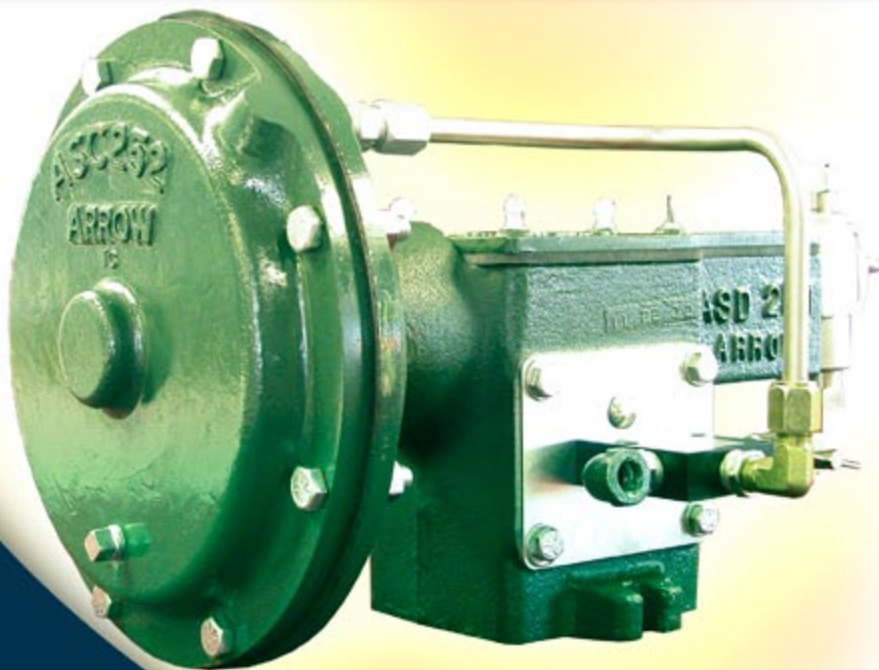




510 CHEMICAL PUMP



ARROW
ENGINE COMPANY



a TRIMAS company

CP510-RP-S-APR12



In 1955 Arrow Engine Company opened for business, beginning the tradition of providing premium service and exceptional products to the oil & gas industry, as well as the industrial engine market, throughout the world.

Arrow is a part of the Engineered Components segment formed by TriMas Corporation. Headquartered in Bloomfield Hills, Michigan, TriMas Corporation (NASDAQ- TRS) provides engineered and applied products for growing markets worldwide. TriMas Corporation is organized into the following reportable segments: Packaging, Energy, Aerospace & Defense, Engineered Components, Cequent North America, and Cequent Asia Pacific. With almost a billion dollars in sales, TriMas Corporation has approximately 4,000 employees at over 60 different facilities in 11 countries.

With a consistent focus on our customers' needs, striving to help them grow their business, and producing the most reliable equipment and parts in the industry, Arrow has forged a 55-year tradition of excellence.



510 Series

PRODUCT INFORMATION

The Arrow Series 510 Chemical Injectors, engineered to precise specifications, are single acting, positive displacement plunger-type pumps, powered by a diaphragm motor with a spring return. The 510 Series Chemical Injectors are used in the introduction of de-emulsifiers, solvents, corrosion inhibitors and de-salting agents into oilfield operations.

► EQUIPMENT

The Series 510 contain a minimum of working parts, simplifying maintenance and ensuring reliable performance throughout the life of the pump. Arrow's fluid pump heads are equipped with stainless steel plungers, ball checks, ball check springs, top bushings, top seats, bottom bushings, adjust-

able type packing and priming valves. The plunger is enclosed with a drain to handle plunger drip. Lubricating oil contamination is eliminated by including a double drip lip on the thrust rod.

► SPEED

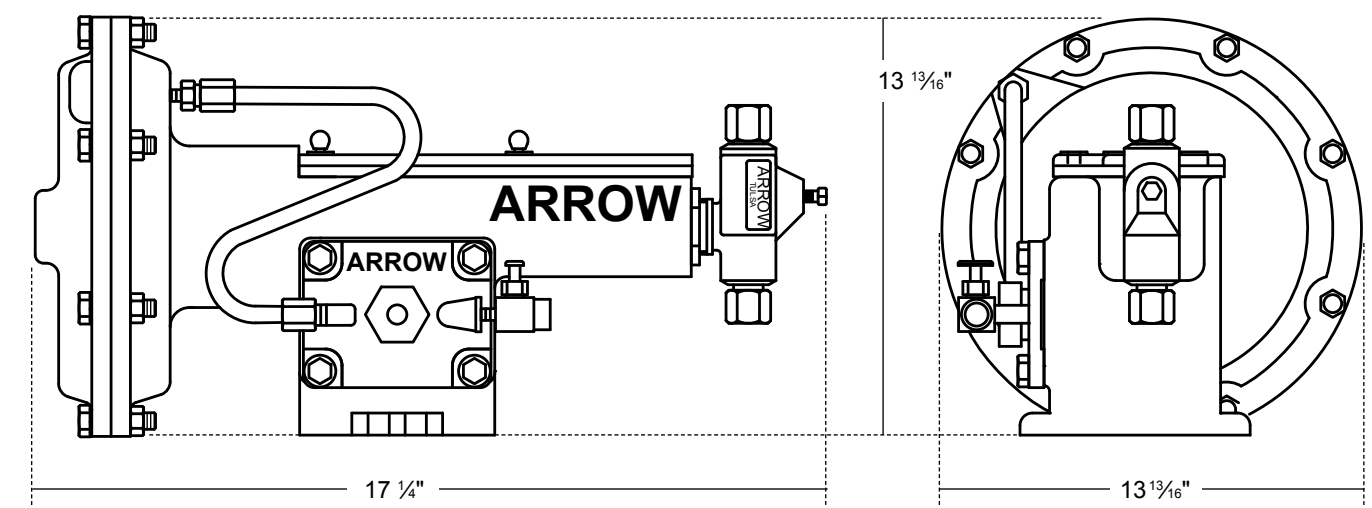
The speed of the 510 Series is controlled by regulating the exhaust gas discharge, with reversal being accomplished with a direct spring actuated switching mechanism.

► VOLUME

The volume of the pump is controlled by the speed of the pump and the stroke length controls. The stroke length on the 510 Series can either be 1" or 1/3" lengths.

DIMENSIONS & SHIPPING WEIGHT

Shipping Weight — 45 lbs
 Carton Dimensions — 21" x 13" x 10"



GAS CONSUMPTION CHART

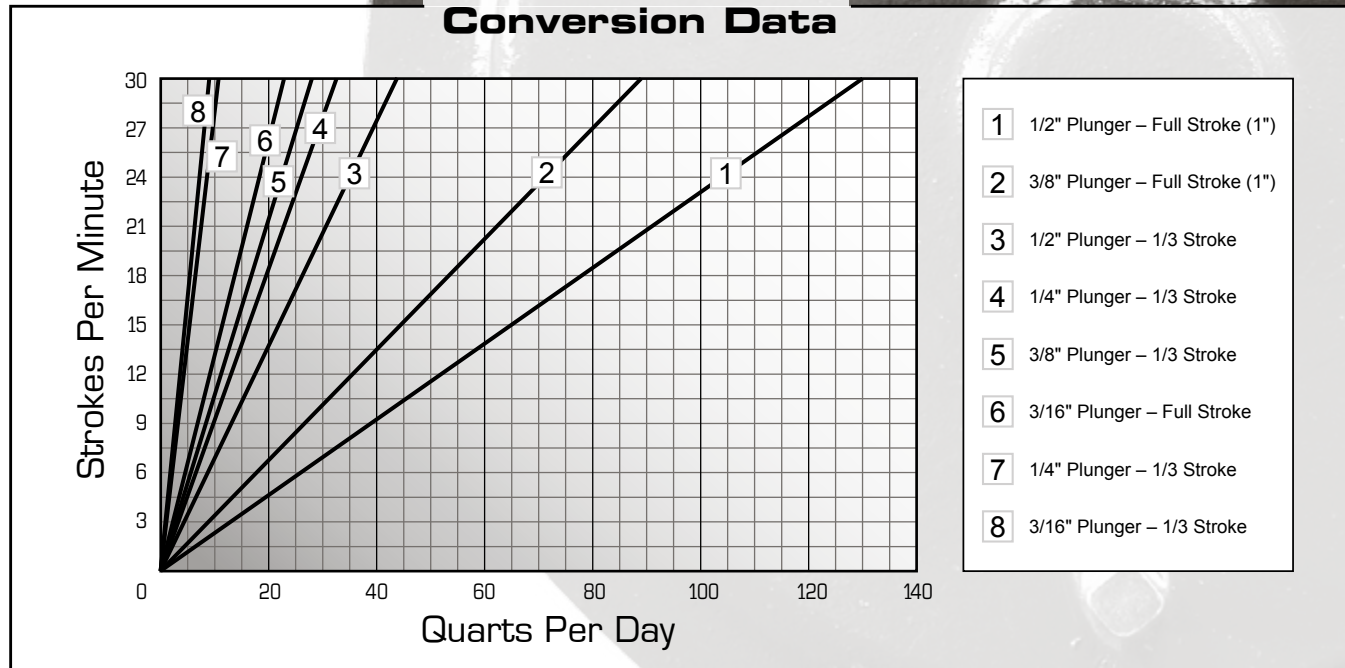
Standard Cubic Feet of Gas Required to Pump One Gallon

