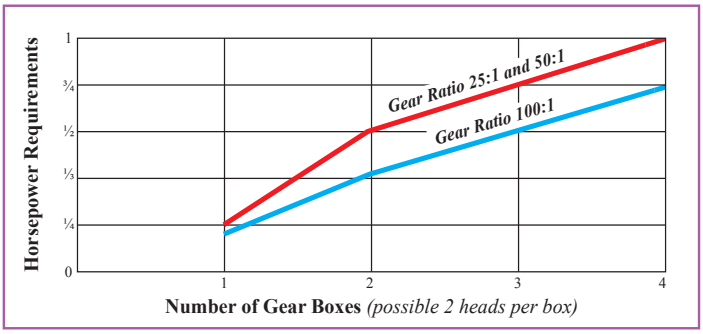
Performance Data and Dimensions

Pressure Volume Range

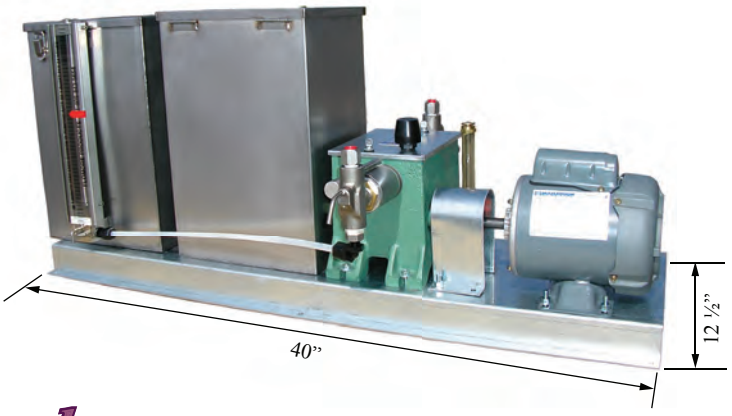
# of Heads	Plunger Size	Maximum Discharge Pressure (PSI)	100:1 Ratio (17.5 SPM)				50:1 Ratio (35 SPM)				25:1 Ratio (70 SPM)			
				Min.*	Max.*			Min.*	Max.*			Min.*	Max.*	
			Model #	60 Hz Motor		50 Hz Motor	Model #	60 Hz Motor		50 Hz Motor	Model #	60 Hz Motor		50 Hz Motor
Single Head Units	3/16"	5000	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	132.8

**Volume expressed in U.S. Gallons Per Day*

Horsepower Requirements for Mulit-Headed Units

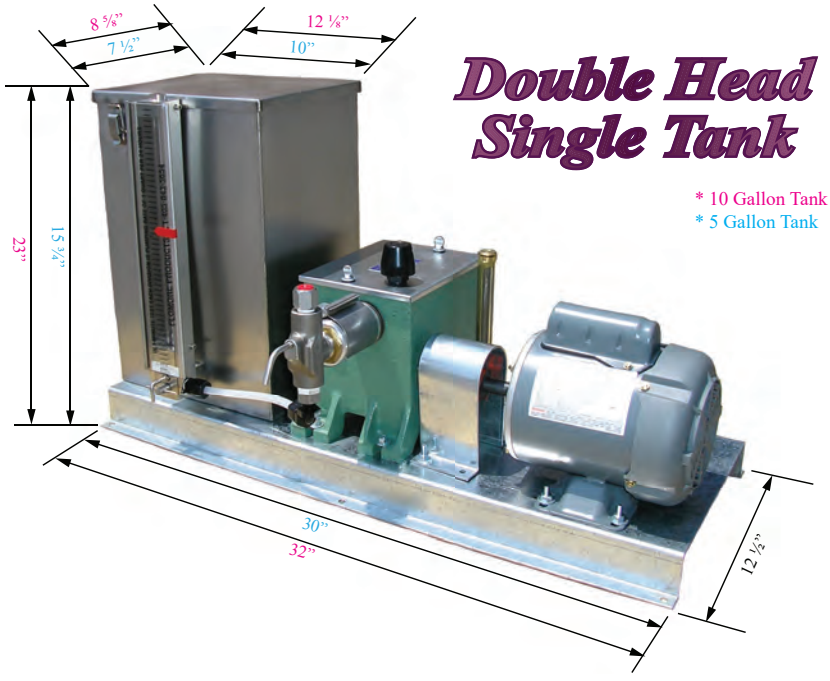


Double Head Double Tank

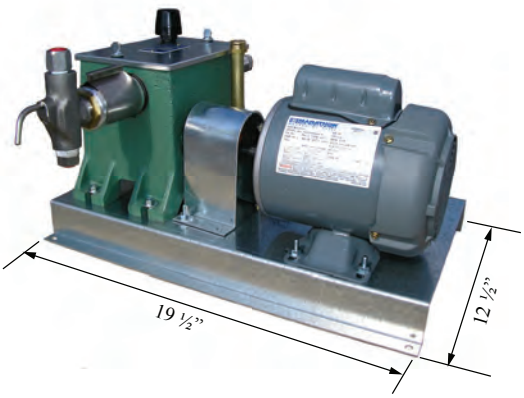


Double Head Single Tank

* 10 Gallon Tank
* 5 Gallon Tank



Single Head



Maintenance

Replacing the Stroke Adjustment Gears, Page 7

1. When replacing the steel stroke adjustment gears, they have to be correctly positioned relative to the crosshead, the stroke adjustment knob, and to each other. Rotate the motor coupling by hand until the crosshead, Item #11, 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, Items #12 & 22, in place. Leave the set screw, Item #16, in the large gear, loose for the time being. The two gears should be in mesh at this point, and rotating the large gear by hand will cause the small gear to move forward and back on the adjustment bolt, Item #9.
3. Turn the large gear in the direction that causes the small gear to move forward toward the crosshead, and continue this turning motion until the small gear is flush up against the crosshead (no lost motion).
4. Now turn the stroke adjustment knob, Item #17, clockwise until it covers the last groove on the spindle, then tighten the set screw, Item #16, 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, Page 7

1. Disconnect and remove pump head from power unit.
2. Remove Item #22, large steel drive gear, by loosening Item #16, set screw, with a 5/64" Allen wrench.
3. Remove Item #15, rod retainers, and Item #14, o'rings, from each end of Item #4, bearing rods.
4. Using proper size punch, push bearing rods through Item #11, crosshead, and out opposite side of gear box.

Remove Worm Gear and Bearing from Gear Box, Page 5

1. Remove cap, Item #25, from bottom of pump.
2. Remove Item #22, hex-head machine screw and spring washer and Item #23, bottom thrust washer. You can now remove the worm gear, Item #27, and Item #21, bearing, through the top of the housing.
3. Upon replacing, be certian the gear roll pin, Item #26, is located in its proper place -- holding the bearing, Item #21, in proper alignment.

To Remove Crosshead Bearing from Worm Gear, Page 7

Remove Item #11, crosshead, and lift bearing off of Item #19, bearing stud.

To Remove the Worm Gear and Shaft, Shaft End Bearing, and/or Oil Stem, Page 7

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

1. Disconnect flexible coupling and remove motor from base. If unit is equipped with container on base, it is best to remove entire gear box from base:
   a. Remove Item #27, truarc ring.
   b. Remove Item #6, pipe plug.
2. Insert proper size punch into recess on small end of Item #8, shaft, (small end under Item #6, pipe plug). Carefully drive shaft out through opposite side of housing. Punch size should be small enough so not to drive against Item #5, inner race, (if it is desirable to remove Item #7, needle bearing, and Item #5, inner race, it should be done after the shaft has been removed.
3. As the shaft is being driven out, care should be taken to see that the large gear worm turns. This will "walk" or disengage the gear teeth.
4. As the shaft emerges from the side of housing, it will force out the oil seal, Item #25, seal cartridge, Item #29, and ball bearing, Item #23.
5. Withdraw the shaft from pump housing.
6. In order to remove ball bearing, Item #23, from shaft, it is necessary to remove one or both truarc rings, Item #24.
7. Upon replacing, care should be taken to "walk" the two worm gears back together.
8. Be sure the two truarc rings, Item #24, are in place: also seal and seal housing are in properly (the seal lips and seal expander spring should face into the pump). Make sure the o'ring, Item #28, is in its proper place.
9. The shaft assembly should be inserted into the pump until shaft bearing, Item #23, shoulders against the truarc ring, Item #24, 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, Page 5:

- Guide and crosshead bearing rod surfaces in contact with crosshead.
- Worm teeth and gear teeth.
- Seal cartridge (Item #29).
- Worm gear in contact with lower bearing (Item #21).
- Thrust washer (Item #23).
- Surface in contact with lower bearing (Item #21).

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC
820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC
213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.
1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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ISO/IEC 17021
MANAGEMENT SYSTEMS CERTIFICATION BODY

WE SUPPORT WOUNDED VETERANS

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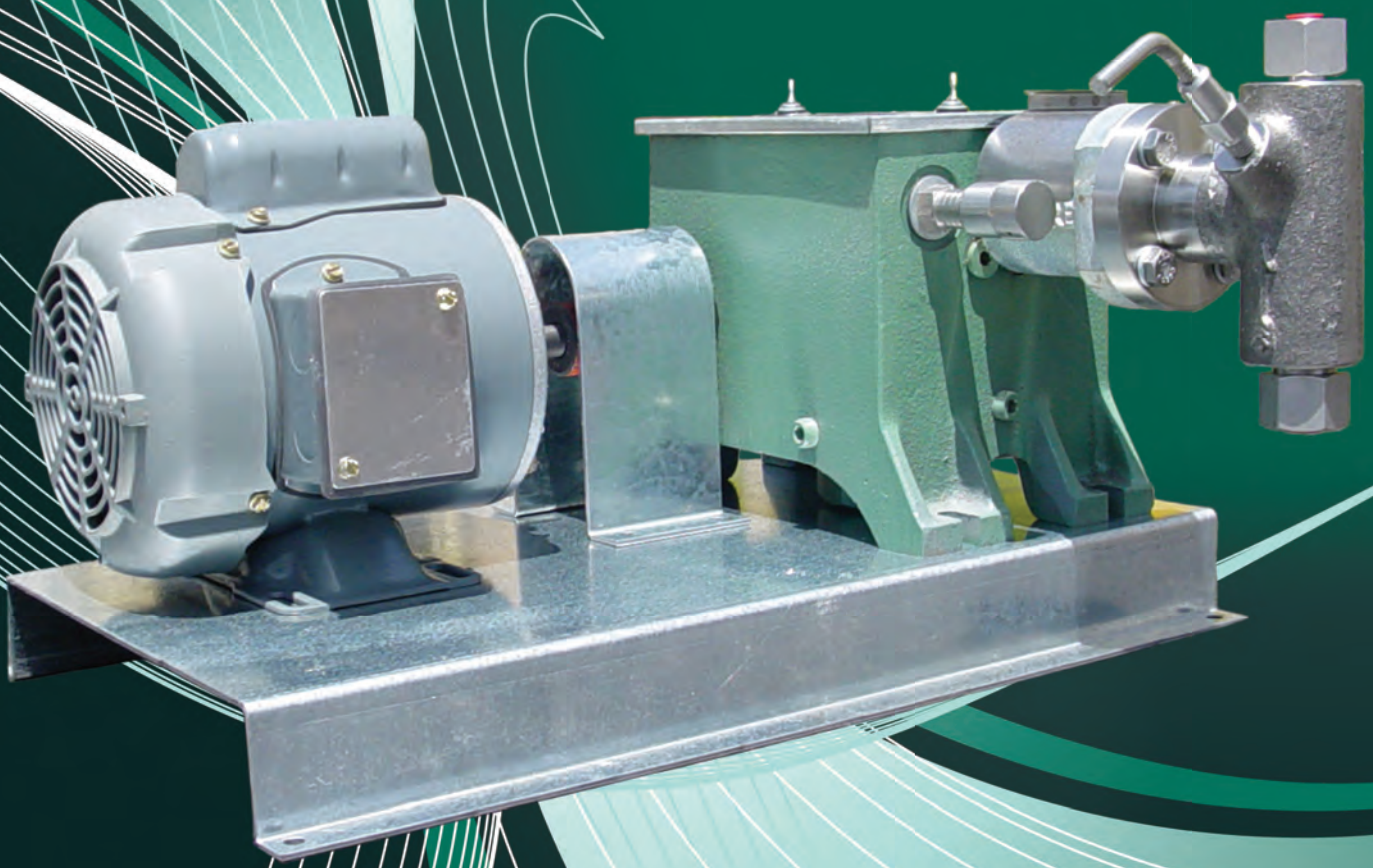
Different By Design

4500 Series Injector



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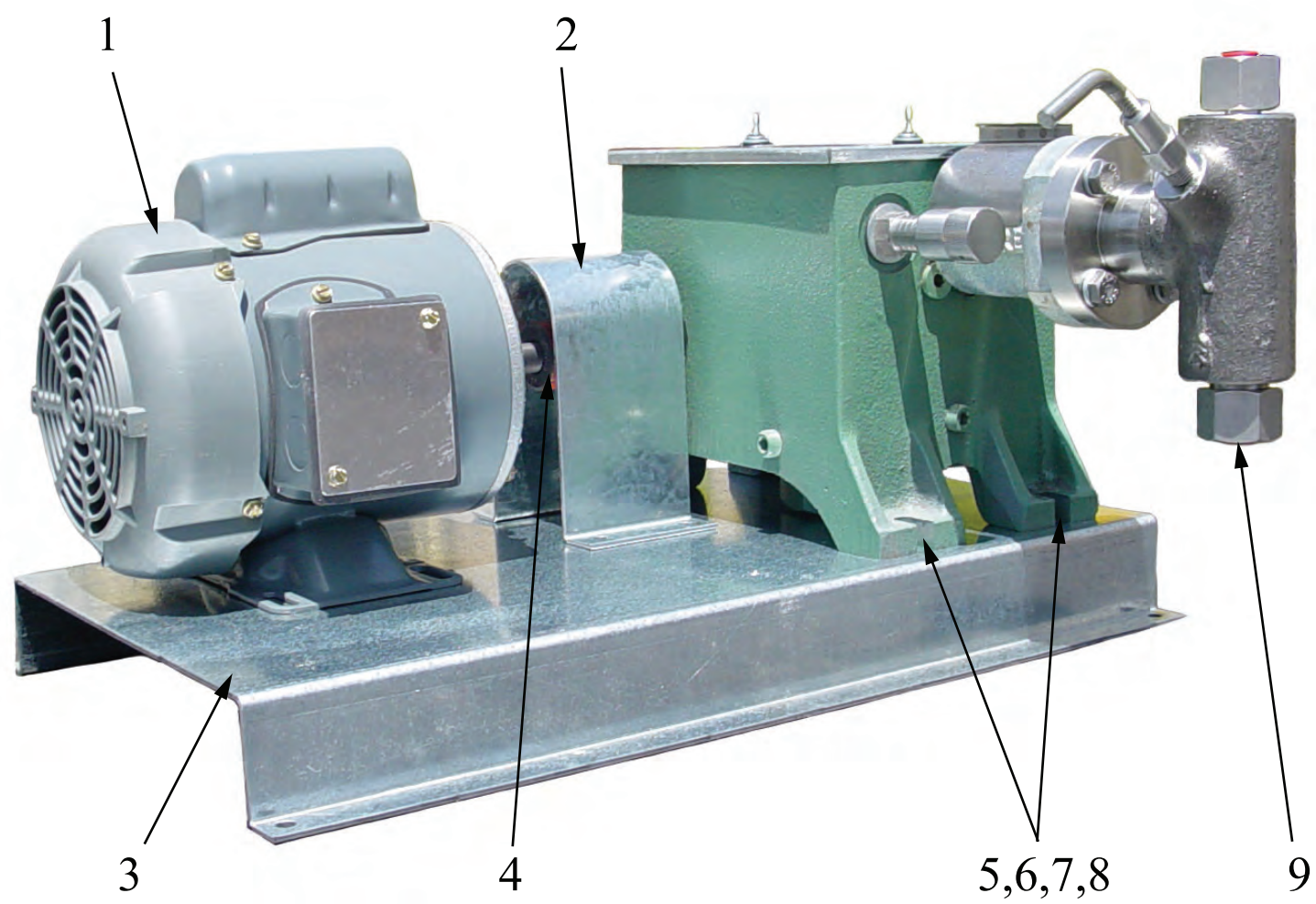
4500 Series Injector



Parts List

Item #	Part #	# Reqd.	Description
1	A-2264	1	1/115/230 TEFC Electric Motor
	A-2268		3/230/460 TEFC ⅓ HP Electric Motor 3 Phase
	A-2265		⅓ HP Electric Motor Single Phase Explosion Proof
	A-2271		3/220/460 TEFC ⅓ HP Electric Motor 3 Phase Explosion Proof
2	B-1167	1	Coupling Guard
3	B-0437	1	Base
4	A-1653	1	½" x ⅝" Coupling
5	A-0164	1	Nut
6	A-3303	1	Split Lockwasher
7	A-0167	1	Flat Washer
8	A-0163	1	Hex Head Bolt
9	See Page 6	See Page 6	Head Assembly

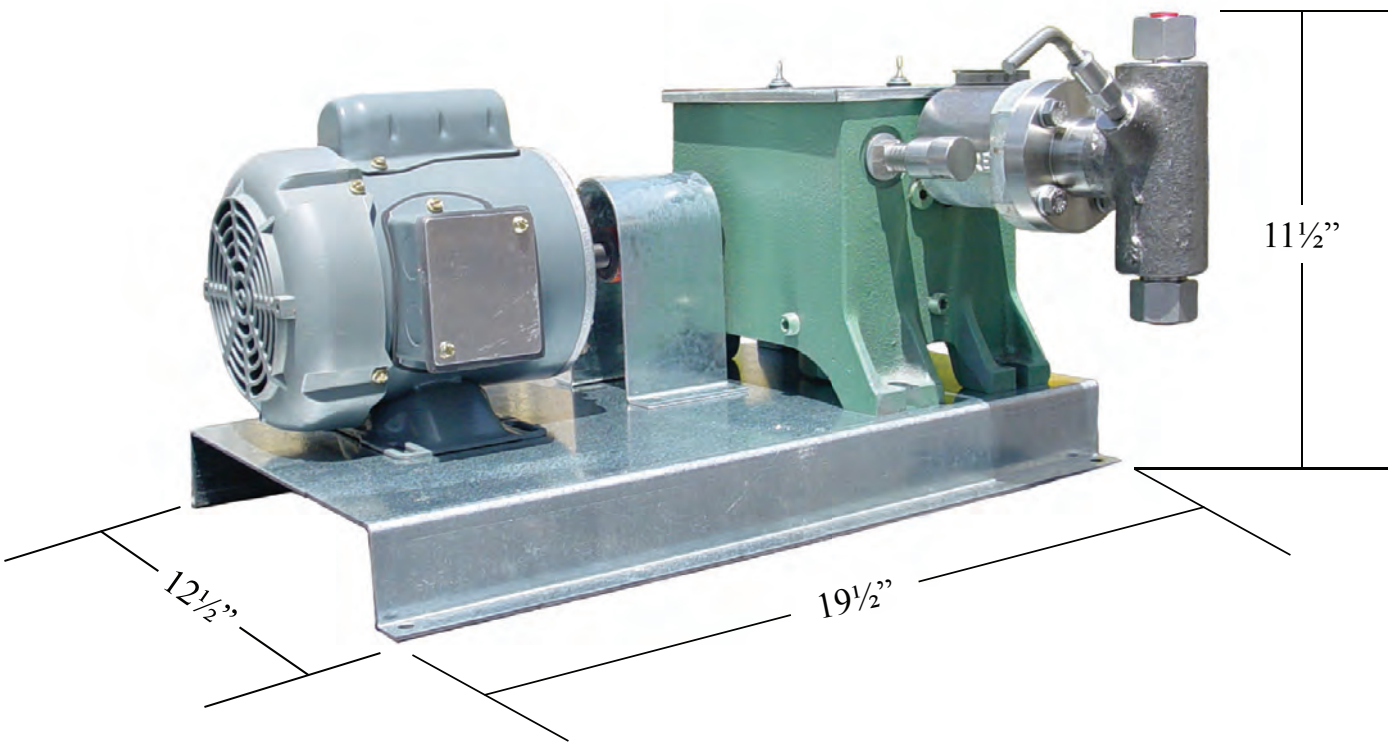
Performance Data

Pressure Volume Range

# of Heads	Plunger Size	Maximum Discharge Pressure	100:1 Ratio (17.5 SPM)				50:1 Ratio (35 SPM)				25:1 Ratio (70 SPM)			
			Part #	Min.* 60 Hz Motor	Max.* 60 Hz Motor	Max.* 50 Hz Motor	Part #	Min.* 60 Hz Motor	Max.* 60 Hz Motor	Max.* 50 Hz Motor	Part #	Min.* 60 Hz Motor	Max.* 60 Hz Motor	Max.* 50 Hz Motor
Single Head	¾"	300 PSI	45-25	4.6	46	38.0	45-05	9.1	91	75.5	45-35	18.2	182	151
	1"	150 PSI	45-26	8.1	81	97.5	45-06	16.3	163	135.2	45-36	32.5	325	269.7
Double Head	¾"	300 PSI	45-25DH	9.2	92	76.3	45-05DH	18.2	182	151	45-35DH	36.4	364	302.1
	1"	150 PSI	45-26DH	16.2	162	134.4	45-06DH	32.6	326	270.5	45-36DH	65.0	650	539.5

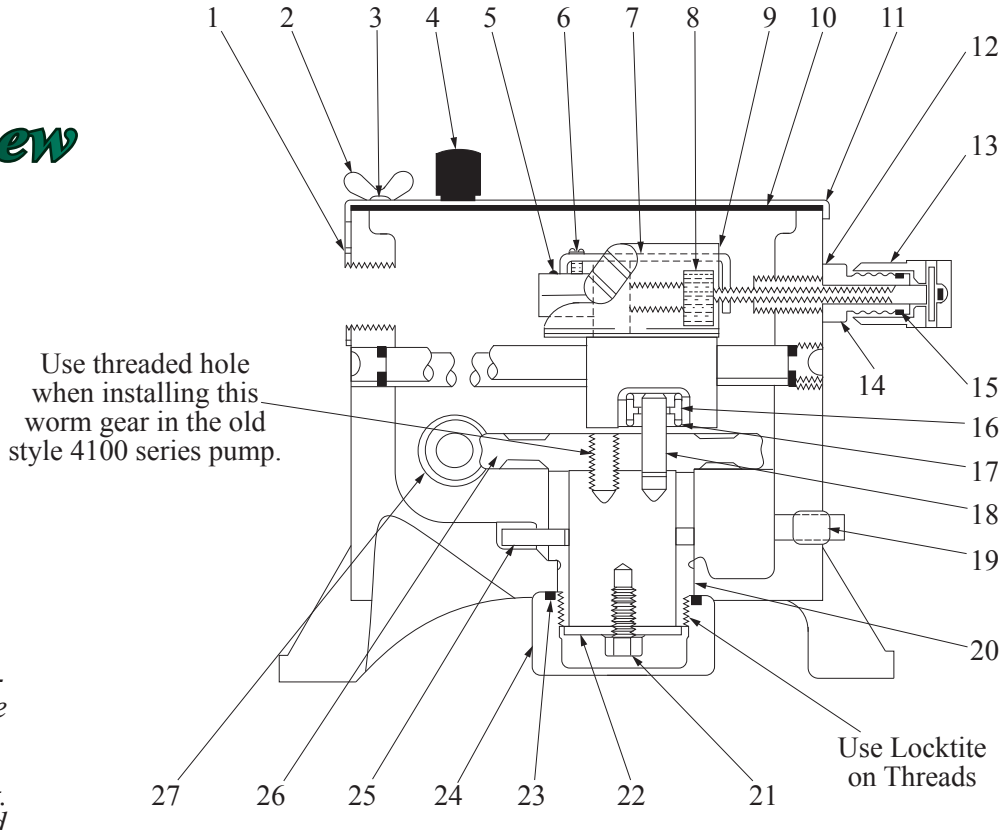
**Volume expressed in U.S. Gallons Per Day*

Dimensions



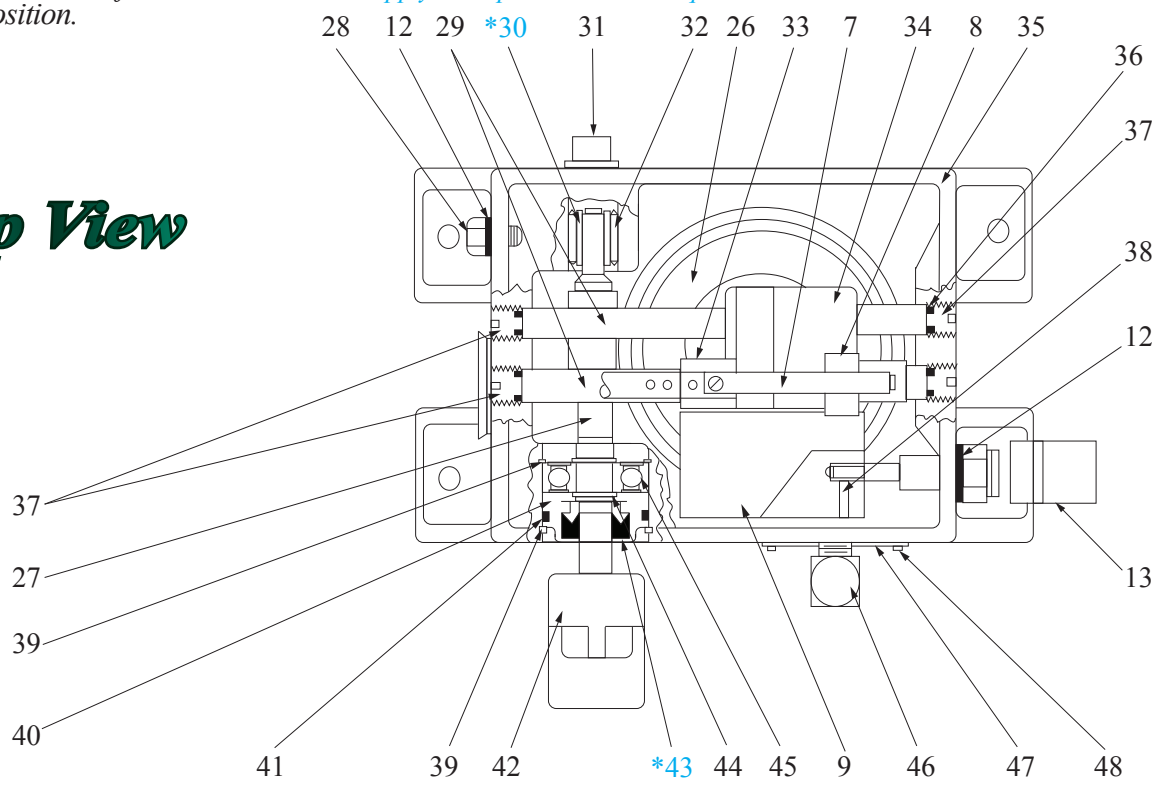
Gear Box Assembly

Side View



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

Top View



** Apply Lubriplate 630 AA or equal*

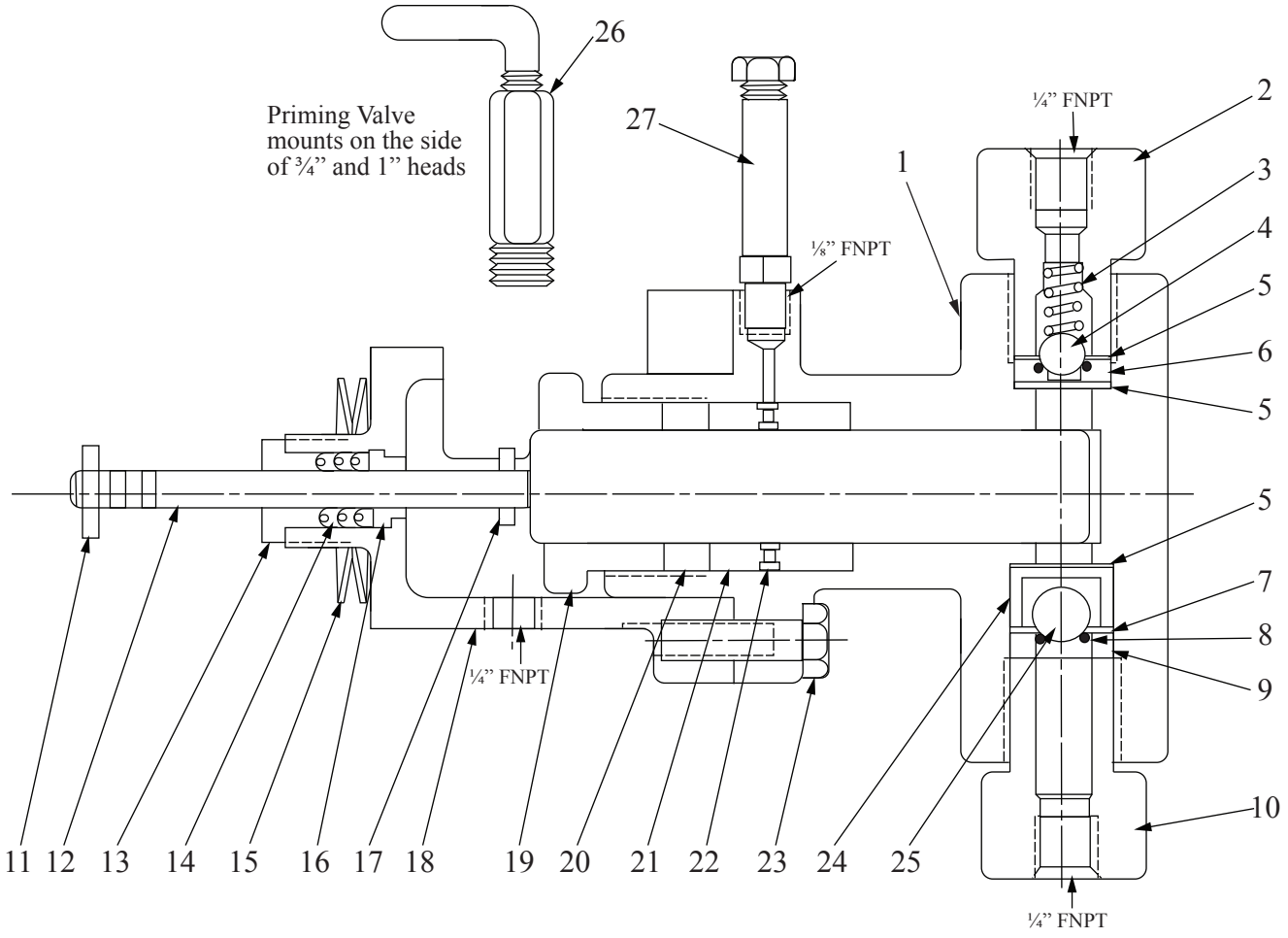
** Apply Lubriplate 630 AA or equal between shaft and seal lips*
**Assemble oil seal flush with end of cartridge*

Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-4256	2	Belleville Washer	302 Stainless Steel
2	A-2970	2	Wing Screw	Cadmium Plated Carbon Steel
* 3	A-4092	2	¼" Stat-O-Seal	Buna-N
4	A-2600	2	Breather	◆
* 5	A-0290	1	Plunger Pin	Carbon Steel
* 6	A-3312	1	Lockwasher	Zinc Plated Steel
	A-4753		Round Head Screw	Zinc Plated Steel
7	A-4756	1	Guide Bar	Zinc Plated 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-4058	1	Washer	Carbon Steel
18	A-4064	1	Bearing Stud	Carbon Steel
19	A-0138	1	Pipe Plug	Zinc Plated Steel
20	B-0619	1	Lower Bearing	Ductile Iron
* 21	A-2501	1	Machine Screw	Zinc Plated Steel
	A-0459		⅜" Spring Lockwasher	Zinc Plated Steel
* 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)	Cast Iron
	B-0623		Worm Gear (100:1 Ratio)	Cast Iron
* 27	A-1871	1	Worm & Shaft Assembly (25:1 Ratio)	Carbon Steel
	A-2250		Worm & Shaft Assembly (50:1 Ratio)	Carbon Steel
	A-1755		Worm & Shaft Assembly (100:1 Ratio)	Carbon Steel
◆	B-0270	1	Thru-Shaft Assembly (25:1 Ratio)	Carbon Steel
	B-0469		Thru-Shaft Assembly (50:1 Ratio)	Carbon Steel
	B-0452		Thru-Shaft Assembly (100:1 Ratio)	Carbon Steel
28	A-4795	1	Bolt	Siinc Plated Steel
29	A-4229	2	Crosshead Guide Bar	Carbon Steel
* 30	A-2287	1	Inner Race Bearing	Carbon Steel
31	A-3309	1	Pipe Plug	Galvanized Malleable Iron
* 32	A-2286	1	Bearing Needle	Carbon Steel
33	A-4755	1	Adjustment Bolt	Carbon Steel
34	B-1333	1	Crosshead	Cast Iron
35	D-0492	1	Housing	Cast Iron
36	A-3849	4	O'Ring	Buna-N
37	A-4228	4	Rod Retainer	Carbon Steel
38	A-4894	1	Set Screw	Steel
* 39	A-3311	2	Truarc Ring	Carbon Steel
40	A-4045	1	Seal Cartridge	Carbon Steel
41	A-1961	1	O'Ring	Buna-N
◆ * 42	A-1653	1	½" x ⅝" Coupling (56 Frame Motor)	Carbon Steel
	A-1836		½" x ½" Coupling (48 Frame Motor)	Carbon Steel
◆ * 43	A-2064	1	Seal	Buna-N
* 44	A-3310	2	Truarc Ring	Carbon Steel
* 45	A-2285	1	Ball Bearing	Carbon Steel
46	A-4066	1	Oil Gauge Assembly	Brass with Glass Tube
47	A-0172	1	Name Plate	Aluminum
48	A-0171	2	Escutcheon Pin	Brass
◆	A-2036	1	Bearing	Brass

Recommended Spare Parts **Directly interchangeable with Series 4400 Pumps* *♦Use when a common motor is used to drive more than one gear box assy.*

Injector Head



Alternative Construction

Item #	Part #	# Reqd.	Description	Material
* 4	A-4657	1	¾" Plunger Packing	Viton
	A-2988			Teflon
	A-2772			Hard
	A-4658		1" Plunger Packing	Viton
	A-1013			Teflon
	A-4135			Hard
* 6	A-2184	1	O'Ring	Viton
* 12	A-0157	1	Top Seat Metal-to-Metal	303 Stainless Steel
* 19	A-0051	1	Bottom Seat Metal-to-Metal	303 Stainless Steel

Recommended Spare Parts

** Interchangable with Series 4400 Pump head*

Injector Head

Parts List

Item #	Part # ¾"	Part # 1"	# Reqd.	Description	Materials
*	C-0188	C-1886	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	C-1887	C-1885			All Stainless Steel
♦ * 1	C-0333	C-0020	1	Body	Ductile Iron
	C-0340	C-0138			Stainless Steel
* 2	A-0152		1	Top Bushing	302 Stainless Steel
* 3	A-0077		1	Ball Check Spring	316 Stainless Steel
* 4	A-0054		1	⅜" Large Top Ball	316 Stainless Steel
5	A-2350		3	Gasket	304 Stainless Steel
* 6	B-0368		1	Top Seat Assembly with Buna-N O'Ring	303 Stainless Steel
* 7	A-2338		1	Gasket	304 Stainless Steel
* 8	A-0612		1	O'Ring	Buna-N
* 9	B-0698		1	Bottom Seat	303 Stainless Steel
10	A-0153		1	Bottom Bushing	303 Stainless Steel
* 11	A-0290		1	Pin Plunger	Carbon Steel
* 12	B-1351	B-1352	1	Plunger	17-4 pH Stainless Steel
♦ 13	A-4094		1	Yoke Packing Nut	Brass
♦ 14	A-4127		1	Yoke Packing Set	Buna-N
♦ 15	A-4256		2	Belleville Washer	Carbon Steel
♦ 16	A-4095		1	Plunger Wiper Ring	Buna-N
♦ 17	A-4095		1	Plunger Drip Ring	Buna-N
♦ 18	C-1884		1	Yoke	Malleable Iron
* 19	A-2768	A-0047	1	Plunger Packing Gland Nut	316 Stainless Steel
20	A-2769	A-0043	1	Plunger Packing Gland	303 Stainless Steel
* 21	A-2771	A-0050	1	Plunger Packing Set	Buna-N
22	A-2770	A-0448	1	Lantern Ring	303 Stainless Steel
23	A-4452		1	Bolt	303 Stainless Steel
24	A-0444		1	Ball Cage	303 Stainless Steel
* 25	A-0053		1	Suction Ball	316 Stainless Steel
* 26	A-0123		1	Priming Valve	303 Stainless Steel
27	A-0558		1	Grease Jack Assembly	Carbon Steel

Recommended Spare Parts **Directly interchangeable with Series 4400 Pumps* *♦Items must be used together to convert old 4000 heads to new 4500 heads.*

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC

820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
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Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
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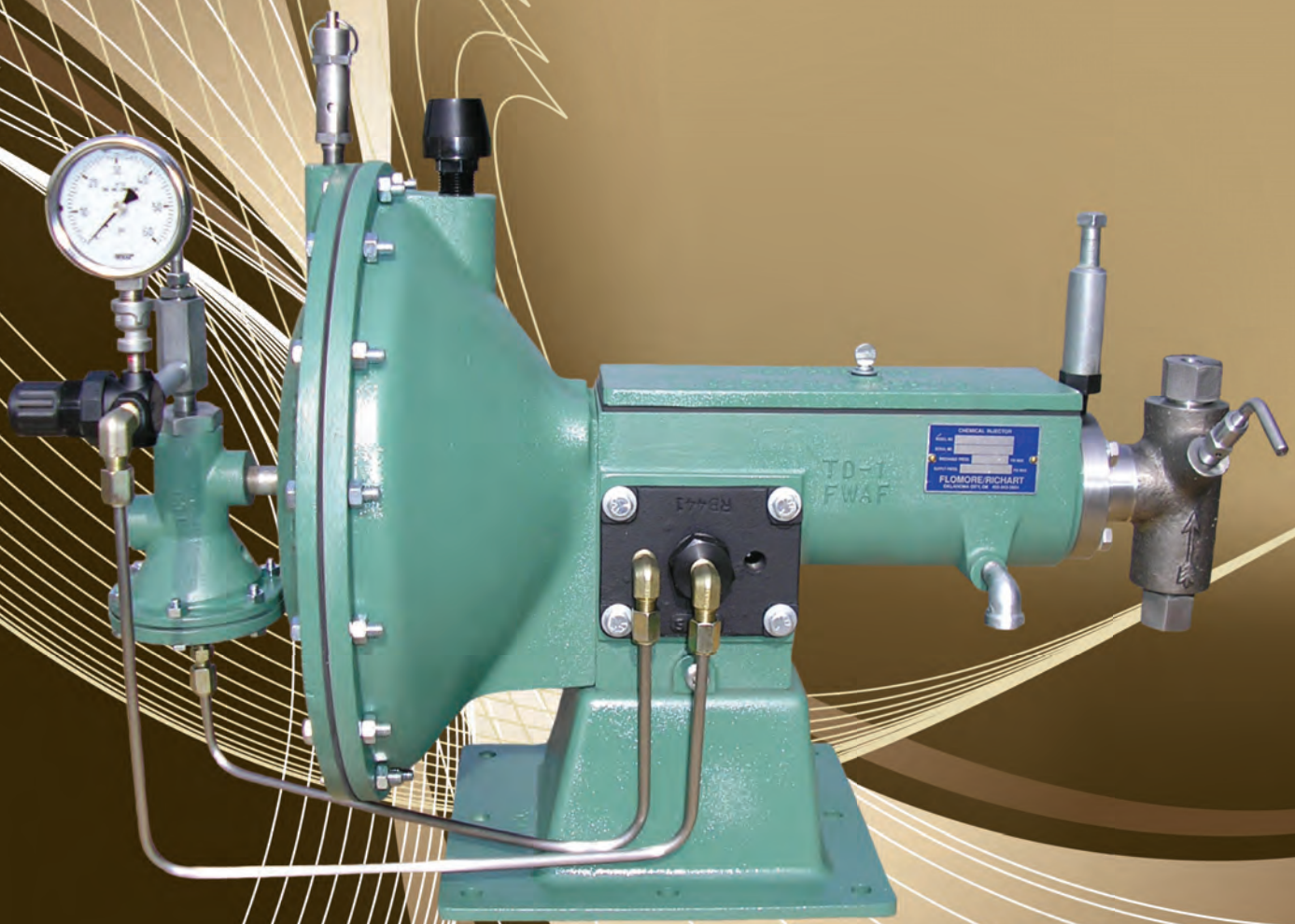
Different By Design

5020 Series Injector



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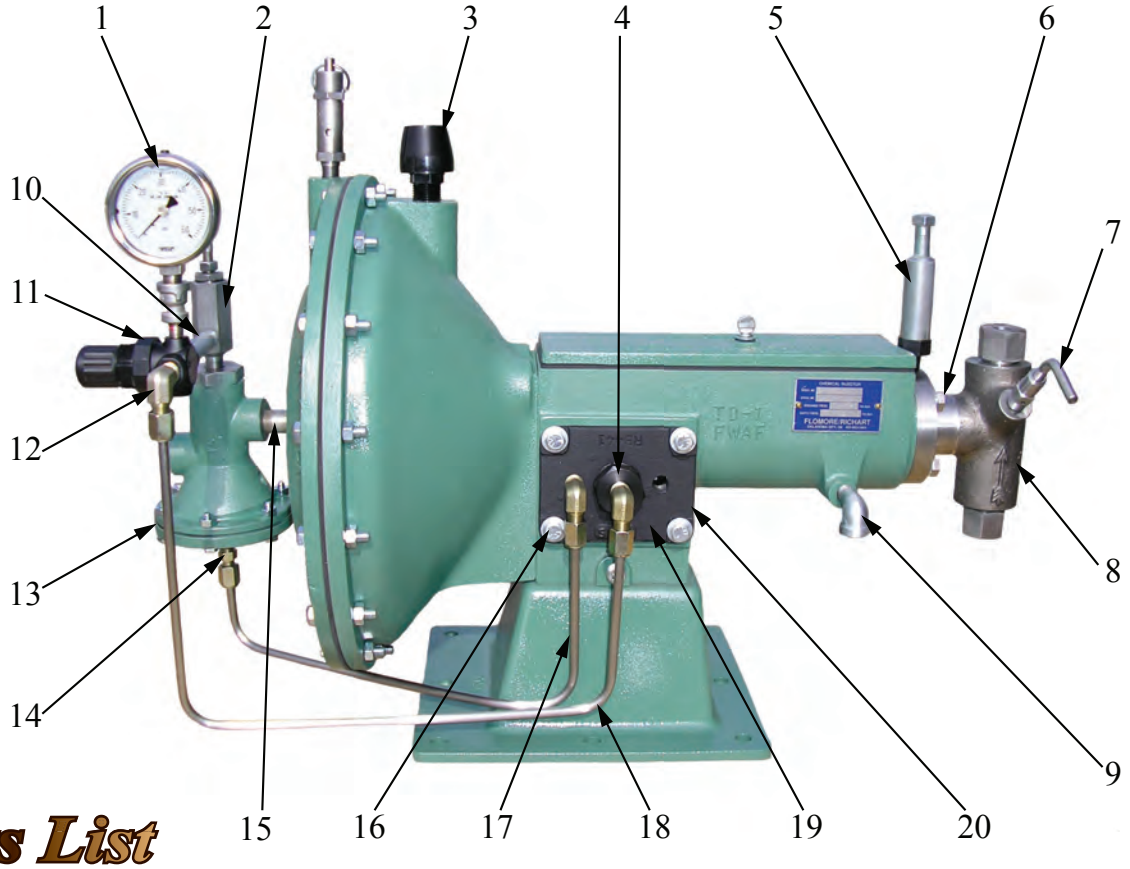
5020 Series Injector



Parts List

Item #	Part #	# Reqd.	Description	Material	Alternate Part #
1	A-1854	1	0-12 PSI Pressure Gauge	◆	A-1295SS
2	A-0022	1	Inlet Gas Valve Assembly	Brass	A-0022SS
3	A-2599	1	Air Filter	Plastic	◆
4	A-0132	2	Elbow	Brass	A-0132SS
5	A-0558	1	Grease Jack	Steel	◆
6	A-4452	1	Bolt	316 Stainless Steel	◆
7	A-0123	1	Priming Valve	304 Stainless Steel	◆
8	See Pages 10 & 11	1	Head Assembly	See Pages 10 & 11	◆
9	A-0075	1	Street Elbow	Steel	◆
10	A-4692	1	Nipple	Steel	◆
11	A-1718	1	Regulator	Plastic	◆
12	A-0132	1	Half Union	Brass	A-0132SS
13	B-0037	1	Master Valve	Aluminum	B-0037SS
14	A-0137	1	Half Union	Brass	A-0137SS
15	A-0009	1	Attachment Nipple	Brass	A-0009SS
16	A-0141	1	Cap Screw	Steel	◆
17	A-1494	1	Master Valve Line	Copper	A-1494SS
18	A-1493	1	Pilot Valve Line	Copper	A-1493SS
19	C-0009	1	Pilot Valve Assembly	Steel Seat	◆
20	A-0058	1	Pilot Valve Gasket	Fiber	◆

** Recommended Spare Parts* ***Furnished on all plungers except 1¼"* ****Alternate Parts for Sour Gas Trim are all Stainless Steel*

Installation and Operating Instructions

1. The discharge bushing is a ¼" NPT connection (Item #9, Page 8), this is where you will connect your fluid discharge line, you should **always** install a line check at the point of injection for additional safety. Our A-0675 stainless steel line check is a ¼" NPT male x female good for discharge pressure of 6,000 PSIG, our ½" NPT female x female line check is 10,000 PSIG rated.

   NOTE: Install line check valves with the flow arrow pointing in the direction of the flow.

2. The suction bushing is a ¼" NPT connection (Item #17, Page 8), care should be taken to make sure no dirt, sand or other foreign objects are left in the suction line before hooking it up, as any of these items will not allow the check valves in the head assembly to operate properly.

3. Before connecting the gas line to power the pump, make sure there is no more than **50 PSIG** available, if the line pressure is higher than **50 PSIG**, you **must** reduce to this pressure. Make sure this line is free of debris and connect to the A-0022 inlet gas assembly (Item #2, Page 2), this is also a ¼" NPT connection. The regulator with a gauge (Item #11, Page 2) is preset to 12 PSIG, and should always be set at this point. This regulator and gauge are used to regulate a very, very small amount of gas going through pilot valve (Item #19, Page 2) and the master valve (Item #13, Page 2) and has **nothing** to do with regulating the **incoming** gas pressure to the pump.

4. Remove thumb screw (Item #9, Page 3) and cover (Item #10, Page 3) and pour 3 quarts of light weight motor oil (10 weight), Marvel Mystery, or transmission fluid, into the chamber next to the large diaphragm, this is true on all size plungers except the 1¼", with it, plug the ¼" NPT drain and fill the chamber that the plunger operates in with oil, this will lubricate the plunger and lengthen the life of the packing.

5. After all connections are made, open the fluid valve on your storage tank and open priming valve (Item #7, Page 2), at the same time, slowly open the speed control valve (Item #2, Page 2) to start pump. After the stream of fluid from the priming valve is free of air bubbles, close this valve.

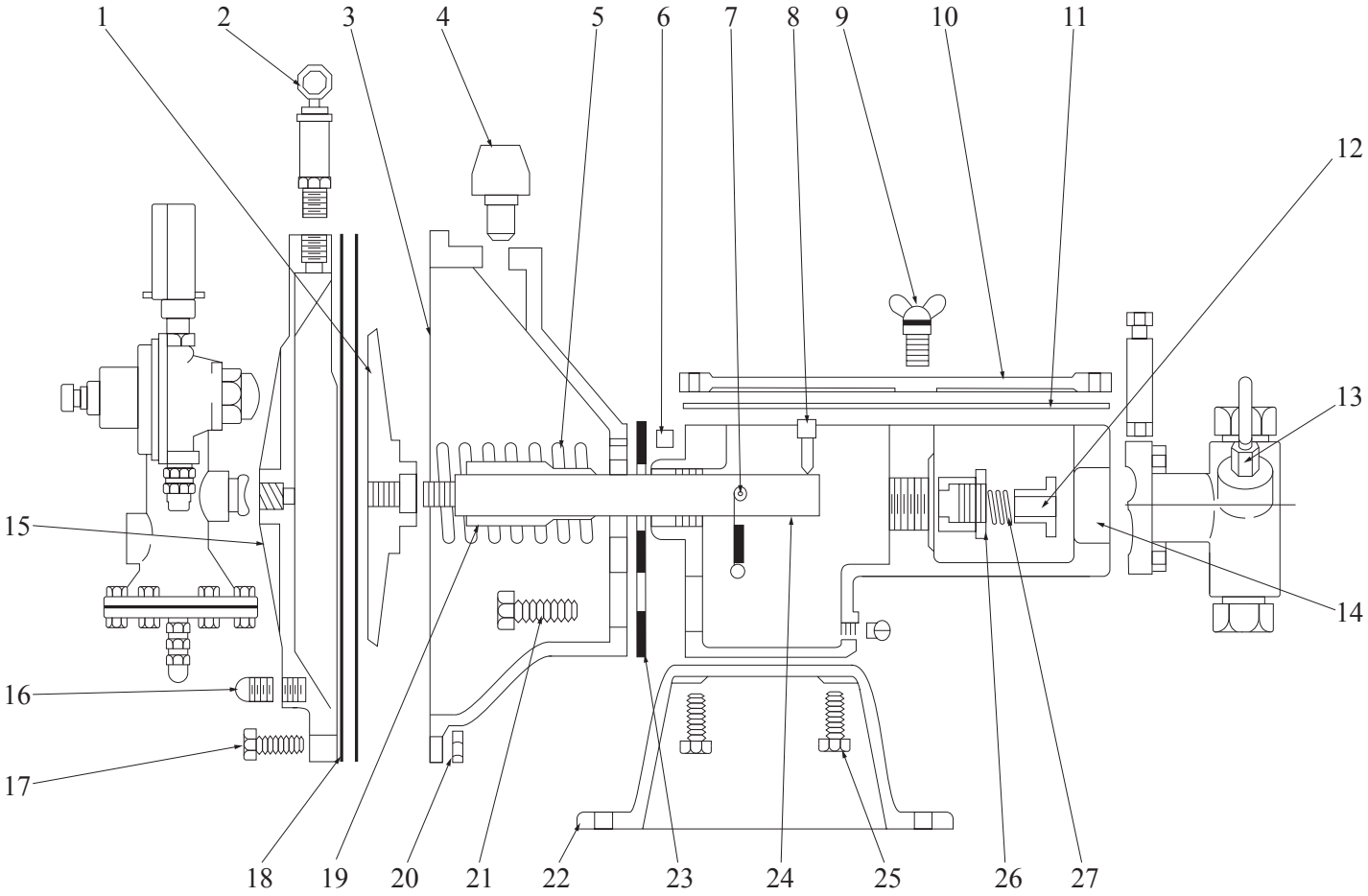
6. When you first start the pump you may see some fluid leakage around the plunger packing nut (Item #2, Page 8), this is OK for the first 2 or 3 minutes, this allows the packing to get wet and take a set, then **stop** the pump and very slightly tighten the packing nut (Item #2, Page 8), then restart the pump.

   NOTE: DO NOT ATTEMPT PACKING ADJUSTMENT WITH PUMP RUNNING!

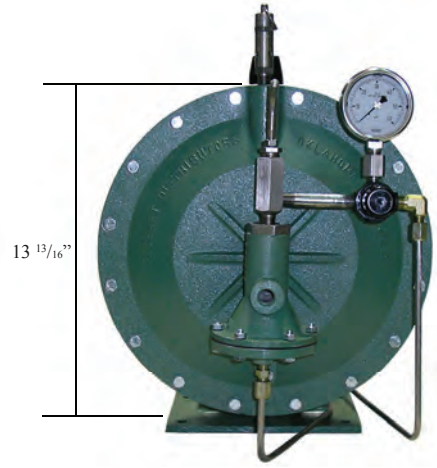
7. Volumes of fluid pumped, are a function of plunger stroke length and speed (SPM). You have available two (2) stroke lengths and a variety of speeds up to 60 SPM continuous or 75 SPM intermittently. To change stroke length, move the plunger pin (Item #8, Page 3) from one hole to the other. The hole nearer the injection head will give you the longest stroke.

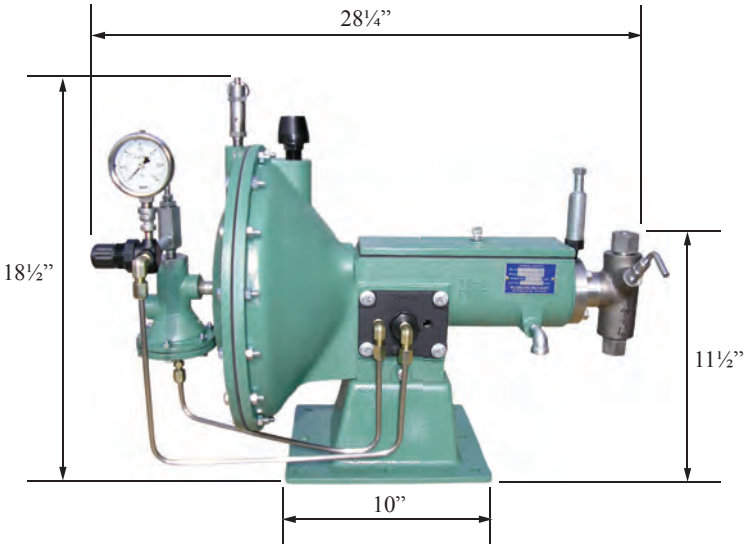
5020 Series Injector

Cross Section



Dimensions





5020 Series Injector

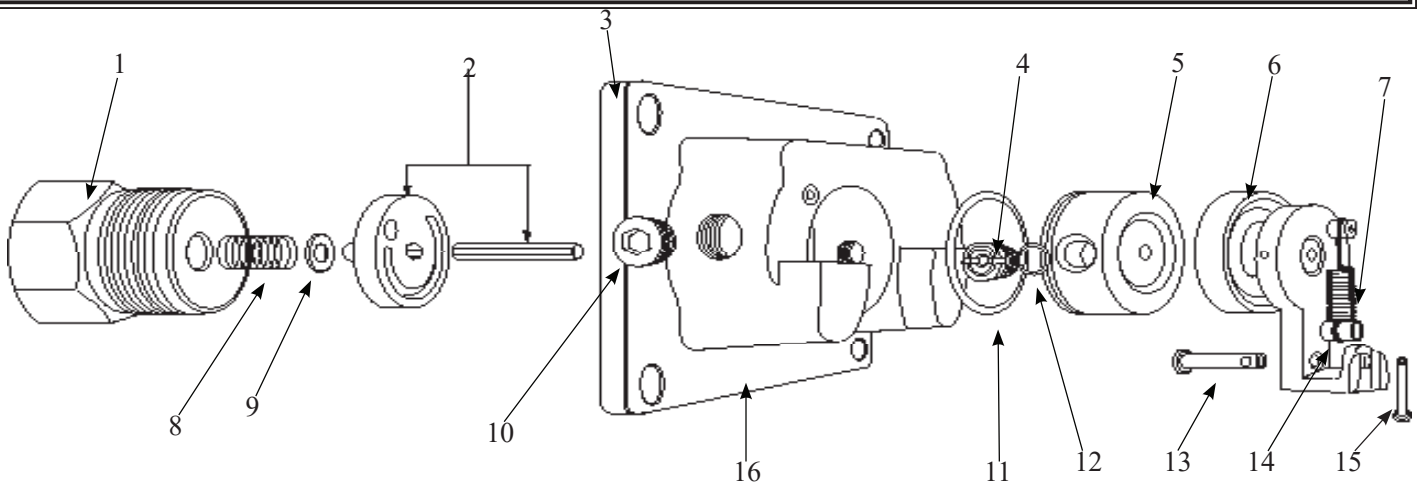
Parts List

Item #	Part #	# Reqd.	Description	Material	Alternate Part #
1	B-0002	1	Disc	Aluminum	♦
2	A-0131	1	¼" Safety Valve Set #50	Brass	A-0131SS
3	D-0434	1	Housing	Aluminum	♦
4	A-2599	1	Air Filter	Plastic	♦
5	A-0025	1	Spring	Steel	♦
6	A-0143	1	Set Screw	Steel	♦
7	A-0020	1	Pin	Steel	♦
8	A-0035	1	Stroke Adjustment Pin	Brass	♦
9	A-2970	1	Wing Screw	Steel	♦
10	B-0004	1	Cover	Aluminum	♦
11	B-0036	1	⅛" Gasket	Buna-N	♦
12	A-0041	1	Nut	Brass	♦
13	A-0123	1	Priming Valve	303 Stainless Steel	♦
14	D-0001	1	Housing	Aluminum	♦
15	C-0001	1	Cover	Aluminum	♦
16	A-0138	1	Drain Plug	Steel	♦
17	A-0142	1	Diaphragm Housing Bolts	Steel	♦
18	B-0010	2	Diaphragm	Buna-N	♦
19	A-0076	1	Bushing	Steel	♦
20	A-0144	1	Nut	Steel	♦
21	A-0139	1	Bolt	Steel	♦
22	C-0004	1	Base	Aluminum	♦
23	B-0011	1	Gasket	Fiber	♦
24	B-0003SS	1	Thrust Rod	303 Stainless Steel	♦
25	A-0141	1	Screw	Steel	♦
26	A-0038	1	Stuffing Box	Brass	♦
27	A-0059	1	Packing	Buna-N	♦

** Recommended Spare Parts*

***Alternate Parts for Sour Gas Trim are all Stainless Steel*

5020 Series
C-0009 Pilot Valve Assembly



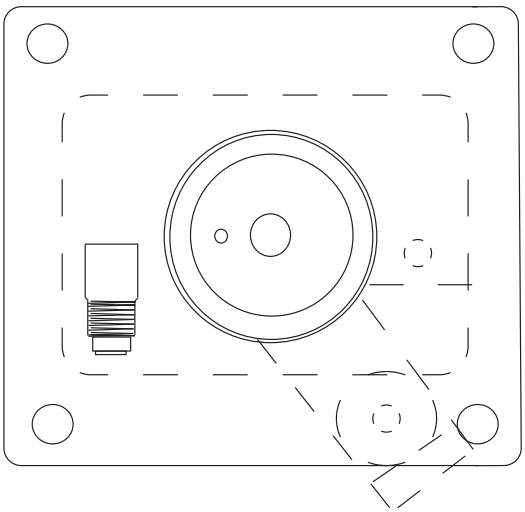
Parts List

NOTE: Using a small amount of grease, lubricate items #11 and #12, o'rings, before and after installation on item #5. This will keep o'rings in place amd facilitate the pressing of the valve seat into positon.

