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1300 Series Injector

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Maintenance Instructions to Inspect and Replace Plunger Packing

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

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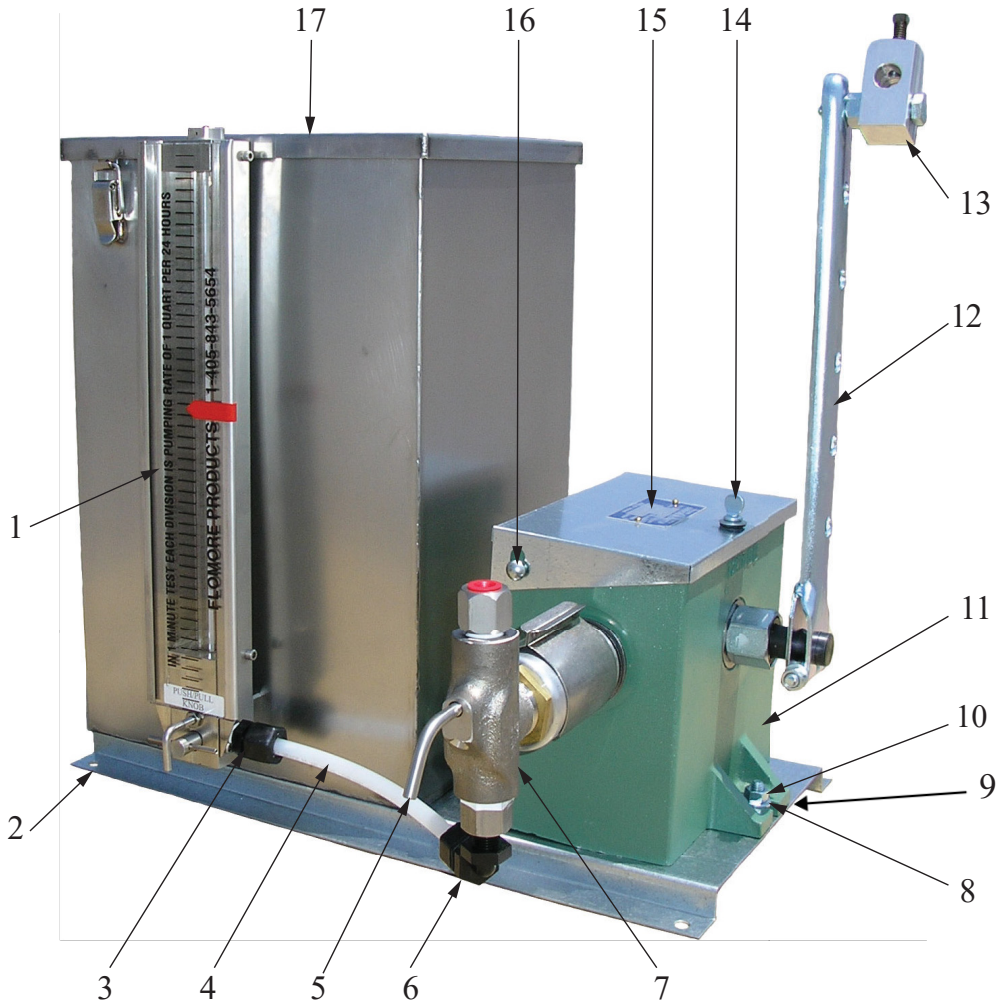


Item #	Part #	Description
1	F-0871	Stainless Steel Tank Gauge Assembly
2	A-0535	Base Assembly
3	A-3118	Connector
4	A-3117	Suction Line
5	A-1497	Priming Valve
6	A-3116	Elbow
7	See Page 8	Head Assembly
8	A-0163	Bolt
9	A-0167	Flat Washer (x2)

Item #	Part #	Description
10	A-0164	Nut
11	B-0091	Box Assembly
12	B-0067	Lever Arm
13	A-0538	Knuckle Assembly
14	A-2577	Thumb Screw
15	A-0960	Lid
16	SP-0001.01	Hinge Rod
	SP-0001.02	Clip (x2)
17	A-0664	5 Gallon Reservoir Assembly 304SS