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

POWER END TO FLUID END RATIO

Plunger Size	Operating Ratio Gas/Fluid
3/16"	1200/1
1/4"	675/1
3/8"	300/1
1/2"	169/1

Volumetric Conversion Data



Installation

INSTALLATION INSTRUCTIONS

- You should first remove the screws that secure the cover and fill the compartment that has the spring with 1 ½ pints of SAE 10 weight nondetergent oil. Continue to fill the compartment until the oil reaches the bottom of the ASB-444 thrust rod. You should now oil the thrust rod.

DO NOT fill with oil if using the Microvalve.
- Select the stroke length (full or short) required for your application. For assistance, consult the data chart in this manual - full stroke is 1", and short is equal to 1/3". You will now want to inspect the plunger packing gland to ensure that the packing is snug, but not too tight.
- Install the priming valve ASA-1497 on the pump head.
- Blow the power line clean to remove any loose particles before hooking up gas line to inlet.

NOTE: the inlet is a 1/4" female connection.
- Make sure you do not hook up the gas supply to the small valve, which is the gas exhaust. The gas supply to the pump should be at a **CONSTANT** pressure to assure an even stroke speed.

Taking into account erratic pressures, if the gas supply exceeds 35 PSI, you should install a regulator (ASA-1718) to reduce the gas pressure to 35 PSI or below. If the gas pressure exceeds 400 PSI, you should install the Arrow ASB-40 regulator which has a maximum inlet pressure of 6000 PSI.
- Close the gas exhaust valve, which is a 1/4" female pipe connection.
- Connect the fluid suction piping to the bottom bushing, which is a 1/4" female pipe connection, on the pump head.
- Pipe a strainer into the suction line to prevent particles from entering the system.

Particles could damage the plunger, plunger packing or interfere with the check valve operation.
- After connecting the suction line to the pump head, connect the fluid discharge line with a 5/16" copper tubing or equivalent. To connect the fluid discharge line, locate the top connection on the pump head (it is a 1/4" FNPT). Install the ASA-676 1/4" line check valve, which is included with the pump, at the point of injection. The possibility of a ruptured fluid discharge line will be greatly reduced with careful observation of the flow direction.

Operation

OPERATING INSTRUCTIONS

1	STARTING THE PUMP Carefully turn the gas on and slowly open the exhaust valve. This will automatically start the pump.
2	Confirm that the suction line is filled with fluid. Test the pump head by opening the priming valve.
3	Close the priming valve for normal operations after the pump discharges clear fluid without bubbles.
4	At this point, visually check the plunger drip and using the ASA-315 gland wrench that is supplied, slowly tighten the gland to prevent excess leakage. Due to some settling, it may be necessary to readjust the packing in 24 hours. A slight leak during break in is beneficial. You should allow ample time to let the packing "seat in". DO NOT overtighten packing or tighten with pressure on the head.
5	After the pump is in operation, you should replace the lid and screws. It is advisable that you keep the gland wrench handy for future adjustment.

TROUBLESHOOTING

SYMPTOM	CORRECTIVE ACTION
Pump is running, but fails to pump fluid.	1 Inspect bottom bushing (ASB-736) and top bushing (ASA-1496) of head, cleaning the seats and balls of all debris. Replace if damaged, cut, or scored.
	2 Remove cover (ASB-548) and check to see if the plunger pins (ASA-290 and ASA-1828) are in place. If not, replace and install pins.
	3 Check to see if pump is properly primed by unscrewing the priming valve stem (ASA-1497). Purge all air from system. When chemical flows from bleed hole, shut off the priming valve.
Pump fails to operate after gas hook-up to the Inlet Bushing Disc Retainer (ASA-906-R).	1 Make sure inlet pressure does not exceed 35 psi. Excessive pressure can lock up pump.
	2 Check that the speed control valve (gas exhaust) is open.
	3 Make sure the plunger packing is not too tight. Use gland wrench to adjust packing gland nut (ASA-1220).

MAINTENANCE

▶ REPLACING THE DIAPHRAGM

First, remove the ASA-252 diaphragm cover then remove the locknut and washer on the end of the ASB-444 rod.

NOTE: You should not let the ASB-444 thrust rod turn when removing the lock nut and washer. To prevent the rod from turning, you should remove the ASB-548 cover and hold the rod in position by inserting a punch or drift pin into the "large" hole forward of the ASA-1832 Stirrup Assembly. You can now replace the diaphragm and reassemble.

▶ REPLACING THE RETURN SPRING

First, remove the ASA-252 diaphragm cover then remove the lock nut and washer on the end of the ASB-444 rod. **NOTE:** You should not let the ASB-444 thrust rod turn when removing the lock nut and washer. To prevent the rod from turning, you should remove the ASB-548 cover and hold the rod in position by inserting a punch or drift pin into the "large" hole forward of the ASA-1832 Stirrup Assembly. Next, pull the ASC-290 diaphragm and the ASB-438 diaphragm plate. The return spring ASA-1821 can now be removed. You can now reassemble the parts in reverse order.

▶ REMOVING VALVE ASSEMBLY (ASB-446) FROM PUMP HOUSING

First, you should disconnect the ASB-1193 SS tubing, the power inlet line from the ASA-906 disc retainer and the gas exhaust line. Next, remove the four 7A-5/16 18 x 7/8 machine screws and the four 1N-5/16 flat washers. You can now remove the ASB-446 valve assembly from pump body. The flipper arm bearing, which is press fitted into the

ASB-441 body, is an integral part of the ASB-440 flipper arm. You will have to use a punch to remove the flipper arm from the valve body. To do this, you will first have to perform the procedures outlined in "Replacing the ASA-4147 Valve Disc". After you remove these parts, you can punch the ASB-440 flipper arm assembly from the body. Make sure that upon reassembling, the lower shaft of the ASB-440 flipper arm fits into the ASA-1608 flipper spring adapter.

▶ REPLACING THE FLIPPER SPRING

You will first need to remove the valve assembly by following the instructions stated in "Removing ASB-446 Valve Assembly from Pump Housing". After you remove the valve assembly, you can remove the ASB-548 cover. You can now turn the ASA-1832 Stirrup Assembly upside down on the thrust rod and unscrew the ASA-1820 flipper spring. You can now reassemble the parts by reversing the above order.