Item #	Part #	# Reqd.	Description	Material
1	C-0495	1	Disc Retainer	Steel
2	C-4668	1	Valve Disc and Pin	Stainless Steel
3	C-0441	1	Pilot Valve Body	Ductile Iron
*4	C-0463	2	Seat Seal Screw	Steel
5	C-0451	1	Valve Seat	Steel
6	A-0065	1	Flipper Arm Assembly	Iron
7	A-4600	1	Flipper Spring Assembly	Steel
8	A-0077	1	Spring	Steel
9	A-0579	1	Washer	Stainless Steel
10	C-3386	1	Flush Seal Plugs	Steel
11	C-0485	1	Seat Seal O' Ring	Buna- N
*12	C-0474	2	Seat Seal Screw O' Ring	Buna- N
13	A-0170	1	Clevis Pin	Steel
14	A-0772	1	Spring Bushing	Brass
15	A-0168	1	Cotter Pin	Steel
16	A-0058	1	Gasket	Fiber

**Recommended Spare Parts* ** Items make up a C- 0600 Pilot Valve Seat and Disc Assembly*

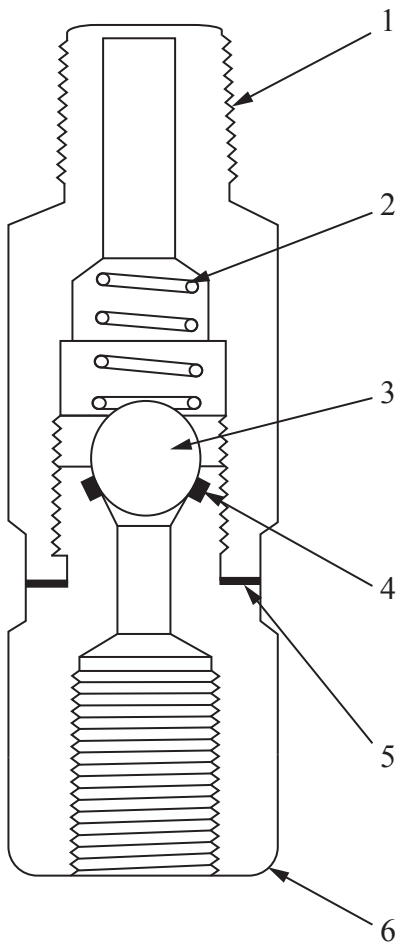
Pilot Valve Assembly



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

5020 Series Components

A-0675 & A-0676 Line Check



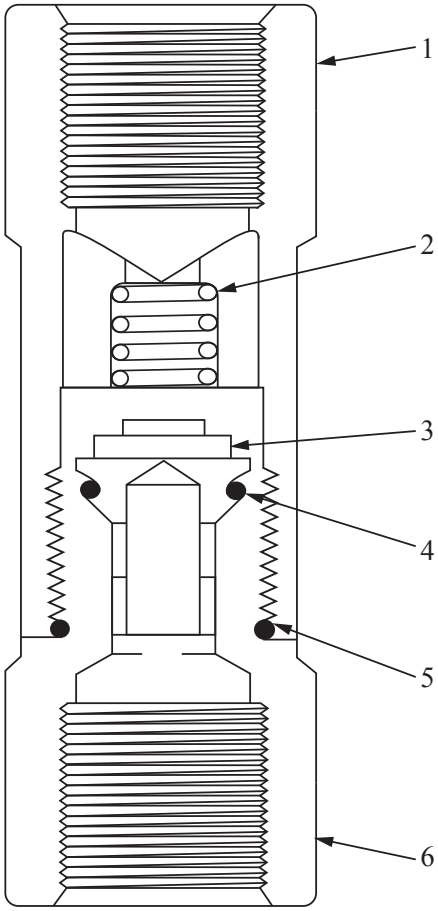
Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0677	1	Outlet Body	Brass
	A-1296	1	Outlet Body	303 Stainless Steel
2	A-0391	1	Spring	Steel
3	A-0054	1	⅜" Ball	316 Stainless Steel
4	A-0479	1	O'Ring	Buna-N
	A-2580	1	O'Ring	Viton
5	A-1574	1	Washer	304 Stainless Steel
6	A-0678	1	Inlet Body	Brass
	A-1297	1	Inlet Body	303 Stainless Steel

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

B-1288 Line Check

15,000 lbs. Working Pressure



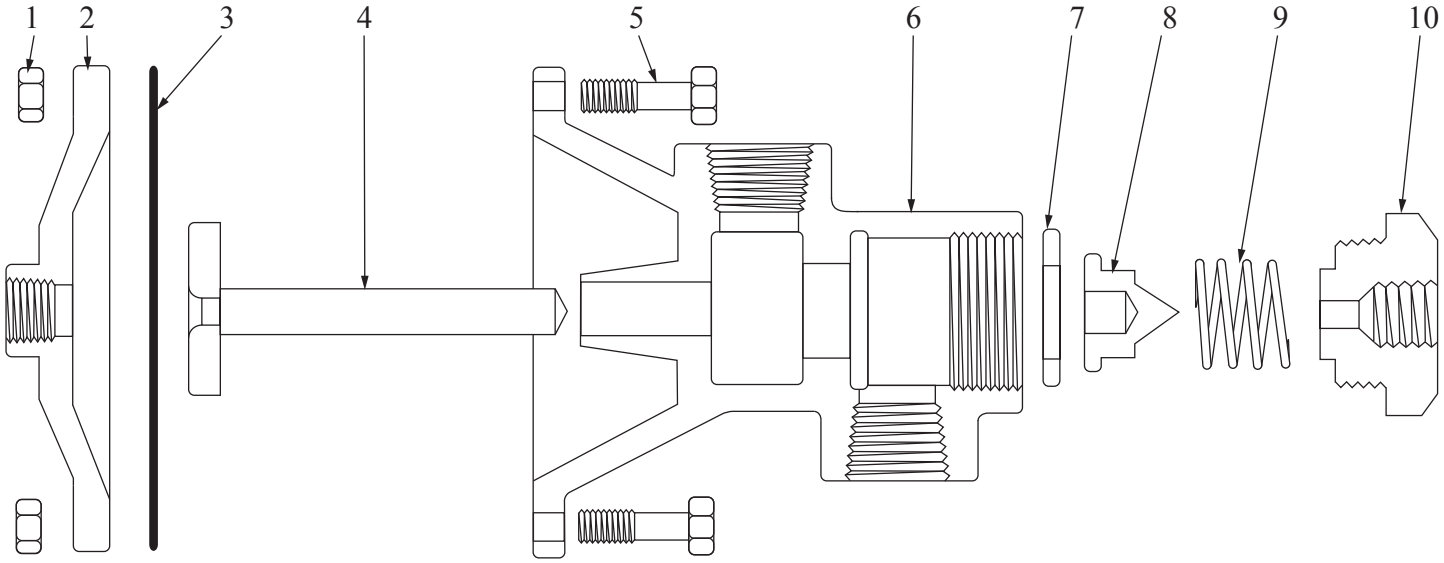
Parts List

Item #	Part #	# Reqd.	Description	Material
1	B-0271	1	Body	303 Stainless Steel
2	A-0391	1	Spring	Steel
3	A-1879	1	Valve	303 Stainless Steel
4	A-0612	1	O'Ring	Buna-N
	A-2184	1	O'Ring	Viton
5	A-1959	1	O'Ring	Buna-N
	A-3979	1	O'Ring	Viton
6	A-1880	1	Bushing	303 Stainless Steel

** Recommended Spare Parts*

5020 Series Components

B-0037 Master Valve Assembly



Parts List

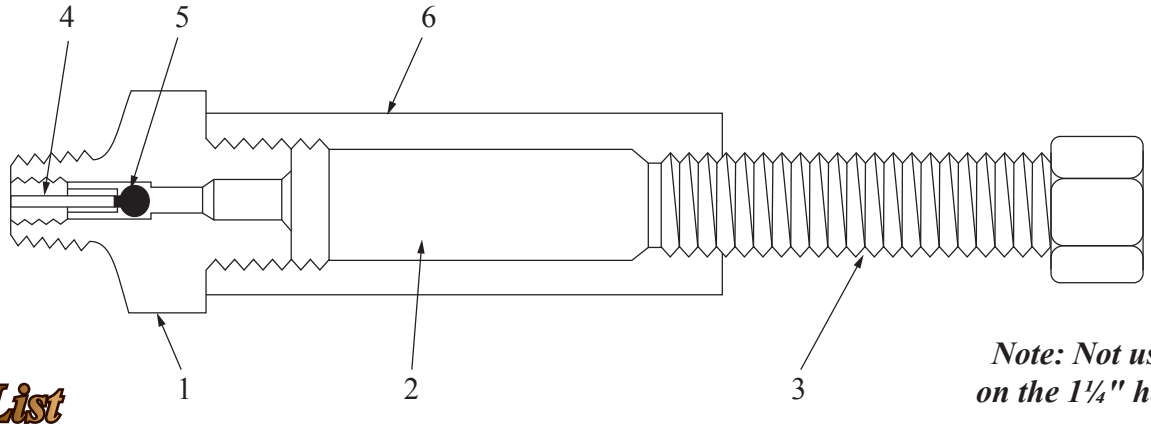
Item #	Part #	# Reqd.	Description	Material
1	A-0164	1	Cap Nut	Steel
2	A-0001	1	Housing Cap	Aluminum
3	A-1329	1	Diaphragm	Buna-N
4	A-0197	1	Stem Assembly	Brass
	A-0197-SS	1	Stem Assembly	Stainless Steel
5	A-0163	1	Cap Bolt	Steel
6	C-0003	1	Housing	Aluminum
7	A-0201	1	Lower Valve Seat	Buna-N
8	A-0196	1	Valve Disc	Brass
	A-0196SS	1	Valve Disc	Stainless Steel
9	A-0202	1	Valve Spring	Steel
10	A-0200	1	Upper Valve Seat	Brass
	A-0200-SS	1	Upper Valve Seat	Stainless Steel

** Recommended Spare Parts*

***Alternate Parts for Sour Gas Trim are all Stainless Steel*

5020 Series Components

A-0558 Grease Jack Assembly



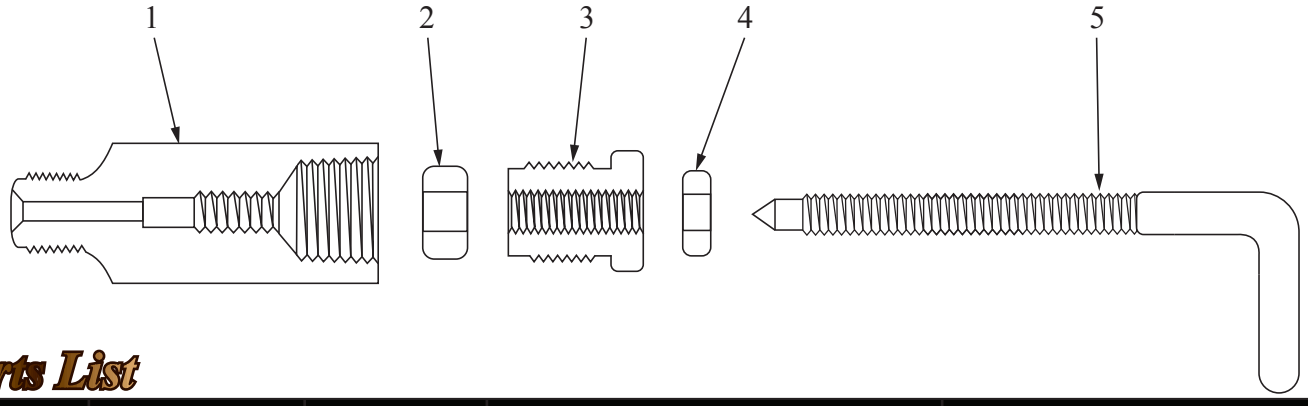
Note: Not used on the 1¼" head.

Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0561	1	Base	Steel
2	A-3179-1	1	Lube Stick	♦
	A-3179-2	1	Carton of 72 Lube Sticks	♦
3	A-0560	1	Screw	Steel
4	A-0562	1	Retainer	Steel
5	A-0564	1	Ball	316 Stainless Steel
6	A-0559	1	Body	Steel

** Recommended Spare Parts*

A-0022 Inlet Valve Assembly



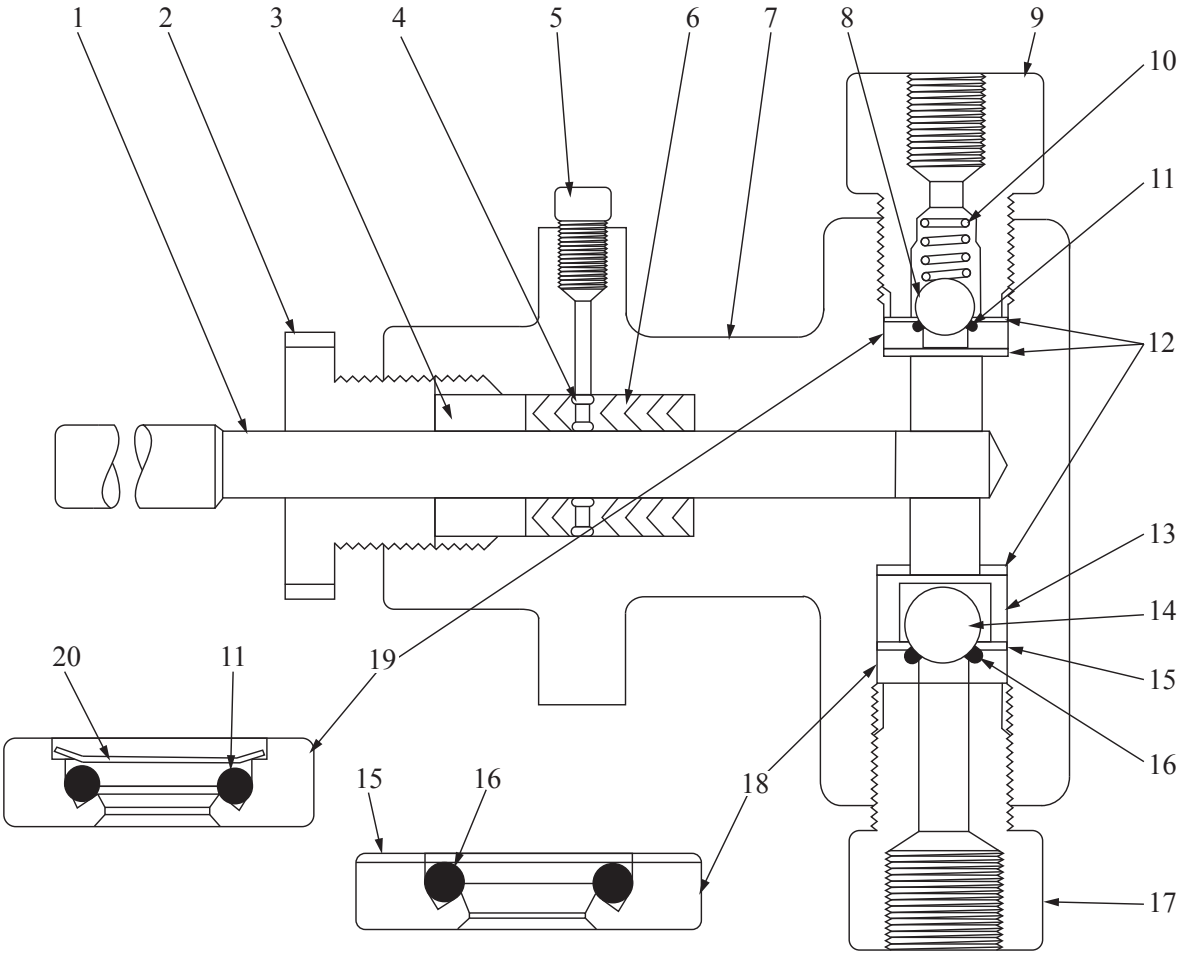
Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0010	1	Body	Brass
2	A-0023	1	Packing	Graphite
3	A-0011	1	Gland Nut	Brass
4	A-0195	1	Nut	Brass
5	A-0013	1	Valve Stem	Brass

** Recommended Spare Parts*

Injector Heads

(For ¼", ⅜", ½", ¾", and 1" Heads)



Alternate Components

Item #	Part #	Description	Material
11	A-2336	O'Ring	Viton
13	A-0157	Metal-to-Metal Top Seat for ¼" & ⅜" Heads	303 Stainless Steel
16	A-2184	O'Ring (1/2" - 1 1/ 4")	Viton
	A-2336	O'Ring (1/4" & 3/8")	
19	A-0157	Metal-to-Metal Bottom Seat for ¼" & ⅜" Heads	303 Stainless Steel
	A-0051	Metal-to-Metal Bottom Seat for ½", ¾" & 1" Heads	

Item #	Part #			Description
	Viton	Teflon	Hard*	
6	A-4102	A-1642	A-2295	¼" Plunger Packing
	A-4101	A-1234	A-1875	⅜" Plunger Packing
	A-4103	A-1012	A-1874	½" Plunger Packing
	A-4657	A-2988	A-2772	¾" Plunger Packing
	A-4658	A-1013	A-4135	1" Plunger Packing

Item #	Part # Ceramic	Description
1	A-2764-C	¼" Plunger
	A-0743-C	⅜" Plunger
	A-0032-C	½" Plunger
	A-2767-C	¾" Plunger
	A-0158-C	1" Plunger

*Hard packing for 3000PSI and above service

Parts List for Ductile Iron Head

Item #	Part # ¼"	⅜"	½"	¾"	1"	# Reqd.	Description	Material
♦	C-1609	C-0085	C-0068	C-0335	C-0019	1	Head Assembly	Ductile Iron with Stainless Steel Trim
1	A-2764	A-0743	A-0032	A-2767	A-0158	1	Plunger	Armaloy - 17.4 pH Stainless Steel
2	A-2765	A-0944	A-0055	A-2768	A-0047	1	Packing Gland Nut	Carbon Steel
3	A-1463	A-0957	A-1219	A-2769	A-0043	1	Packing Gland	303 Stainless Steel
4	A-2766	A-0742	A-0447	A-2770	A-0448	1	Lantern Ring	303 Stainless Steel
5	A-0516					1	Pipe Plug	♦
*6	A-1461	A-1456	A-0959	A-2771	A-0050	1	Plunger Packing	Buna-N
7	C-1608	C-0084	C-0022	C-0333	C-0020	1	Body	Ductile Iron
8	A-0054					1	⅜" Top Check Ball	316 Stainless Steel
9	A-0152					1	Top Bushing	303 Stainless Steel
10	A-0077					1	Ball Check Spring	316 Stainless Steel
*11	A-2097					1	O'Ring	Buna-N
12	A-2350					3	Gasket	304 Stainless Steel
13	A-0444					1	Ball Cage	17.4 pH Stainless Steel
14	A-0054		A-0053			1	Bottom Check Ball	316 Stainless Steel
15	A-2350		A-2338			1	Gasket	304 Stainless Steel
*16	A-2097		A-0612			1	O'Ring	Buna-N
17	A-0153					1	Bottom Bushing	303 Stainless Steel
*18	B-0368		B-0698			1	Bottom Seat Assembly	303 Stainless Steel
*19	B-0368					1	Top Seat Assembly	303 Stainless Steel
20	A-3523					1	O'Ring Retainer	Stainless Steel

Parts List for Stainless Steel Head

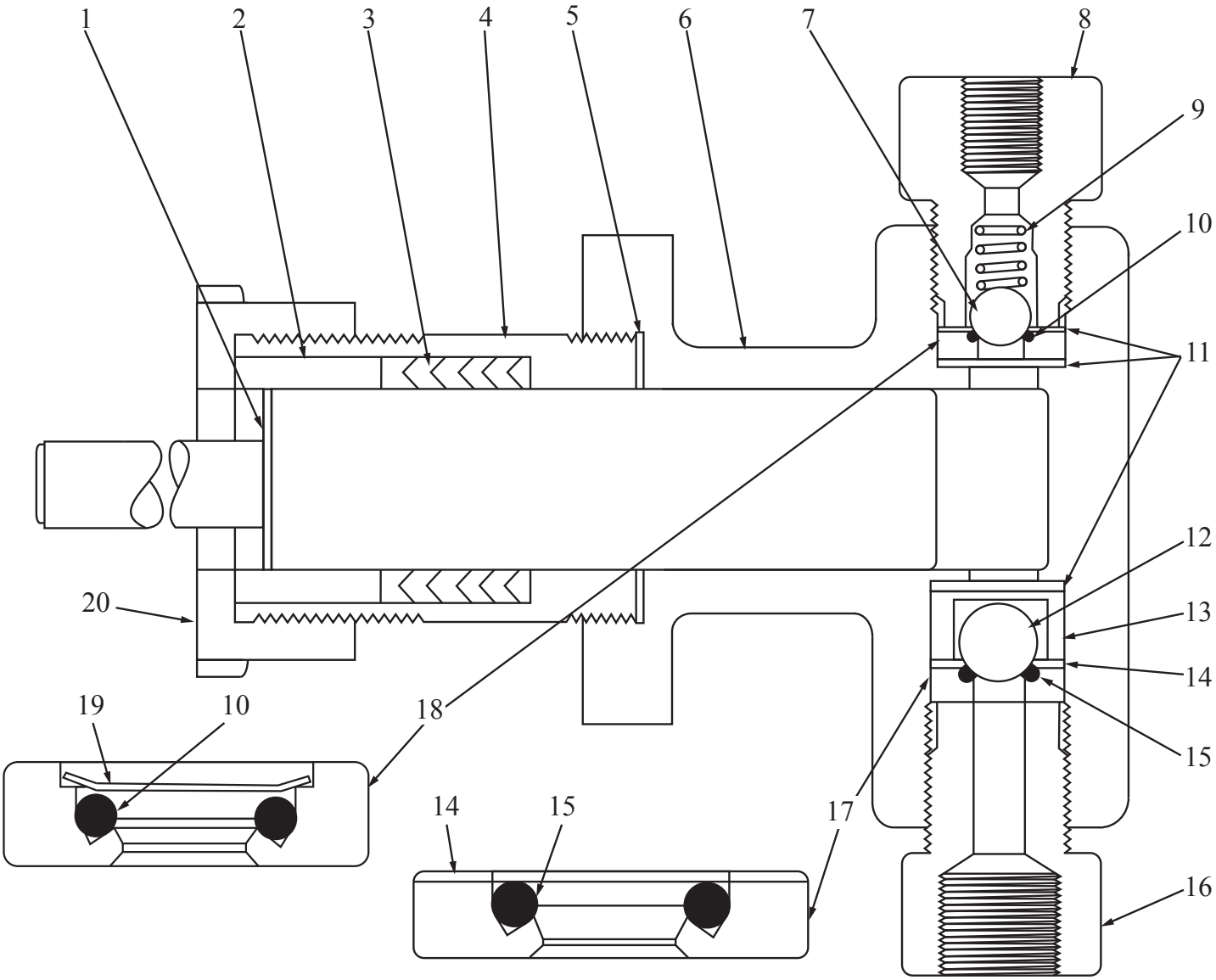
Item #	Part # ¼"	⅜"	½"	¾"	1"	# Reqd.	Description	Material
♦	C-1611	C-0148	C-0139	C-0337	C-0137	1	Head Assembly	Stainless Steel
*1	A-2764	A-0743	A-0032	A-2767	A-0158	1	Plunger	Armaloy - 17.4 pH Stainless Steel
2	D-0250	D-0375	D-0500	D-0750	D-1000	1	Packing Gland Nut	Stainless Steel
3	A-1463	A-0957	A-1219	A-2769	A-0043	1	Packing Gland	303 Stainless Steel
4	A-2766	A-0742	A-0447	A-2770	A-0448	1	Lantern Ring	303 Stainless Steel
5	A-0516					1	Pipe Plug	♦
*6	A-1461	A-1456	A-0959	A-2771	A-0050	1	Plunger Packing	Buna-N
7	C-1610	C-0147	C-0140	C-0340	C-0138	1	Body	Stainless Steel
8	A-0054					1	⅜" Top Check Ball	316 Stainless Steel
9	A-0152					1	Top Bushing	303 Stainless Steel
10	A-0077					1	Ball Check Spring	316 Stainless Steel
*11	A-2097					1	O'Ring	Buna-N
12	A-2350					3	Gasket	304 Stainless Steel
13	A-0444					1	Ball Cage	17.4 pH Stainless Steel
14	A-0054		A-0053			1	Bottom Check Ball	316 Stainless Steel
15	A-2350		A-2338			1	Gasket	304 Stainless Steel
*16	A-2097		A-0612			1	O'Ring	Buna-N
17	A-0153					1	Bottom Bushing	303 Stainless Steel
*18	B-0368		B-0698			1	Bottom Seat Assembly	303 Stainless Steel
*19	B-0368					1	Top Seat Assembly	303 Stainless Steel
20	A-3523					1	O'Ring Retainer	Stainless Steel

** Recommended Spare Parts*

**Alternate Components Availiable (see tables on page 10)*

Injector Heads

(For 1¼" Heads)



Injector Heads
(For 1¼" Heads)

Parts List

Item #	Part #	# Reqd.	Description	Material
♦	C-0048	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	C-0134			Stainless Steel
1	A-0408	1	Plunger	Armaloy - 17.4 pH Stainless Steel
2	A-0404	1	Packing Gland	303 Stainless Steel
*3	A-0405	1	Plunger Packing	Buna-N
4	A-0923	1	Adapter	303 Stainless Steel
5	A-0521	1	Gasket	Copper
6	C-0049	1	Body	Ductile Iron
	C-0135			Stainless Steel
7	A-0054	1	⅜"Top Check Ball	316 Stainless Steel
8	A-0152	1	Top Bushing	303 Stainless Steel
9	A-0077	1	Ball Check Spring	316 Stainless Steel
*10	A-2097	1	O'Ring	Buna-N
11	A-2350	3	Gasket	304 Stainless Steel
12	A-0053	1	½" Bottom Check Ball	316 Stainless Steel
13	A-0444	1	Ball Cage	17.4 pH Stainless Steel
14	A-2338	1	Gasket	304 Stainless Steel
*15	A-0612	1	O'Ring	Buna-N
16	A-0153	1	Bottom Bushing	303 Stainless Steel
*17	B-0698	1	Bottom Seat Assembly	303 Stainless Steel
*18	B-0368	1	Top Seat Assembly	303 Stainless Steel
19	A-3523	1	O'Ring Retainer	Stainless Steel
20	A-0403	1	Packing Nut	Stainless Steel

** Recommended Spare Parts* **Alternate Components Availiable (see table above)*

Alternate Construction

Item #	Part #	Description	Material
1	A-0408-C	Plunger (Stainless Steel Head)	Ceramic
3	A-4480	Plunger Packing	Viton
	A-1014		Teflon
	A-4133		Hard
10	A-2336	O'Ring	Viton
15	A-2184	O'Ring	Viton
17	A-0051	Metal-to-Metal Bottom Seat	303 Stainless Steel
18	A-0157	Metal-to-Metal Top Seat	303 Stainless Steel

Performance Data and Applications

Applications for 5020 Series Injectors

- Introducing detergents in air-gas drilling operations
- Blending foaming agents in water laden gas wells
- High pressure addition of fluid compounds in blending and chemical processing
- Pilot laboratory procedure involving high pressure circulation of mercury and other test substances
- Introduction of de-salting agents, de-emulsifiers, inhibitors and flocculants in crude oil and gas streams
- High and low pressure lubrication systems
- Methanol and alcohol injection in gas systems to prevent freezing
- General high pressure injection applications
- Fluid blending of extreme pressures within varied, controlled processes
- Hydrostatic testing
- Glycol circulation
- Pumping liquefied gasses
- Water treatment
- High pressure sampling

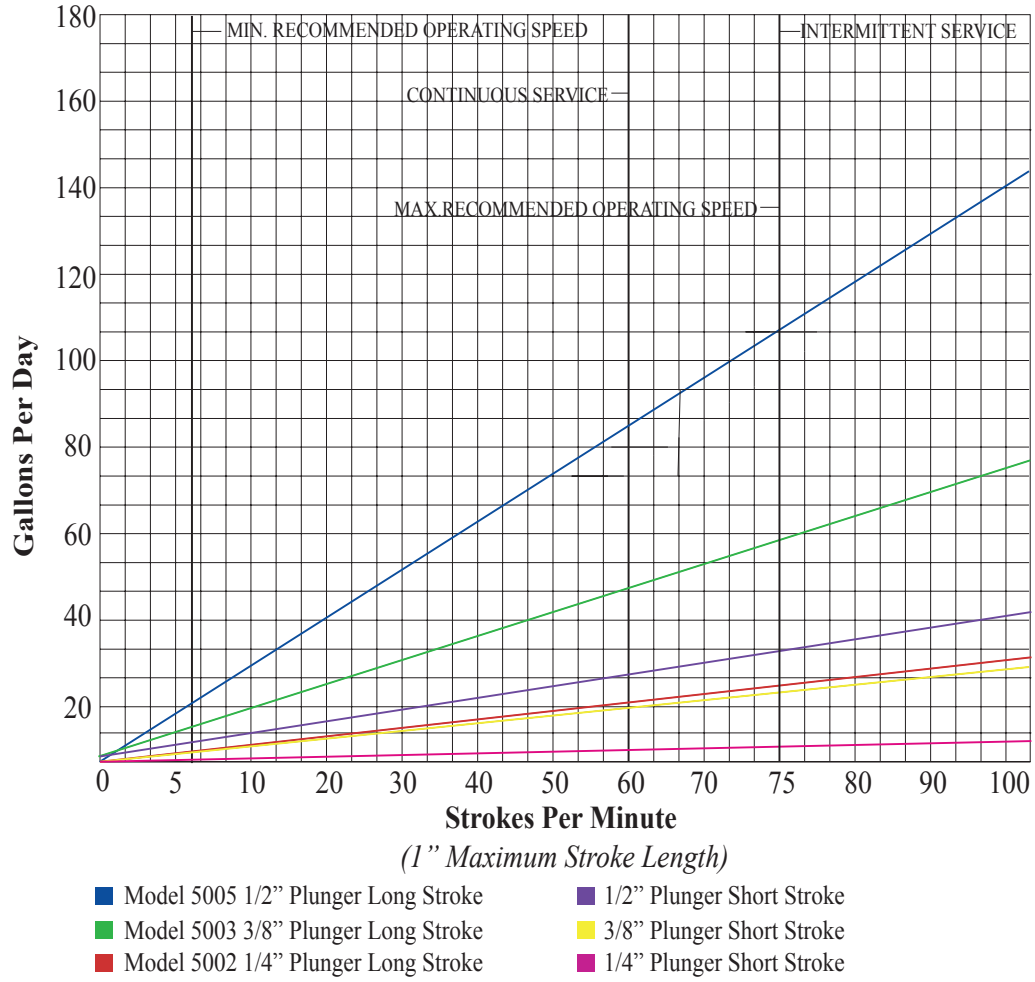
Performance Data

Model #	*Plunger Size*	*Operating Ratio (gas*/fluid)*	*Maximum Discharge Pressure (PSIG)*		*Maximum Volume*			
					Intermittent		*Continuous*	
			Hard Packing	*Soft Packing*	*GPH*	*GPD*	*GPH*	*GPD*
50-22	¼”	1000/1	20,000	3,000	0.83	20	0.67	16
50-23	⅜”	497/1	20,000	3,000	2.33	56	1.79	43
50-24	½”	264/1	12,000	3,000	4.38	105	3.54	85
50-25	¾”	115/1	5,000	3,000	7.42	190	6.67	160
50-26	1”	66/1	♦	3,000	16.66	400	13.33	320
50-27	1¼”	42/1	♦	2,000	26.04	625	20.83	500

