

Material Codes - The Last 3 Digits of Part Number

Code	Description	Code	Description	Code	Description
000	Assembly, sub-assembly	333	Carbon Steel, Electroless, Nickel Plated	544	Nylon Injection Molded
010	Cast Iron	335	Galvanized Steel	550	Polyethylene
015	Ductile Iron	337	Silver Plated Steel	551	Glass Filled Polypropylene
020	Ferritic Malleable Iron	350	FDA Approved Hytrel®	552	Unfilled Polypropylene
080	Carbon Steel, AISI B-1112	351	Food Grade Santoprene®	553	Yellow Glass Filled Polypropylene
110	316 Stainless Steel – ASTM A743 CF8M	353	Geolast	555	Polyvinyl Chloride
111	316 Stainless Steel - Electro Polished	354	#203-40 Santoprene®	556	Black Vinyl
112	Alloy C – ASTM494 CW-12M01 spec.	356	Hytrel®	557	Unfilled Conductive Polypropylene
113	316 Stainless Steel - Hand Polished	357	Injection Molded Polyurethane	558	Conductive HDPE
114	303 Stainless Steel	358	Urethane Rubber Compression Mold	559	Glass Filled Conductive Polypropylene
115	302/304 Stainless Steel	359	Urethane Rubber	570	Rulon II®
117	440-C Stainless Steel (Martensitic)	360	Nitrile Rubber Color coded: RED	580	Ryton®
120	416 Stainless Steel - Wrought Martensitic	363	FKM Fluorocarbon Color coded: YELLOW	600	PTFE (virgin material)
148	Hardcoat Anodized Aluminum	364	EPDM Rubber, Color coded: BLUE	603	Blue Gylon®
150	6061-T6 Aluminum	365	Neoprene Rubber, Color coded: GREEN	604	PTFE
152	2024-T4 Aluminum (2023-T351)	366	Food Grade Nitrile	606	PTFE
155	356-T6 Aluminum	368	Food Grade EPDM	607	Envelon
156	356-T6 Aluminum	371	Philtane (Tuftane)	608	Conductive PTFE
157	Die Cast Aluminum Alloy #380	374	Carboxylated Nitrile	610	PTFE Encapsulated Silicon
158	Aluminum Alloy SR-319	375	Fluorinated Nitrile	611	PTFE Encapsulated FKM
162	Brass, Yellow, Screw Machine Stock	378	High Density Polypropylene	632	Neoprene/Hytrel®
165	Cast Bronze, 85-5-5-5	379	Conductive Nitrile	633	FKM/PTFE
166	Bronze, SAE 660	408	Cork and Neoprene	634	EPDM/PTFE
170	Bronze, Bearing Type, Oil Impregnated	425	Compressed Fibre	635	Neoprene/PTFE
180	Copper Alloy	426	Blue Gard	637	PTFE, FKM/PTFE
305	Carbon Steel, Black Epoxy Coated	440	Vegetable Fibre	638	PTFE, Hytrel®/PTFE
306	Carbon Steel, Black PTFE Coated	500	Delrin® 500	639	Nitrile/TFE
307	Aluminum, Black Epoxy Coated	502	Conductive Acetal	643	Santoprene®/EPDM
308	Stainless Steel, Black PTFE Coated	503	Conductive Acetal, Glass-Filled	644	Santoprene®/PTFE
309	Aluminum, Black PTFE Coated	506	Delrin® 150	661	EPDM/Santoprene®
313	Aluminum, White Epoxy Coated	520	Injection Molded PVDF	668	PTFE, FDA Santoprene® / PTFE
330	Zinc Plated Steel	540	Nylon	661	EPDM/Santoprene®
332	Aluminum, Electroless Nickel Plated	541	Glass Filled Nylon	668	PTFE, FDA Santoprene® / PTFE

RECYCLING

Warren Rupp, manufacturer of Versamatic, is an ISO14001 registered company and is committed to minimizing the impact our products have on the environment. Many components of Versamatic® AODD pumps are made of recyclable materials. We encourage pump users to recycle worn out parts and pumps whenever possible, after any hazardous pumped fluids are thoroughly flushed. Pump users that recycle will gain the satisfaction to know that their discarded part(s) or pump will not end up in a landfill. The recyclability of Versamatic products is a vital part of Warren Rupp's commitment to environmental stewardship.