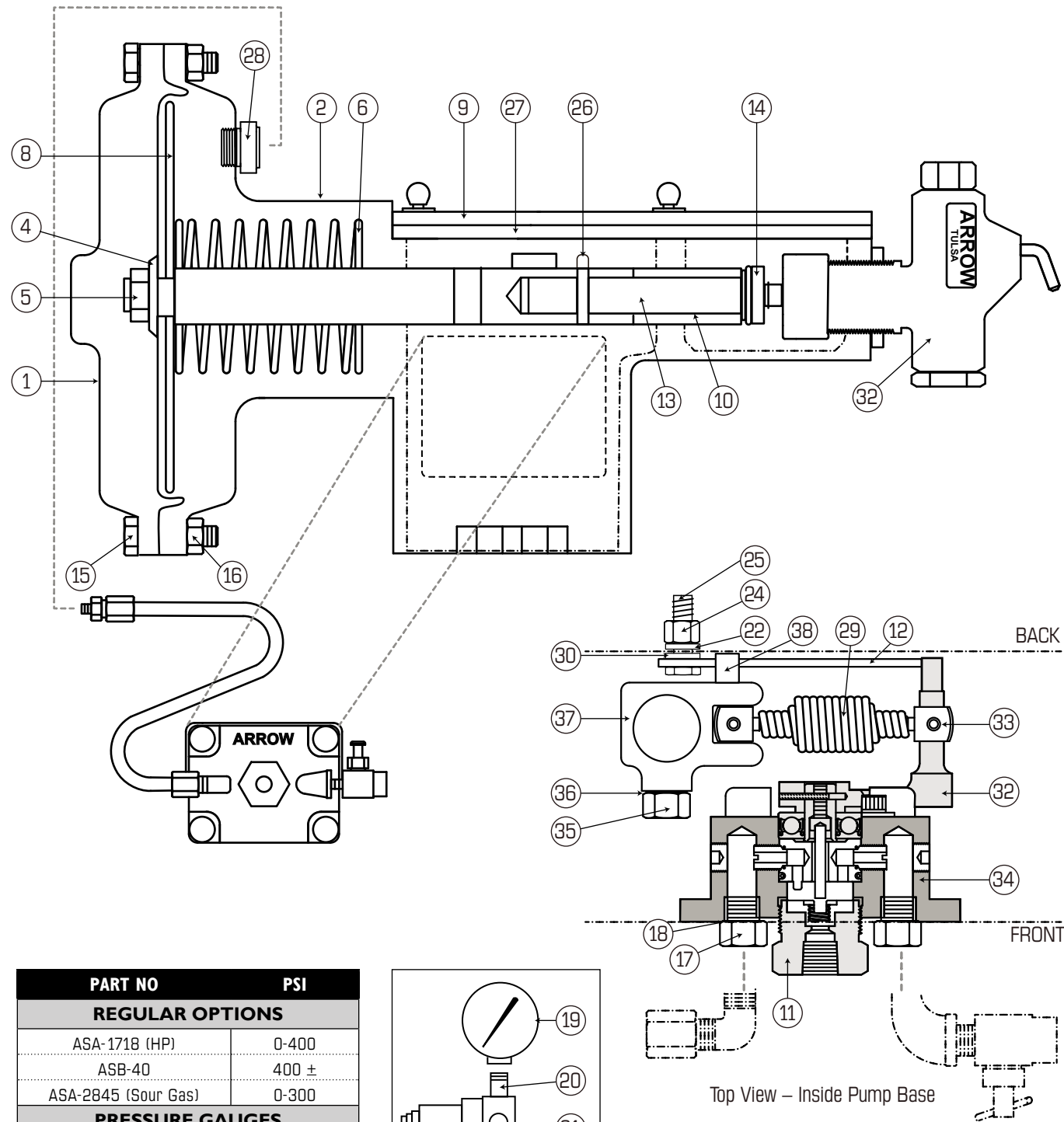
▶ REPLACING THE VALVE DISC (ASA-4147)

If you detect continuous leaking of gas into the lubricating oil, ASA-4147 valve disc needs to be replaced. The ASA-4147 valve disc should be returned to the same position as it was removed, so be sure to note the position when removed. The power supply into the ASA-906 disc retainer should be disconnected. You can now remove the ASA-906 disc retainer from the ASB-441 body.

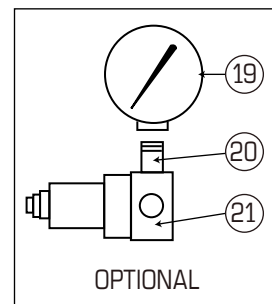
CAUTION: Care should be taken not to lose the ASA-77 valve spring and the ASA-579 washer directly under ASA-906 disc retainer. You should lap the ASA-4147 disc with a good valve grinding compound before replacing. You should replace the drive pin when replacing ASA-4147 valve disc.

Parts

CHEMPUMP 510



PART NO	PSI
REGULAR OPTIONS	
ASA-1718 (HP)	0-400
ASB-40	400 ±
ASA-2845 (Sour Gas)	0-300
PRESSURE GAUGES	
ASA-1854	0-35
ASA-129	35 ±
ASA-2847 (Sour Gas)	0-60

