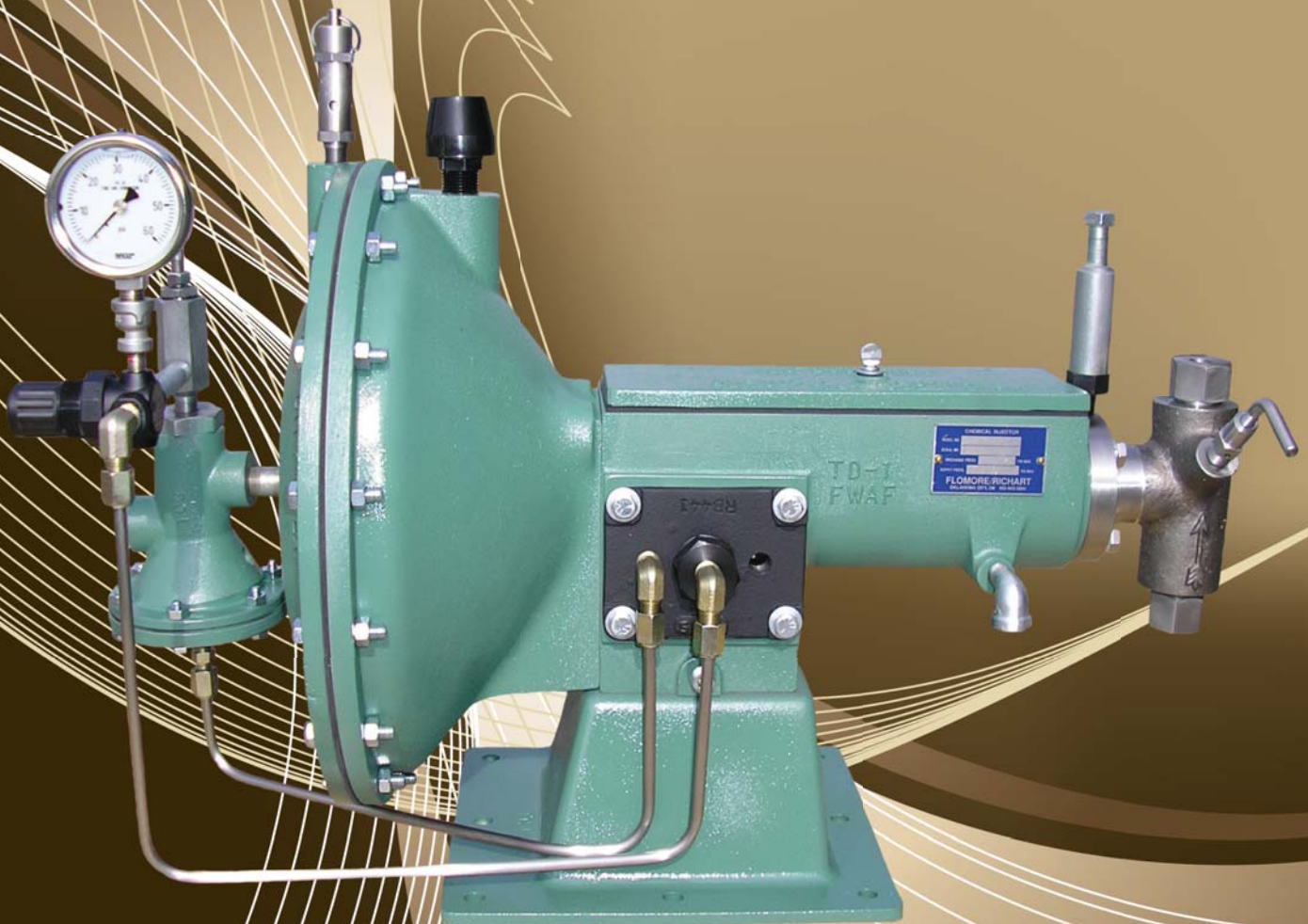


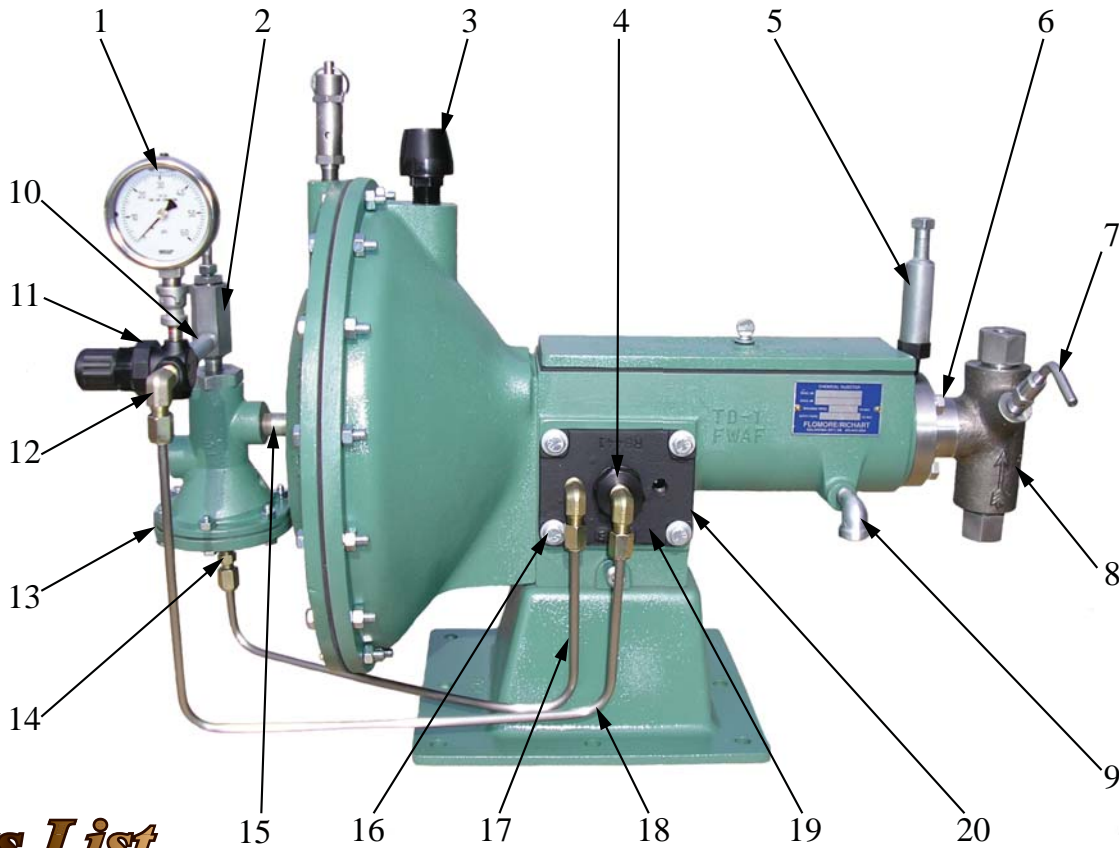
# ***FLOMORE***

*Different By Design*

# ***5020 Series Injector***



# 5020 Series Injector



## Parts List

Item #	Part #	# Req'd.	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 1/4"