- Delrin and Hytrel are registered tradenames of E.I. DuPont
- Nylatron is a registered tradename of Polymer Corp.
- Gylon is a registered tradename of Garlock, Inc.
- Santoprene is a registered tradename of Exxon Mobil Corp.
- Rulon II is a registered tradename of Dixon Industries Corp.

Center Section Assembly

Tools Required

- Lineman or standard pliers (air valve repair)
- Torque wrench
- 1/2" Socket
- Ratchet
- 7/32" Hex bit socket
- Phillips screwdriver

Torque Values

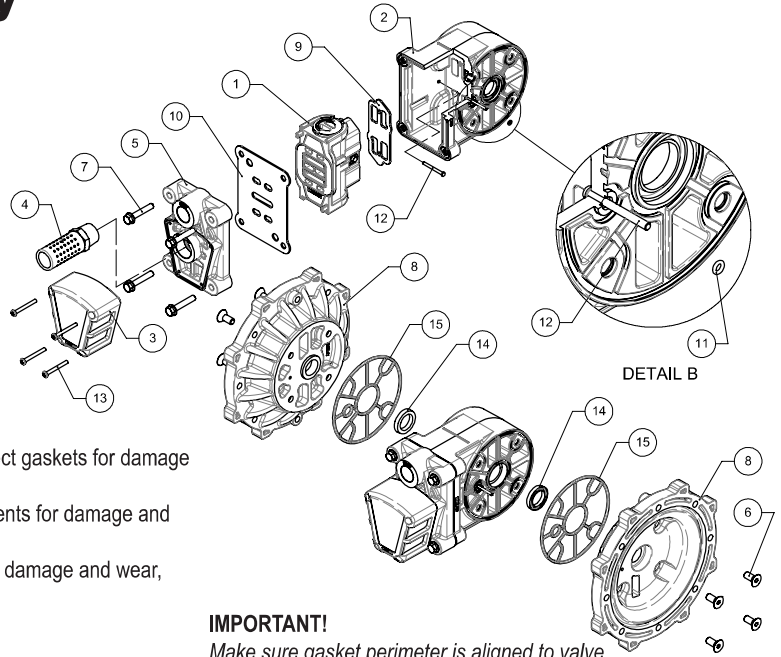
- Capscrews (#6).....150 in-lb
- Capscrews (#7).....150 in-lb

Center Section Assembly Servicing

- Step 1.** Remove capscrews (6) to remove inner chambers (8).
Step 2. Remove air inlet cap (5) by removing 4 capscrews (7).
Step 3. Remove gasket (10), air valve assembly (1) and gasket (9); inspect gaskets for damage and wear, replace if necessary. See next page for air valve service.
Step 4. Remove actuator pins (12) and o-rings (11) inspect both components for damage and wear, replace if necessary.
Step 5. Remove seals (15) and u-cups (14), inspect both components for damage and wear, replace if necessary.

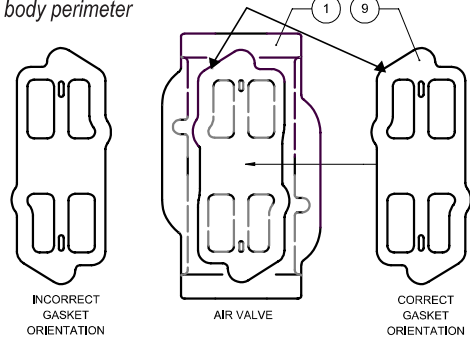
Reinstallation

- Step 6.** Install u-cups (14) and seals (15) into intermediate (2), open end of u-cup seal (14) will face outward towards inner chamber (6)
Step 7. Install actuator pins (12) and o-rings (11) into intermediate, o-rings (11) will hold actuator pins (12) in place and help to align inner chambers (8) during assembly.
Step 8. Install inner chambers (8) using actuator pins (12) to help align. Fasten to intermediate (2) using capscrew bolts (6), torque to value given above.
Step 9. Place gasket (9) onto valve body (1) tabs.
CAUTION: Ensure gasket is properly aligned to valve body (1), tabs on valve body will hold gasket in place for assembly (see figure to right).
Step 10. With gasket (9) on the valve body (1), slide the valve body into the intermediate (2). Align gasket (10) with tabs on air valve body (1), install air inlet cap (5) with capscrews (7), torque to value given above



IMPORTANT!