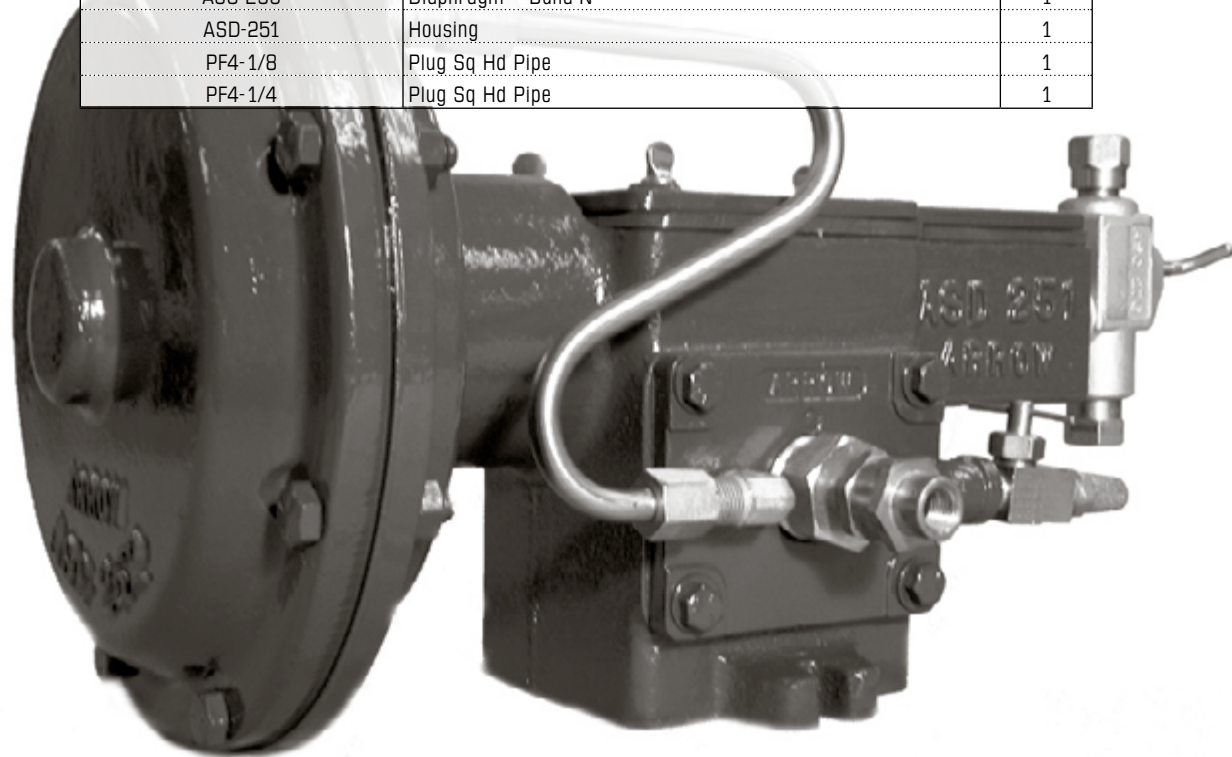


Top View - Inside Pump Base

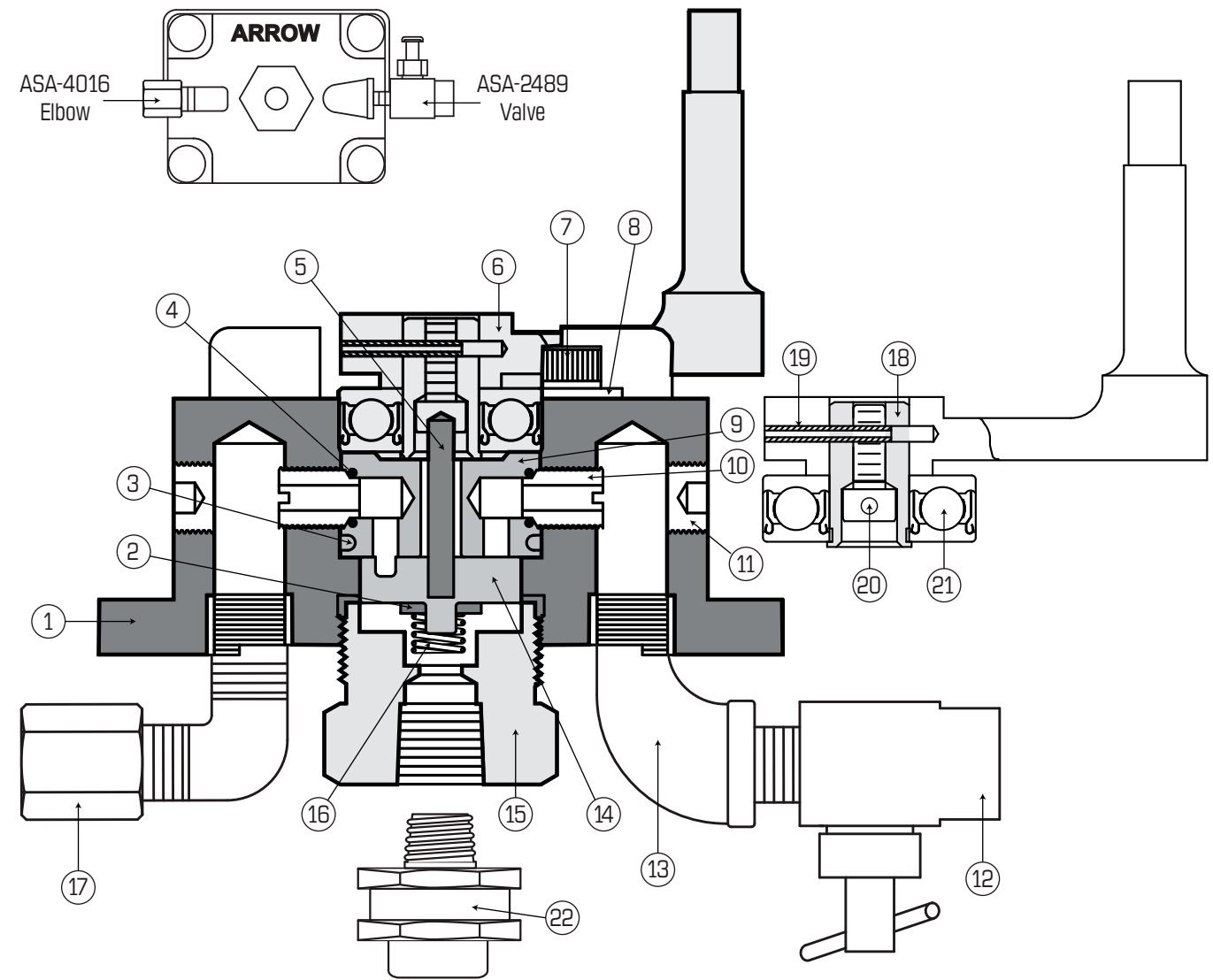
ITEM NO	PART NO	DESCRIPTION	QTY
Item numbers correspond to illustration shown on page 8.			
1	ASC-252	Diaphragm Cover	1
2	ASD-251	Housing	1
3	ASC-290	Diaphragm - Buna-N	1
4	1N-5/8	Plated Lockwasher	1
5	33A-5/818	Jam Nut Finished Hex	1
6	ASA-1821	Spring	1
7	ASA-136	Thumbscrew	4
8	ASB-438	Diaphragm Plate	1
9	ASB-548	Cover	1
10	ASB-444	Rod	1
11	ASB-446-R	Pilot Valve	1
12	ASA-1823	Plate	1
13	ASA-447	Rod Adapter	1
14	ASA-290	Pin	1
15	29A-3/816x112	Capscrew Hex Hd	8
16	29A-3/816	Hex Nut	8
17	7A-5/1618x7/8	Hex Head Capscrew	4
18	1N-5/16	Plated Lockwasher	4
19	ASA-1854	Pressure Gauge 0-35 (optional)	1
	ASA-2847	Pressure Gauge 0-60 - Sour Gas (optional)	1
20	ASA-1718	High Pressure Gauge 510 (optional)	1
21	ASA-3324	Nipple (optional)	1
22	1A-3/8	Plated Lockwasher	1
23	ASA-1293	Inlet Tag	1
24	29A-3/824	Nut Finished Hex	1
25	ASA-1827	Screw	1
26	ASA-1828	Pin	1
27	ASA-1546	Gasket	1
28	ASA-302	Strainer Bushing Assembly	1
29	ASA-1820	Spring	1
30	1N-3/8	Flat Washer SAE	3
31	ASB-440	Flipper Arm Assembly	1
32	ASB-166-0	Head Assembly 1/4" Ductile	1
	ASB-775	Head Assembly 1/4" SS	1
	ASB-203-0	Head Assembly 3/8" Ductile	1
	ASB-756	Head Assembly 3/8" SS	1
	ASB-496-0	Head Assembly 1/2" Ductile	1
	ASB-732	Head Assembly 1/2" SS	1
33	ASA-1608	Spring Adapter	2
34	ASA-58	Valve Gasket	1
35	ASA-1829	Screw	1
36	2C-3/8	Internal Lockwasher	1
37	ASB-471	Stirrup	1
38	41A-3/8x13/4	Roll Pin	1

CHEMPUMP 510 PARTS

PART NO	DESCRIPTION	QTY
1A-3/8	Lockwasher Plated	1
1N-3/8	Washer Flat SAE Plated	3
1N-5/8	Washer Flat SAE Plated	1
1N-5/16	Washer Flat SAE Plated	4
7A-3/816x11/2	Capscrew Hex Hd	8
7A-5/1618x7/8	Capscrew Hex Hd	4
29A-3/816	Nut Hex Finished	8
29A-3/824	Nut Hex Finished	1
33A-5/818	Locknut Nylon Insert	1
ASA-58	Gasket Valve	1
ASA-136	Thumbscrew	4
ASA-302	Bushing Strainer Assembly	1
ASA-1546	Gasket Cover	1
ASA-1608	Spring Adapter Plated	1
ASA-1820	Spring	1
ASA-1821	Spring	1
ASA-1823	Plate	1
ASA-1827	Screw	1
ASA-1828	Pin	1
ASA-1832	Stirrup Assembly	1
ASA-1855	Tag, Warning	1
ASB-438	Diaphragm Plate	1
ASB-444	Rod	1
ASB-446-R	Pilot Valve Assembly	1
ASB-447	Rod Adapter	1
ASB-548	Cover	1
ASB-1193	Line Assembly w/Fittings SS	1
ASC-252	Diaphragm Cover	1
ASC-290	Diaphragm - Buna-N	1
ASD-251	Housing	1
PF4-1/8	Plug Sq Hd Pipe	1
PF4-1/4	Plug Sq Hd Pipe	1