**Maximum Power Gas Pressure: 50 PSI*
Stroke Length - Long: 1¼”; Short: ½”

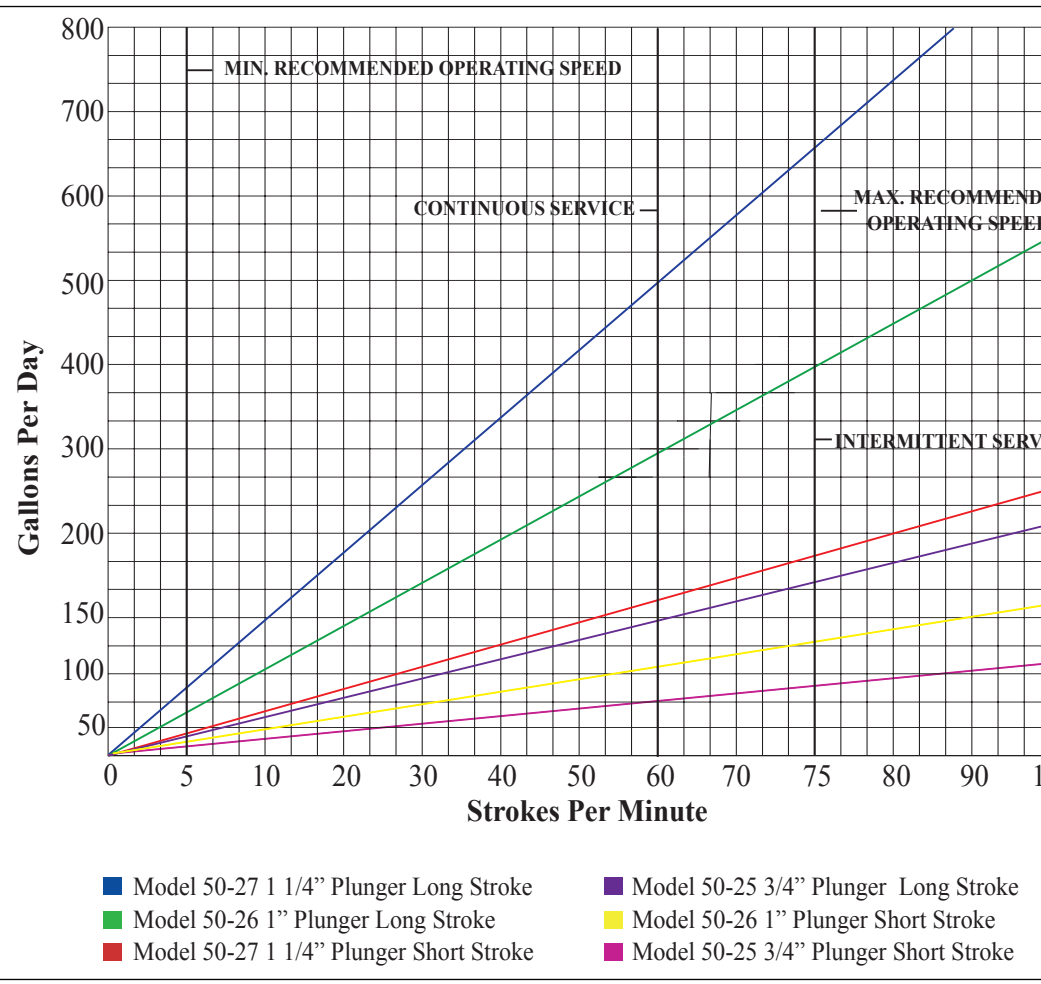
VOLUME

This information applies to FIOMORE pumps: 50-22, 50-23, 50-24



VOLUME

This information applies to FIOMORE pumps: 50-25, 50-26, 50-27



Performance Data

Gas Consumption Chart

Injection Press In P.S.I	50	100	150	200	250	300	400	500	600	700
1/4” Piston Long Stroke	280	281.2	282.4	283.6	284.8	286	289	292	294.6	297.2
1/4” Piston Short Stroke	700	703	706	707	709	712	720	724	731	737
3/8” Piston Long Stroke	140	140.6	141.2	141.8	142.4	143	144.5	146	147.3	148.6
3/8” Piston Short Stroke	355	355.6	356.2	356.8	357.4	358	359.5	361	362.3	363.6
1/2” Piston Long Stroke	80.6	81.2	81.8	82.4	83	83.6	84.8	86	87.2	88.4
1/2” Piston Short Stroke	200.6	201.1	201.8	202.4	203	203.6	204.8	206	207	208.4
3/4” Piston Long Stroke	36	37	38	39	40	41	43	45	47.3	49.4
3/4” Piston Short Stroke	89	91	92	94	95	96	99	101	105	109
1” Piston Long Stroke	20.6	21.2	21.8	22.4	23	23.6	24.8	26	27.2	28.4
1” Piston Short Stroke	50.6	51.2	51.8	52.4	53	53.6	54.8	56	57.2	58.4
1 1/4” Piston Long Stroke	13.6	14.2	14.8	15.4	16	16.6	17.8	19	20.2	21.4
1 1/4”Piston Short Stroke	32.6	33.2	33.8	34.4	35	35.6	36.8	38	39.2	40.4

and Applications

Standard cubic feet of gas required to pump one gallon													
800	900	1000	1500	2000	3000	3500	4000	5000	6000	7000	8000	9000	10000
300	303	306	318	330	356	368	380	404	428	452	476	500	522
741	748	756	779	802	854	872	897	937	984	1017	1057	1090	1122
150	151.5	153	159	165	178	184	190	202	214	226	238	250	262
365	366.5	368	374	380	393	399	405	417	429	441	453	465	477
89.6	90.8	92	98	104	116	122	128	140	152	164	176	188	200
209.6	210.8	212	218	224	236	242	248	260	272	284	296	308	320
51.3	52.8	55.6	66	76.2	97	107	114	121					
111	113	117	132	145	172	183	190	191					
29.6	30.8	32	38	44	56	62							
59.6	60.8	62	68	74	86								
22.6	23.8	25	31	37	49								
41.6	42.8	44	50	56									

Troubleshooting

NOTE: Make sure valves on suction and discharge lines are open.

Pump will not run.

1. If the pump will not run, make sure you have gas and pressure (50 PSIG Max) to the A-0022 speed control valve (Item #2, Page 2). Check pressure on line that pump is injecting into, too high pressure will result in a stalled pump.
2. Check the position of the pilot valve disc (Item #2, Page 5) by removing the fitting and disc retainer, C-0495 (Item #1, Page 5), to expose the C-4668 (Item #2, Page 5).
3. With a long screwdriver, move the flipper arm forward, towards the injection head, then check the hole in the C-4668 to make sure it aligns with the hole in the C-0451 (Item #5, Page 5) body, this hole is a 9 o'clock, there is another hole at 3 o'clock, but is not to be considered when timing this pump.
4. The pump is now in time, replace all items, and start pump.

   NOTE: A hole in the diaphragm (Item #18, Page 3) is evident by gas discharging constantly into the oil chamber.

Pump makes only one stroke forward and does not make return stroke.

1. Check ¼" NPT pilot hole located on right side of pilot valve assembly (Item #19, Page 2), this hole should be clear, because it is the discharge port for the pilot gas system (very small amount) which is necessary for the pump to make the return stroke.
2. Pull the lift ring on the A-0131 safety valve (Item #2, Page 3), if there is a constant discharge of gas then check the A-1329 diaphragm (Item #3, Page 7) of the B-0037 master valve (Item #13, Page 2) for a hole, while you are there make sure the A-0197 stem assembly (Item #4, Page 7) will move up (against spring tension) and return, if not disassemble the B-0037 completely, wash all parts to remove sand, slag, rust or other material that might be obstructing proper operation of this valve. At the same time check items A-0200 upper valve (Item #10, Page 7) seat, A-0196 valve disc seat (Item #8, Page 7), A-0201 lower valve seat (Item #7, Page 7) (rubber) for excessive wear and A-0202 spring (Item #9, Page 7) for breakage.
3. Make sure both ⅜" NPT ports are open and unobstructed by sand, rust, oil or other debris that might impede gas flow.

Pump runs but will not pump.

1. Make sure the fluid to be pumped is getting to the suction bushing (Item #17, Page 8) in quantity. Open the priming valve to bleed air from head assembly. If you have a liquid level gauge (and you should) shut valve on gauge as if you were making a volume test, if fluid falls in the tube on the suction stroke, then rises on the discharge stroke, the suction valve (Item #18, Page 8) is leaking or by-passing fluid.
2. Disconnect suction line, remove suction bushing, replace o'ring (Item #16, Page 8) in bottom check valve seat (Item #18, Page 8). Viton o'rings should be used in chemical service, both in bottom and top check valve seats.
3. Restart pump, set speed for volume needed.

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FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC
820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC
213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.
1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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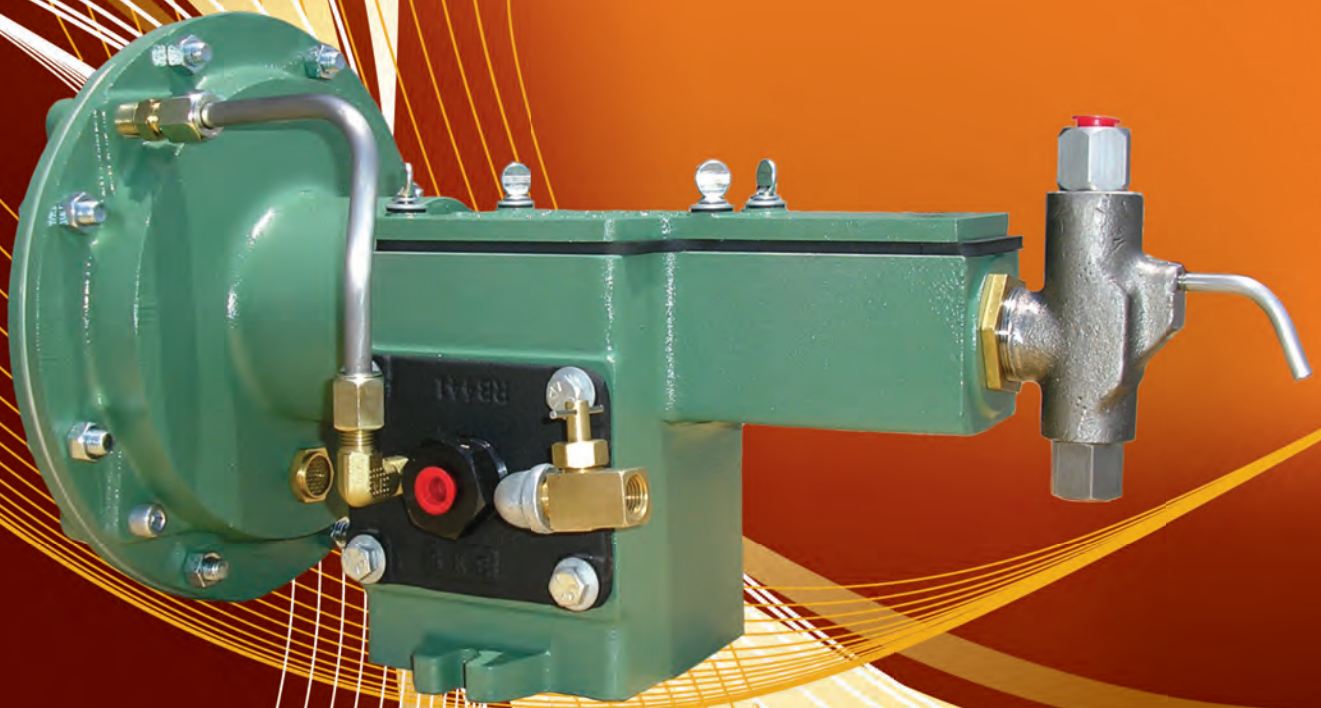
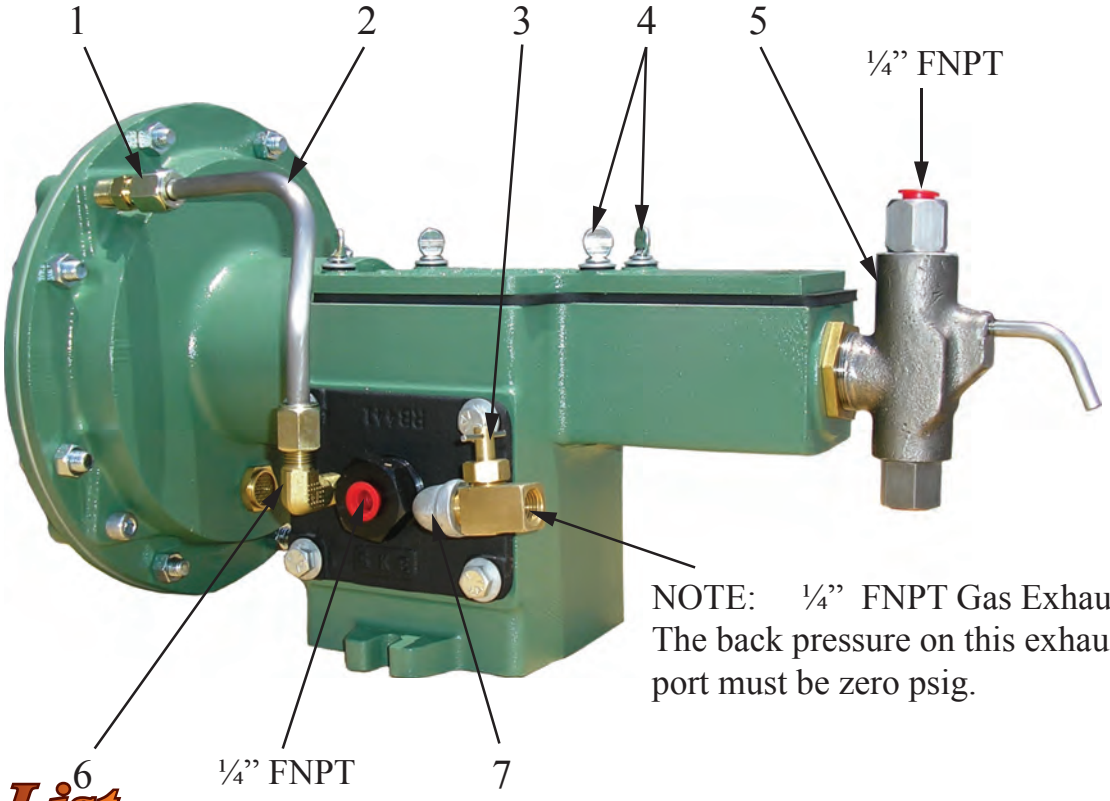
5200 Series Injector



5200 Series Injector



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

Parts List

Item #	Part #	# Reqd.	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	Wing Screws	Cadmium Plated Steel
5	See Page 8	1	Injector Head	See Page 8
6	A-4016	1	Elbow Connector and Compression Nut Assembly	Cadmium Plated Carbon Steel
7	A-0075	1	Street Ell	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 Connector and Compression Nut Assembly	Polypropylene
11	A-0950	1	Base	Steel
12	A-3123	1	⅜" x 22" Suction Line	Polypropylene
13	A-0167	4	Cut Washer	Steel
14	A-0425	2	Lock Washer	Steel
15	A-0144	1	Hex Nut	Steel
16	A-0142	1	Hex Head Cap Screw	Cadmium Plated Steel
17	F-0871	1	5 Gallon Tank Gauge	♦
	A-1285		10 Gallon Tank Gauge	

**Parts not pictured*

Installation and Operating Instructions

First check for the following items shipped loose, not installed on the pump: (1) ¼" 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 gas supply line, if pressure exceeds 35 PSI reduce with regulator at pump. Do not connect to the small ¼" 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 ¼" 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 further gives 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 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 that portion of the reservoir that contains the spring (A-1820) you can see 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 this 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 priming valve (A-1497) opening for air bubbles in liquid being pumped. As soon as bubbles stop, close priming valve and adjust pump for desired SPM and pumping rate. A quick check of packing gland nut (A-4104) to see if there is packing leakage, if so tighten slightly with wrench furnished. **Do not overtighten** because it may stall pump and/or cause excessive packing wear.
8. Replace cover and gasket with thumb screws.

Applications

- The introduction of de-emulsifiers, solvents, corrosion inhibitors, de-scaling 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

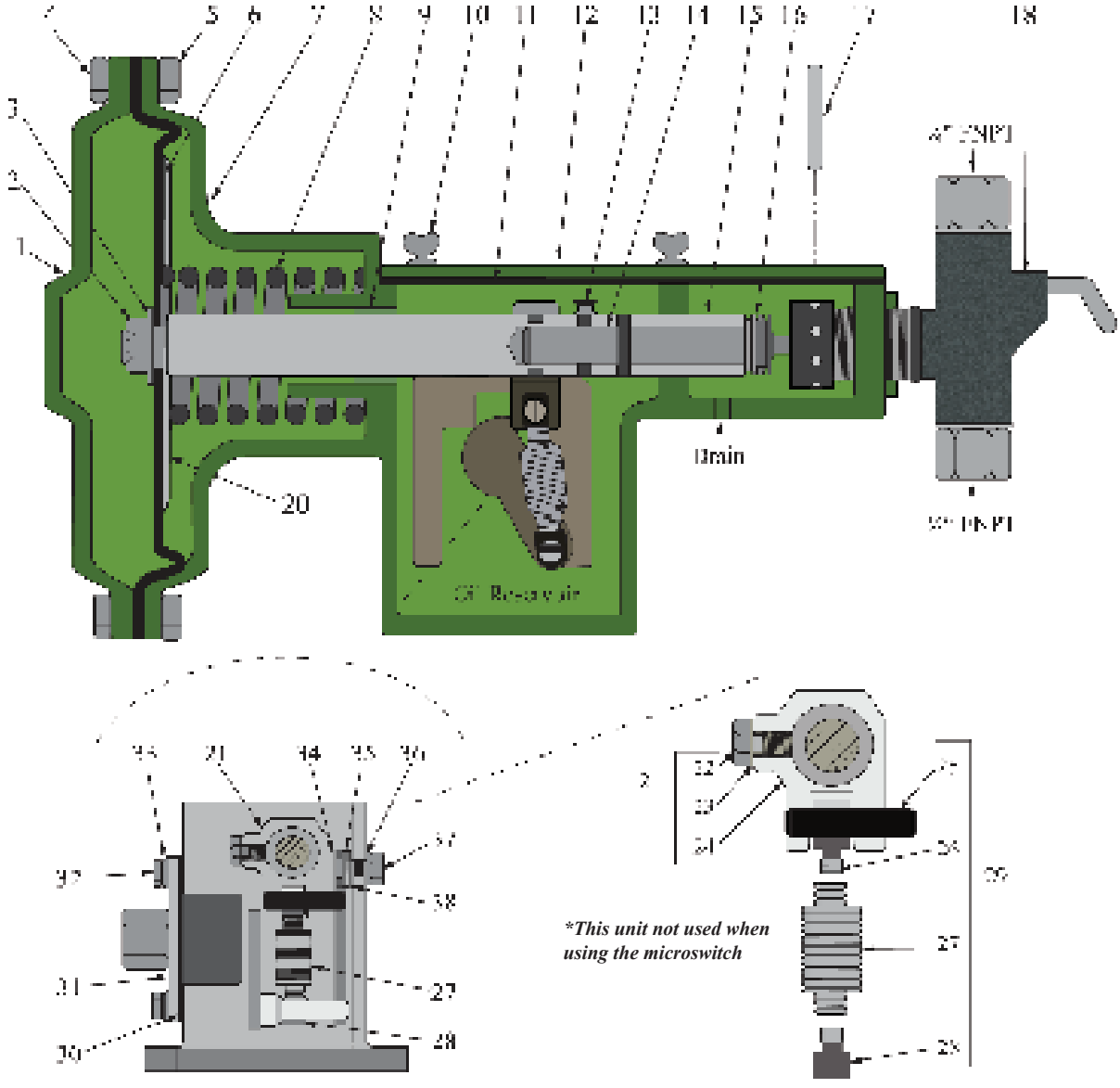
- Teflon or Viton Packing
- Slow Speed Controller
- Microswitch Valve Controller
- CxC Non-packing Head Assembly

Sour Gas Trim

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

5200 Series Injector

Cross Section



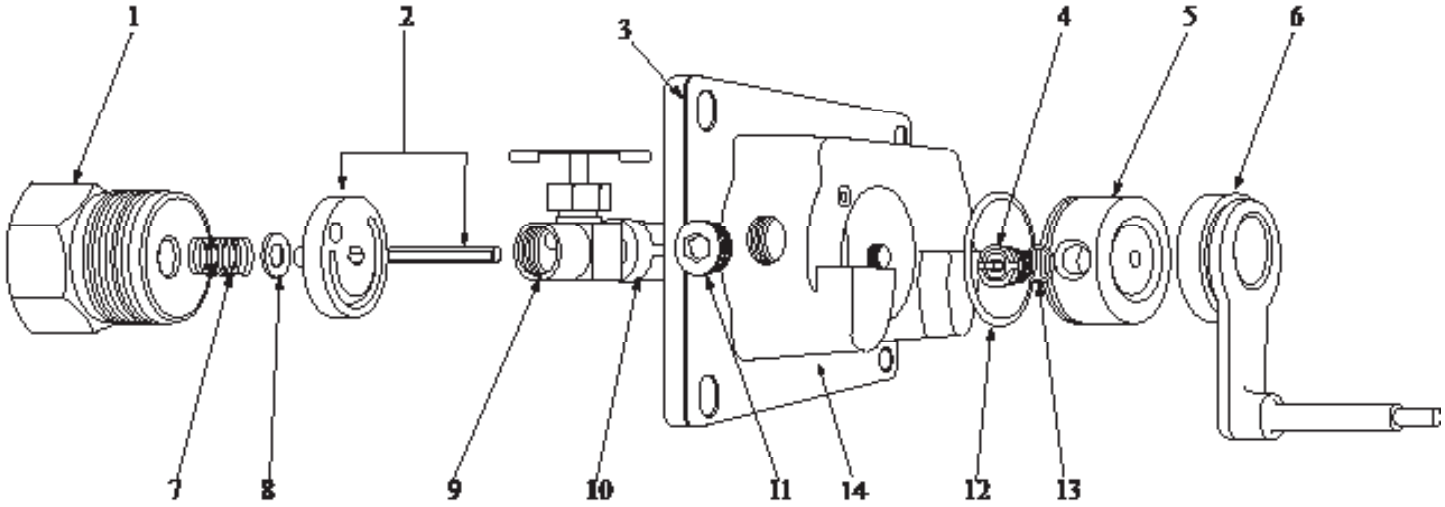
5200 Series Injector

Parts List

Item #	Part #	# Reqd.	Description	Material
1	C-0252	1	Diaphragm Cover	Aluminum
2	A-3320	1	Locknut	Cadmium Plated Steel
3	A-3321	1	Washer	Cadmium Plated Heavy Steel
4	A-0139	8	Hex Head Cap Screw	Steel
5	A-2207	8	Hex Nut	Steel
6	C-0290	1	Molded 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	Wing Screws	Cadmium Plated Steel
11	A-1546	1	Gasket	Buna-N
12	B-0548	1	Cover	Aluminum
13	A-1828	1	Adjusting Pin	Steel
14	B-0447SS	1	Rod Adapter	303 Stainless Steel
15	B-0444SS	1	Thrust Rod	303 Stainless Steel
16	A-0290	1	Pin	Steel
17	A-0315	1	Gland Wrench	Steel
18	See Page 8	1	Injector Head	See Page 8
19	A-1835	1	Air Vent	Brass
20	B-0438	1	Diaphragm Plate	Steel
21	A-1832	1	Stirrup Sub-Assembly	Aluminum and Steel
22	A-1829	1	Hex Head Screw	Steel
23	A-3406	1	Internal Tooth Lockwasher	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	Flipper Spring	Steel
28	A-1838	1	Spring Adapter (bottom)	Steel
29	A-1831	1	Stirrup Assembly	♦
30	A-0058	1	Pilot Valve Gasket	Fiber
31	C-0446	1	Pilot Valve	♦
32	A-0141	4	Hex Head Machine Screw	Cadmium Plated Carbon Steel
33	A-0425	4	Lockwasher	Cadmium Plated Steel
34	A-1827	1	Bumper Plate Screw	Steel
35	A-1823	1	Bumper Plate	Steel
36	A-0459	1	Light Lockwasher	Cadmium Plated Steel
37	A-3323	1	Hex Nut	Cadmium Plated Semifinish Steel
38	A-0746	5	Washer	Steel

** Recommended Spare Parts* ***Parts packaged separately*

5200 Series Replaceable Seat



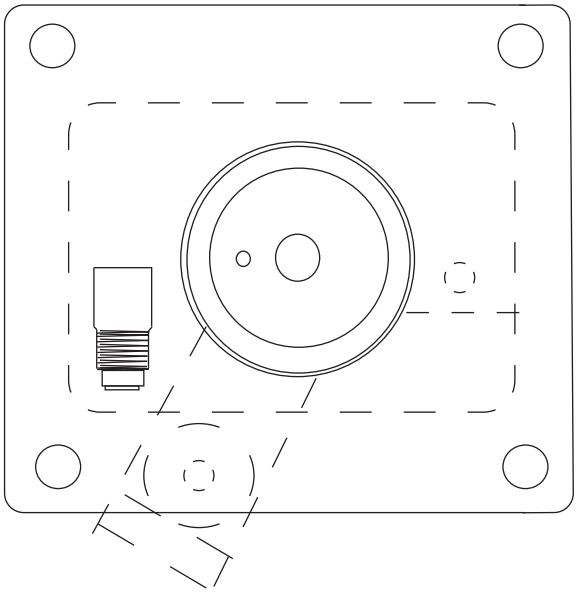
Parts List

NOTE: Using small amount of grease, lubricate Items #12 and #13, o'rings, before and after installation on Item #5. This will keep o'rings in place and facilitate the pressing of the valve seat into position.

Item #	Part #	#	Description	Material
1	C-0495	1	Disc Retainer	Steel
2	C-4147	1	Valve Disc and Pin	Stainless Steel
3	C-0441	1	Pilot Valve Body	Ductile Iron
*4	C-0463	2	Seat Seal Screw	Steel
5	C-0451	1	Valve Seat	Steel
6	B-0440	1	Flipper Arm Assembly	Steel
7	A-0077	1	Spring	Steel
8	A-0579	1	Washer	Stainless Steel
9	A-2489	1	Valve	Brass
10	A-0075	1	Street Elbow	Steel
11	C-3386	1	Flush Seal Plugs	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.

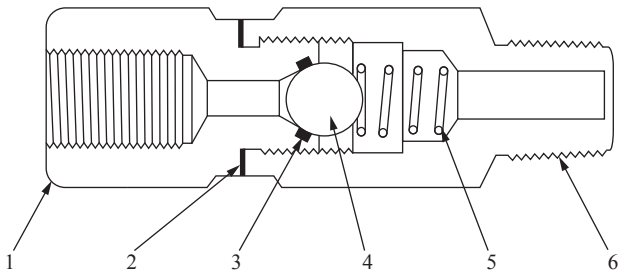
5200 Series Components

A-0675 & A-0676 Line Check

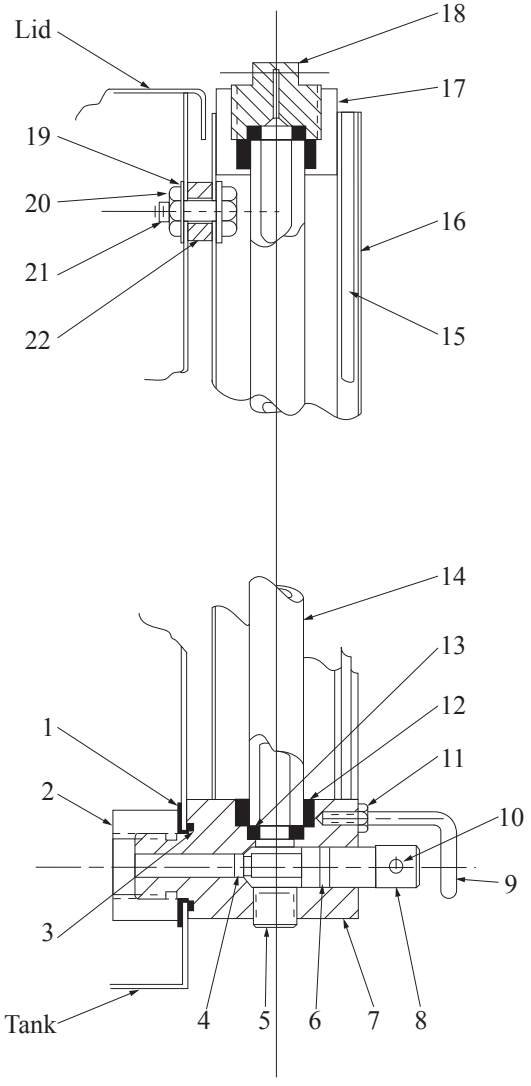
Parts List

Item #	Part #	# Reqd.	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	⅜" Ball	316 Stainless Steel
5	A-0391	1	Spring	Steel
6	A-0679	1	Outlet Body	Brass
	A-1296	1	Outlet Body	303 Stainless Steel

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



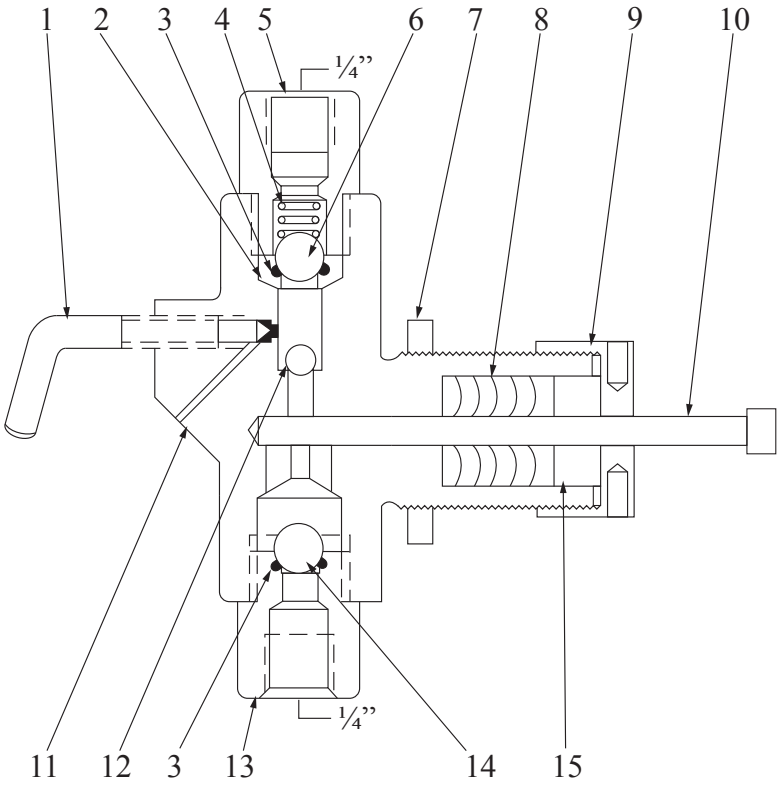
F-0871 Model 2000 Tank Gauge



Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0306	1	Washer	Teflon
2	F-0871.01	1	¾-16" Nut	Stainless Steel
3	F-0871.03	1	2-019 O'Ring	Viton
4	F-0871.04	1	2-006 O'Ring	Viton
5	A-0138	2	¼" NPT Pipe Plug	Steel
6	F-0871.06	1	2-011 O'Ring	Viton
7	F-0871.07	1	Valve Body	Stainless Steel
8	F-0871.08	1	Valve Stem	Stainless Steel
9	F-0871.11	1	Valve Stop	Stainless Steel
10	F-0871.09	1	⅛" x 2" Roll Pin	Stainless Steel
11	F-0871.10	1	Valve Stop Nut	Stainless Steel
12	15470	2	Tube Gasket	Buna-N
13	D-0013	2	Tube End Seal	Viton
14	A-3102	1	Glass Tube	Glass
15	F-0871.15	1	Scale	Acrylic
16	F-0871.16	1	Housing	Stainless Steel
17	F-0871.17	1	Top Block	Aluminum
18	F-0871.18	1	Vent Plug	Stainless Steel
19	A-4092	2	Stat-O-Seal	Steel
20	F-0871.20	1	¼-20" Nut	Stainless Steel
21	F-0871.21	1	¼-20" x ¾" Bolt	Stainless Steel
22	A-0987	1	Spacer	Stainless Steel