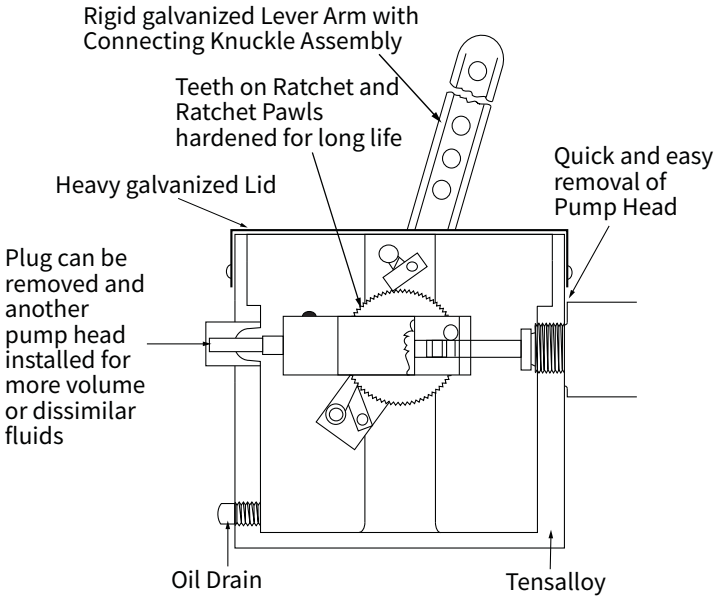
Installation and Operating Instructions

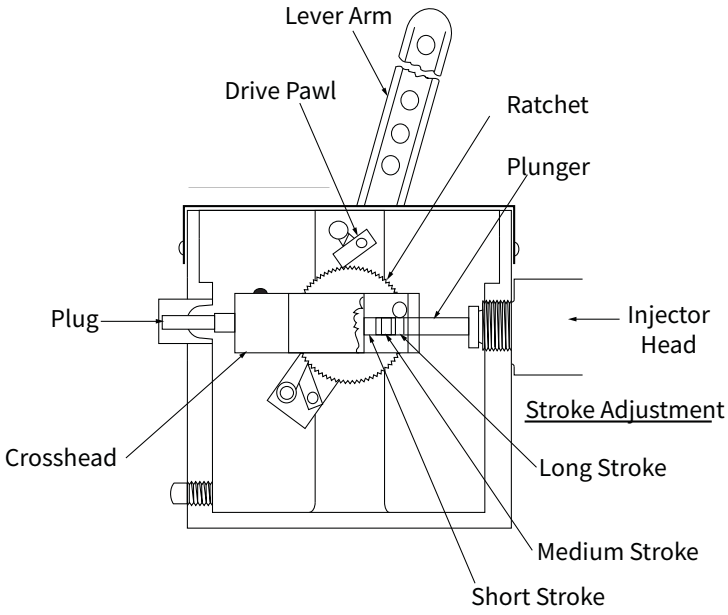
1. Install the A-1497 priming valve (included with pump, but shipped loose in carton) on the pump head.
2. Connect the suction line to the pump head. If a reservoir is furnished with the pump, the suction line is already connected. Fill the reservoir and completely open the tank gauge valve.
3. Connect the discharge line (5/16" tubing will suffice). One brass or stainless-steel 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 1/4" female pipe thread connection.***
4. Connect the lever arm to the power source as follows:
   - (make sure the pumping unit cannot start automatically) 3/8" 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 A-0538 Connecting Knuckle on the lever arm, tighten set screws to secure position of rod or pipe.
   - Wire line. Simply attach to the walking beam and the A-0538 connecting knuckle.
5. Fill the B-0091 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 the 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 10) to obtain the 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 A-0538 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 the positioning of the A-0290 plunger pin in the end of the plunger. ***Note: A quick calculation using the performance data charts (Page 10) 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. An additional head can be installed on the opposite side of the B-0091 box by removing the A-0434 guide plug assembly. An A-0451 Cross-head (Duplex) (Page 7) can be purchased to complete the dual head transformation.***
7. Start the pumping unit and prime the pump head by opening the priming valve. After discharging 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 (included with pump), slowly tighten the gland to prevent excess drippage and waste of chemicals. Do not overtighten the 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.