PILOT VALVE



ASB-446-R PILOT VALVE ASSEMBLY

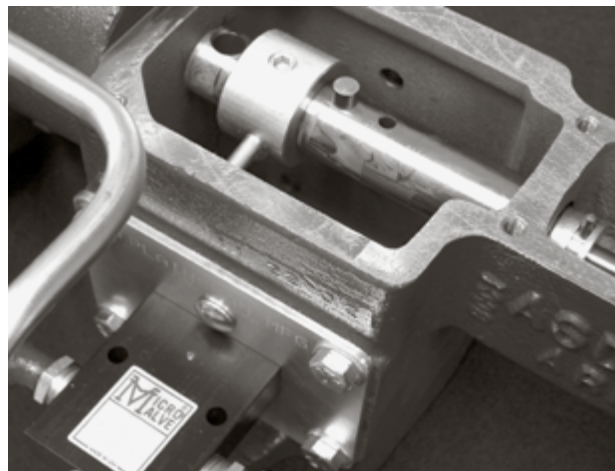
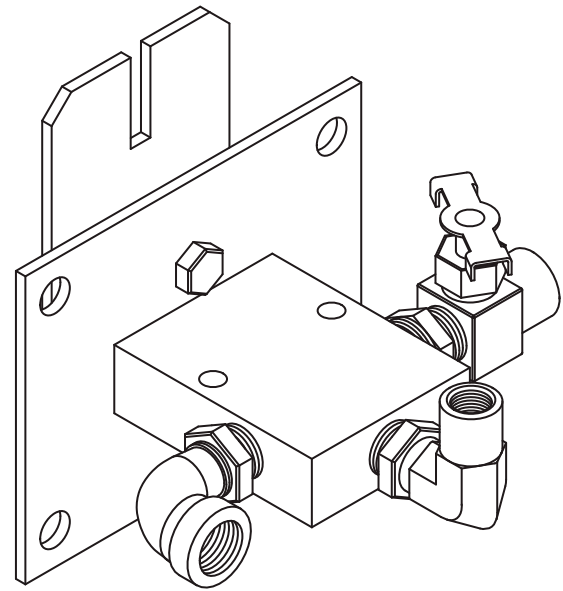
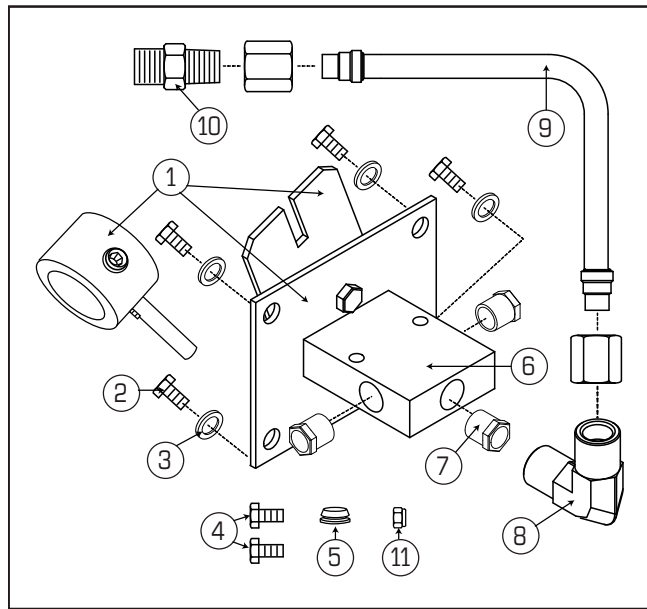
ITEM NO	PART NO	DESCRIPTION	QTY
1	ASB-441-R	Pilot Valve Body	1
2	ASA-579	Washer	1
3	ASA-1018	O-Ring	1
4	ASA-1017	O-Ring	2
5	ASA-816-R	Valve Drive Pin	1
6	ASB-440	Flipper Arm Assembly	1
7	9A-1/420x3/8	Socket Head Cap Screw	1
8	1N-1/4	Washer Flat SAE Plated	2
9	ASB-441-1	Replaceable Seat	1
10	ASB-441-2	Seal Screw	2
11	ASB-516-R	Plug, Lever Type	2
12	ASA-2489	Valve	1

ITEM NO	PART NO	DESCRIPTION	QTY
13	PF5-1/4	90 Deg Street Elbow	1
14	ASA-4147-R	Valve Disc	1
15	ASA-906-R	Disc Retainer for Replaceable Seat	1
16	ASA-77	Spring	1
17	ASA-4016	Elbow	1
18	ASA-815	Flipper Bearing Pin	1
19	41A-3/32x3/4	3/32 x 3/4" Roll Pin	1
20	9A-1032x1/2	Socket Head Cap Screw	1
21	ASA-457	Bearing	1
22	ASA-670	Inlet Filter (SOLD SEPARATELY*)	1

*Inlet Filter (ASA-670) is not included in ASB-446-R Assembly.

MICROVALVE

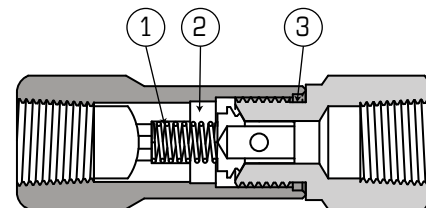
ASB-446-MV - COMPLETE MICROVALVE ASSEMBLY



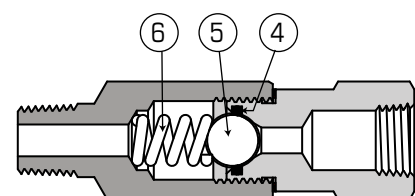
ITEM NO	PART NO	DESCRIPTION	QTY
OPTIONS (order as separate part numbers)			
1	ASB-446-MVSA	Microvalve Sub Assembly	1
2	7A-5/1618x1/2	Capscrew Hex Hd	4
3	1N-5/16	Washer Flat SAE Plated	4
4	7A-1/420x1/2	Capscrew Hex Hd	2
5	ASB-446-MVN	Case Hole Plug	1
6	ASB-446-MVL	Microvalve	1
7	PF9-3/4x1/4	Bushing Pipe Plated	1
8	ASA-4016	Elbow (CAD Plated)	1
9	ASB-446-MVJ	Line, Pump to Microvalve	1
10	ASA-4015	Male Connector	1
11	ASB-446-MVM	Thrust Rod Collar Set Screw	1

LINE CHECKS

ITEM NO	PART NO	DESCRIPTION	QTY
1	ASA-391	Spring	1
2	ASA-5050-BA	O-Ring - Buna-N	1
	ASA-2184	O-Ring - Viton	1
3	ASA-1959	O-Ring - Viton	1
	ASA-4296-BA	O-Ring - Buna	1
4	ASA-2580	O-Ring - Viton	1
	ASA-2597	O-Ring - Buna	1
5	ASA-54	Steel Ball 3/8"	1
6	ASA-391	Spring	1



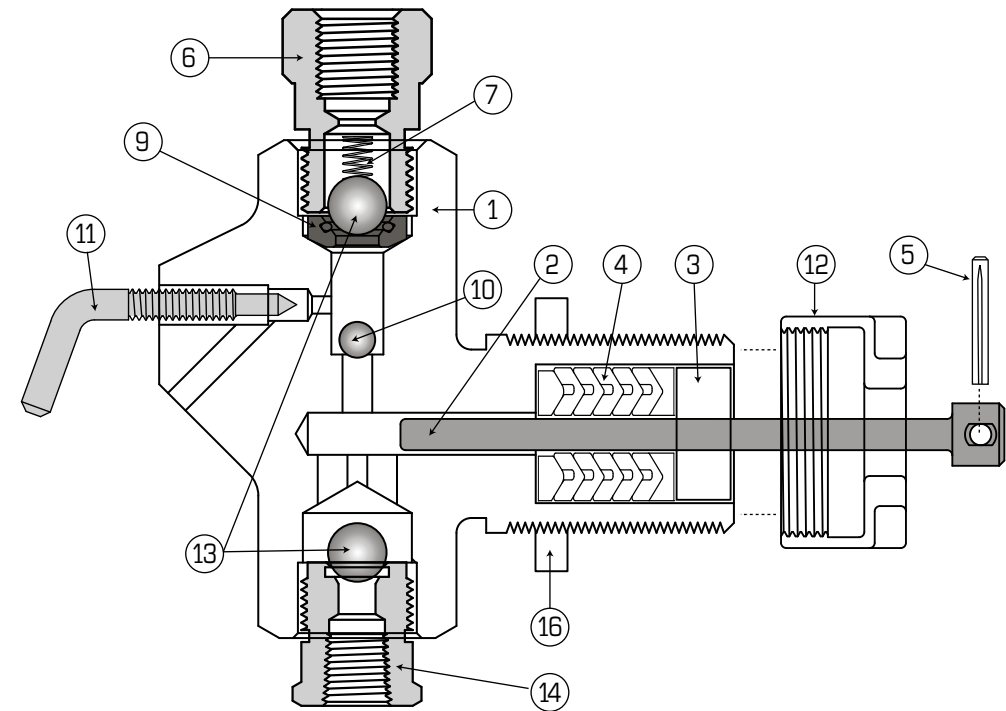
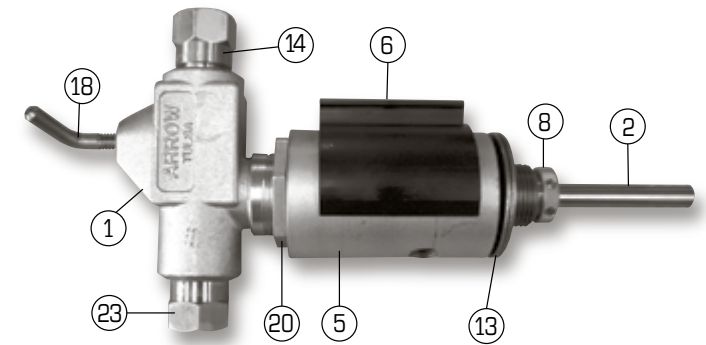
ASB-283 LINE CHECK ASSEMBLY