Make sure gasket perimeter is aligned to valve body perimeter

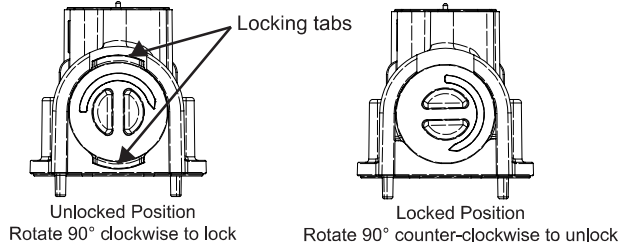


ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL	NOMENCLATURE (See Page 5)	
					P6	P13
1	031.219.000	Main Air Valve Assembly	1	Glass Filled Polypropylene	P	
1	031.219.001	Main Air Valve Assembly - ATEX	1	Conductive Polypropylene	C	
2	114.039.551	Intermediate	1	Glass Filled Polypropylene	P	
2	114.039.559	Intermediate - ATEX	1	Conductive Polypropylene	C	
3	165.169.551	Muffler Assembly	1	Glass Filled Polypropylene	P	0
3	165.169.559	Muffler Assembly - ATEX	1	Conductive Polypropylene	C	1
4	530.033.000	Muffler	1	Zinc Plated Carbon Steel		6
5	165.163.551	Air Inlet Cap	1	Glass Filled Polypropylene	P	
5	165.163.559	Air Inlet Cap - ATEX	1	Conductive Polypropylene	C	
6	171.015.115	Capscrew, Flate Head, 3/8-16 x .88	8	Stainless Steel	Common	
7	171.068.115	Capscrew, Flanged Hex Hd, 5/16-18 x 1.75	4	Stainless Steel	Common	
8	196.224.551	Inner Chamber	2	Glass Filled Polypropylene	P	
8	196.224.559	Inner Chamber - ATEX	2	Conductive Polypropylene	C	
9	360.130.379	Air Valve Body Seal	1	Conductive Nitrile	Common	
10	360.131.379	Air Inlet Cap Seal	1	Conductive Nitrile	Common	
11	560.001.360	O-Ring	2	Nitrile	Common	
12	620.026.114	Actuator Pins	2	Stainless Steel	Common	
13	710.015.115	Screw, Self Tapping, 10-14 x 1.75	4	Stainless Steel	Common	
14	720.004.360	U-Cup Seal	2	Nitrile	Common	
15	720.080.360	Intermediate Seal	2	Nitrile	Common	
14	720.004.360	Seal, U-Cup	2	Nitrile	Common	
15	720.080.360	Seal, Intermediate	2	Nitrile	Common	

Air / Pilot Valve Assembly

Main Air Sleeve and Spool Set

Step 1. Remove end caps (1-D). Use lineman pliers and rotate end caps 90° counter-clockwise to unlock (disengage locking tabs, see figure below). Then pull the end caps straight out of bore. Channel lock or needle nose pliers are not recommended.



Step 2. Remove spool (1-A) from sleeve (1-C) – use caution, do not scratch spool or sleeve. Inspect O-rings and glide rings (1-AA) for damage or wear, replace if necessary.

Step 3. Remove sleeve (1-C) from valve body (1-B).

Step 4. Inspect o-rings (1-E) for damage or wear, replace if necessary.

Reinstallation

Step 5. Install o-rings (1-E) onto sleeve (1-C), lightly lubricate o-rings (1-E).

Step 6. Press sleeve (1-C) into valve body (1-B).

Step 7. Install glide ring assemblies (1-AA) onto spool (1-A); install o-ring first, then glide ring over the o-ring.

Step 8. Carefully slide spool (1-A) back into the sleeve (1-C).