\*\*\*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.**

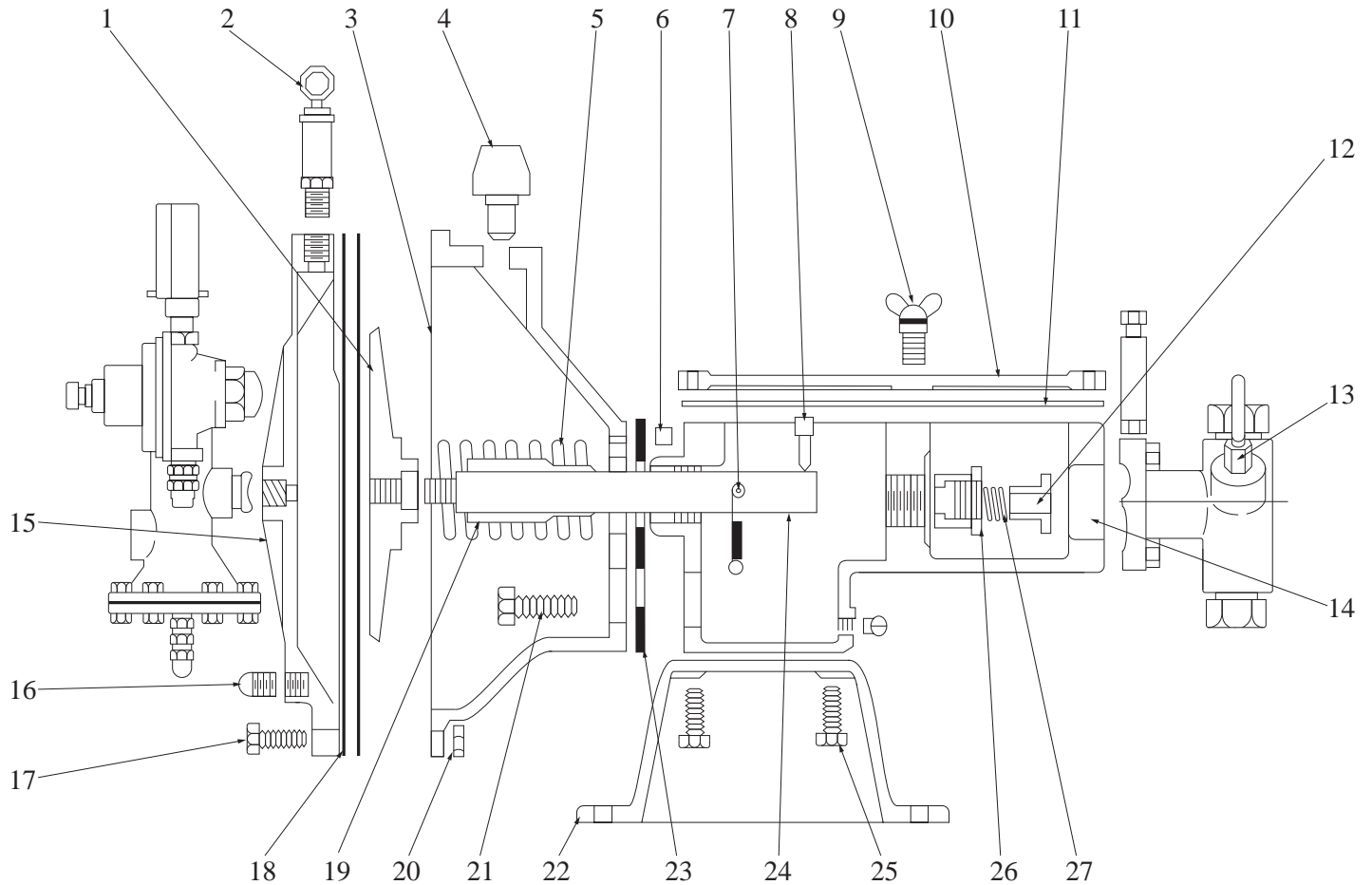
2. The suction bushing is a ¼" NPT connection (Item #17, Page 8), care should be taken to make sure no dirt, sand or other foreign objects are left in the suction line before hooking it up, as any of these items will not allow the check valves in the head assembly to operate properly.
3. Before connecting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

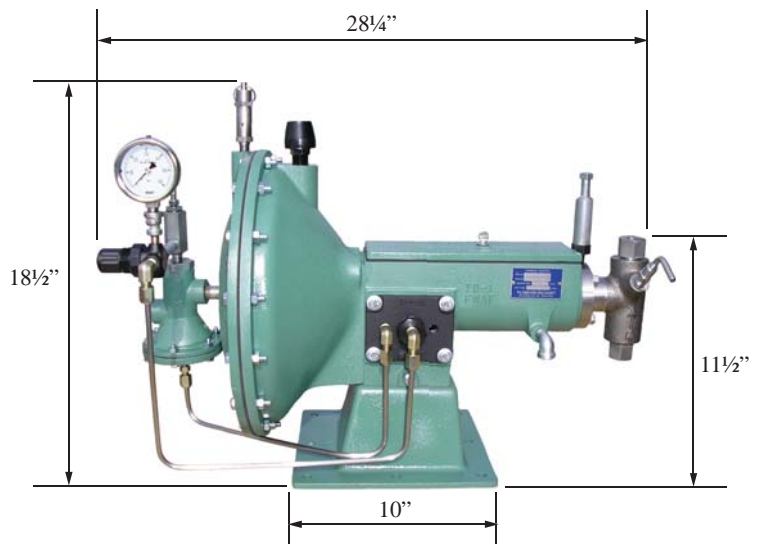
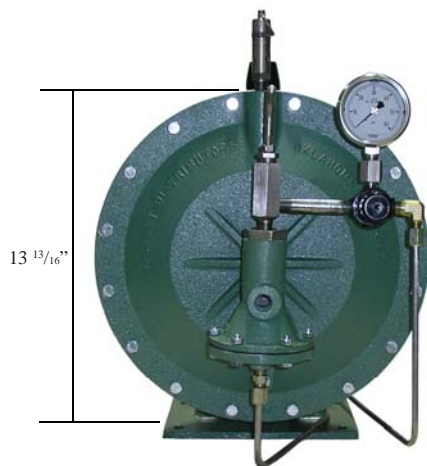
7. Volumes of fluid pumped, are a function of plunger stroke length and speed (SPM). You have available two (2) stroke lengths and a variety of speeds up to 60 SPM continuous or 75 SPM intermittently. To change stroke length, move the plunger pin (Item #8, Page 3) from one hole to the other. The hole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