ASA-675 - 316 SS
ASA-676 - BRASS

PUMP HEAD

ITEM NO	PART NO	DESCRIPTION
1	ASC-2040	Head Body 3/16" SS *
2	ASB-1471	3/16" Plunger *
5	ASB-1173	Yoke
6	ASC-1604	Yoke Cover
8	ASA-4094	Yoke Packing Nut
13	ASA-4256	Washers (2)
14	ASA-1496	Top Bushing Inj Hd
18	ASA-1497	Priming Valve
20	ASA-225	Injection Head Lock
23	ASB-736	Btm Bushing w/O-Ring *



ITEM NO	PART NO	DESCRIPTION	3/16"		1/4"		3/8"		1/2"	
			S	D	S	D	S	D		
	ASB-755	Head Assembly 1/4" SS								
	ASB-166	Head Assembly 1/4" Steel								
	ASB-756	Head Assembly 3/8" SS								
	ASB-203	Head Assembly 3/8" Steel								
	ASB-732	Head Assembly 1/2" SS								
	ASB-496	Head Assembly 1/2" Steel								
1	ASC-2040	Head Body 3/16" SS	X							
	ASC-275	Head Body 1/4" Steel				X				
	ASC-291	Head Body 1/4" SS			X					
	ASC-276	Head Body 3/8" Steel					X			
	ASC-425	Head Body 3/8" SS					X			
	ASC-272	Head Body 1/2" Steel							X	
	ASB-349	Head Body 1/2" SS							X	

CONTINUED ON NEXT PAGE

Ordering

HOW TO ORDER

To order, call Arrow Engine at 1-800-331-3662. When ordering pump, give description as follows:

- BASE PUMP:** Start with base pump model number - 510.

BASE PUMP	MODEL NUMBER
510 Series	510

- PLUNGER SIZE:** Add plunger size number.

PLUNGER SIZE	NUMBER
3/16"	1.5
1/4"	2
3/8"	3
1/2"	4

- HEAD MATERIAL:** Add head material letter.

MATERIAL	LETTER
316 Stainless Steel	S
Carbon Steel	D

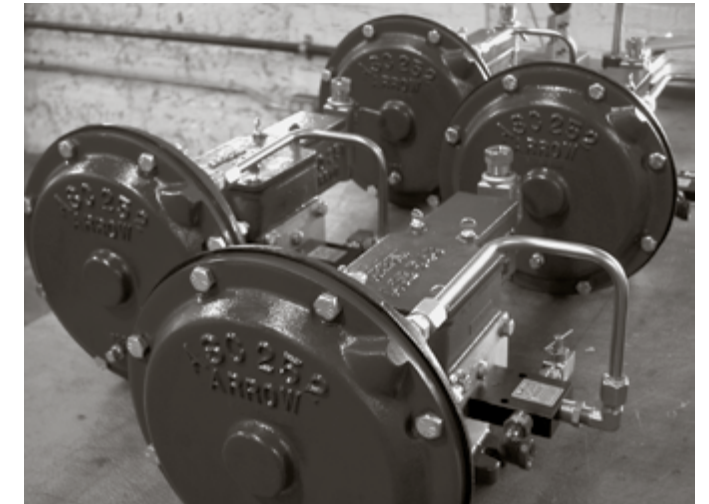
EXAMPLE: Example part number for series 510 gas pump with 3/8" plunger, stainless steel head:

510-3S

Indicates **BASE PUMP** model number and number of fluid ends.

Indicates **PLUNGER SIZE**.

Indicates **HEAD MATERIAL**.



ITEM NO	PART NO	DESCRIPTION	3/16"		1/4"		3/8"		1/2"	
			S	D	S	D	S	D	S	D
2	ASA-5643	Plunger 3/16"	X							
	ASA-1312	Plunger 1/4"		X	X					
	ASA-1745	Plunger 3/8"				X	X			
	ASA-1876	Plunger 1/2"						X	X	
3	ASA-5642	Packing Gland 3/16"	X							
	ASA-1463	Packing Gland 1/4"		X	X					
	ASA-957	Packing Gland 3/8"				X	X			
	ASA-1219	Packing Gland 1/2"						X	X	
4	ASA-3969	Plunger Packing – Buna-N 3/16"	X							
	ASA-1461	Plunger Packing – Buna-N 1/4"		X	X					
	ASA-1456	Plunger Packing – Buna-N 3/8"				X	X			
	ASA-959	Plunger Packing – Buna-N 1/2"						X	X	
4	ASA-3948	Plunger Packing – Hard 3/16"	X							
	ASA-2295	Plunger Packing – Hard 1/4"		X	X					
	ASA-1875	Plunger Packing – Hard 3/8"				X	X			
	ASA-1874	Plunger Packing – Hard 1/2"						X	X	
4	ASA-3967	Plunger Packing – Viton 3/16"	X							
	ASA-4102	Plunger Packing – Viton 1/4"		X	X					
	ASA-4101	Plunger Packing – Viton 3/8"				X	X			
	ASA-4103	Plunger Packing – Viton 1/2"						X	X	
4	ASA-3966	Plunger Packing – Teflon 3/16"	X							
	ASA-1642	Plunger Packing – Teflon 1/4"		X	X					
	ASA-1234	Plunger Packing – Teflon 3/8"				X	X			
	ASA-1012	Plunger Packing – Teflon 1/2"						X	X	
5	ASA-290	Grooved Pin	X	X	X	X	X	X	X	
6	ASA-1496	Top Bushing Injector Head		X	X	X	X	X	X	
7	ASA-77	Spring		X	X	X	X	X	X	
8	ASA-54	SS Ball 3/8"	X	X	X	X	X	X	X	
9	ASB-737	Seat w/Viton O-Ring	X	X	X	X	X	X	X	
	ASB-737-0	Seat w/Buna O-Ring	X	X	X	X	X	X	X	
	ASA-806	Top Seat Assembly – Metal-to-metal		X	X	X	X	X	X	
10	ASA-126	SS Ball 1/4"		X	X	X	X	X	X	
11	ASA-5462	Priming Valve	X							
	ASA-1497	Priming Valve		X	X	X	X	X	X	
12	ASA-1220	Packing Gland Nut	X	X	X	X	X	X	X	
13	ASA-54	SS Ball 3/8"	X	X	X	X	X	X	X	
	ASA-53	SS Ball 1/2" – Metal-to-metal		X	X	X	X	X	X	
14	ASB-1216	Bottom Seat – Buna-N 3/16"	X							
	ASB-736	Bottom Seat – Viton		X	X	X	X	X	X	
	ASB-736-0	Bottom Seat – Buna-N		X	X	X	X	X	X	
	ASA-771	Bottom Seat – Metal-to-metal		X	X	X	X	X	X	
15	ASA-4394	Gasket	X							
16	ASA-225	Injector Head Lock	X	X	X	X	X	X	X	

Accessories

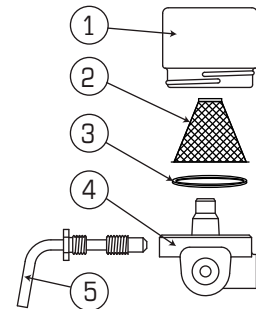
OPTIONAL EQUIPMENT

Optional equipment is available as shown in the chart below. Optional parts should be ordered as separate part numbers.