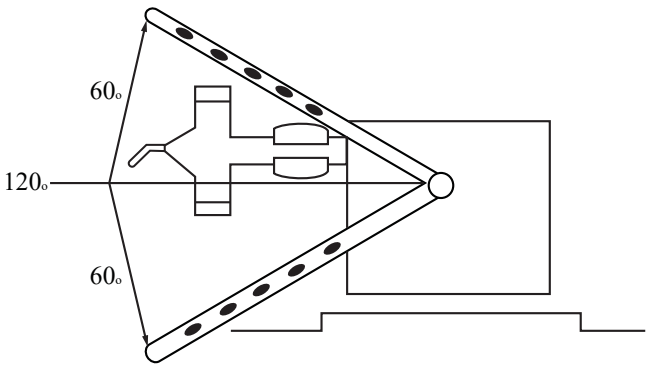
1300 Series Injector

1300 Series Components

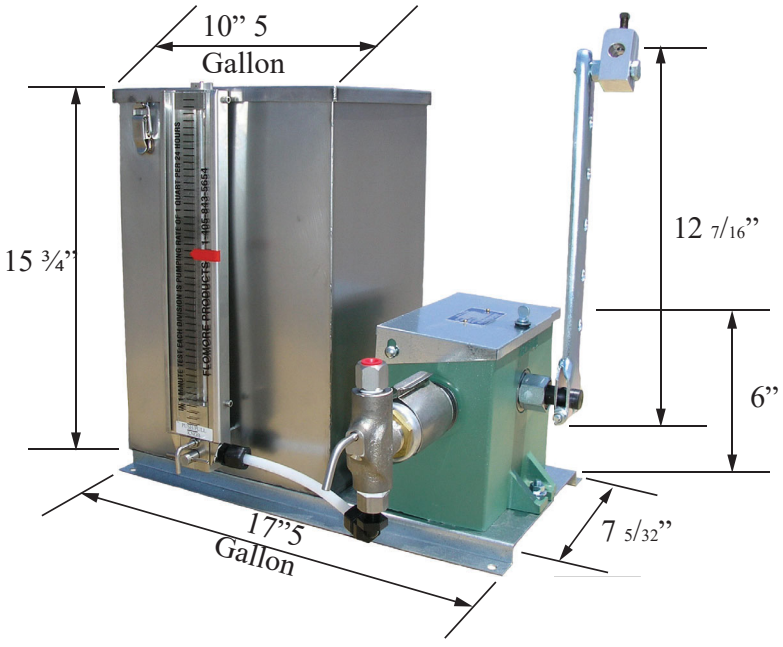




Handle Positions

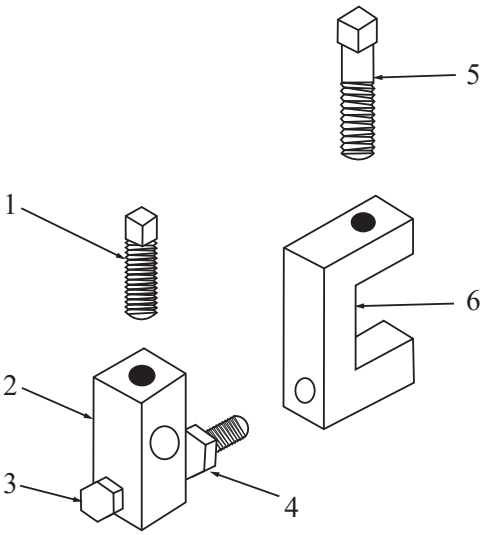


Dimensions



1300 Series Components

A-0701 Beam Clamp Assembly



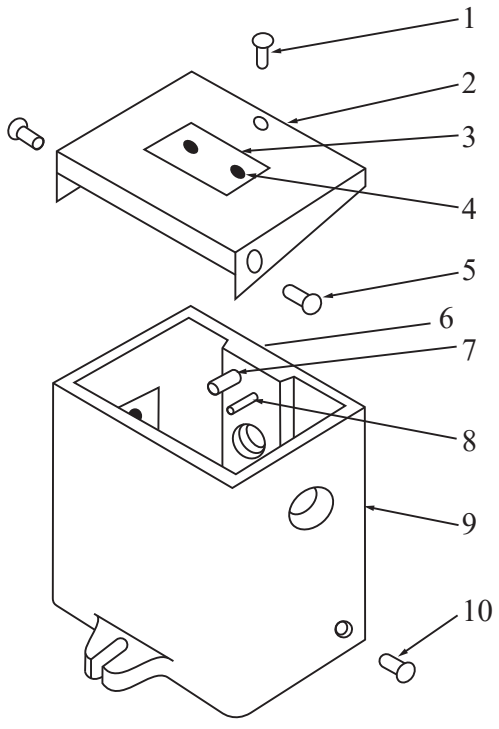
Parts List

Item #	Part #	Description	Material
1	A-0452	Thumb 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