Step 9. Reinstall end caps (1-D). Align end caps (1-D) to the unlocked position, make sure locking tabs clear valve body (1-B) features (see figure above). Push end caps (1-D) into valve body (1-B), locking tabs should be sitting flat on valve body (1-B) surface. Using pliers, rotate end caps (1-D) clockwise 90° to engage locking tabs on end caps (1-D, see figure above).

Pilot Sleeve and Spool Set

Step 1. Remove retaining ring (1-H).

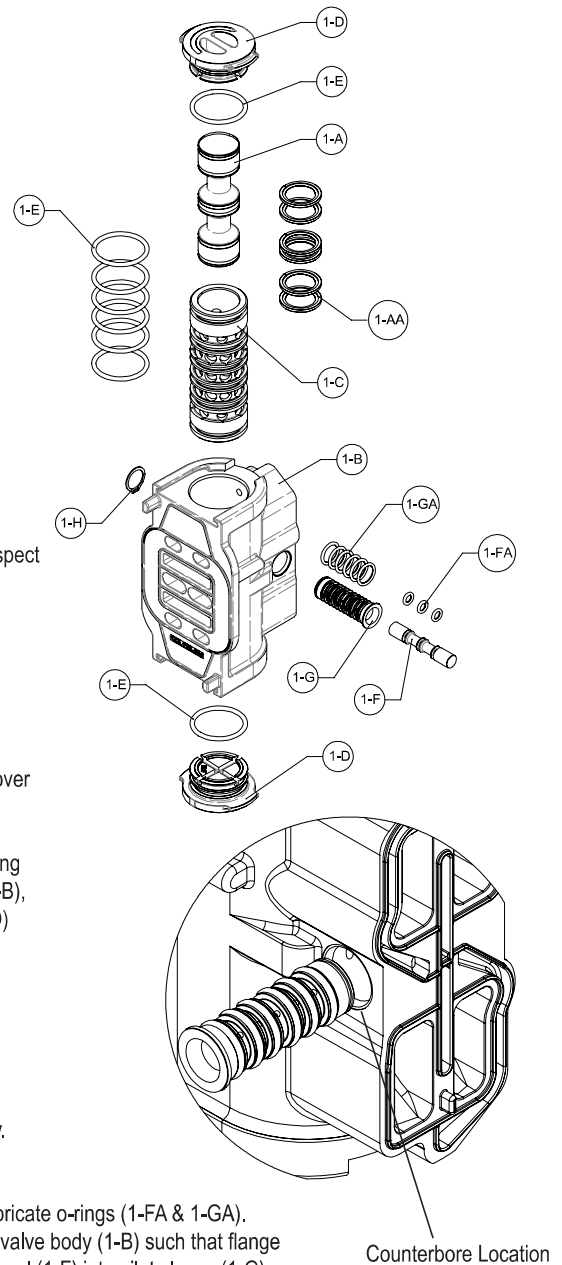
Step 2. Remove spool (1-F), inspect o-rings (1-FA) for damage and wear, replace if necessary.

Step 3. Remove sleeve (1-G), inspect o-rings (1-GA) for damage and wear, replace if necessary.

Reinstallation

Step 4. Install orings (1-FA) onto spool (1-F). Install orings (1-GA) onto sleeve (1-G). Lightly lubricate o-rings (1-FA & 1-GA).

Step 5. Locate counterbore in valve body (1-B), (see figure to right). Install pilot sleeve (1-G) in valve body (1-B) such that flange on sleeve is located within counter bore of valve body (1-B). Reinstall snap ring (1-E), slide pilot spool (1-F) into pilot sleeve (1-G).