PART NO.	DESCRIPTION
TFE-510-OP	Teflon Packing
MMS-510-OP	Metal-to-Metal Seats
RG-510-OP	Regulator & Gauge
TBG-510-OP	Tank, Base, Lines, & Gauge
SG-510-OP	Sour Gas Reg & Gauge
VTP-3/16-OP	3/16" Viton Packing Option
VTP-1/4-OP	1/4" Viton Packing Option
VTP-3/8-OP	3/8" Viton Packing Option
VTP-1/2-OP	1/2" Viton Packing Option

SITE FEED

ITEM NO	PART NO	DESC	QTY
1	ASA-98	Bowl	1
2	ASA-206	Strainer	1
3	ASA-104	Gasket	1
4	ASA-39	Body	1
5	ASA-101	Shutoff	1



ASB-38 OPTIONAL SITE FEED ASSEMBLY

INJECTOR HEAD

FEATURES

- ▶ The standard injector heads have steel bodies with stainless steel trim. A 316 stainless steel head assembly is available as an option.
- ▶ Teflon packing and metal-to-metal seats are available as alternatives to standard injector head parts at no additional cost when specified on new pumps.
- ▶ Buna-N O-Ring type resilient check seats are standard on all heads.

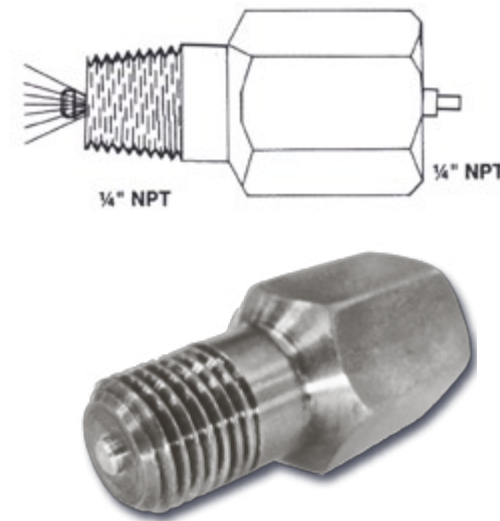
ITEM	PART NO	DESCRIPTION	3/16"		1/4"		3/8"		1/2"		QUANTITY
			D	S	D	S	D	S	D	S	
2	ASA-5643	Plunger 3/16"	X								1
	ASA-1312	Plunger 1/4"		X	X						1
	ASA-1745	Plunger 3/8"				X	X				1
	ASA-1876*	Plunger 1/2"						X	X		1
3	ASA-5642	Packing Gland 3/16"	X								1
	ASA-1463	Packing Gland 1/4"		X	X						1
	ASA-957	Packing Gland 3/8"				X	X				1
	ASA-1219	Packing Gland 1/2"						X	X		1
4	ASA-3969	Plunger Packing Buna N 3/16"	X								1
	ASA-1461	Plunger Packing Buna N 1/4"		X	X						1
	ASA-1456	Plunger Packing Buna N 3/8"				X	X				1
	ASA-959	Plunger Packing Buna N 1/2"						X	X		1
	ASA-3948	Plunger Packing Hard 3/16"	X								1
	ASA-2295	Plunger Packing Hard 1/4"		X	X						1
	ASA-1875	Plunger Packing Hard 3/8"				X	X				1
	ASA-1874	Plunger Packing Hard 1/2"						X	X		1
	ASA-3967	Plunger Packing Viton 3/16"	X								1
	ASA-4102	Plunger Packing Viton 1/4"		X	X						1
	ASA-4101	Plunger Packing Viton 3/8"				X	X				1
	ASA-4103	Plunger Packing Viton 1/2"						X	X		1

AM-0001 ATOMIZER

FEATURES

- ▶ Makes chemical more effective by breaking it up at point of injection
- ▶ Accelerates the mixing of liquids or promotes atomization of liquid into gas
- ▶ Use for line check or as a backup for line check
- ▶ All stainless steel construction

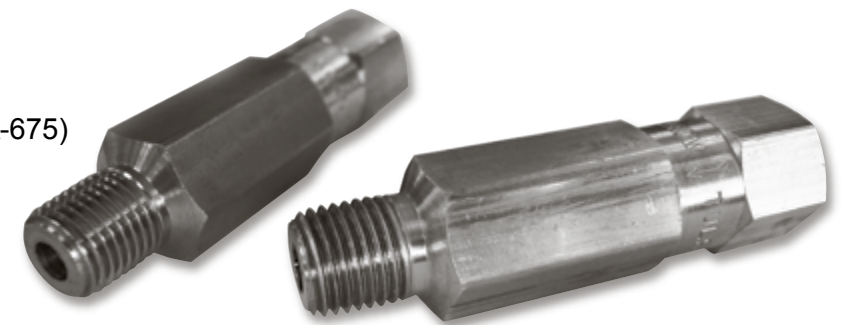
Team up the AM-0001 Atomizer with an Arrow Chemical Pump for the best possible combination.



LINE CHECKS

FEATURES

- ▶ Available in 1/4" brass (ASA-676) 3000 psi max working pressure
- ▶ Available in 1/4" stainless steel (ASA-675) 6000 psi max working pressure
- ▶ Available in 1/2" stainless steel (ASB-283) 6000 psi max working pressure



A line check should be installed in the discharge line as close to the point of injection as possible to prevent backup and contamination of chemical.

TANK PLUGS

- ▶ Patch and/or permanently repair holes in storage tanks
- ▶ Fills a puncture or opening with a permanent and durable seal

PART NO.	DESCRIPTION
1/4-TP	1/4" Tank Plug
3/8-TP	3/8" Tank Plug
1/2-TP	1/2" Tank Plug



TANK PATCHES

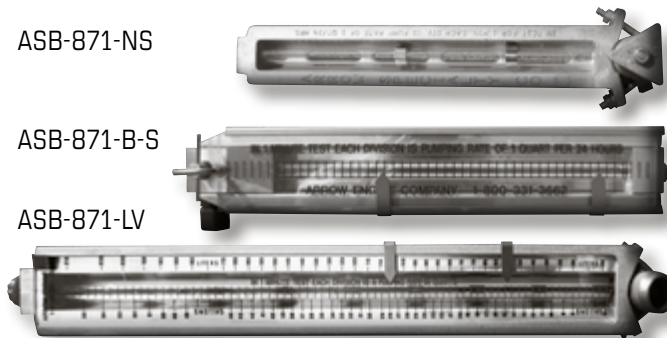
- ▶ Special heat treated, shear proof, solid hinge pin
- ▶ Wetted parts, heavy duty cadmium plated
- ▶ Thick 1/8" neoprene gaskets
- ▶ Installation is easy with only a screwdriver & wrench
- ▶ Patches a 3/4" to 2" hole



PART NO.	DESCRIPTION
ASST-TP	(6) 1/4", (6) 3/8", & (2) 1/2" Tank Plugs
AS-316	Tank Patch w/Lever Operation
AS-317	Vertical Application Toggle-Type Patch

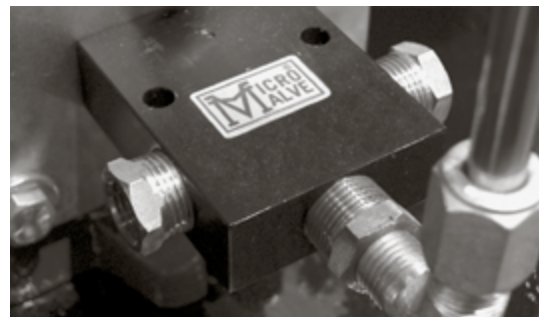
GAUGES

PART NO.	DESCRIPTION
ASB-871-NS	Tank gauge for a 5-gal tank (new style)
ASB-871-B-S	Tank gauge for a 5-gallon tank
ASB-871-LV	Barrel gauge for a 55-gallon barrel



MICRO VALVE

- ▶ Trouble free Microvalve replaces ASA-4147 lapped disk
- ▶ Operates slowly one stroke every two minutes to twenty strokes per minute.
- ▶ Kit available to convert existing pumps part number ASB-446-MV
- ▶ Complete pump with Microvalve



Replace the Pilot Valve Assembly in your 5100Series TXT or Older 510 Arrow Pump with the new Microvalve Assembly

CHEMICAL PUMP AND CHEMICAL PUMP PARTS WARRANTY

I. TERMS OF EXPRESS LIMITED WARRANTY

Arrow Engine Company warrants that it will repair or replace, at its election and expense, a chemical pump or chemical pump part (hereinafter referred to as "Products") manufactured by Arrow Engine Company, which proves to have had a defect in material or workmanship. All warranty work must be pre-approved by Arrow Engine Company.