Injector Heads



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	O'Ring	Viton
8	♦	3/16" Plunger Packing	Hard
	A-3967		Viton
	A-3966		Teflon
	A-2295	¼" Plunger Packing	Hard
	A-4102		Viton
	A-1642		Teflon
	A-1875	⅜" Plunger Packing	Hard
	A-4101		Viton
	A-1234		Teflon
	A-1874	½" Plunger Packing	Hard
	A-4103		Viton
	A-1012		Teflon
* 13	A-0771	Bottom Seat Assembly (Metal-to-Metal)	316 Stainless Steel
13	B-0844	Suction Bushing with Viton O'Ring	303 Stainless Steel
* 14	A-0053	½" Suction Ball	316 Stainless Steel

*Recommended Spare Parts **Items must be used together

Plunger Packing Chart

Material	Maximum Discharge Pressure (PSIG) 3/16"	¼"	⅜"	½"
Buna-N		1500	1500	1500
Viton		3500	3500	3500
Hard		6000	6000	3500
Teflon		1500	1500	1500

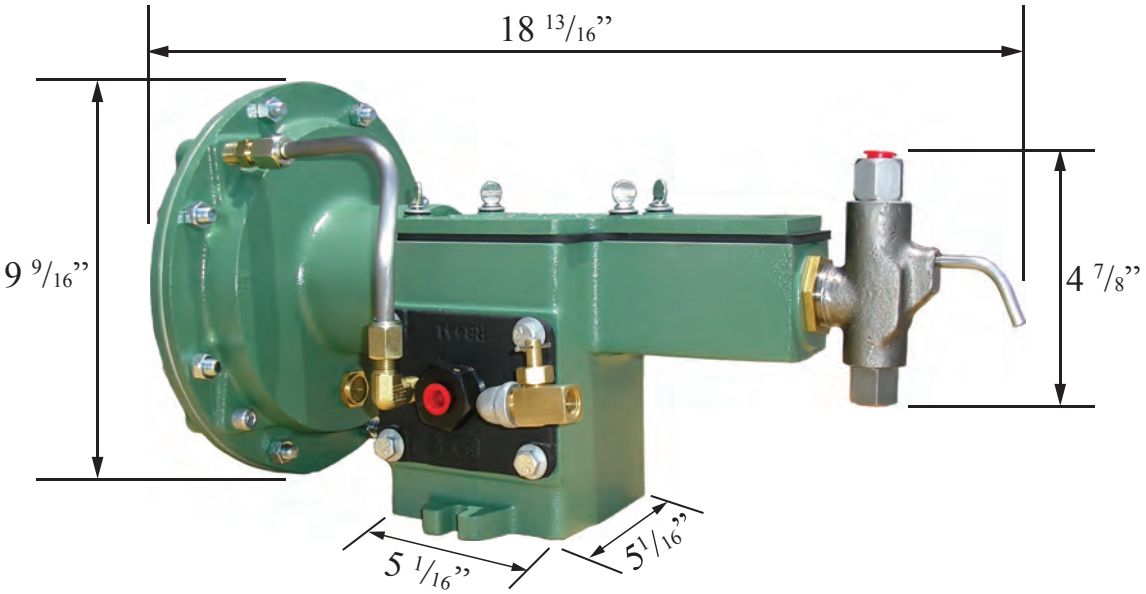
Parts List

Item #	Part # 3/16"	¼"	⅜"	½"	# Reqd.	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			All 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	Suction & Discharge O'Ring	Buna-N
4	A-0077				1	Ball Check Spring	316 Stainless Steel
5	A-1496				1	Top Bushing	303 Stainless Steel
6	A-0054				1	⅜" Large Top Ball	316 Stainless Steel
7	A-0225				1	Locknut	Brass
* 8	A-3969	A-1461	A-1456	A-0959	1	Plunger Packing	Buna-N
9	A-4104				1	Plunger 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			Stainless Steel
12	♦	A-0126			1	¼" Small Top Ball	316 Stainless Steel
* 13	B-1216	B-0736			1	Bottom Seat Assembly-Buna	303 Stainless Steel
* 14	A-0054				1	⅜" Suction Ball	316 Stainless Steel
15	A-4332	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
16	A-0126	♦			1	¼" Ball	316 Stainless Steel
17	A-4394	♦			1	Suction Bushing Sealing Washer	304 Stainless Steel

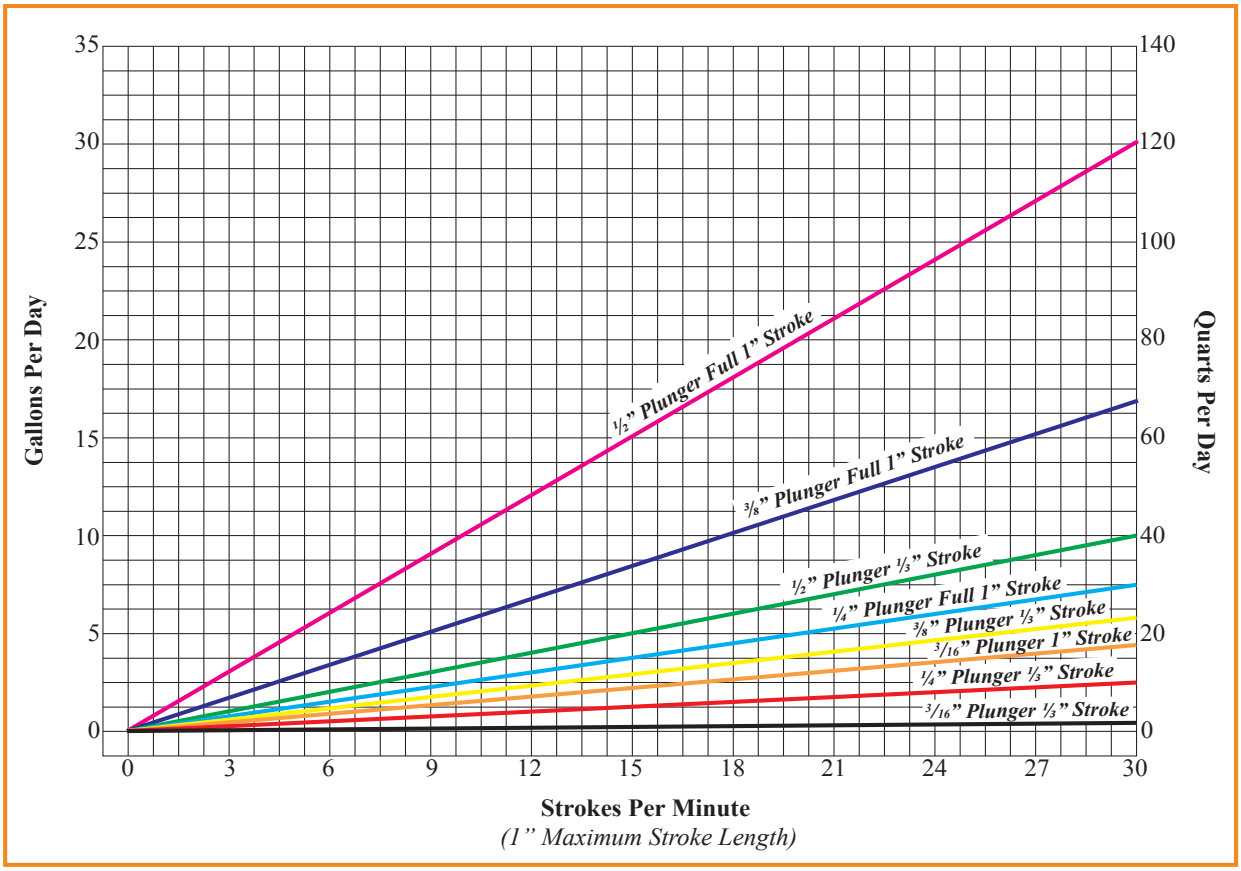
*Recommended Spare Parts ** Alternate construction availiable see chart above

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
⅓ Stroke	3/16"	1371	1374	1386	1407	1428	1590	1635	1665	1680	1725	1776
	¼"	732	735	744	810	864	924	1020	1065	1107	1215	1491
	⅜"	360	378	444	492	531	555	729	834	942	1065	1122
	½"	159	162	171	186	213	228	252	285	♦	♦	♦
Full Stroke	3/16"	457	458	462	469	476	530	545	555	560	575	589
	¼"	244	245	248	270	288	308	340	355	369	405	497
	⅜"	120	126	148	164	177	185	243	278	314	355	374
	½"	53	54	57	62	71	76	84	95	♦	♦	♦

Maximum Recommended Speed Above 1500 PSI Injection Pressure

Plunger Size	Strokes Per Minute
3/16"	28
¼"	26
⅜"	14
½"	14

Power End to Fluid End Ratio

Plunger Size	Operating Ratio Fluid/Gas
3/16"	1200/1
¼"	750/1
⅜"	300/1
½"	180/1

Pressure / Volume Chart

Series	Plunger Size	Maximum Discharge Pressure (PSI)	For Operation Off Air or Gas Pressure to 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
	¼"	1500	52-01	7.5	52-01T	7.5
	⅜"	1500	52-03	16.8	52-03T	16.8
	½"	1500	52-05	32	52-05T	32
5210 High Pressure	3/16"	6000	52-14	3.65	52-14T	3.65
	¼"	6000	52-11	6.5	52-11T	6.5
	⅜"	6000	52-13	7.9	52-13T	7.9
	½"	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)*

Maintenance and Troubleshooting

Oil Thrust Rod

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

Packing Leakage

Check for packing leakage, tighten or replace as needed, overtightening will shorten 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 suction bushing (B-0736).

Pump Stopped Running and Gas is Escaping

Should pump stop running but you can hear gas escaping from vent (A-1835) remove diaphragm cover (C-0252) and inspect diaphragm for hole or tear, replace as needed. At this time, visually inspect larger turning spring (A-1821) for breakage. When installing a new diaphragm, put a sealant line Permatex "Form a Gasket" around the center hole on both sides of the diaphragm. This will prevent gas leak in that area. Reinstall diaphragm making sure the small hole on outer edge of diaphragm and diaphragm cover line up with 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 gas supply and pressure (35PSI max), overpressure and underpressure can cause pump to stall.

Pump Stalls in Forward Discharge Position

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

Pump Still Stalled

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

Pump is Running but Not Pumping

There could be air in the injection head, open priming valve (A-1497) until air bubbles in fluid subside. If 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 suitable container and save to replace in reservoir. Remove (C-0446) pilot valve assembly, then remove broken spring from flipper arm (B-0440). Loosen (A-1829) hex screw on the (A-1832) stirrup assembly, rotate assembly, remove (A-2355) rollpin, install new (A-1820) spring slide pilot valve assembly partially in and reattach (A-1838) spring adapter, retighten (A-1829) making sure it is in the groove on the thrust rod, rebolt (C-0446), replace oil and restart pump (See Pump Stalls in Forward Discharge Position and Pump Still Stalled).

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC

820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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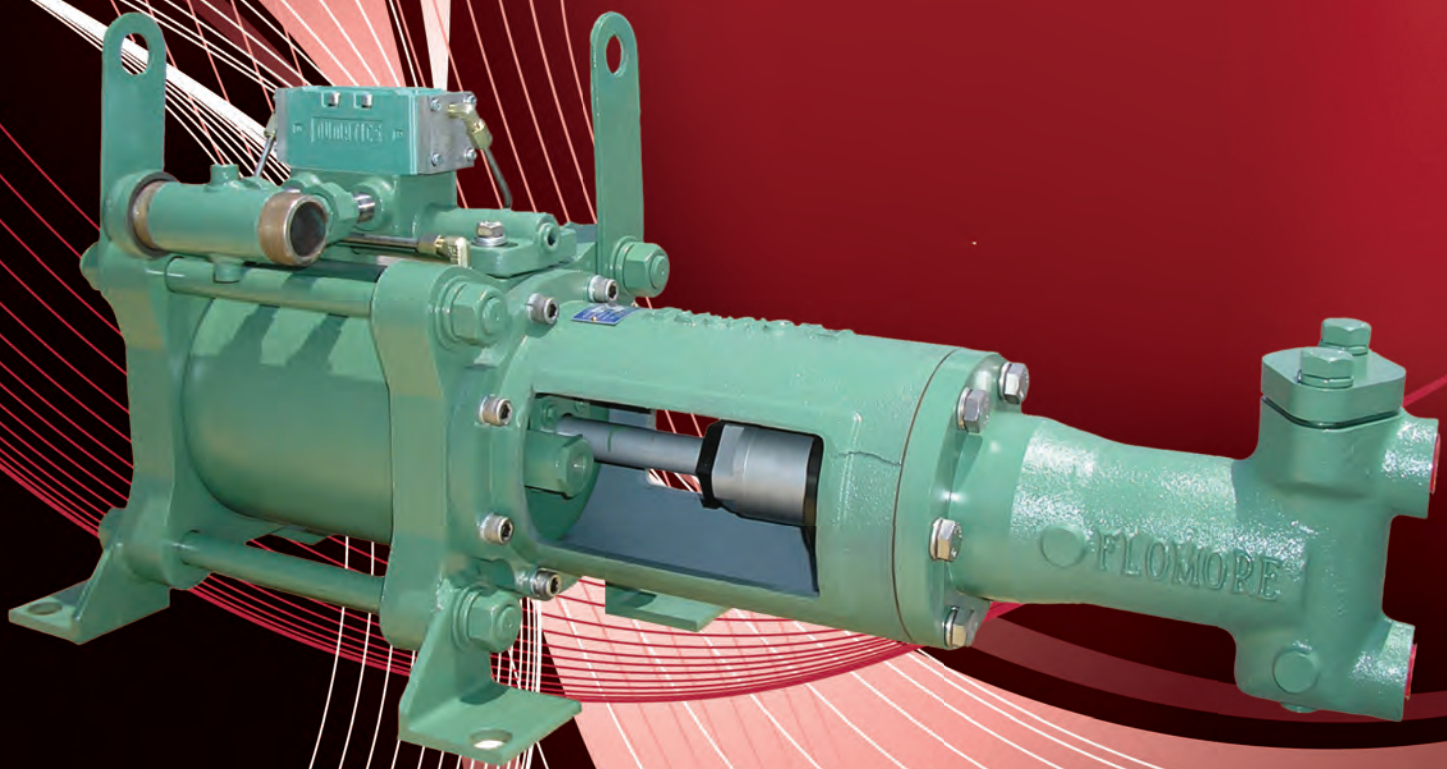
Different By Design

6200 Series Injector



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6200 Series Specifications

The Flomore 6200 Series Pump line consists of a series of basic pump options all developed from a modular power unit. All units are pneumatically driven positive displacement, single or double acting, reciprocating pumps.

The basic pump is designed for use with three fluid ends, a 1¼" and 2¾" diameter plunger, and a 4" piston. The fluid ends are interchangeable with the modular power unit and can be assembled as single ended units or double ended units in any combination of sizes. All fluid ends are designed to withstand maximum output force of the power unit.

Due to the balanced valving of the power cylinder it is, in theory, possible to operate the pump against a back pressure equal to the inlet power gas pressure; however, a differential in these two pressures must be maintained for the pump to stroke. See *Power to Fluid Ratio* below. When the exhaust gas is piped off to other areas, the pilot valves may also be connected to the pump exhaust manifold system.

Fluid ends are designed with removable check valves. These valves may be replaced without disconnecting the suction and discharge piping.

Material Specifications

Power End		*Fluid End Models 6211, 6212, 6221, & 6222*		*Fluid End Models 6241 & 6242*	
Part	***Material***	***Part***	***Material***	***Part***	***Material***
Main Power Cylinder	Carbon Steel	Pump Head Body	Cast Steel (316SS Optional)	Pump Head Body	Cast Steel (316SS Optional)
Power Cylinder End Cap	Carbon Steel	Valve Cover	Carbon Steel	Valve Cover	Carbon Steel
Power Piston	Aluminum	Valve Plug	Stainless Steel	Valve Plug	Stainless Steel
Power Piston Seals	Buna-N	Plunger	Stainless Steel	Roll Pin	Stainless Steel
Power Cylinder Seals	Buna-N	Valve Ball	Stainless Steel	Valve Ball	Stainless Steel
Power Piston Rod	Stainless Steel	Valve Seat Insert	Stainless Steel	Valve Seat Insert	Stainless Steel
Piston Rod Packing Gland	Carbon Steel	Valve Seat Gasket	Teflon	Valve Seat Gasket	Teflon
Piston Rod Packing	Optional	Valve Seat Seals	Buna-N	Piston	Carbon Steel
		Packing	Optional	Piston Cup	Buna-N
		Lantern Ring	Stainless Steel	Piston Rod	Stainless Steel
		Packing Gland	Delrin	Cylinder	Cast Ductile Iron
		Packing Nut	Carbon Steel	Cylinder Sleeve	Stainless Steel

Installation and Operating Instructions

1. Remove pump from shipping container and inspect for possible shipping damage. If damaged, file a claim with the carrier.
2. Mount pump by bolting to a stable foundation. Four legs are supplied on the power unit for this purpose.
3. Connect fluid suction and discharge lines. Caution should be exercised to avoid piping stresses to the fluid head of the pump. A relief valve should be installed in the discharge line between the discharge check valve and the nearest shut off valve or auxiliary check valve.

   Caution: When pump is installed in a closed or hazardous area, power gas exhaust (including pilot devices) must be vented in a safe manner. All gas connections must be checked periodically for leaks. If power gas or air supply pressure exceeds 250 PSIG, a regulator and pressure relief valve of proper size must be installed.
4. Connect power supply lines as shown in Figure 1. Power supply pressure must not exceed 250 PSIG.
5. Fill lubricator reservoir with 1 quart SAE 10, SAE 20, or SAE 30 non-detergent oil dependent upon operating temperature.
6. For connections where it is necessary to pipe off exhaust gas such as back pressure service or pollution control, refer to Figure 3. Order Exhaust Manifold B-1126 and make all connections shown in Figure 4.
7. Open supply line slowly in order to check pump and system operation.
8. Adjust supply volume and pressure to regulate operating speed to meet desired conditions of discharge pressure and volume.
9. Adjust lubricator to minimum supply rate.
10. On 6200 pumps maintain plunger lubrication by adjusting grease jack periodically.

****For safe operation, a safety valve sized to meet the maximum capacity of the supply source should be installed in the supply line at or near the pump.***

Operational Data			
Plunger Size	1¼"	2¾"	4"
Pump Model Number	6211	6221	6241
Fluid Discharge Pressure Maximum	9000 PSI	1800 PSI	900 PSI
Fluid Discharge Volumes up to Maximum Pressure	See Chart Page 12	See Chart Page 12	See Chart Page 12
Operating Speed Maximum and Minimum	See Chart Page 12	See Chart Page 12	See Chart Page 12
Power/Fluid Power Ratio *(Inlet Gas Pressure - Exhaust Back Pressure) x Power to Fluid Ratio = Maximum Fluid Discharge Pressure at Stall*	40:1	8:1	4:1
Pneumatic Pressure Required to Operate Pump	See Chart Page 12	See Chart Page 12	See Chart Page 12
Maximum Temperature	200°F with Buna-N Trim 400°F with Viton Trim		
Minimum NPSHR	8 Feet of Water		

Dimensional Data

NOTE: Do not use for construction. Contact factory for certified dimensions when required.

Figure 1: Model 6211 & 6221 (Top View)

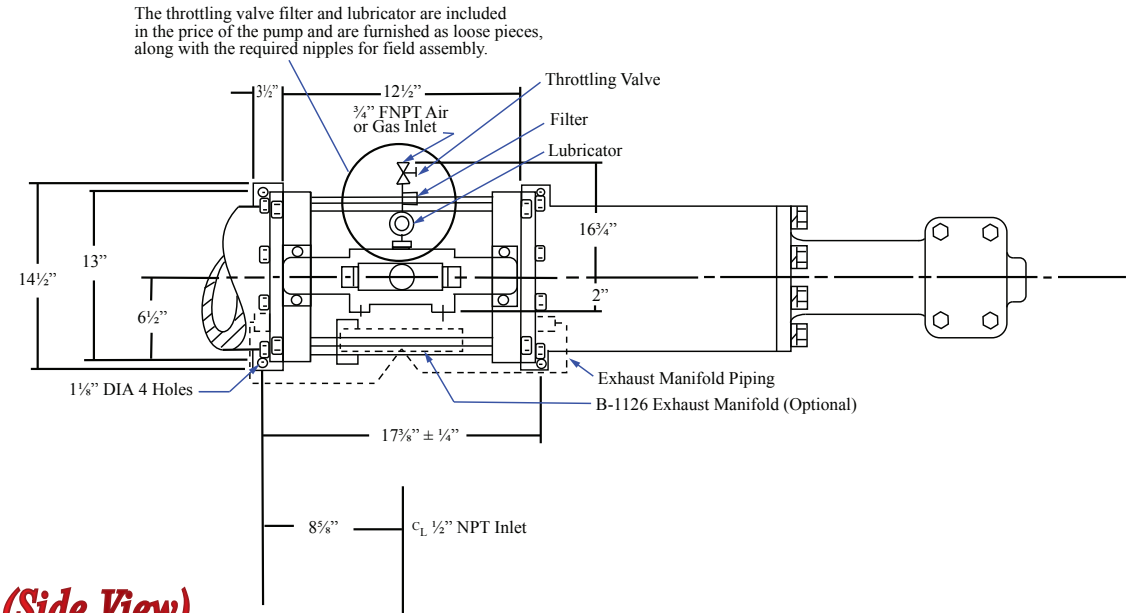
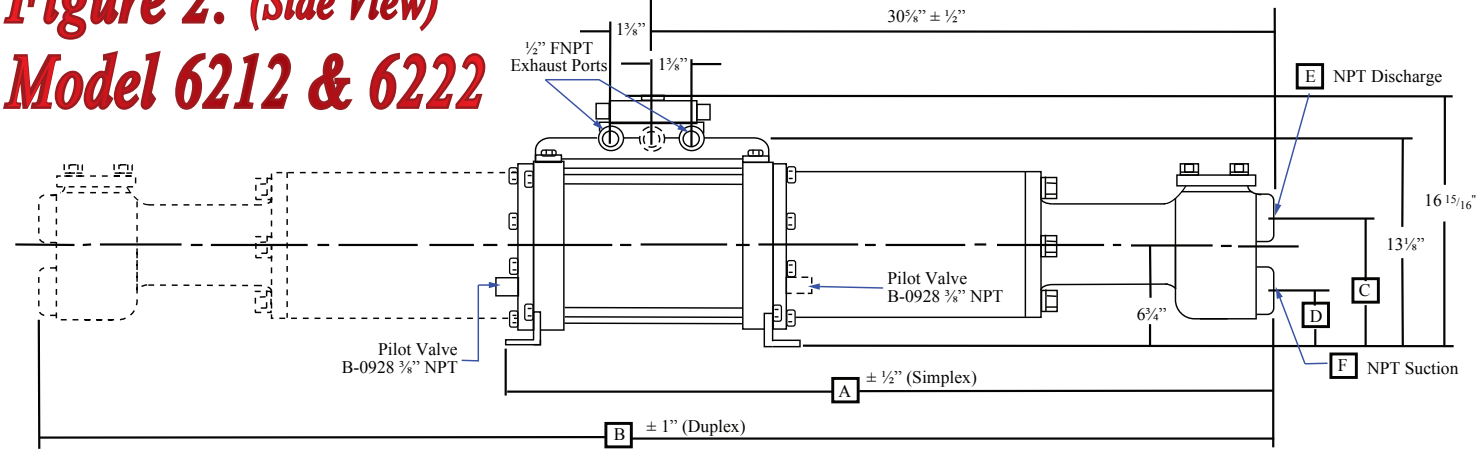


Figure 2: (Side View) Model 6212 & 6222



Weights & Dimensions

Model #	A	B	C	D	E	F	Weight
6211	40 ¼	◆	8 ⅝	4 11/16	¾	¾	260
6212	◆	61 ¼	8 ⅝	4 11/16	¾	¾	340
6221	40 ¼	◆	9 5/16	4 ¼	1	1	268
6222	◆	61 ¼	9 5/16	4 ¼	1	1	362
6241	42 ½	◆	9 23/32	3 ⅝	2	2	315
6242	◆	65 ⅝	9 23/32	3 ⅝	2	2	430

Dimensional Data

NOTE: Do not use for construction. Contact factory for certified dimensions when required.

Figure 3: Model 6241

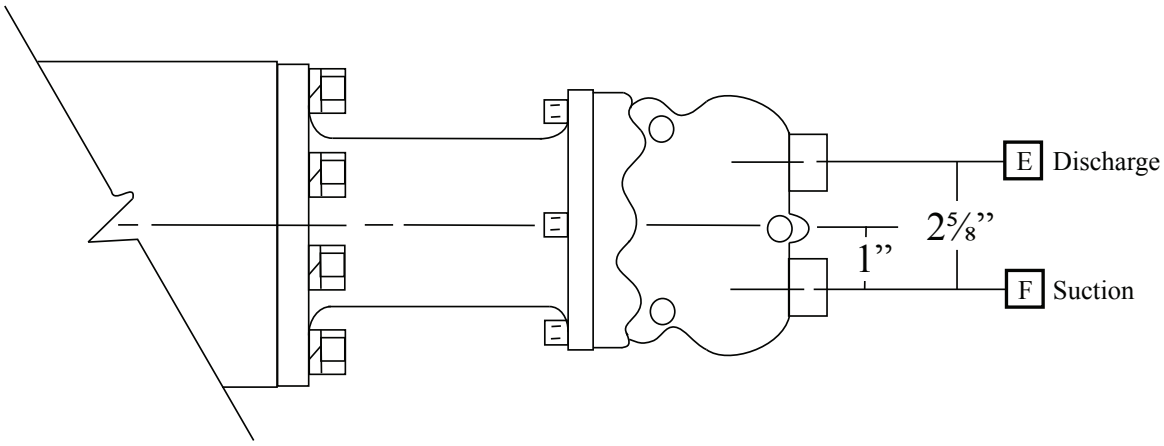
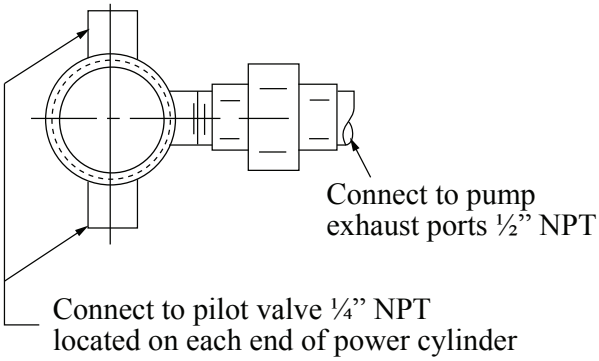
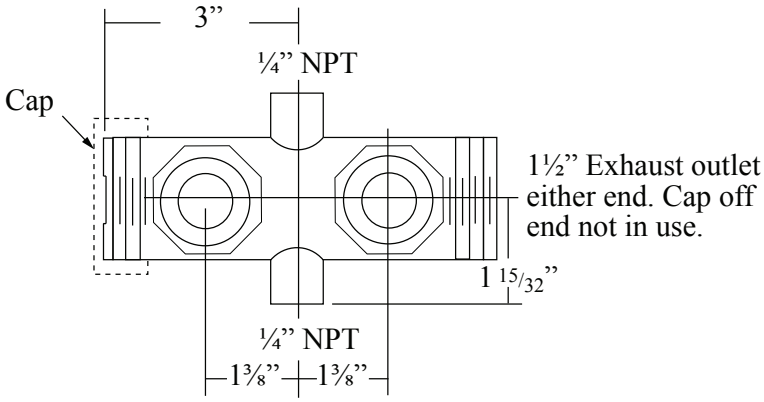


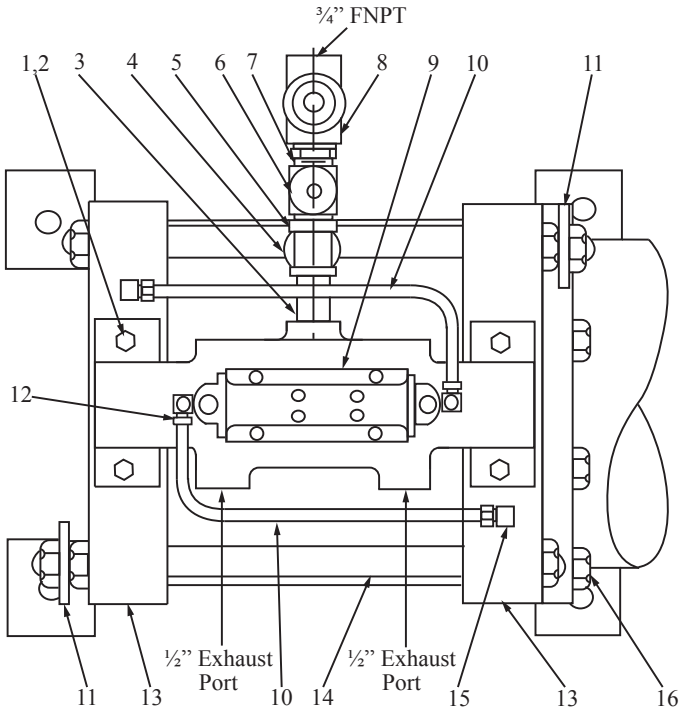
Figure 4: Exhaust Manifold B-1126 (optional)