# 5020 Series Injector

## Cross Section



## Dimensions



# *5020 Series Injector*

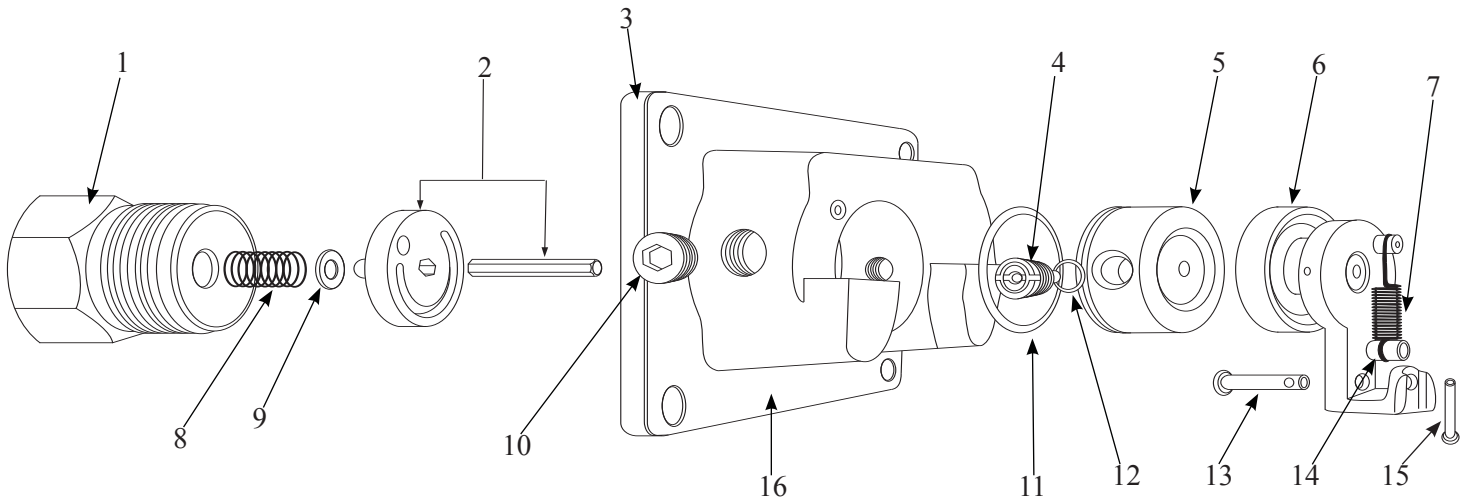
## *Parts List*

<i>Item #</i>	<i>Part #</i>	<i># Req'd.</i>	<i>Description</i>	<i>Material</i>	<i>Alternate Part #</i>
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-0146	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-0003	1	Thrust Rod	Brass	◆
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



**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 and facilitate the pressing of the valve seat into position.

## Parts List

Item #	Part #	# Req'd.	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

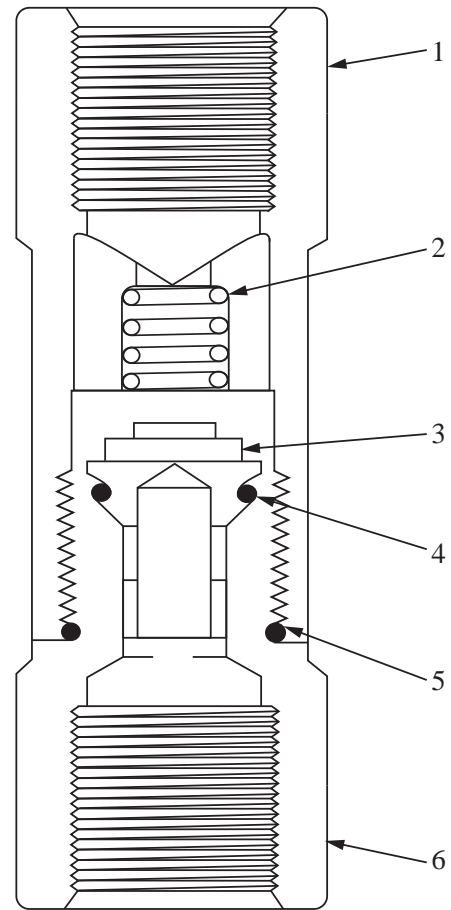
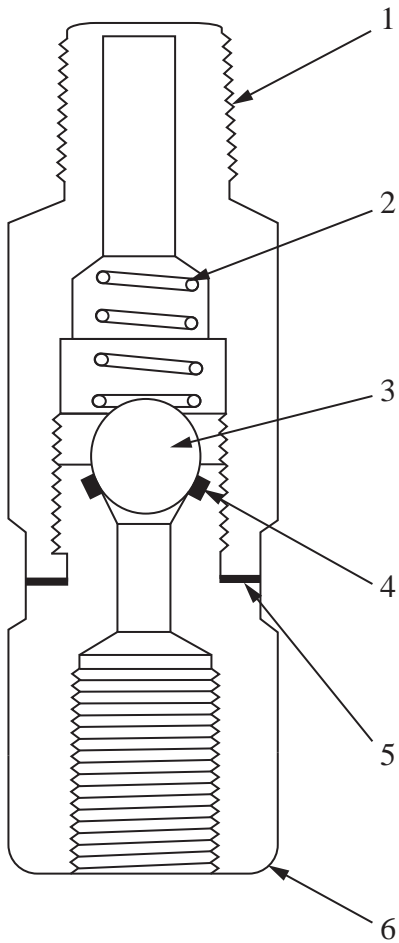
\* Items make up a C- 0600 Pilot Valve Seat and Disc Assembly