II. TERM LIMITATIONS OF EXPRESS LIMITED WARRANTY

This coverage shall commence upon shipment of Product and shall expire 1 year after ship date.

III. ARROW ENGINE COMPANY'S RESPONSIBILITIES UNDER THE EXPRESS LIMITED WARRANTY

Arrow Engine Company shall be responsible for:

- The repair or replacement, at Arrow Engine Company's election, of covered product and all reasonable labor required regarding a warranted failure during the express limited warranty and term. All such labor shall be provided by Arrow Engine Company's authorized contractor or distributor.
- Reasonable and necessary travel (total mileage not to exceed 300 miles) and expenses incurred by Arrow Engine Company's authorized contractors or distributor. Additional mileage and/or travel by air, water or land will need preauthorization from Arrow Engine Company.
- Replacement of lubricating oil, coolant, filter elements, or other normal maintenance items that are contaminated and/or damaged as a direct result of a warranted failure.

NOTWITHSTANDING THE FOREGOING, ARROW ENGINE COMPANY SHALL NOT BE RESPONSIBLE FOR LABOR COSTS ASSOCIATED WITH WARRANTY CLAIMS.

IV. OWNER/ DISTRIBUTOR/ CONTRACTOR'S RESPONSIBILITIES UNDER THE EXPRESS LIMITED WARRANTY

Owner shall be responsible for:

- The operation and maintenance of the Product within the guidelines established by Arrow Engine Company.
- Making the Product available to Arrow Engine Company or authorized contractors or distributors for any warranty repair, during normal business hours.
- All additional costs incurred for premium or overtime labor, should owner request that repairs be made on a premium overtime schedule.
- All costs incurred as the result of removal or reinstallation of the Product as may be required to effect any warranted repair.
- All administrative costs and expenses resulting from a warranted failure.
- Any costs of transportation, towing, repair facilities, or associated costs.
- Loss of revenue and loss of/or damage to real and/or personal property.
- All warranty work must be pre-approved by Arrow Engine Company
- Warranted repairs not to exceed 50% of the product replacement cost without prior approval from Arrow Engine Company. Replacement cost equates to distributor net price from factory.

V. LIMITATION OF ARROW ENGINE COMPANY'S OBLIGATIONS

The obligations of Arrow Engine Company under this express limited warranty shall be waived and voided, and Arrow Engine Company shall not, thereafter, be responsible for:

- Any failure resulting from owner or operator abuse or neglect, including but not by way of limitation, any operation, installation, application, or maintenance practice not in accordance with guidelines or specifications established by Arrow Engine Company; or
- Any failure resulting from unauthorized modifications or repairs of the Products or;
- Any failure resulting from overload, overspeed, overheat, accident, improper storage; or
- Failure of owner, contractor or distributor to promptly provide notice of a claimed defect. All warranty claims must be authorized, documented and submitted within 30 days of the failure date while under the warranty period; or
- Failure of Products for which Arrow Engine Company did not receive properly completed start-up reports; or
- Repairs of a covered failure performed with non-genuine Arrow Engine Company parts; or
- Repairs of a covered failure performed by non-authorized contractors or distributors; or
- Failure to make Products available to Arrow Engine Company or its authorized representatives, or
- Failure to supply documents such as drawing and specifications relating to the specific application of the Products.

VI. APPLICABILITY AND EXPIRATION

The warranties set out above are extended to all owners in the original chain of distribution. The warranties and obligations of Arrow Engine Company shall expire and be of no further effect upon the dates of expiration of the applicable warranty periods. The foregoing sets forth Arrow Engine Company's only obligations and owners' exclusive remedy for breach of warranty, whether such claims are based on breach of contract, tort (including negligence and strict liability), or other theories, and the foregoing is expressly in lieu of other warranties whatsoever expressed, implied, and statutory, including without limitation, the IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS.

Notwithstanding the preceding, in no event shall Arrow Engine Company be liable for any direct, special, incidental or consequential damages (whether denominated in contract, tort, strict liability, negligence or other theories) arising out of this Agreement or the use of any Products provided under this Agreement. Any action arising hereunder or relating hereto, whether based on breach of contract, tort (including negligence and strict liability), or other theories must be commenced within one (1) year after the cause of action accrues or it shall be barred.

With respect to products not manufactured by Arrow Engine Company, Arrow makes no representations or warranties of whatsoever nature, directly or indirectly, expressed or implied including but not limited to any representations or warranties with respect to suitability, durability, fitness for a particular purpose or merchantability, except to the extent that Arrow can enforce warranties provided by the manufacturers of such parts.

Effective 5/17/06 and supersedes all previously issued warranty.

ARROW MANUFACTURED
**REPLACEMENT
PARTS**

Caterpillar® Engines

G379	G3304
G398	G3306
	G399

Waukesha® Engines

F2895	P9390
F3521	145G/F817
F5108	140G/F554
L5790	WAK/1197
	L7042

Fairbanks Morse® Engines

ZC-118	ZC-503
ZC-208	ZC-739
	ZC-346

Ajax® Engines

5 x 6½
EA-22, 6½ x 8 CMA
EA-30, 7¼ x 8 CMA
E-30, 7½ x 10 CMA
E-42, 8½ x 10 CMA
DP-60, 9½ x 10 CMA
DP-70/80/160, 11 x 14 CMA
DP-115/230, 13¼ x 16

Piston & Rod Assemblies
180
360
600
800

Waukesha®, VHP®, and VGF® are registered trademarks of Dresser Industries, Inc., Caterpillar®, is a registered trademark of Caterpillar, Inc., Fairbanks Morse® is a registered trademark of Coltec Industries, Inc., and Ajax® is a registered trademark of Cameron International Corporation.

OEM

C-Series

*C-46	*C-96
*C-66	*C-101
*C-106	*C-255

VR-Series

VR-155	VR-310
VR-220	*VR-330
VR-232	*VR-330CF
*VR-260	VR-265
VR-283	*VR-380

A-Series

*A42	*A54	*A62
------	------	------

K6 Slow Speed Engine

*

Lufkin Engines

L-333	L-1770
*L-795	L-2165

Witte Engines

98	E15	F32
B12	E20	F42

Arrow Chemical Pumps

- * 10 Series (beam operated)
- * 12 & 13 Series (pneumatic)
- * 430 Series (electric)
- * 500 & 510 Series (pneumatic)
- * Solar Chempump

Gas Compressors

* *VRC-2 *VRC-CNG

Gas Products

- * Volume Tanks
- * Vertical & Horizontal Separators
- * Suction Scrubbers
- * Meter Runs
- * Coalescers
- * Skids



ARROW ENGINE COMPANY

2301 East Independence
Tulsa, Oklahoma 74110

toll free 800 331-3662

local 918 583-5711

toll free fax in US & Canada 800 266-1481

fax 918 388-3202

www.arrowengine.com

copyright Arrow Engine

* Products currently manufactured by Arrow Engine Company & owned as OEM