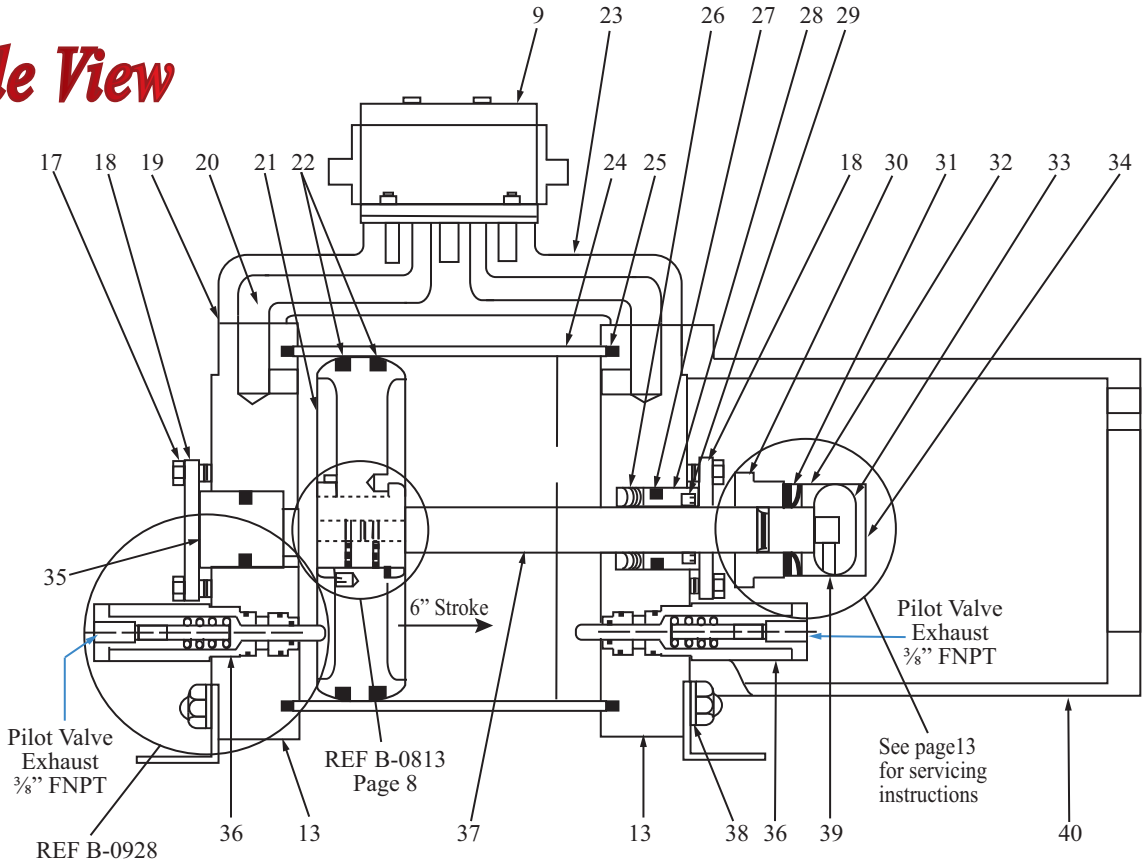


6200 Series
Power Unit (D-0365)

Top View



Side View



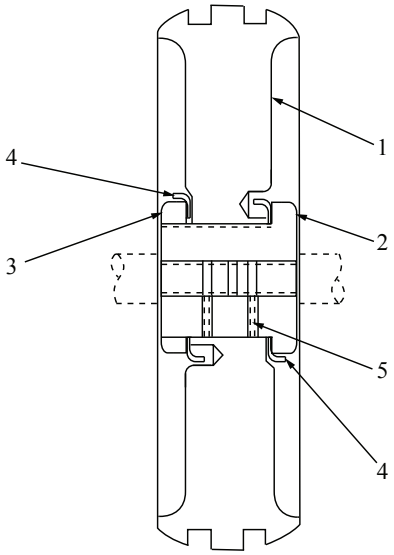
Parts List

Item	Part #	# Reqd.	Description	Material
1	A-2813	4	Lock Washer	304 Stainless Steel
2	61283P015	4	Hex Head Cap Screw	316 Stainless Steel
3	A-3241	1	Nipple	Steel
4	A-3221	1	Lubricator (1 quart capacity)	Aluminum
5	A-3242	2	Nipple	Steel
6	A-3220	1	Filter	Aluminum
7	A-3243	1	Hex Bushing	Steel
8	A-3209	1	¼" Capacity Control Ball Valve	316 Stainless Steel
9	B-1510	1	Spool Valve Assembly	Various
10	A-5690	2	Line	304 Stainless Steel
11	A-2839	2	Lifting Eye	Steel
12	A-3364	2	90° Male Elbow	Cadmium Plated Steel
13	C-0533	2	End Cap	Steel
14	A-4451	4	Stud and Nut Assembly	304 Stainless Steel / Steel
15	A-3244	2	90° Male Elbow	Cadmium Plated Steel
*16	A-2521	8	Hex Head Cap Screw	304 Stainless Steel / Steel
17	A-0163SS	8	Hex Head Cap Screw	304 Stainless Steel
18	A-2781	2	Packing Plate	Steel
19	A-2898	2	Gasket	Buna-N and Cork
20	A-4517	2	Wire Screen Filter	Brass
21	B-0813	1	Power Piston Assembly	Aluminum
22	A-3761	2	Piston Seals	Buna-N
23	C-2061	1	Manifold	Ductile Iron
24	B-0815	1	Power Cylinder	Steel
25	A-2859	2	O'Ring	Buna-N
*26	A-2860	1	Power Rod Packing	Buna-N
27	A-1962	2	O'Ring	Buna-N
*28	A-2786	1	Gland Bushing	Cast Iron
*29	A-2897	1	Wiper Ring	Buna-N
*30	A-2803	1	Retainer	Steel
*31	A-2854	4	Belleville Washer	Steel
*32	A-2783	1	Back-up Ring	Steel
*33	A-2782	1	Ball Bearing Connection	Carbon Steel
*34	A-2787	1	Thrust Bearing	Carbon Steel
35	A-2830	1	End Plug	Cast Iron
36	B-0928	2	Pilot Valve	See Page 8
*37	B-0810	1	Power Piston Rod	17-4 pH Stainless Steel
38	A-2813LW	8	Lock Washer	304 Stainless Steel
*39	A-3250	1	Set Screw	Steel
*40	D-0310	1	Spacer	Ductile Iron
41	A-0171	2	Pin (not shown)	Brass
42	A-0172	1	Nameplate (not shown)	Stainless Steel

Notes: Recommended Spare Parts **Two parts or sets required on double head configurations* *Required only on single head configuration*

6200 Series Components

Power Piston B-0813

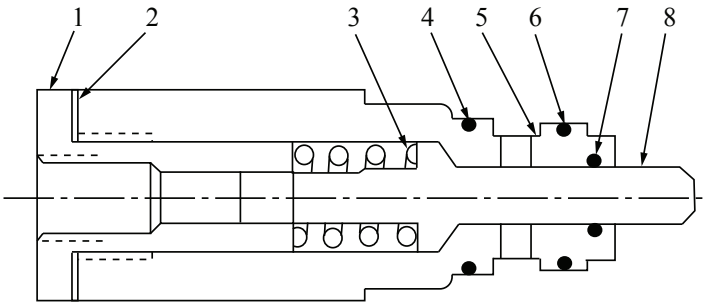


(See Servicing Instructions - Page 13 & 14)

Item	Part #	# Reqd.	Description	Material
1	C-0789	1	Piston	Aluminum
2	B-1125	1	Bushing	Steel
3	A-3760	1	Bushing Nut	Steel
4	A-3759	2	Locking Ring	Steel
5	A-3762	1-Simplex 2-Duplex	Set Screw	Steel

Pilot Valve B-0928

Two Required

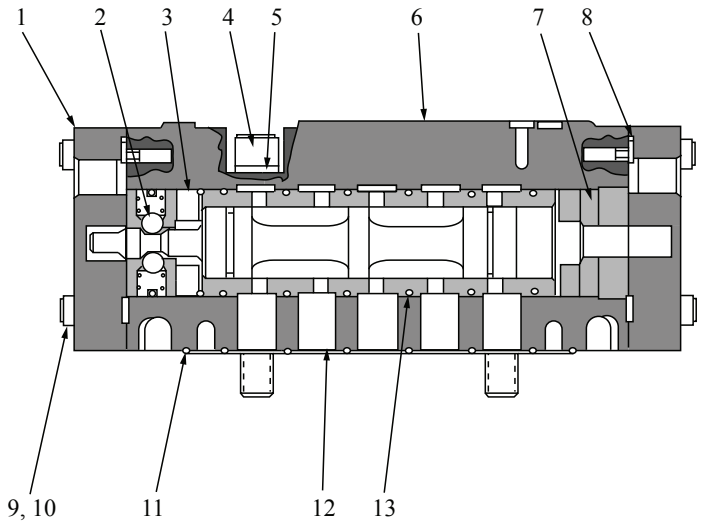


(See Servicing Instructions - Page 13)

Item	Part #	# Reqd.	Description	Material
1	A-2901	1	Sleeve Adapter	Stainless Steel
2	A-3024	1	Gasket	304 Stainless Steel
3	A-1053	1	Spring	Steel
4	A-3219	1	O'Ring	Buna-N
5	B-0817	1	Pilot Valve Body	Steel
6	A-3212	1	O'Ring	Buna-N
7	A-0612	1	O'Ring	Buna-N
8	A-2805	1	Plunger	Delrin

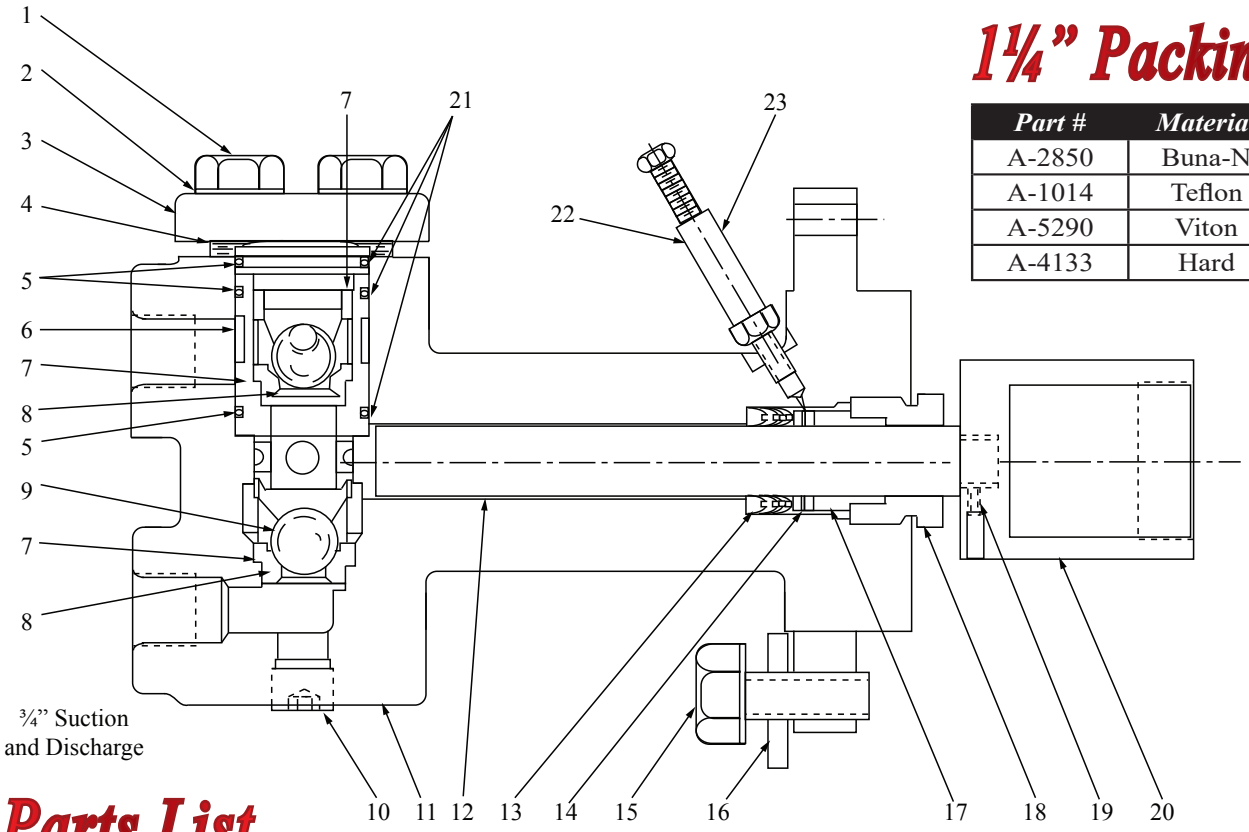
**Recommended Spare Parts*

Spool Valve B-1510



Item	Part #	# Reqd.	Description	Material
1	A-6191	2	End Cap	Aluminum
2	A-6175	1	Detent Assembly	Aluminum
3	A-6176	2	Bumper	Urethane
4	A-6177	4	Screw	Carbon Steel
5	A-6178	4	Lock Washer	Carbon Steel
6	♦	1	Body Assembly	Aluminum
7	A-6179	1	Bumper	Urethane
8	A-6180	2	O'Ring	Buna-N
9	A-6181	8	Screw	Carbon Steel
10	A-6185	8	Lock Washer	Carbon Steel
11	A-6182	1	Gasket	Buna-N
12	A-6184	1	Sleeve Assembly	Stainless Steel
13	A-6183	6	O'Ring Seal	Buna-N

Models 6211 & 6212
1¼" High Pressure Pump Head Assembly
(D-0318 Cast Steel) (C-1980-0 Stainless Steel)



1¼" Packing Chart

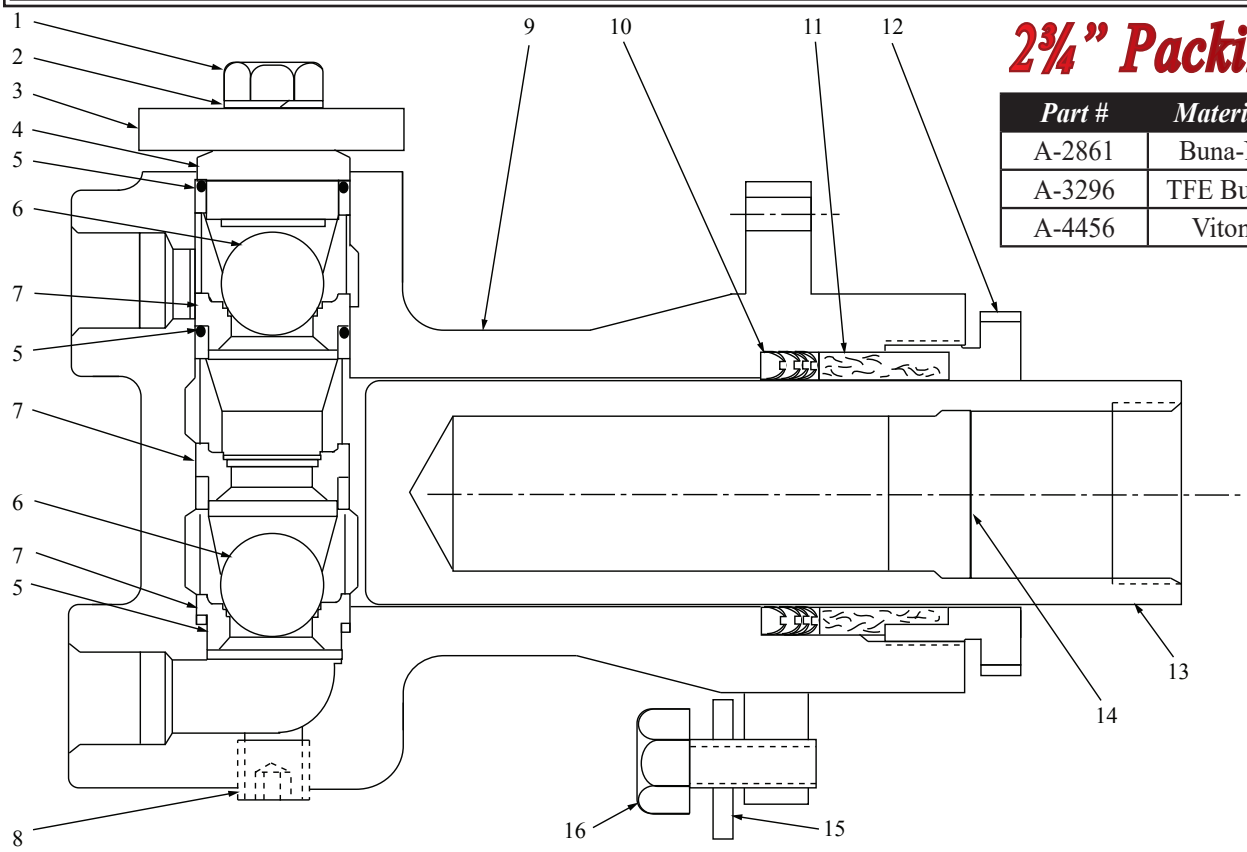
Part #	Material	Max W.P.
A-2850	Buna-N	3000
A-1014	Teflon	500
A-5290	Viton	3000
A-4133	Hard	9000

Parts List

Item	Part #	# Reqd.	Description	Material
1	A-2868	4	Hex Head Cap Screw	316 Stainless Steel
2	A-2756	4	Washer	316 Stainless Steel
3	B-0816	1	Cover	Steel
4	A-2849	1	Valve Plug	Stainless Steel
5	A-2852	5	Back-up Ring	Teflon
6	B-0812	1	Spacer	316 Stainless Steel
7	61421P004	3	Gasket	Teflon
8	61437P023	2	Valve Seat Insert	316 Stainless Steel
9	61265P041	2	7/8" Valve Ball	440C Stainless Steel
10	A-2152	1	Pipe Plug	Steel
11	D-0500	1	Pump Head Body	Cast Steel
11.1	D-0500-SS	1	Pump Head Body	Stainless Steel
12	B-1609	1	Plunger	17-4 pH Stainless Steel
13	See Packing Chart	1	Packing	See Packing Chart
14	A-2855	1	Lantern Ring	304 Stainless Steel
15	A-3239	6	Cap Screw	316 Stainless Steel
16	A-3060	6	Lock Washer	316 Stainless Steel
17	A-2788	1	Packing Gland	Delrin
18	A-2789	1	Packing Nut	Steel
19	A-3250	1	Set Screw (S.H.)	303 Stainless Steel
20	A-2780	1	Ball Cup Connection	Steel
21	A-2856 or A-4479	3	O'Ring	Buna-N / Viton
22	A-3179-1	◆	1 Lube Stick	◆
	A-3179-2		72 Stick Carton	
23	A-0558	1	Grease Jack	Steel

**Recommended Spare Parts* *Not Included in Assembly*

Models 6221 & 6222
2¾" Pump Head Assembly
(D-0314 Cast Steel) (C-1979-0 Stainless Steel)



2¾" Packing Chart

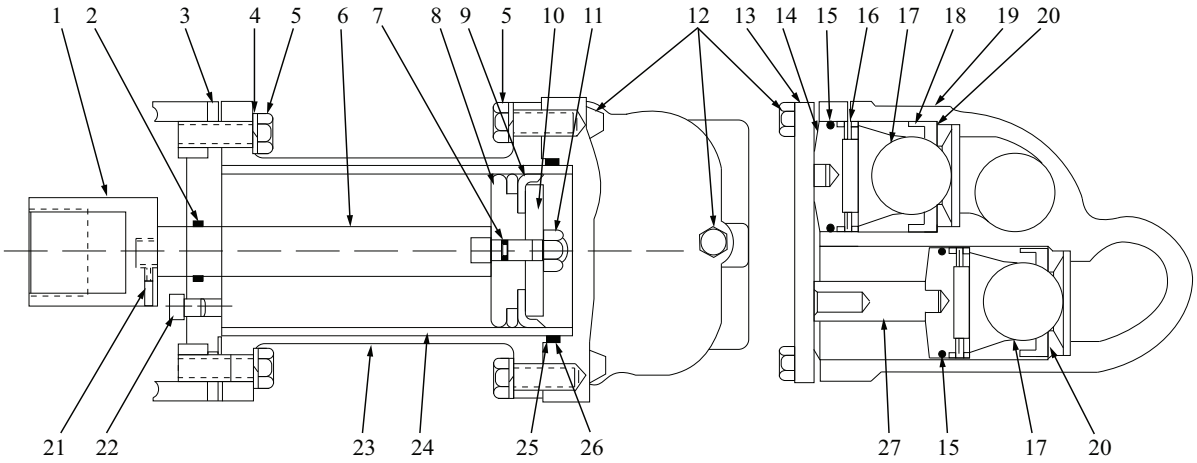
Part #	Material	Max W.P.
A-2861	Buna-N	1800
A-3296	TFE Buna	1800
A-4456	Viton	1800

Parts List

Item	Part #	# Reqd.	Description	Material
1	A-2868	2	Hex Head Cap Screw	316 Stainless Steel
2	A-2756	2	Washer	316 Stainless Steel
3	A-2800	1	Cover	Steel
4	A-3213	1	Valve Plug	Stainless Steel
5	A-3853 or A-4457	3	O'Ring	Buna-N / Viton
6	61265P061	2	1¼" Valve Ball	440C Stainless Steel
7	B-1022	3	Valve Seat Insert	316 Stainless Steel
8	A-2152	1	Pipe Plug	Steel
9	D-0501	1	Pump Head Body	Cast Steel
9.1	D-0501-SS	1	Pump Head Body	Stainless Steel
10	See Packing Chart	1	Packing	See Packing Chart
11	A-2784	1	Packing Gland	Delrin
12	B-0809	1	Packing Nut	Steel
13	B-0808	1	Plunger	17-4 pH Stainless Steel
14	A-2785	1	Thrust Plate	Steel
15	A-3060	6	Lock Washer	316 Stainless Steel
16	A-3239	6	Cap Screw	316 Stainless Steel

**Recommended Spare Parts* *Not Included in Assembly*

Models 6241 & 6242
4" Pump Head Assembly
(D-0348 Cast Steel) (C-1978-0 Stainless Steel)



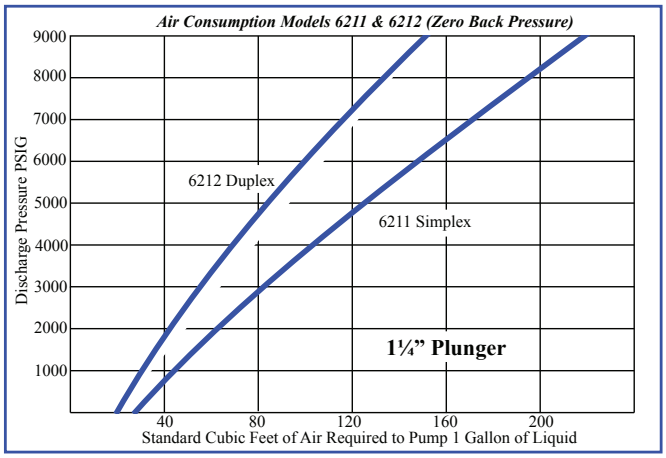
Parts List

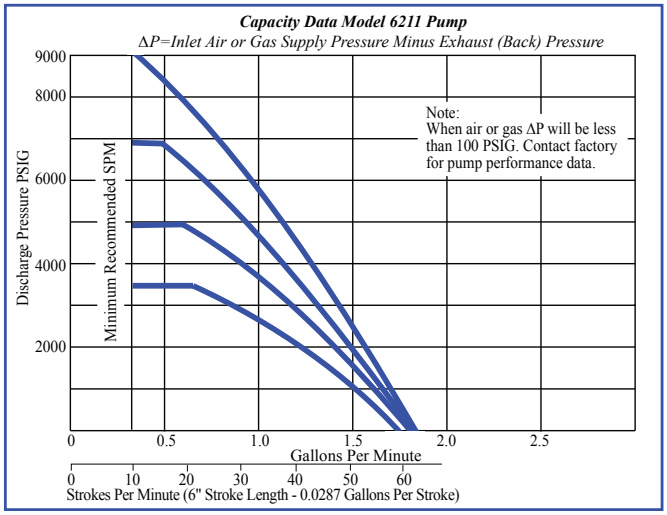
Item	Part #	# Reqd.	Description	Material
1	A-2780	1	Connector Cup	Steel
2	A-2897	1	Wiper Ring	Buna-N
3	B-0856	1	End Plug	Steel
4	A-3060	12	Lock Washer	304 Stainless Steel
5	A-3240	6	Hex Head Screw	304 Stainless Steel
6	B-0854	1	Armaloy Piston Rod	17-4 pH Stainless Steel
7	A-3226 or A-4254	1	O'Ring	Buna-N / Viton
8	B-0857	1	Piston	Carbon Steel
9	A-3202	1	Piston Cup	Buna-N
10	A-3248	1	Backup Retainer	304 Stainless Steel
11	A-3246	1	Hex Nut	304 Stainless Steel
12	A-3245	3	Hex Head Screw	304 Stainless Steel
13	B-0855	1	Cover	Steel
14	A-3490	2	Valve Plug	316 Stainless Steel
15	A-2104 or A-2171	2	O'Ring	Buna-N / Viton
16	A-3514	4	Roll Pin	316 Stainless Steel
17	61265P071	2	2" Valve Ball	440C Stainless Steel
18	B-1023	2	Valve Seat Insert	316 Stainless Steel
19	D-0504	1	Pump Head Body	Cast Steel
19.1	D-504-SS	1	Pump Head Body	Stainless Steel
20	61421P006	2	Gasket	Teflon
21	A-3250	1	Set Screw	304 Stainless Steel
22	A-1835	1	Breather	Assembly
23	C-0390	1	Cylinder	Cast Ductile Iron
24	B-0950	1	Sleeve	304 Stainless Steel
25	A-2148	1	Backup Ring	Buna-N
26	A-3218 or A-2155	1	O'Ring	Buna-N / Viton
27	A-3051	1	Plug Extension	303 Stainless Steel

*Recommended Spare Parts

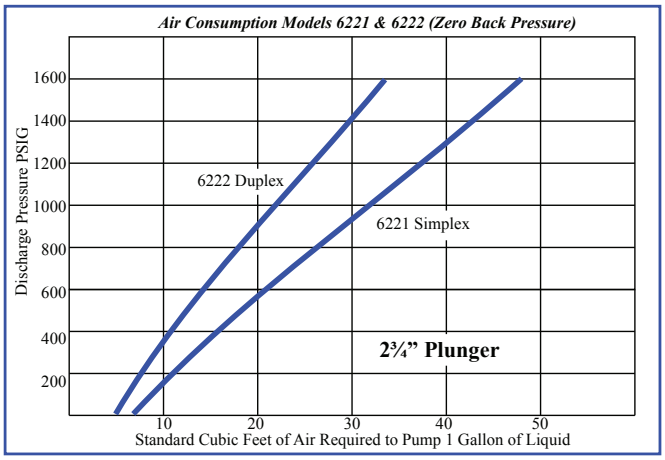
Performance Data

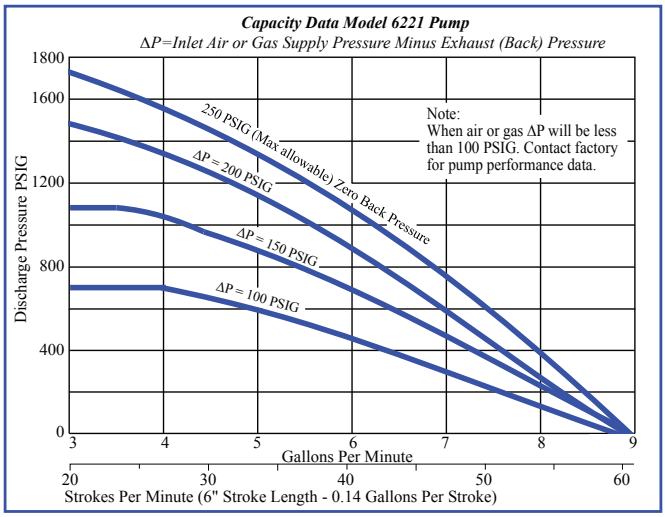
Models 6211 & 6212



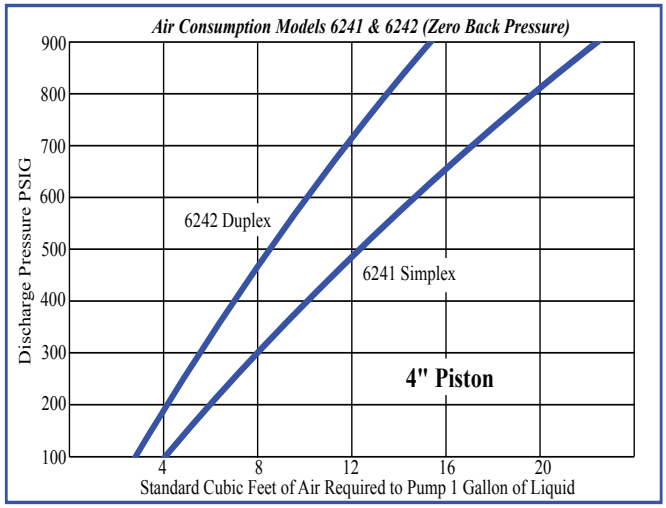


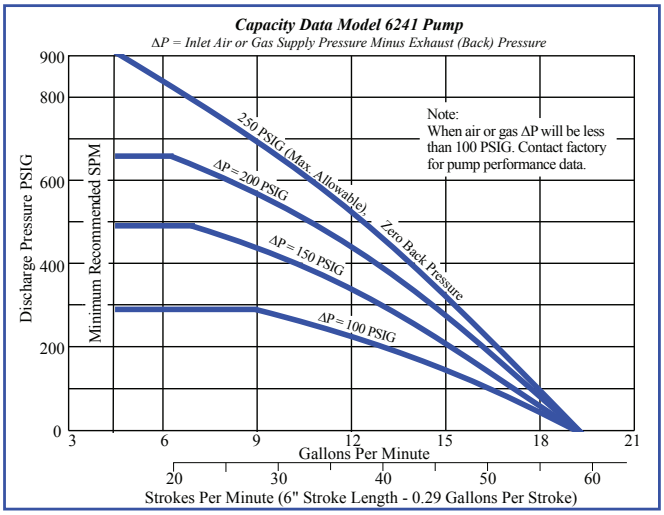
Models 6221 & 6222





Models 6241 & 6242





Servicing Instructions

Power Unit D-0365, Page 6 & 7

CAUTION: Prior to performing any maintenance on the power or fluid end of this pump, all pneumatic and hydraulic pressure must be removed and isolated from the unit.