3: EXP VIEW

ITEM NO.	PART NUMBER	DESCRIPTION	031.218.000/QTY.	ATEX Rated Pumps
				031.218.001/QTY.
1-A	775.062.000	Main Air Spool Assembly, with O-rings	1	1
1-AA	675.075.000	Glyde Ring Assembly, with O-rings	6	6
1-B	095.128.551	Air Valve Body	1	-
1-B	095.128.559	Air Valve Body	-	1
1-C	755.048.148	Main Air Sleeve	1	1
1-D	165.164.541	End Cap	2	2
1-E	560.020.360	O-Ring	8	8
1-F	775.061.000	Pilot Spool Assembly, W/ O-rings	1	1
1-FA	560.023.360	O-Rings	3	3
1-G	755.052.000	Pilot Sleeve Assembly, with O-Rings	1	1
1-GA	560.033.360	O-Ring	6	6
1-H	675.037.080	Retaining Ring	1	1

Fluid Section Assembly

Tools Required

- Torque wrench
- 1/2" Socket
- Ratchet
- 1/2" box end wrench

Torque Values

- End ported manifolds (32 & 31) to outer chambers (25).....100 in-lb
- Manifolds (31 & 32) or Elbows (26 & 27) to outer chambers (25).....100 in-lb
- Outer chambers (25) to inner chambers150 in-lb
- Elbows (26 & 27) to manifold (34).....150 in-lb

Manifold, check balls and outer chamber service

** Pump either equipped with end ported manifolds (31 & 32) or center ported configuration. Center ported manifolds include elbows (26 & 27) and manifold (34).

Step 1. Remove 8 capscrews (23) from discharge manifold flange, remove seats (37), seals (36) and check balls (22); inspect seals (36), seats (37) and check balls for damage and wear, replace as necessary

Step 2. Flip pump upside down 180°, remove 8 capscrews (23) from suction manifold, remove seats (37), seals (36) and check balls (22); inspect seals and check balls for damage and wear, replace as necessary

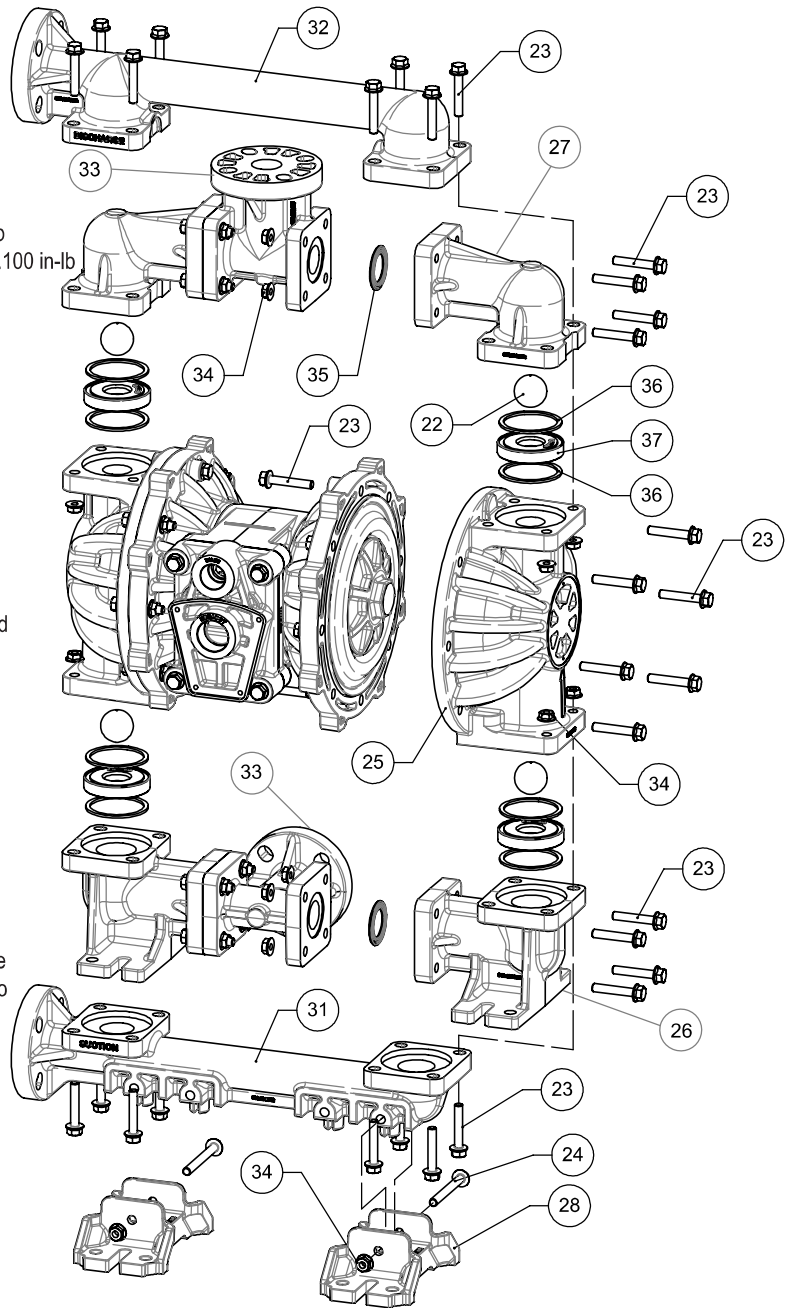
Step 3. Remove 16 capscrews (23) from outer chamber (25) flanges.