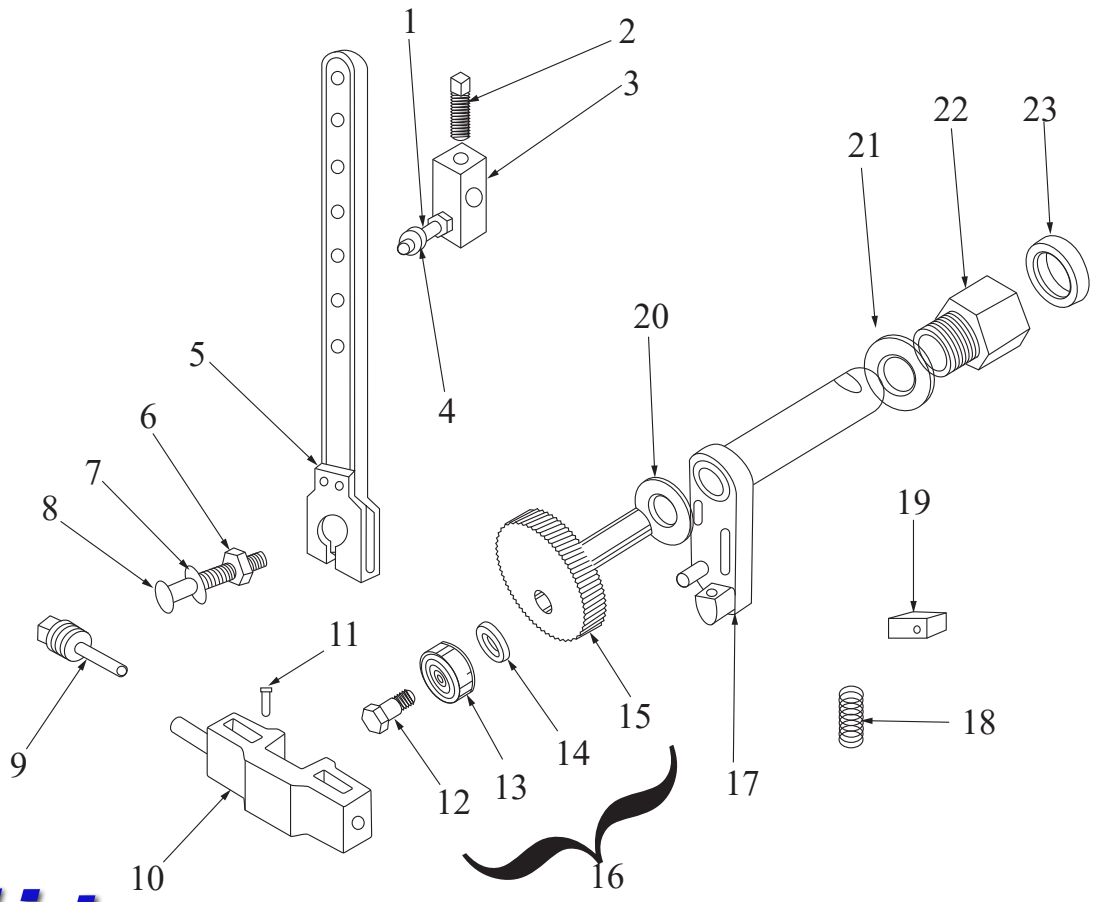
Parts List

Item #	Part#	Description	Material
1	A-2577	Thumb Screw	Steel
2	A-0960	Lid	Steel
3	A-0172	Name Plate	Aluminum
4	A-0171	Brass Pin (x2)	Brass
5	SP-0001.01	Hinge Rod	Stainless Steel
	SP-0001.02	Hinge Rod Clip (x2)	Steel
6	A-4894	Set Screw	Steel
	A-4891	Set Screw	Steel
7	A-0986	Check Pawl Spring Shaft	Steel
8	A-0985	Pawl Shaft	Steel
9	B-0091	Box Assembly	Aluminum
10	A-0138	Drain Plug	Iron