# 5020 Series Components

## A-0675 & A-0676 Line Check

## B-1288 Line Check

15,000 lbs. Working Pressure



### 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	3/8" 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

### 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

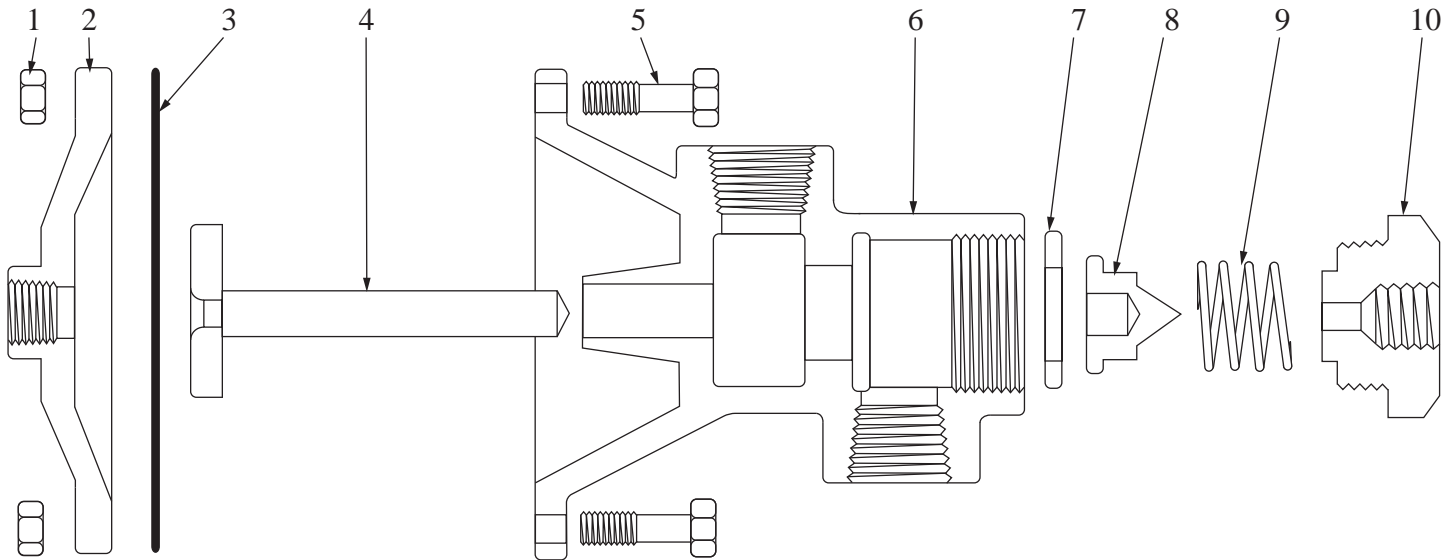
\*\*A-0675 Only

\*\*\*A-0676 Only

\* 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

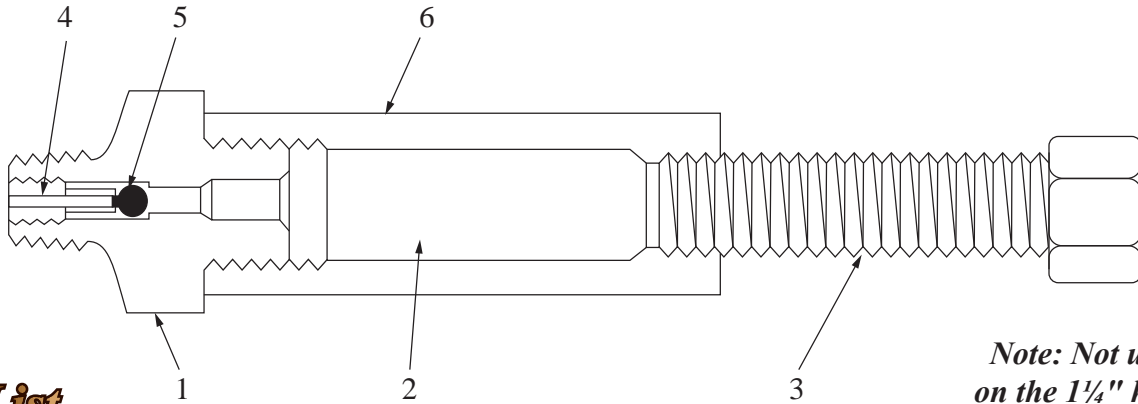
\* Recommended Spare Parts

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