Item #9 B-1510 (page 8) valve is a 2-position, 4-way spool valve with internal parts for bleeder pilot operation. To inspect, proceed as follows:

1. Remove 4 allen head cap screws #9 from pilot end caps.
2. Remove pilot end cap. (One end cap contains the detent body springs and balls.)
3. Remove bumper #7.
4. Remove spool and examine.
5. If required, the sleeve assembly #12 can be removed; however, this assembly contains the static o'ring seals and may be difficult to reassemble.
6. To remove valve from pump, loosen 4 cap screws.

   NOTE: When reassembling, extreme care must be exercised to eliminate damage to the static o'rings, to eliminate contamination on the sleeve and/or spool, and to protect end gaskets.

Item #11 Control Lines: All connections must be tight and leak free.

Item #23: Manifold must be securely fastened at both end cap connections and to the spool valve. When reassembling this unit, care must be exercised to protect o'ring seals as leakage in this area will cause unit to short stroke or make unit entirely inoperative.

Pilot valve assembly may be removed from the power end cap #13 as a unit. In reassembling this unit, care must be exercised to protect o'ring seals as leakage in this area will cause unit to short stroke or make unit entirely inoperative.

Disassembly of Pilot Valve B-0928, Page 8

1. Remove adapter #1 from sleeve #5.
2. Remove spring #3 and examine for set and stress failure.
3. Remove plunger #8 and examine angled seat face and O.D. surface of probe end. Probe end must be smooth enough to effect a pneumatic seal with o'ring #7.
4. Examine all o'rings and replace if necessary.

Disconnect Fluid Head from Power Cylinder Page 6

1. Position pump in discharge position if possible.
2. Remove retainer #30 from cup (this is a right hand thread).

Disconnect Fluid Head from Power Cylinder Page 6 Continued

3. Slowly apply power to withdraw power piston rod #37 from cup. If pump does not operate this connection may be pried apart.

Disassembly of Power Cylinder (Power Unit D-0365, Page 6 & 7)

1. Loosen set screw #39 and remove connector bearing ball #33 from end of rod #37.
2. Remove back-up ring #32, Belleville washers #31 and retaining nut #30.
3. Remove 4 hex head screws #17 and packing plate #18.
4. Disconnect both pilot control lines #10.
5. Remove 4 manifold bolts #2. The valve and manifold assembly may be removed from the power cylinder.
6. Remove tie down bolts.
7. Remove hex nuts #1 from one end of each tie rod #14.
8. Remove end caps #13 from cylinder #24.
9. Remove piston #21 and power piston rod #37 from cylinder #24.

Disassembly of Power Piston B-0813, Page 8

1. Bend down tab on both locking rings #4.
2. Remove bushing nut #3 from bushing #2.
3. Remove bushing #2 (with piston rod attached) from piston #1.
4. Remove set screw #5 from bushing #2.
5. Remove power piston rod from bushing #2.

Assembly of Power Piston B-0813, Page 8

1. Install B-0810 power piston rod/rods into bushing #2 using Loctite #242 and tighten securely.
2. Install set screw/screws #5 using Loctite #242 and tighten firmly against power piston rod/rods.
3. Bend one (1) tab on each of two (2) locking rings #4, 90° to the plane of the ring.
4. Place one (1) locking ring #4 over bushing #2 (bent tab positioned away from bushing shoulder) and install assembly into piston #1 using Loctite #242. Postition locking ring #4 with bent tab engaged in hole in piston #1. Tighten bushing assembly into piston as tightly as possible.

Servicing Instructions

Assembly of Power Piston B-0813, Page 8 Continued

3. Place other locking ring #4 over exposed thread on bushing #2 with bent tab positioned to engage hole in piston #1. Install bushing nut #3 and tighten as tight as possible.
4. Bend one exposed tab on each locking ring #4 up against a flat surface of the hex on both the bushing #2 and bushing nut #3.
5. Allow assembly to set one hour minimum for Loctite to fix.

Assembly of Power Unit D-0365, Page 6 & 7

1. Lubricate I.D. of cylinder #24 and examine for surface defects.
2. Install piston seals ring #22 into last groove to inner cylinder #24 and insert piston #21 into cylinder.
3. Pass piston #21 though cylinder #24 until second groove is exposed.
4. Install other piston seal ring #22 and draw piston #21 back into cylinder #24.
5. Examine ends of cylinder for possible damage. Place o'ring #25 into groove in end cap #13 and install cylinder #24 into recess taking care not to pinch or otherwise damage o'ring.
6. Place o'ring #25 into groove in other end cap #13.
7. Insert power piston rod #37 through center hole in end cap #13.
8. Install tie rods #14. Torque hex nuts to approximately 130 ft/lbs. Make sure end plates #13 are brought up uniformly.
9. Position manifold gaskets #19 and manifold #23 over ports in end caps #13 making sure that gaskets do not block ports.
10. Secure manifold #23 with hex head cap screws #2 by tightening to approximately 20-25 ft/lbs.
11. Install valve gasket and spool valve #9 and secure to manifold #23 with 4 socket head cap screws #4.
12. Install pilot control lines #10.
13. Lubricate center bore of end cap #13 and O.D. of power piston rod #37 and install rod packing #26.
14. Install o'ring #27 and wiper ring #29 into gland bushing #28.
15. Place gland bushing #28 over power piston rod #37 and seat into place against packing #26.
16. Position packing plate #18 against gland bushing #28 and tighten into place with 4 hex head cap screws #17. Do not overtighten.

Assembly of Power Unit D-0365, Page 6 & 7 Continued

17. For double ended pumps, repeat steps 14 through 17 for opposite end. For single ended pumps, place o'rings #27 onto end plug #35. Lubricate with a suitable grease and install end plug into end cap #13.
18. Secure end plug #35 with packing plate #18 and 4 hex head cap screws #17 at approximately 10 ft/lbs. torque.
19. Assemble 2 pilot valves B-0928, Page 8, steps (a) through (e)
    (a) Install o'ring #7 into I.D. of sleeve #5.
    (b) Install o'rings #6 and #4 onto O.D. of sleeve #5.
    (c) Lubricate plunger #8 and insert into sleeve #5.
    (d) Place spring #3 over exposed end of plunger #8.
    (e) Install gasket #2 over end of adapter #1 and install adapter into sleeve #5.
20. Lubricate O.D. seals of adapter #36 and install one pilot valve assembly into each end cap #13.
21. Place retainer #30, 3 Belleville washers #31 and a back-up ring #32 over the end of the power piston rod #37.
22. Install spacer #40 onto end cap #13 using 8 cap screws #16. Spacer should be oriented with ½" drain on bottom. (Two spacers required for double ended pumps.)

Assembly of 6211 Head Assembly, Page 9

1. Examine head body #11 to make sure valve cage seating surface and packing areas are free of nicks and burrs. Check all thread areas for condition of threads.
2. Install seal #7 onto seal surface.
3. Install lower valve cage #8 and ball #9 into valve bore of pump head #11.
4. Install o'rings #21 and back-up rings #5 onto spacer cage #6 and lubricate seal area.
5. Install spacer cage #6 from step 4 into pump head #11.
6. Install seal #7 onto seal surface inside spacer cage #6.
7. Install upper valve cage #8 and ball #9 into spacer cage.
8. Install o'ring #21 and back-up ring #5 onto valve plug #4.
9. Place seal #7 on top surface of upper valve cage #9.
10. Install valve plug #4 from step 8 into top of pump body.

Servicing Instructions

Assembly of 6211 Head Assembly, Page 9 Continued

11. Place cover plate #3 over valve plug #4 and secure cover using 4 hex head cap screws #1 with lock washers #2. Torque to approximately 30-40 ft/lbs.
12. Install pipe plug #10 using Loctite pipe sealant or equal.
13. Install packing #13 and lantern ring #14.
14. Place packing gland #17 into packing gland nut #18 and thread assembly into pump body #11. Do not tighten more than hand tight.
15. Assemble ball connector cup #20 onto plunger #12 using Loctite #222 if availiable. Secure connection with set screw #19.
16. Lubricate plunger #12 and insert through packing end of pump head #11.
17. Install grease jack #23, containing 2 sticks of Chennola lubricant.

NOTE: When using teflon packing, replace grease jack with pipe plug.

Assembly of 6221 Head Assembly, Page 10

1. Examine head body #9 to insure valve cage seating surfaces and packing areas are free of nicks and burrs. Check threaded areas for thread condition.
2. Install seal #5 onto lower seal surface.
3. Install lower valve cage #7 and valve ball #6 into pump head #9.
4. Install spacer cage #7.
5. Install seal #5 onto top surface of spacer cage #7.
6. Install top valve cage #7 and valve ball #6 into pump head #10.
7. Place top seal #5 onto top surface of top valve cage #7.
8. Install valve plug #4.
9. Position cover plate #3 over valve plug #4 and secure using 2 hex head cap screws #1 with locknuts #2. Torque to approximately 30-40 ft/lbs.
10. Install pipe plug #8 using Loctite pipe seal or equal.
11. Insert packing #10 into packing bore of pump body #9.
12. Install packing gland #11 into packing gland nut #12 and thread assembly into pump body #9. Do not tighten more than hand tight.
13. Lubricate O.D. of plunger #13 and insert through packing end of pump head #19.

Assembly of 6241 Head Assembly, Page 11

1. Examine pump head #19 to insure valve cage sealing surfaces and cylinder sealing surface are free of defects. Check thread areas for thread condition.
2. Install seals #21 onto lower seal surfaces of each cavity in pump head #19.
3. Install valve ball #17 into valve cage #18. Insert valve plug #14 into valve cage #18 and fasten with roll pin #16. Install o'ring #15 onto valve plug #14 and lubricate each cavity in pump head #19.
4. Insert plug and insert assembly into each cavity of pump head #19.
5. Install plug #27 as shown.
6. Position cover plate #13 and secure using 3 hex head cap screws #12. Torque to approximately 20-30 ft/lbs.
7. Assemble bell connector #1 onto end of piston rod #6 and secure with set screw #21.
8. Install breather #22 and wiper ring #2 into end plug #3.
9. Insert piston rod #6 through end plug #3 as shown.
10. Position end plug #3 onto spacer and position cylinder #23 using 6 screws #5 and 6 washers #4. Flat end of cylinger must be used. Do not tighten this joint, leave at least ¼" gap.
11. Install sleeve #24 into cylinder #23.
12. With piston rod #6 moved to full forward position, install o'ring #7, piston #8, piston cup #9, back-up retainer #10 and nut #11.
13. Install o'ring #26 and back-up #25 onto end of sleeve #24.
14. Place assembled pump head from step 10 over end of sleeve #24. Secure cylinder #23 to pump head using 6 screws #5 and 6 washers #4. This joint should be brought face to face. If a gap exists, loosen joint made in step 13.
15. After tightening cylinder to head connection, then tighten cylinder to spacer connection. A gap will exist at this joint - do not overtighten.

Assembly of Fluid End to Power Units, Page 6

1. Insert ball joint thrust bearing #33 into connector cup.
2. Insert connector bearing ball #32 (on end of preassembled power piston rod #35) into connector cup and tighten retainer #29. Retainer should shoulder against end of connector cup without excessive pressure.

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Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

Cardon Sales Company, LLC

820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

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MANAGEMENT SYSTEMS CERTIFICATION BODY

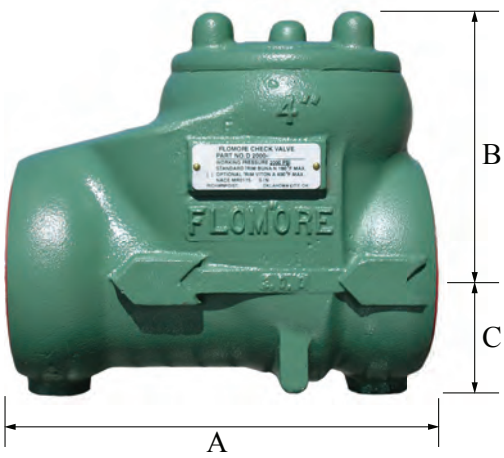
FLOMORE

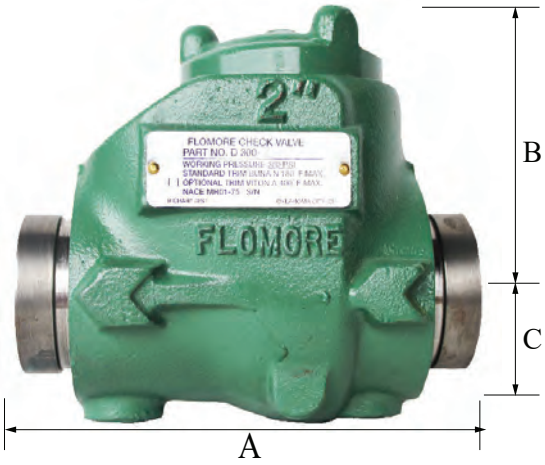
Different By Design

Check Valves

Swing Check Valves

D Series / Screwed Bonnet Screwed End - Full Opening
Ductile Iron Swing Checks





Threaded Swing Checks

Working Pressure	Size 1"	2"	3"	4"
300#	D300-1	D300-2	D300-3	D300-4
600#	D600-1	D600-2	D600-3	D600-4
1000#	D1000-1	D1000-2	D1000-3	D1000-4
1500#	D1500-1	D1500-2	D1500-3	D1500-4
2000#	D2000-1	D2000-2	D2000-3	D2000-4

Grooved End - Swing Check Valve

Working Pressure	2"	3"	4"
300#	D300-2GE	D300-3GE	D300-4GE
600#	D600-2GE	D600-3GE	D600-4GE
1000#	D1000-2GE	D1000-3GE	D1000-4GE
1500#	D-1500-GE	N/A	N/A
2000#	D2000-2GE	N/A	N/A


Bonnet


Clapper Assembly

Body

Demensions

Size	End	A	B	C	Flow Coefficient	Weight (lbs.)
1"	T	4.25	4.5	1.25	60	5
2"	T	6	4.25	1.75	240	11
2"	GE	7	4.25	1.75	240	13
3"	T	8	4.875	2.5	665	20
3"	GE	12.125	4.875	N/A	665	25
4"	GE	10.73	5.750	N/A	1300	37
4"	T	10	5.750	3.125	1300	33

T = Threaded End GE= Grooved End

Parts List

Description	Size 1"	2"	3"	4"
Clapper Assembly	1CA	2CA	3CA	4CA
Clapper Seal	1CS	2CS	3CS	4CS
Bonnet Seal O'Ring	1CR	2CR	3CR	4CR

Steel Swing Check Valves

D Series / Screwed Bonnet Screwed End - Full Opening Steel Swing Checks

S2003-2000-1
2000#

S3003-3000-1
3000#

S3603-3600-1
3600#

S1503-1440-1
1440#

Made in USA

FLOMORE

S5003-5000-1
5000#

Material Specifications

Part	Size	WCB Steel
Clapper	1”	WCB Steel
		316 Stainless Steel (opt.)
Clapper	2”	WCB Steel
		316 Stainless Steel (opt.)
Clapper	3” & 4”	Ductile Iron
Clapper Seal	1” - 4”	Buna-N (180°F Max)
		Viton (400°F Max) (opt.)
Bonnet Seal O’Ring	1” - 4”	Buna-N (180°F Max)
		Viton (400°F Max) (opt.)

**NACE materials per MR-01-75 are standard on all valves*

Steel Swing Checks

Valve Numbers

Size	Weight (lbs.)	Flow Coefficient	Working Pressure	Model Number
1”	7	60	720#	S703-720-1
			1440#	S1503-1440-1
			1500#	S1503-1500-1
			2000#	S2003-2000-1
			3000#	S3003-3000-1
			3600#	S3603-3600-1
			5000#	S5003-5000-1
2”	16	240	2000#	S2003-2000
			2160#	S2003-2160
			3000#	S3003-3000
			3600#	S3603-3600
			*5000#	S5003-5000

*Max working pressure on S5003-5000 is 5000lbs

Ball Check Valves

Features:

- Replaceable resilient seal with secondary metal-to-metal seal
- Nominal flow restriction
- Can be installed horizontal and vertical
- No ball spring
- Minimum parts wear from low flow rates or pulsating service

Warning:

DO NOT WRENCH ON THIS SURFACE.

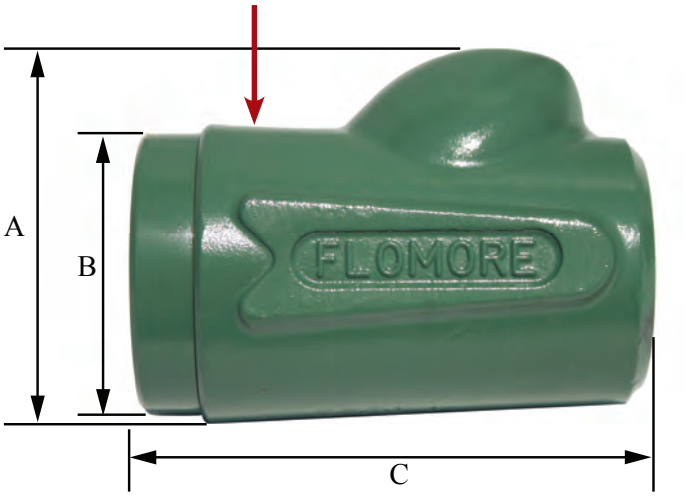
You will break the seal between the body & cover.

(surface marked by red arrow)

Steel and Stainelss Steel Ball Checks

Valve Numbers

Working Pressure (lbs.)	Material	Size ½"	Size 1"	Size 2"
2000	Steel	♦	2001-1	2001CS-2
	Stainless Steel	2001S-.5	2001S-1	2001S-2
3000	Steel	♦	3001-1	3001CS-2
	Stainless Steel	3001S-.5	3001S-1	3001S-2
5000	Steel	♦	5001-1	5001CS-2
	Stainless Steel	5001S-.5	5001S-1	5001S-2



Performance Ratings

- Valve design rating: 5,000 lb **MAXIMUM** working pressure
- Maximum temperature
  - Buna Seat 180 degrees
  - Viton Seat 400 degrees

Dimensions

Size	A	B	C	Weight (lbs.)
½"	3.06	2.375	4.208	7
1"	3.06	2.375	4.208	5
2"	4.88	3.205	6.375	16

Materials

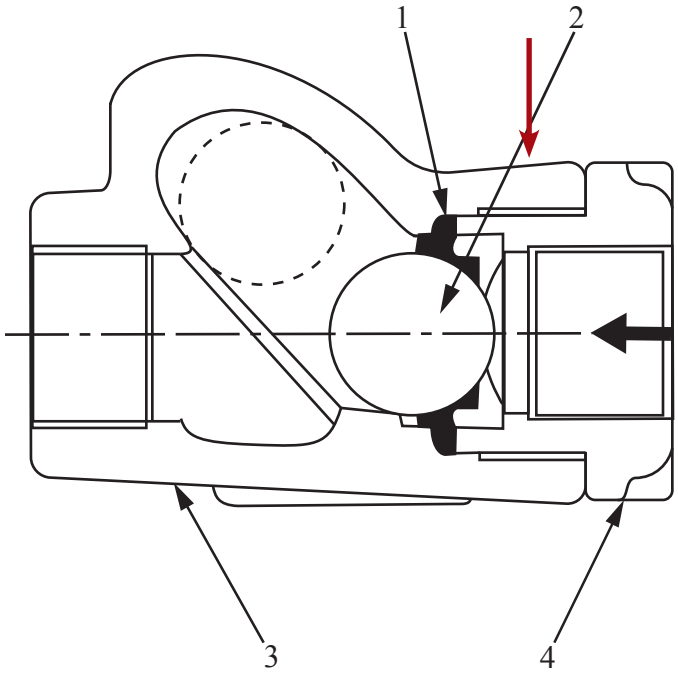
Part	Material
Body	ASTM A 216 WCB
End Cover	ASTM A 108
Ball	AISI 440C SS
Seat	Buna or Viton
Seat Backing	303 SS

Ball Check Valves

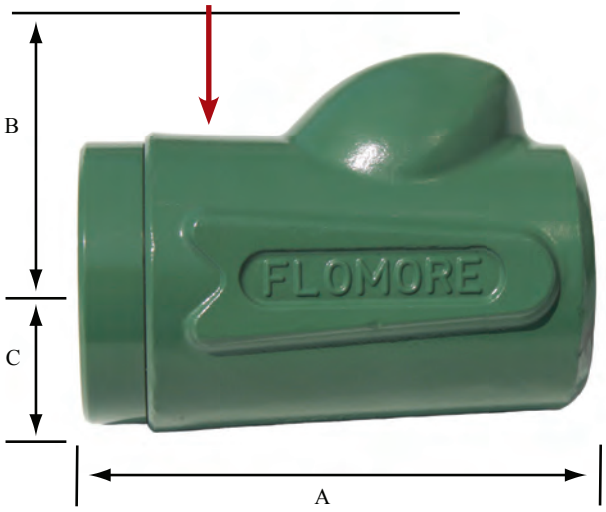
DBC Series / End Entry Ductile Iron Ball Checks

Valve Numbers

Working Pressure (lbs.)	Size ½"	1"	2"
1000	1031-DBC-.5	1031-DBC-1	1031-DBC-2
1500	1531-DBC-.5	1531-DBC-1	1531-DBC-2
2000	2031-DBC-.5	2031-DBC-1	2031-DBC-2



Dimensions



Size	A	B	C	Weight (lbs.)
½"	4.5	2	1.25	4
1"	4.5	2	1.25	4
2"	6	3	1.875	13

Flow Coefficients

Size	CV
1"	30
2"	105

Parts List

Item #	Description	Material	Size ½"	1"	2"
1	Seal Assembly	Buna-N (180°F Max)	20205F	20205F	30349F
		Viton (400°F Max.)	20262F	20262F	30423F
2	Ball	440 Stainless Steel	10186F	10186F	10194F
3	Body	Ductile Iron	♦	♦	♦
4	Cap	Ductile Iron	♦	♦	♦

*We also offer cold weather seals to minus 400 Degrees Fahrenheit

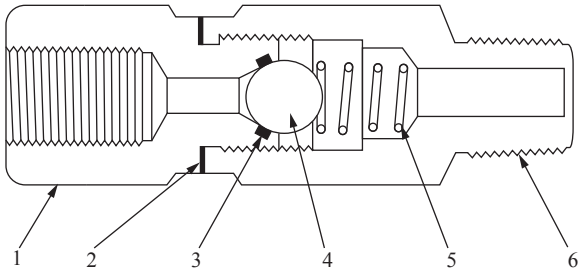
Line Check Valves

Valve Numbers

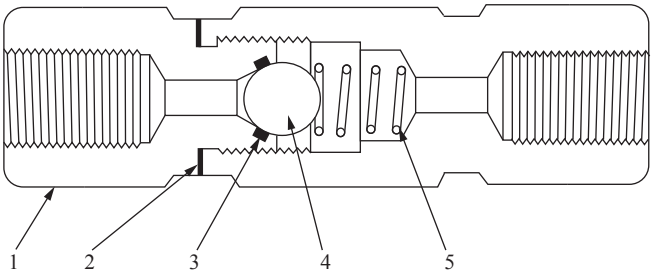
Connection Size	Connection Type	Part #	Working Pressure (lbs.)	Material	Weight (lbs.)	Pressure to Open
⅛"	M x F	A-0672	3000	Brass	0.25	30 psi
		TE-0018	6000	303 Stainless Steel	0.25	30 psi
¼"		A-0676	3000	Brass	0.25	30 psi
		A-0675	6000	303 Stainless Steel	0.25	30 psi
		A-1302	10,000	303 Stainless Steel	0.35	30 psi
	F x F	A-0680	6000	303 Stainless Steel	0.25	30 psi

Optional Heavy Spring = 100 psi Optional Light Spring = 16 psi

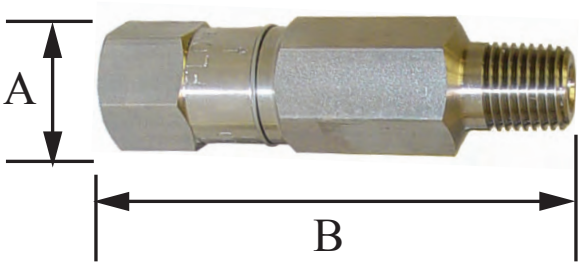
M x F Line Checks



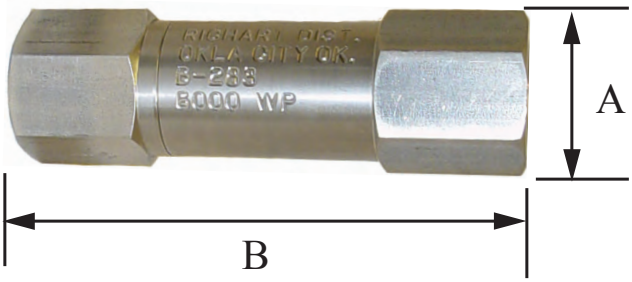
F x F Line Check



Dimensions



Valve Number	A	B
A-0672	¾"	2 7/8"
TE-0018	¾"	2 7/8"
A-0676	¾"	2 7/8"
A-0675	¾"	2 7/8"
A-0680	¾"	2 7/8"



Valve Number	A	B
B-0283	1⅛"	3 7/8"
B-1288	1½"	3 7/8"

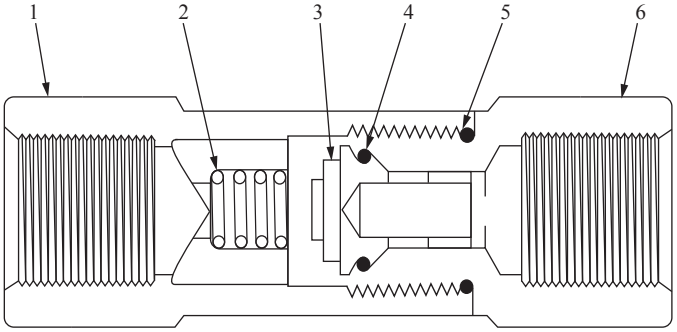
Parts List

Item #	Part #	# Reqd.	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	⅜" Ball	316 Stainless Steel
5	A-0391	1	Spring	316 Stainless Steel
6	A-0679	1	Outlet Body	Brass
	A-1296	1	Outlet Body	303 Stainless Steel

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

Line Check Valves

B-0283 & B-1288 Line Checks



Parts List

Item #	Part #	# Reqd.	Description	Material
1	B-0271	1	Body	303 Stainless Steel
2	A-0391	1	Spring	316 Stainless Steel
3	A-1879	1	Valve	303 Stainless Steel
4	A-0612	1	O-Ring	Buna-N
	A-2184	1	O-Ring	Viton
5	A-1959	1	O-Ring	Buna-N
	A-3979	1	O-Ring	Viton
6	A-1880	1	Bushing	303 Stainless Steel

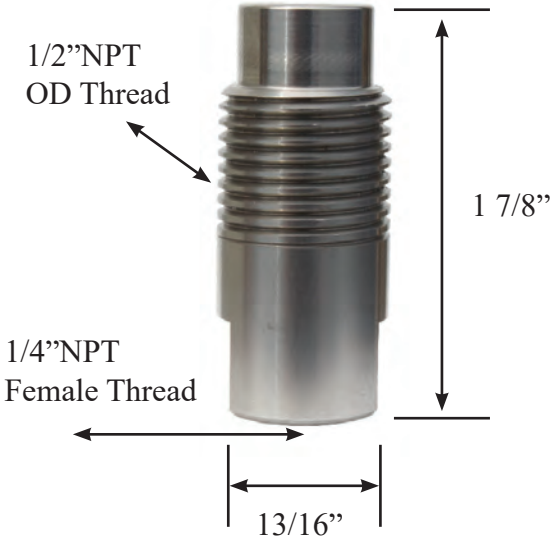
* Recommended Spare Parts

Valve Numbers

Connection Size	Connection Type	Part #	Working Pressure (lbs.)	Material	Weight (lbs)	Pressure to Open
½”	F x F	B-0283	6000	303 Stainless Steel	¾	16 psi
		B-1288	15000	303 Stainless Steel	1½	16 psi

Atomizing Nozzle

1/4LND-1P Dimensions



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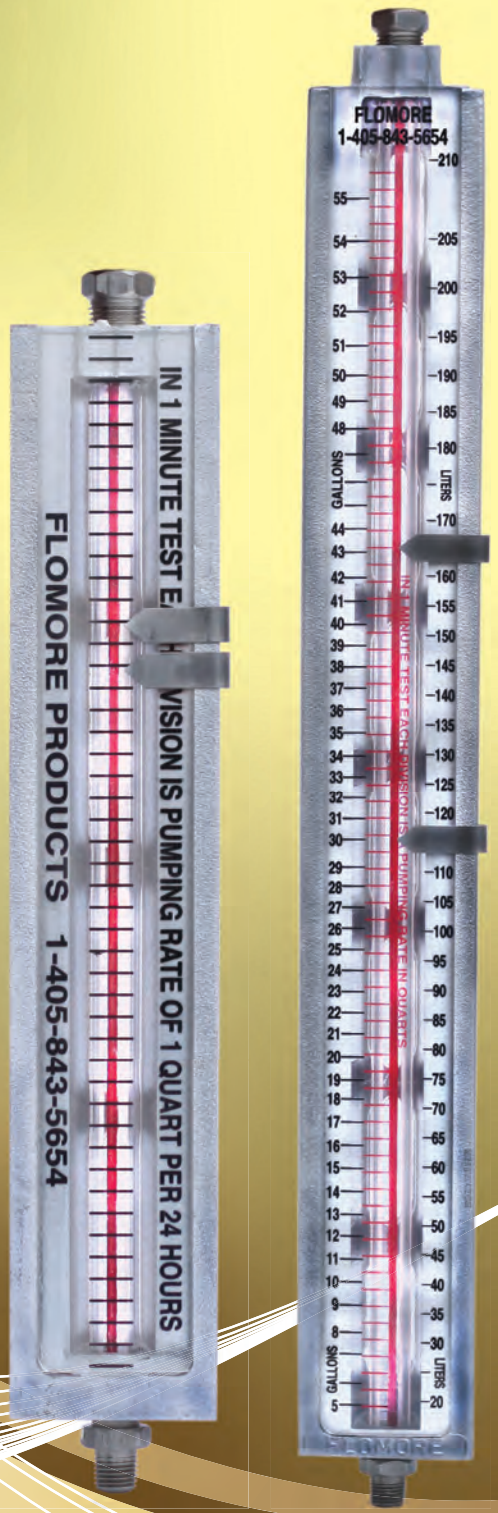
Different By Design

Gauges



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Features

Unique Features Offered By Flomore

» Red-lined sight glass.
» Acrylic covers for protection with screen printed markings.
» Multiple material options to choose from.
» Buna or Viton sealing o-rings available, depending on application.
» Full line of gauges and materials kept in stock.