1300 Series Components

Injector Parts

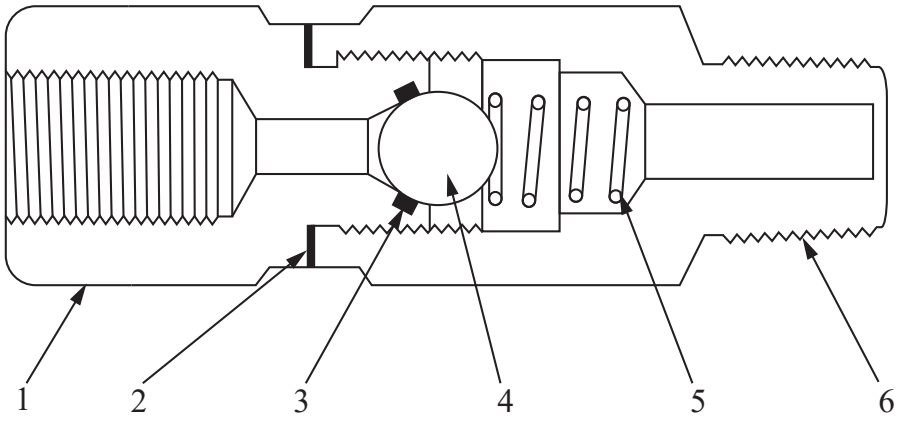


Parts List

Item #	Part #	# Req	Description	Material	Item#	Part #	#Req	Description	Material
1	A-0438	1	Cap Screw	Steel	12	A-0433	1	Ratchet Bearing Bolt	Steel
2	A-0452	1	Set Screw	Steel	13	A-0457	1	Ratchet Bearing	Steel
3	A-0409	1	Knuckle	Aluminum	14	A-0458	1	Cut Washer	Steel
4	A-0439	1	Nut	Steel	15	A-0420	1	Ratchet Subassembly	Steel
5	B-0067	1	Lever Arm	Steel	16	A-0537	1	Rachet Assembly	Steel
6	A-0144	1	Nut	Steel	17	B-0066	1	Drive Shaft	Steel
7	A-0425	1	Lock Washer	Steel	18	A-0456	2	Pawl Spring	Stainless Steel
8	A-0424	1	Lever Bolt	Steel	19	A-0455	2	Pawl	Steel
9	A-0434	1	Guide Plug Assembly	Steel	20	A-4251	1	Nylon Washer	Nylon
10	A-0536	1	Crosshead (Simplex)	Ductile Iron	21	A-0410	1	Washer	Steel
	A-0451	1	Crosshead (Duplex)	Ductile Iron	22	A-5199	1	Shaft Bearing	Steel
11	A-0290	1	Plunger Pin	Steel	23	A-5200	1	Seal	Neoprene