# 5020 Series Components

## A-0558 Grease Jack Assembly

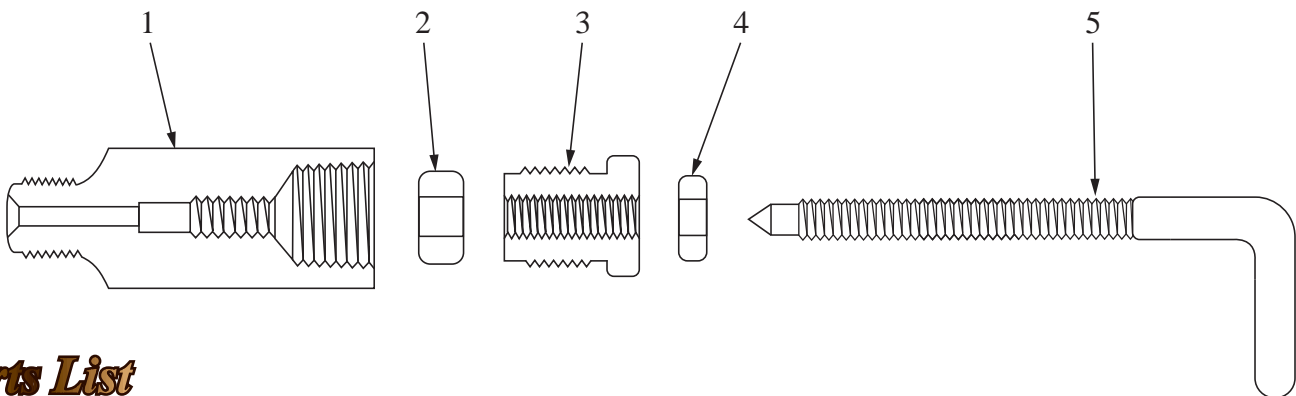


### Parts List

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



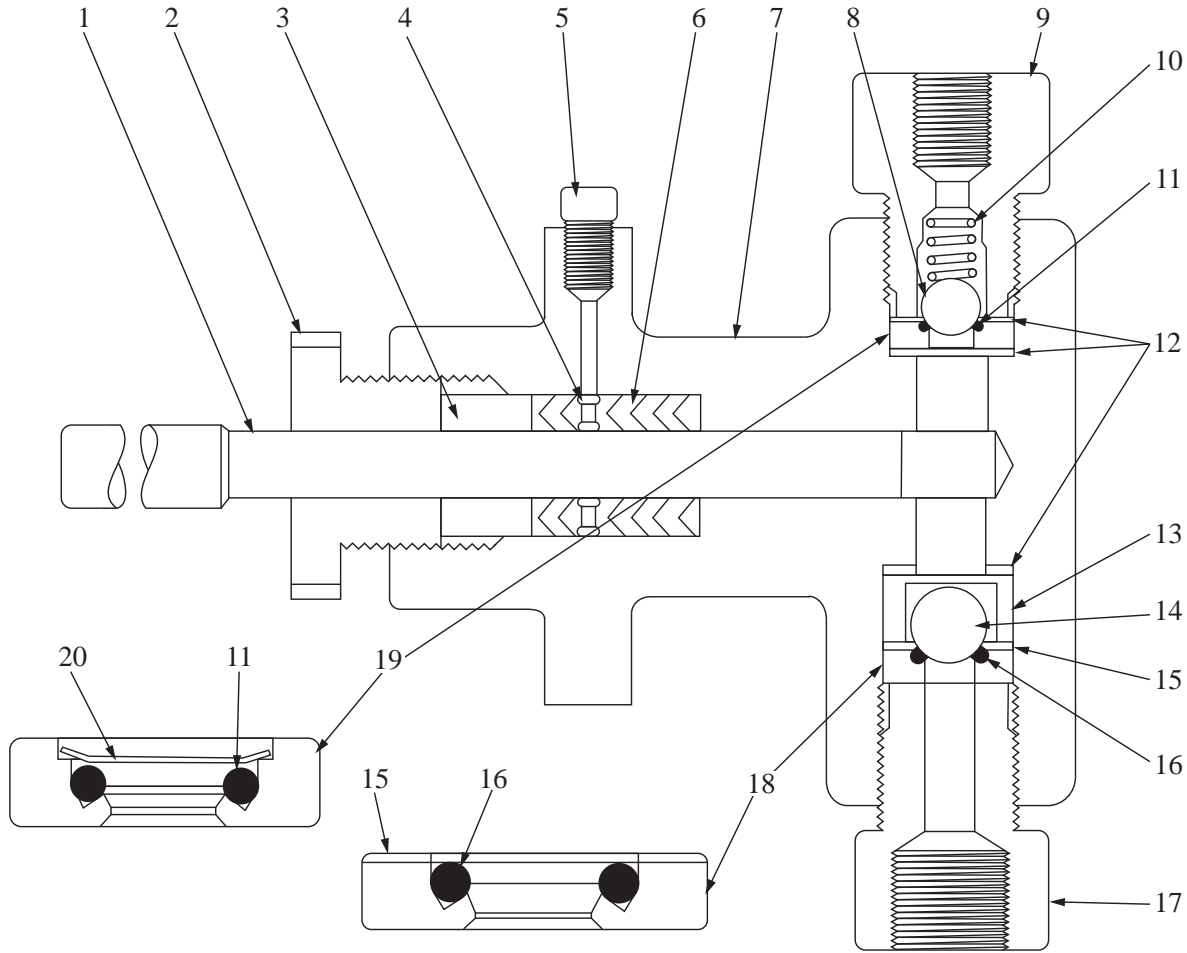
### Parts List

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 1/4", 3/8", 1/2", 3/4", and 1" Heads)*



## *Alternate Components*

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

Item #	Part #			Description
	Viton	Teflon	Hard*	
6	A-4102	A-1642	A-2295	1/4" Plunger Packing
	A-4101	A-1234	A-1875	3/8" Plunger Packing
	A-4103	A-1012	A-1874	1/2" Plunger Packing
	A-4657	A-2988	A-2772	3/4" Plunger Packing
	A-4658	A-1013	A-4135	1" Plunger Packing

Item #	Part #		Description
	Ceramic		
1	A-2764-C		1/4" Plunger
	A-0743-C		3/8" Plunger
	A-0032-C		1/2" Plunger
	A-2767-C		3/4" Plunger
	A-0158-C		1" Plunger

\*Hard packing for 3000PSI and above service

## Parts List for Ductile Iron Head

Item #	Part #					# Req'd.	Description	Material
	1/4"	3/8"	1/2"	3/4"	1"			
◆	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	Armalooy - 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	3/8" 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