Reinstallation

Step 4. Attach outer chambers (25) using 16 capscrews (23), torque to value shown above

Step 5. Install seat seals (36), check balls (22) and seats (37) on suction side of pump. Attach suction manifold using 8 capscrews (23), torque to value shown above. Torque manifolds by torquing one side at a time (torque 4 bolts on left flange, then torque 4 remaining bolts on right flange), torque to value shown above.

Step 6. Rotate pump 180° and repeat steps 4 – 5 for the second manifold.



Fluid Section Assembly

ITEM NO.	PART NUMBER	DESCRIPTION	PORTING		MATERIAL	NOMENCLATURE			
			CENTER	END		(See Page 5)			
			QTY	QTY		P5	P9	P10	P15
22	050.028.354	Check Ball	4		Santoprene		R		
	050.028.360				Nitrile		B		
	050.028.365				Neoprene		N		
	050.028.600				PTFE		T		
23	171.068.115	Capscrew, Flanged Hex Hd, 5/16-18 x 1.75	48	32	Stainless Steel	Common			
24	171.070.115	Capscrew, Flanged Hex Hd, 5/16-18 x 3	2	-	Stainless Steel				E
25	196.225.552	Outer Chamber	2		Unfilled Polypropylene	P			
	196.225.557				Conductive Polypropylene	C			
	196.225.520				PVDF	K			
26	312.125.552	Suction Elbow		2	Unfilled Polypropylene	P			C
	312.125.557				Conductive Polypropylene	C			C
	312.125.520				PVDF	K			C
27	312.126.552	Discharge Elbow		2	Unfilled Polypropylene	P			C
	312.126.557				Conductive Polypropylene	C			C
	312.126.520				PVDF	K			C
28	326.055.551	Mounting Foot		-	Unfilled Polypropylene	P			E
	326.055.520				PVDF	K			E
31	518.230.552	Suction Manifold		-	Unfilled Polypropylene	P			E
	518.230.520				PVDF	K			E
32	518.231.552	Discharge Manifold		-	Unfilled Polypropylene	P			E
	518.231.520				PVDF	K			E
33	518.232.552	Manifold		2	Unfilled Polypropylene	P			C
	518.232.557				Conductive Polypropylene	C			C
	518.232.520				PVDF	K			C
34	544.005.115	Nut, Hex Flange, 5/16-18	35	22	Stainless Steel	Common			
35	720.044.600	Manifold Seal	4	-	PTFE				C
36	560.215.604	Check Valve Seal	8		PTFE	Common			
37	722.134.552	Check Valve Seat		4	Unfilled Polypropylene	P/C		P	
	722.134.520				PVDF	K		K	