Not Required for Duplex Pump

A-0675 & A-0676
Line Checks

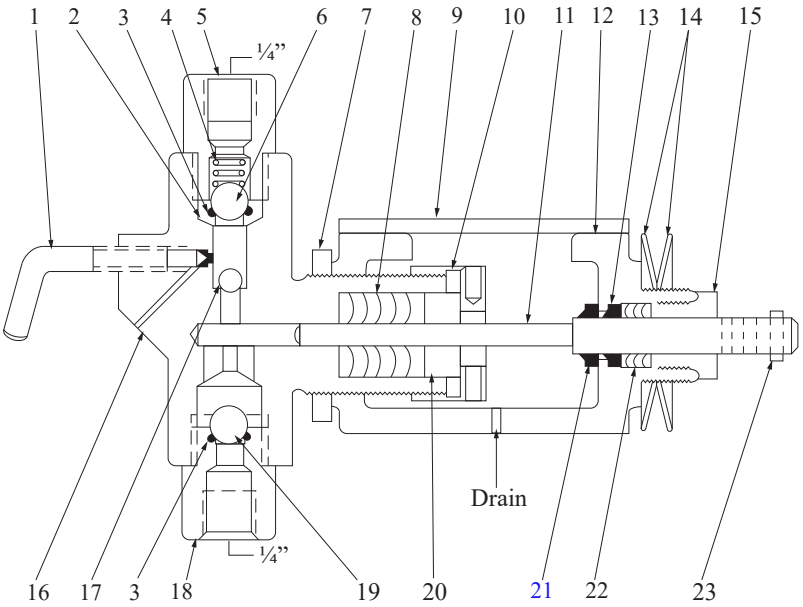


Item #	Part #	#Req	Description	Material
1	A-0678	1	Inlet Body	Brass
	A-1297	1	Inlet Body	303 Stainless Steel
2	A-1574	1	Washer	304 Stainless Steel
3	A-0479	1	O-Ring	Buna-N
	A-2580	1	O-Ring	Viton
4	A-0054	1	3/8" Ball	316 Stainless Steel
5	A-0391	1	Spring	316 Stainless Steel
6	A-0677	1	Outlet Body	Brass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

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

Injector Heads

Alternate Construction



Note: Drip Ring moves with Plunger.

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	1/4" Plunger Packing	Viton
	A-1642		Teflon
	A-2295		Hard
	A-4101	3/8" Plunger Packing	Viton
	A-1234		Teflon
	A-1875		Hard
	A-4103	1/2" Plunger Packing	Viton
	A-1012		Teflon
	A-1874		Hard
18	A-0771	Bottom Seat Assembly	303 Stainless Steel
19	A-0053	1/2" Ball	316 Stainless Steel

Parts List

*Recommended Spare Parts *Alternate Components Available

Item #	Part # 1/4"	Part # 3/8"	Part # 1/2"	# Req.	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			2	O-Ring	Buna-N
4	A-0077			1	Ball Check Spring	316 Stainless Steel
5	A-1496			1	Top Bushing	302 Stainless Steel
6	A-0054			1	3/8" Large Top Ball	316 Stainless Steel
7	A-0225			1	Yoke Lock Nut	Brass
*8	A-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	Wiper Drip 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	1		Stainless Steel
17	A-0126			1	1/4" Small Top Ball	316 Stainless Steel
*18	B-0736			1	Bottom Seat Assembly	303 Stainless Steel
*19	A-0054			1	3/8" Suction Ball	316 Stainless Steel
20	A-1463	A-0957	A-1219	1	Plunger Packing Gland	303 Stainless Steel
21	A-4095			1	Wiper Drip Ring	Buna-N
22	A-4127			1	Yoke Packing Set	Buna-N
23	A-0290			1	Plunger Pin	Carbon Steel

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*
1/4"	1500	13-01	0.5	7.2
3/8"	1000	13-03	0.5	18.0
1/2"	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**	**1/4" Plunger**			**3/8" Plunger**			**1/2" 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*

1300 Series Maintenance

To Remove B-0067, Page 7

Remove A-0424 lever bolt . B-0067 lever can then be removed from the B-0066 drive shaft assembly. Upon reassembly, be sure the bolt fits into the slot in the end of the drive shaft assembly.

To Remove A-0536 Crosshead, Page 7

It is not necessary to remove the pump head from a single-headed unit in order to remove the cross-head 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 cross-head. Lift out cross-head. To remove cross-head from double-headed unit, it is necessary to remove one pump head from the gear box.

To Remove A-0537 Ratchet Assembly, Page 7

It is necessary to follow both procedures outlined above.

1. After crosshead is removed, A-0537 ratchet 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 sub-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 7

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 7

It is necessary to remove A-0537 ratchet assembly.

To Repack Fluid Pump Head, Page 7 and 9

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, the plunger drip ring, plunger packing gland, and plunger packing gland nut can be removed. This gives access to the main plunger packing.

To Check Discharge Ball, Seat, Springs and O-Ring, Page 9

Remove A-1496 top bushing.

To Check Suction Ball, Page 9

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

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