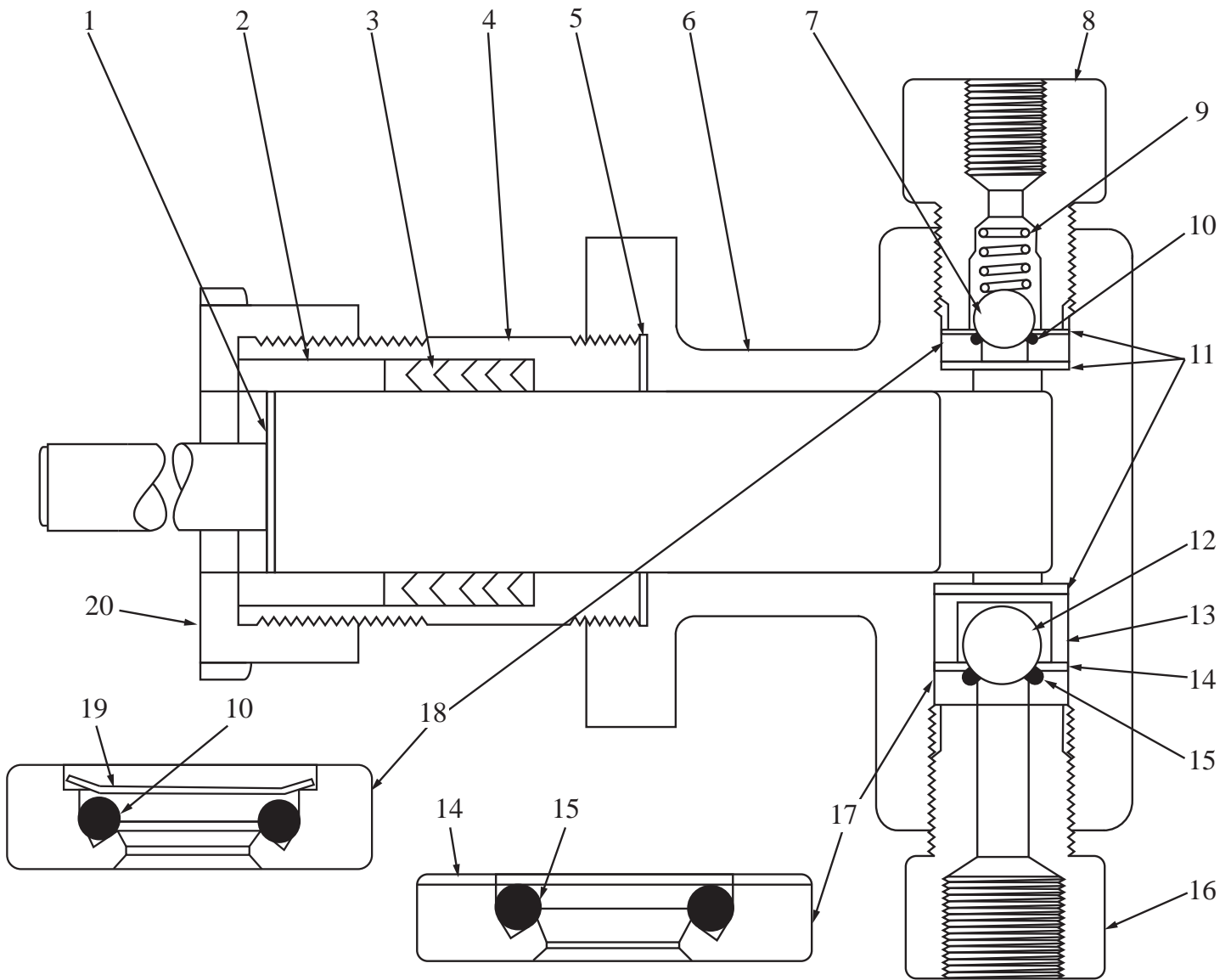
Item #	Part #					# Req'd.	Description	Material
	1/4"	3/8"	1/2"	3/4"	1"			
◆	C-1611	C-0148	C-0139	C-0337	C-0137	1	Head Assembly	Stainless Steel
*1	A-2764	A-0743	A-0032	A-2767	A-0158	1	Plunger	Armalooy - 17.4 pH Stainless Steel
2	D-0250	D-0375	D-0500	D-0750	D-1000	1	Packing Gland Nut	Stainless Steel
3	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-0350	C-0138	1	Body	Stainless Steel
8	A-0054					1	3/8" 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 Available (see tables on page 10)

# *Injector Heads*

*(For 1¼" Heads)*



# *Injector Heads*

## *(For 1¼" Heads)*

### *Parts List*

<i>Item #</i>	<i>Part #</i>	<i># Req'd.</i>	<i>Description</i>	<i>Material</i>
♦	C-0048	1	Head Assembly	Ductile Iron with Stainless Steel Trim
	C-0134			Stainless Steel
1	A-0408	1	Plunger	Armaly - 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 Available (see table above)

### *Alternate Construction*

<i>Item #</i>	<i>Part #</i>	<i>Description</i>	<i>Material</i>
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*

<i>Model #</i>	<i>Plunger Size</i>	<i>Operating Ratio (gas*/fluid)</i>	<i>Maximum Discharge Pressure (PSIG)</i>		<i>Maximum Volume</i>			
			<i>Hard Packing</i>	<i>Soft Packing</i>	<i>Intermittent GPH</i>	<i>Intermittent GPD</i>	<i>Continuous GPH</i>	<i>Continuous GPD</i>
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"

# *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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