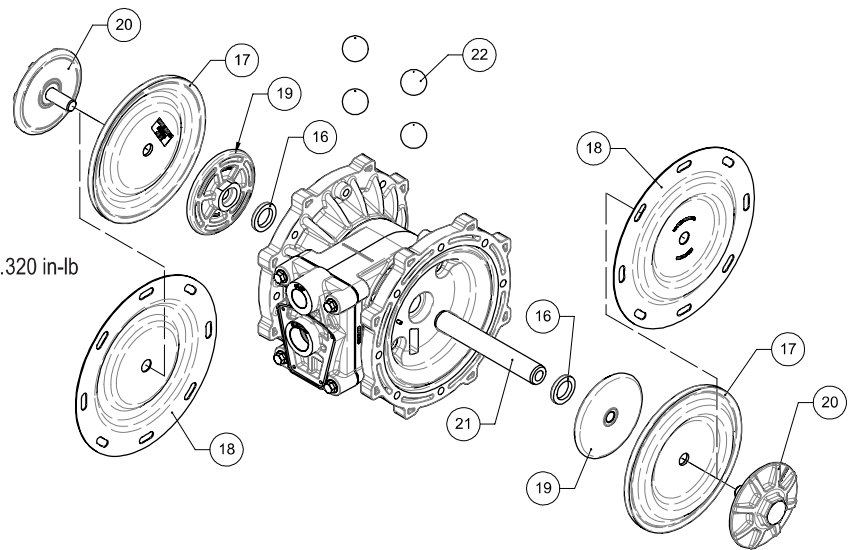
Diaphragm Assembly

Tools Required

- Torque wrench
- ½" Socket
- 6 point socket, 1.375" or 35 mm
- Ratchet

Torque Values

- Outer diaphragm plate (18) to inner diaphragm plate (20)320 in-lb
- Diaphragm plate assemblies to shaft (21).....120 in-lb



Step 1. With manifolds and outer chambers removed, remove outer diaphragm plate (18), diaphragm overlay (17), if equipped, diaphragm (16) and inner plate (20) from one side. NOTE: do not use pipe wrench on hex of outer diaphragm plate (18) best option: 6 point, 1.375" or 35mm socket

Step 2. Remove the remaining diaphragm assembly and shaft from intermediate (2). Hold diaphragm shaft (21) and remove remaining diaphragms (16) and inner and outer plates (18 & 20). NOTE: Flaws in diaphragm shaft (21) surface can damage u-cups (14), use caution, do not use pipe wrenches

Step 3. Inspect diaphragms (16) for wear, cracks or chemical attack. Inspect inner and outer plates (18 & 20) for deformities and wear. Inspect diaphragm shaft (21) for wear or marks. Clean or repair if appropriate, replace as required.

Step 4. Remove u-cup seal (14), and bumpers (19) inspect for wear, replace if necessary; clean before re-installation.

Reinstallation

Step 5. Lightly lubricate diaphragm contact faces of inner and outer diaphragm plates (18 & 20), with compatible material. When using PTFE overlay diaphragms, no lubrication is required on outer diaphragm plate. Water is recommended for EPDM diaphragms.

Step 6. Hold the inner diaphragm plate (20) by the hex with either a vise or 6 point 1.375" (35mm) socket or wrench. Locate the text "AIR SIDE" on the diaphragm (16) with air side facing the inner diaphragm plate surface. Torque outer diaphragm plate (18) to inner diaphragm plate (20), to value given above. Repeat step for second diaphragm and plate assembly.

Step 7. Attach 1 diaphragm assembly (from step 6) to diaphragm shaft (21), torque to specified value above. Lightly lubricate diaphragm shaft (21). Slide assembly through inner chamber holes and align diaphragm seal bead with inner chamber. With assembly installed into intermediate and inner chambers, install opposite diaphragm assembly onto diaphragm shaft (21), torque to specified value above.

ITEM NO.	PART NUMBER	DESCRIPTION	QTY	MATERIAL	P6	P8	P9	P10
16	132.140.357	Bumper	2	Urethane	COMMON			
17	286.125.354	Diaphragm	2	Santoprene		R	R	
	286.125.360		2	Nitrile		B		
	286.125.363		2	FKM		V		
	286.125.364		2	EPDM		E		
	286.125.365		2	Nitrile		N		
18	286.126.600	Diaphragm, Overlay	2	Ptfe		T		
19	612.254.157	Inner Diaphragm Plate	2	Aluminum, Die Cast	COMMON			
20	612.255.552	Plate, Outer Diaphragm	2	PVDF	K			
	612.255.520			Polypropylene, Unfilled	P			
21	685.058.120	Rod, Diaphragm	1	Stainless Steel, 416	COMMON			