More Drum Gauge Features

- Volume Scale in gallons and liters is provided for visual reference
- Chemical injection rate scale is calibrated in Quarts/24 hours and Liters/24hours
- Available in a wide range of materials for ultimate corrosion resistance
- Models available to accommodate diaphragm operated pumps
- Can handle pump rates up to 19.5 gallons per day and 74 liters per day
- Installs easily in 3/4” NPT outlet of drum head
- Adjustable steel gauge markers for easy calibration

Optional Vent Connection

The Drum Gauges are vented to atmosphere. These gauges can be supplied with a 1/4” FNPT connection to vent the gauge back into the tank. To specify gauges with this connection, add “V” to the product number , i.e. 779-v.

100 Series Drum Gauges

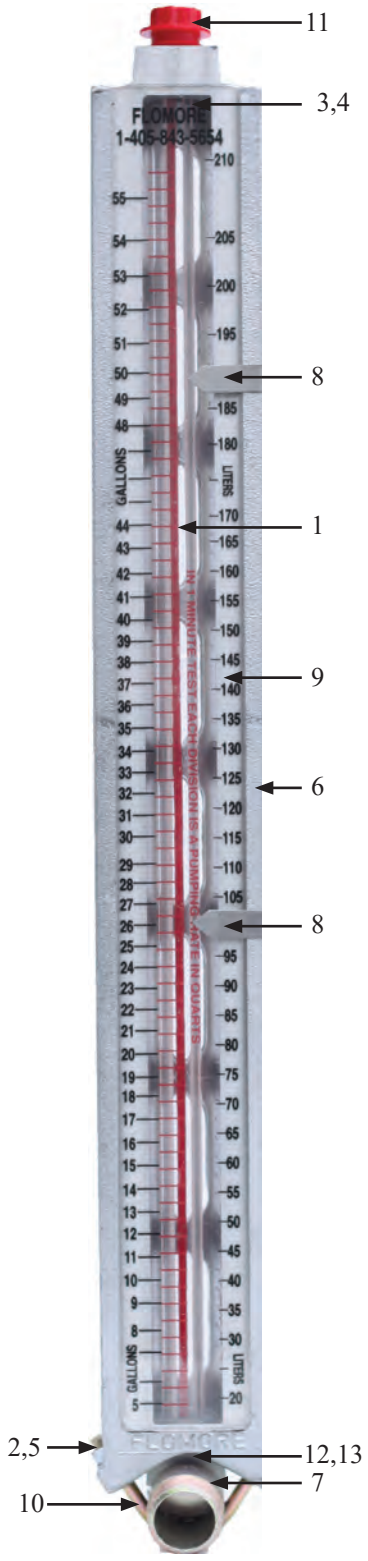
Parts List

Item #	Part #	# Reqd.	Description	Materials
1	1D20E	1	5/8” x 20” Red Line Glass Tube	Glass
2	A-0164	2	Nut	Steel
3	A-3100	1	Drum Gauge Spring	Steel
4	A-3101	1	Fiber Washer	Composite
5	A-3303	2	Split Lockwasher	Steel
6	C-596.01	1	Solid Side Frame	Aluminum
●7	D-0020	1	Drum Gauge Seat	Delrin
8	EZ.01	2	Pointer	Stainless Steel
9	K-596-SCALE	1	Scale	Acrylic
●10	K-598	1	Mounting Nipple	Steel
11	P-0048	1	1/2” Plastic Plug	Plastic
●12	A-0612	1	Buna N O-Ring	Buna
●13	D-0020.01	1	O-Ring for D-0020 Seat	Buna
14	A-0935	1	Hex Bushing	Stainless Steel
15	G-0001	1	Insert	Stainless Steel
16	D-0021	1	Vent Gasket	Viton

Not used for Vented style Drum Gauges Add for Vented Drum Gauges

● See Alternate Material Chart

* Mounts in the 3/4” outlet of a horizontal 55 gallon drum. The glass sight tube is protected by a cast aluminum frame which is calibrated in gallons and liters, indicating the liquid content of the drum.



Alternate Materials

Item #	Part #	# Reqd.	Description	Material
7	D-0020	1	Drum Gauge Seat	Delrin
	D-0025	1	Viton Seat Seal	Viton
10	K-598	1	Mounting Nipple	Steel
	K-598S	1	Mounting Nipple	Stainless Steel
	K-598PVC	1	Mounting Nipple	PVC
12	A-0612	1	Buna N O-Ring	Buna
	A-2184	1	Viton O-Ring	Viton
13	D-0020.01	1	O-Ring for D-0020 Seat	Buna
	D-0020.02	1	Viton O-Ring	Viton

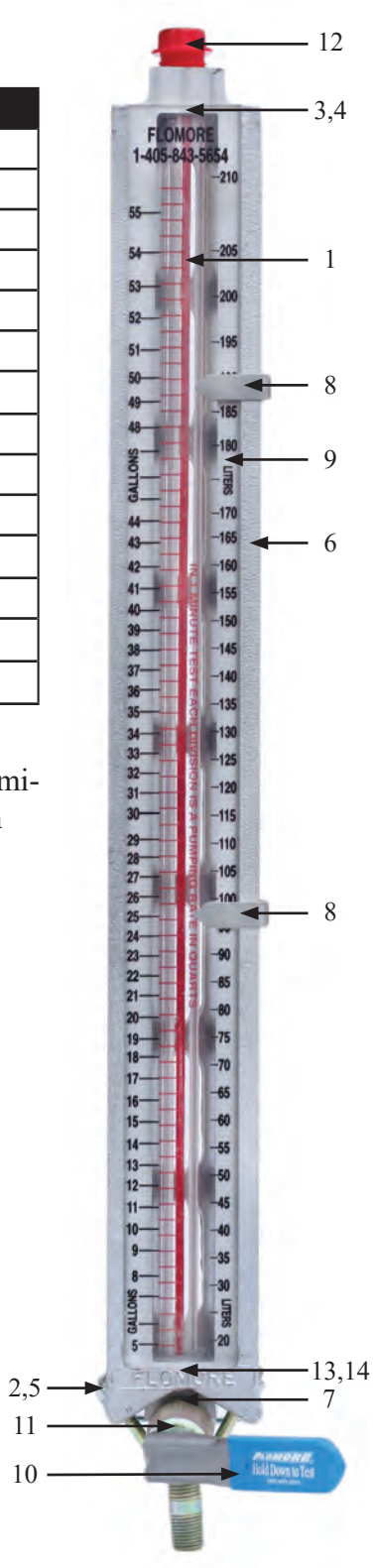
200 Series Drum Gauges

Parts List

Item #	Part #	# Reqd.	Description	Materials
1	1D20E	1	5/8” x 20” Red Line Glass Tube	Glass
2	A-0164	2	Nut	Steel
3	A-3100	1	Drum Gauge Spring	Steel
4	A-3101	1	Fiber Washer	Composite
5	A-3303	2	Split Lockwasher	Steel
6	C-596.01	1	Solid Side Frame (For Scale)	Aluminum
●7	D-0020	1	Drum Gauge Seat	Delrin
8	EZ.01	2	Pointer	Stainless Steel
9	K-596-SCALE	1	Scale	Acrylic
10	K-779HS	1	779 Gauge Handle Sleeve	Vinyl
●11	K-779AN	1	Assembled 200.01 Nipple	Steel
12	P-0048B	1	1/2” Plastic Plug	Plastic
●13	D-0020.01	1	Buna N O-Ring	Buna
●14	A-0612	1	O-Ring for D-0020 Seat	Stainless Steel

● See Alternate Material Chart

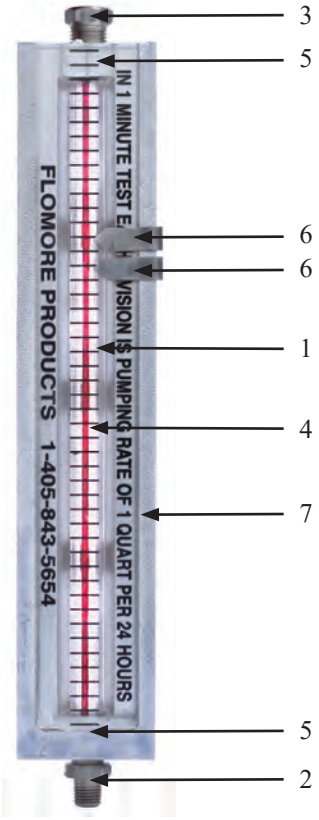
*Comes complete with a spring loaded test valve for checking injection rates of chemical pumps. This gauge also amounts in 3/4” tank outlet and indicates tank volume in gallons and liters. The connection for the chemical pump suction line is 1/4” MNPT and is located as shown in the photograph.



Alternate Materials

Item #	Part #	# Reqd.	Description	Material
7	D-0020	1	Drum Gauge Seat	Delrin
	D-0025	1	Viton Seat Seal	Viton
11	K-779AN	1	Assembled 200.01 Nipple	Steel
	K-779ANS	1	Assembled 200.03 Nipple	Stainless Steel
	K-779PVC	1	Assembled 200.02 Nipple	PVC
14	A-0612	1	Buna N O-Ring	Buna
	A-2184	1	Viton O-Ring	Viton
13	D-0020.01	1	O-Ring for D-0020 Seat	Buna
	D-0020.02	1	Viton O-Ring	Viton

300-400 Series Drum Gauges

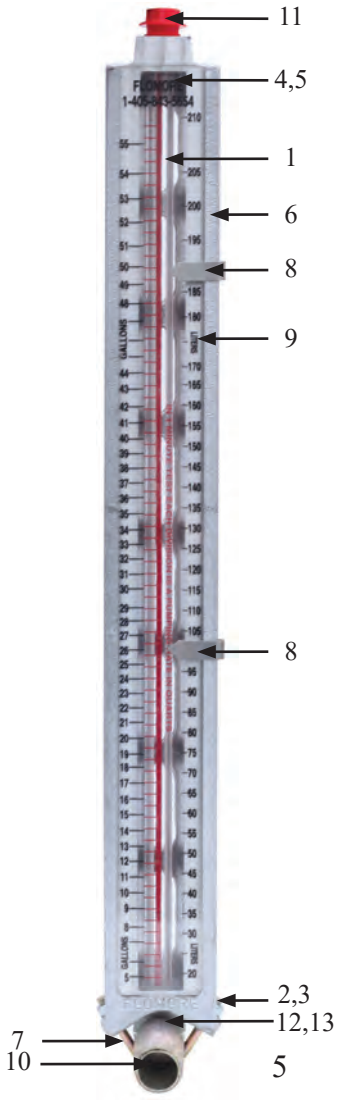


300 Series Drum Gauges

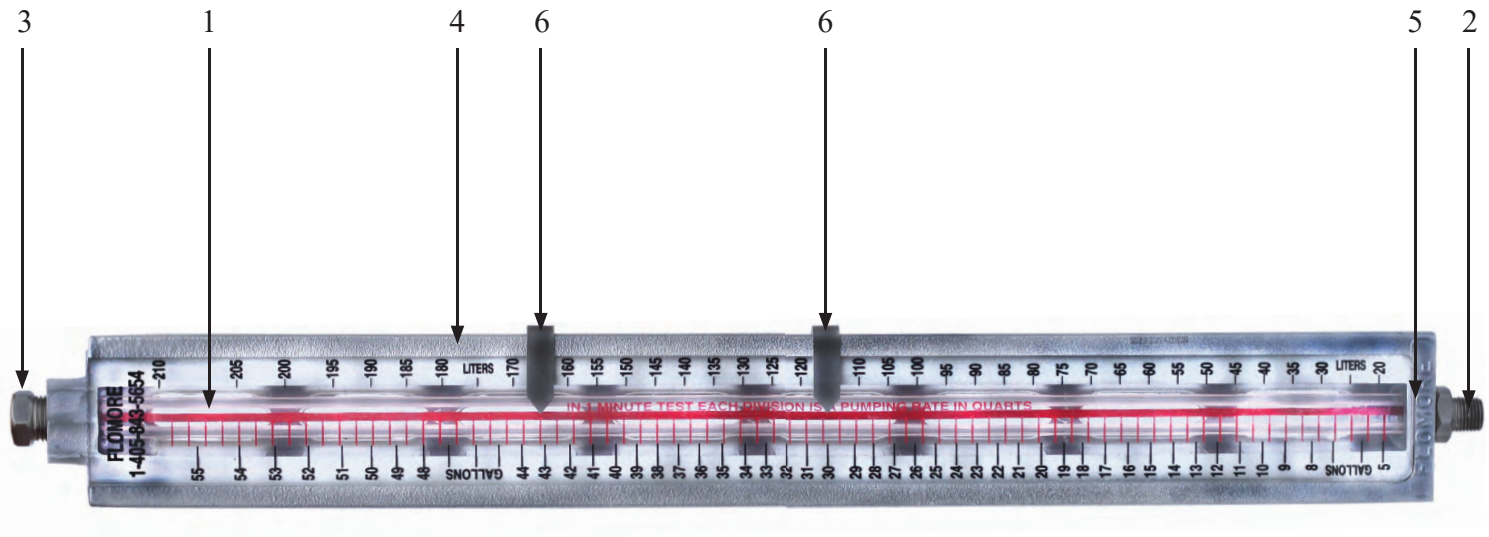
Item #	Part #	# Reqd.	Description	Material
1	A-0930	1	Scale	Acrylic
2	A-0931	1	1/4” Male Lower Packing Nut	Stainless Steel
3	A-0932	1	1/4” Female Upper Packing Nut	Stainless Steel
4	A-3102	1	Gauge Glass	Glass
5	D-0013	2	Viton Gasket	Viton
6	EZ.01	2	Pointer	Stainless Steel
7	F-929	1	Gauge Frame for 300.01	Aluminum

400 Series Drum Gauges

Item #	Part #	# Reqd.	Description	Material
1	1D20E	1	5/8” x 20” Red Line Glass Tube	Glass
2	A-0164	2	Nut	Steel
3	A-0167	2	Flat Washer	Steel
4	A-3100	1	Drum Gauge Spring	Steel
5	A-3101	1	Fiber Washer	Fiber
6	C-596.01	1	Solid Side Frame (For Scale)	Aluminum
7	D-0020	1	Drum Gauge Seat	Delrin
8	EZ.01	2	Pointer	Stainless Steel
9	K-596-SCALE	1	Scale	Acrylic
10	K-0405	1	Finished Nipple	Steel
11	P-0048B	1	1/2” Plastic Plug	Plastic
12	D-0020.01	1	O-Ring for D-0020	Buna
13	A-0612	1	Buna N O-Ring	Buna
14	K-0403	1	3/4” Stainless Steel Cap	Stainless Steel



F-350 Series Drum Gauges



Parts List

Item #	Part #	# Reqd.	Description	Material
1	1D20E	1	5/8” x 20” Red Line Glass Tube	Glass
2	A-0931	1	1/4” Male Lower Packing Nut	Stainless Steel
3	A-0932	1	1/4” Female Upper Packing Nut	Stainless Steel
4	F-350.01	1	Gauge Frame for 350 Series	Aluminum
5	D-0013	1	Viton Gasket	Viton
6	EZ.01	2	Pointer	Stainless Steel

F-6000 Series Tank Gauges

Features

- » Frame material available in aluminum or 303 stainless steel.
- » Lexan scale is replaceable.
- » 1/2” Male NPT inlet and outlet. (303 Stainless fittings)

Parts List

Item #	*Part #*	*# Reqd.*	*Description*	*Material*
1	F-0010	2	303SS Bushing	Steel
2	A-0612	2	Buna N O-Ring	Buna
3	D-0013	2	Viton Gasket	Viton
4	1D48E	1	5/8” x 48” Red Line Glass Tube	Glass
5	F-0006	1	Protective Shield for 48” Gauge	Plastic
6	F-0009	1	48” Aluminum Frame w/ Welded Blocks	Aluminum
7	A-4127	1	Yolk Packing Set	Buna

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Corporate Office

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820 South Commerce Street
Kilgore, TX 75662
(903) 984-3070
Fax: (903) 984-7901
THunt@cardonsales.com

Louisiana Branch

Cardon Sales Company, LLC

213 Cummings Road
Broussard, LA 70518
(337) 839-1704
Fax: (337) 839-1706
bcardon@cardonsales.com

Odessa Branch

Patterson Equipment Sales, Inc.

1610 S. Regal Avenue
Odessa, TX 79763
(432) 332-3345
Fax: (432) 332-3348
chad@pattersonequipsalesinc.com

platinum REGISTRATION, INC. ISO 9001:2015 CERTIFIED

ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

WE SUPPORT WOUNDED VETERANS

FLOMORE

Different By Design

Model 2000 Tank Gauge

5.2020.17.d

Model 2000 Tank Gauge

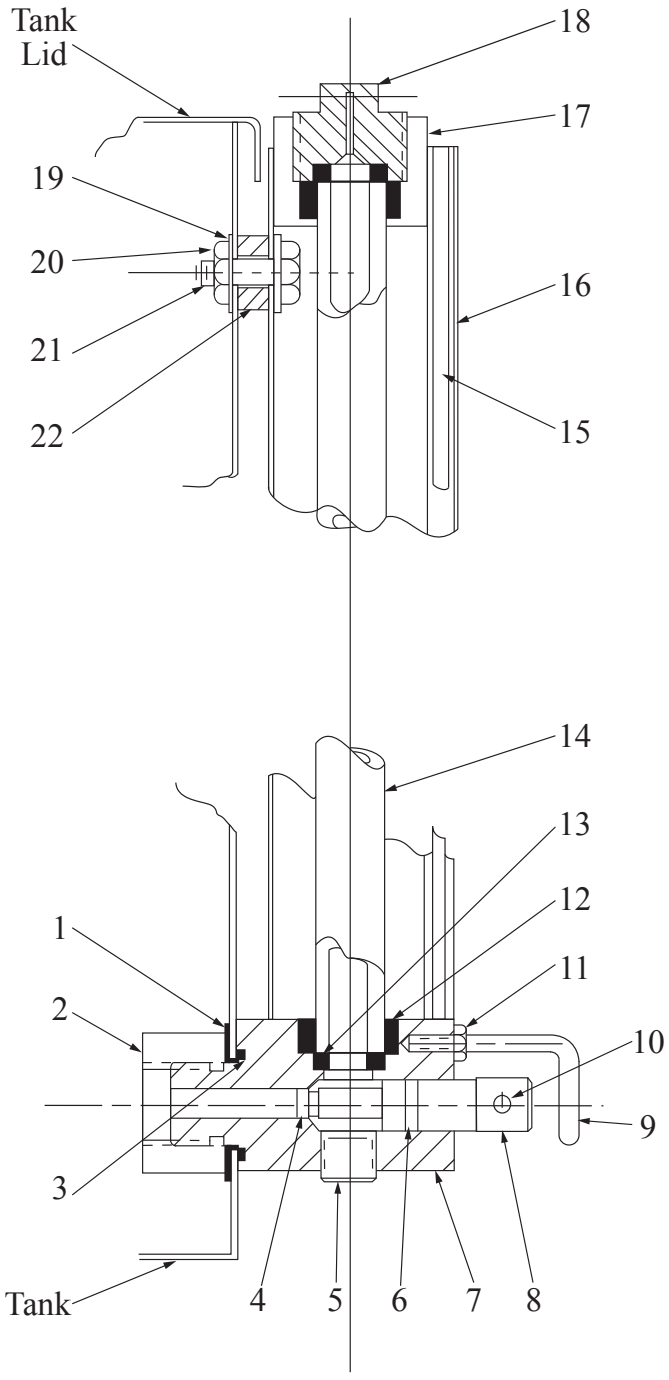
Features

- All metal parts are 303 or 304 stainless steel.
- Simple push-pull valve operation for test (push) run (pull).
- The movable level indicator is made from stainless steel and will not be effected by sunlight or ozone or break like an o'ring.
- 5 Gallon version (F-0871)
- 10 Gallon version (F-1285)

Maintenance

A gauge you can actually clean the tube without complete disassembly of the unit.

1. Empty the tank.
2. Remove Item #5, the ¼" NPT plug on the bottom of the valve assembly.
3. Remove Item #18, the top vent plug.
4. Loosen Item #11, valve stop nut, so you can turn Item #9, valve stop, either right or left.
5. Pull Item #8, valve stem, completely out of the body.
6. Run a ⅝" tube brush thru the tube and out the bottom of the assembly. Hold down the tube to keep it from moving.
7. Inspect o-rings on valve stem, replace if needed and reinstall.



Parts List

Item #	Part #	# Reqd.	Description	Material
1	A-0306	1	Washer	Teflon
2	F-0871.01	1	¾-16" Nut	Stainless Steel
3	F-0871.03	1	2-019 O-Ring	Viton
4	F-0871.04	1	2-006 O-Ring	Viton
5	A-0138	2	¼" NPT Pipe Plug	Steel
6	F-0871.06	1	2-011 O-Ring	Viton
7	F-0871.07	1	Valve Body	Stainless Steel
8	F-0871.08	1	Valve Stem	Stainless Steel
9	F-0871.11	1	Valve Stop	Stainless Steel
10	F-0871.09	1	⅛" x 2" Roll Pin	Stainless Steel
11	F-0871.10	1	Valve Stop Nut	Stainless Steel
12	15470	2	Tube Gasket	Buna-N
13	D-0013	2	Tube End Seal	Viton
14	A-3102	1	Glass Tube	Glass
15	F-0871.15	1	Scale	Acrylic
16	F-0871.16	1	Housing	Stainless Steel
17	F-0871.17	1	Top Block	Aluminum
18	F-0871.18	1	Vent Plug	Stainless Steel
19	A-0987	1	Spacer	Teflon
20	F-0871.20	1	¼-20" Nut	Stainless Steel
21	F-0871.21	1	¼-20" x ¾" Bolt	Stainless Steel
22	A-4092	2	Stat-O-Seal	Steel

FLOMORE

Different By Design

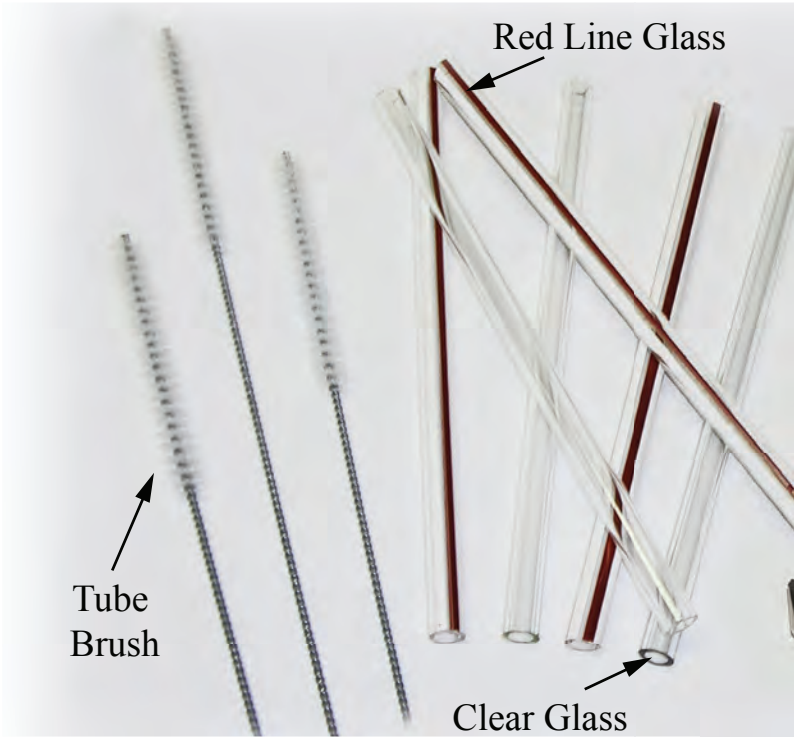
Glass Tubing and Accessories

5.2021.22.k

Glass

Red Line Glass

Part Number	Dimensions (inches)
1D12E	⅝ x 12
1D14.75E	⅝ x 14.75
1D20E	⅝ x 20
1D24E	⅝ x 24
1D36E	⅝ x 36
1D48E	⅝ x 48
1D50E	⅝ x 50
1D60E	⅝ x 60
1D72E	⅝ x 72
1E24E	¾ x 24
1E36E	¾ x 36
1E48E	¾ x 48
1E60E	¾ x 60
1E72E	¾ x 72
Extra Heavy Red Line Glass	
1D24EXX	⅝ x 24
1D36EXX	⅝ x 36
1D48EXX	⅝ x 48
1D60EXX	⅝ x 60



Maximum Pressures

Length (inches)	Clear Glass	Red Line Glass	Heavy Clear Glass	Extra Heavy Red Line Glass	Extra Heavy clear Glass
12	370	370	600	600	600
24	290	290	470	580	580
36	220	220	360	500	500
48	175	175	285	350	350
60	135	135	220	265	265
72	100	100	150	175	175

Working pressures are based off information from the provider of this product.

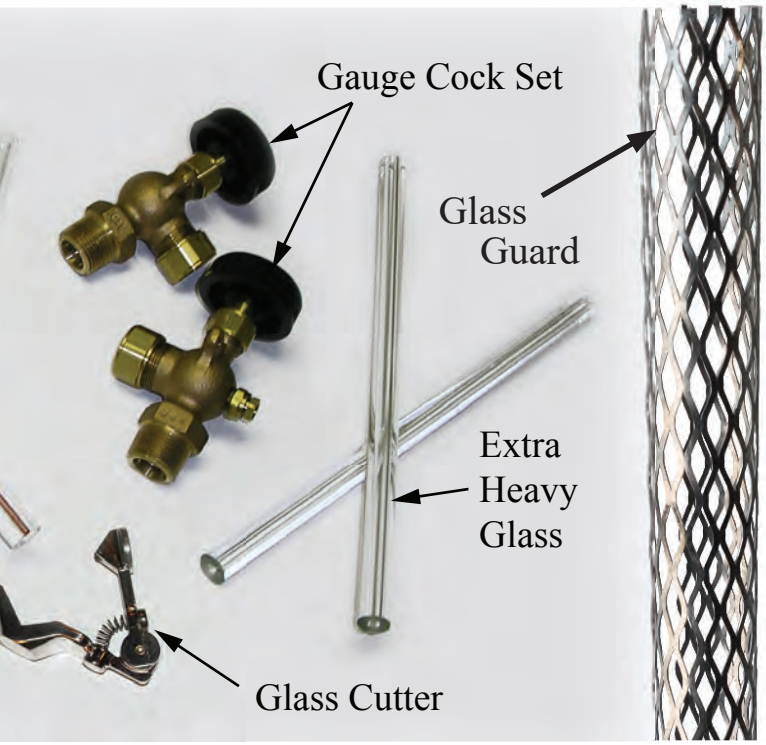
NOTE: No corrosion at 150°F

Clear Glass

Clear Glass	
Part Numbers	Dimensions (inches)
1D24C	⅝ x 24
1D36C	⅝ x 36
1D48C	⅝ x 48
1D60C	⅝ x 60
1D72C	⅝ x 72
Extra Heavy Clear Glass	
1D24CX	⅝ x 24
1D36CX	⅝ x 36
1D48CX	⅝ x 48
1D60CX	⅝ x 60
1D72CX	⅝ x 72
Extra Extra Heavy Clear Glass	
1D24CXX	⅝ x 24
1D36CXX	⅝ x 36
1D48CXX	⅝ x 48
1D60CXX	⅝ x 60
1D72CXX	⅝ x 72

Recommended for extra high pressures

Glass Accessories



Plastic Tube

Part Number	Dimensions (inches)
1D72P	⅝ x 72
1E72P	¾ x 72

Extra Heavy Plastic Tube

Part Number	Dimensions (inches)
1D72PX	⅝ x 72

Recommended for extra high pressures

Tube Brush

Part Number	Description
15466	⅝" x 48" Tube Brush

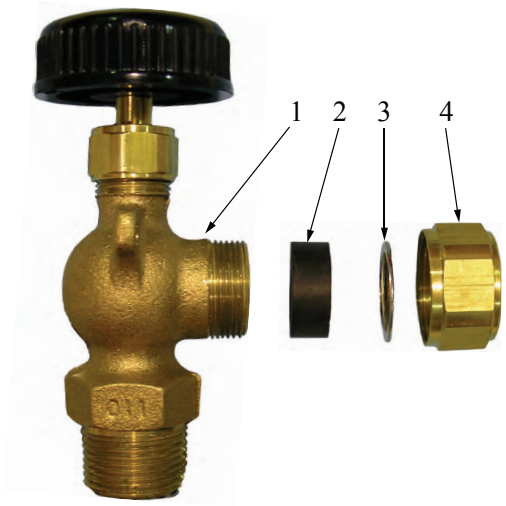
Glass Guard

Part Number	Dimensions (inches)
15424	24"
15436	36"
15448	48"
15572	72"

Made of pliable 18-gauge aluminum

Gauge Cocks

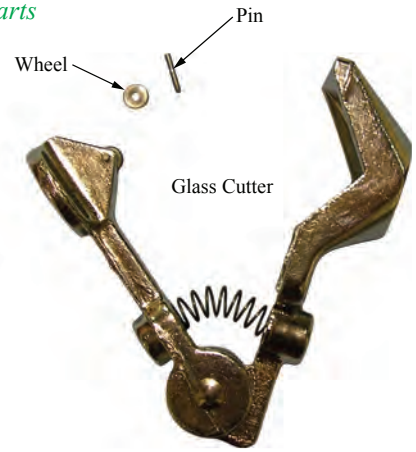
**Sold in sets of 2*



Item #	Part #	# Reqd.	Description
1	20-250-03	1	½"NPT x ⅝" Glass
1	20-254-03	1	¾"NPT x ¾" Glass
2	15470	1	⅝" Square Cut Washer (Buna)
	15469		⅝" Square Cut Washer (Viton)
	15472		¾" Square Cut Washer (Buna)
3	15473	1	¾" Brass Washer
	15474		⅝" Stainless Steel Washer
4	15475	1	¾" Brass Nut
	15476		⅝" Brass Nut

Recommended Spare Parts

Glass Cutter



Part Number	Description
GCH-13520	Glass Cutter
GCH-13600-5	Replacement Wheel and Pin

Recommended Spare Parts

FLOMORE®

Richart Distributors, Inc.

Corporate Office

3415 South I-35 Service Road
Oklahoma City, OK 73129
1-866-843-5654
Fax: (405) 619-3007
Richart@flomore.com

Dickinson Branch

533 East Villard Suite B
Dickinson, ND 58601
(701) 483-8267
Fax: (701) 483-8268

Kilgore Branch

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