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Applicable additional manuals:
None

Aerospace Group
Conveyance Systems Division

Carter® Ground Fueling

Maintenance & Repair Manual

3” Internal/Bottom Loading Valves

Model 64129
Model 64129A

Table Of Contents

Maintenance, Overhaul & Test Instructions
Carter® brand Models 64129 & 64129A
Internal/Bottom Loading Valves

1.0 INTRODUCTION

This manual furnishes detailed instructions covering the maintenance and overhaul of Eaton's Carter brand Models 64129, and 64129A internal/bottom loading valves. An early short run production unit, 64077 and 64077A were also sold. The major difference between these valves and the 64129/64129A valves was in the piston assembly. The 64129 valves will not allow the valve to be opened with pump suction at the inlet while the 64077 would open. The 64077 can be converted to the 64129. Ask your Carter distributor for more information.

2.0 EQUIPMENT DESCRIPTION

Models 64129 and 64129A 3" valves can be used either as a straight internal valve or for bottom loading control, mounted directly into a 3" TTMA tank sump ring. Model 64129A is used with Carter brand Model 64079 level sensor for bottom loading control. A basic 64129 internal valve can be converted to a bottom-loading valve, 64129A, by adding a pilot valve.

The units are spring loaded "overbalanced" piston valves. Fuel inlet pressure is routed to the inside of the piston chamber through a two-staged orifice in its center. If the piston chamber has no exit, the areas inside the piston chamber (outer diameter of the piston) is larger than the face seal of the piston, hence the balance of pressure forces, plus the spring force will keep the piston (valve) closed.

If the piston chamber is vented, normally only in the 64129A, through the pilot valve, the piston chamber pressure is reduced significantly by the pressure drop across the inlet orifice and the balance of forces will cause the piston to open, hence the valve.

When the piston chamber is once again closed (pilot valve closes), the balance of forces again causes the valve to close.

The 64129A although normally utilized with the 64079 level sensor can also be used with a solenoid valve. Either approach will provide or deprive the pilot valve of pressure (usually routed from the bottom loading adapter), causing the opening and closing of the valve. The use of a solenoid valve allows the 64129A to be used with either the Civacon Liberty or the Scully Optic Probes.

The center rod exposed at the top of the valve can be used to connect the 64129 to a mechanically operated auxiliary vent, which will open and close, with the 64129. Note that some early versions had a shorter rod making this not possible.

The 64129A superceded the 64077A. The 64077A did not have the capability of staying closed against suction pressure. The 64077A can be converted to a 64129A by changing the piston assembly and will automatically be accomplished if a piston for the 64077A is ordered. Contact Carter for more information.

3.0 TABLE OF OPTIONS

The 64129 basic valve is designed for use as an internal valve and has no other functional controls.

The "A" option (64129A) adds a pilot valve to the basic unit making it a bottom loading control valve.

4.0 DISASSEMBLY

4.1 Refer to Figures 1-4 for parts breakdown. The item numbers consist of two parts, the figure number plus the item called out on that figure. Example, (1-21) is the item 21 shown in figure 1.

4.2 Carefully remove Spring (1-10).

4.3 Unscrew Nut (1-13) from Screw (1-12) and remove both from assembly.

4.4 Pull Lever (1-11) from unit. Do not disassemble Clip (1-14) from Lever (1-11) unless replacement is deemed necessary.

4.5 Unscrew Bushing (1-15) from unit and remove from Shaft (1-18). Remove and discard O-ring (1-16 or 1-16B) and Quad-ring (1-17).

4.6 Rotate Shaft (1-18) counter-clockwise to line up pins (1-19) on shaft to allow it to be removed from the Body (1-11). Do not remove Pin (1-1A) from Body (1-1). Do not remove Pins (1-19) from Shaft (1-18) unless replacement is deemed necessary due to damage. If they are to be removed, observe the installation of the pins and measure the protrusion of them for reinstallation. To remove them use an appropriate size drift pin and with the Shaft (1-18) fully supported drive the Pins (1-19) out of the Shaft (1-18).

4.7 Remove the eight Screws (1-5) from the Cap (1-2) and put aside for reuse.

4.8 Pull Cap (1-2) off of unit. Remove and discard U-Cup Seal (1-49 or 1-49B) from Cap (1-2). Remove Spring (1-42).

4.9 If the unit being overhauled is an internal valve without a pilot control for bottom loading proceed to 4.9.1, if pilot is present go to 4.9.2.

4.9.1 Remove Plug (1-4) and discard Gasket (1-6).

4.9.2 Remove Pilot Valve Assy (1-3) and discard Gasket (1-6). Remove 6 Screws (2-8) and Washers (2-9). Remove and discard Diaphragms (2-5). Pressure Pad (2-4) can be removed at this point. If there have been no problems during bottom loading it is not necessary to disassemble the pilot further. If necessary, carefully remove Retaining Ring (2-10) to disassemble the rest of the parts.

4.10 The rest of the internal assembly of parts may now be removed. Grasp the protruding shaft and rotate slightly in either direction and pull the entire assembly from the Body (1-1).

4.11 The Cam (1-7) can be removed by removing Cotter Pin (1-9) from Pin (1-8).

4.12 Remove Screws (1-34) and separate Piston (1-1-3) from the rest of the assembly. Set Piston (1-3) aside carefully taking steps to not damage the outer diameter finish.

4.13 Split Washer (1-25) that is used to retain Balls (1-35) can now be removed, to remove the Balls (1-35). Discard the Balls (1-35).

4.14 Grasp the Link (1-39) end of the assembly and holding the Check Valve Assy (1-29) pull the shaft assembly from the unit. Do not attempt to disassemble the Check Valve Assy into its component parts. If any part of it is damaged, replace it as a complete unit.

4.15 Remove and discard O-ring (1-24). Remove Ring (1-23) and Washer (1-22) and set aside for later reuse. Slide Shaft (1-21) into remaining assembly to uncover Cotter Pin (1-38). Remove and discard Cotter Pin (1-38). Washer (1-37) can now be removed and saved for reuse. Shaft (1-21) is free to be removed completely.

4.16 Orifice (1-27) will now slide downward to expose Pin (1-36) for removal. Remove Pin (1-36) and Orifice (1-27). Retainer (1-41) and Spring (1-40) can then be removed.

4.17 Remove and discard O-rings (1-43) and (1-48) and Seal (1-44) from Body (1-1). If necessary to replace the screen, remove Screws (1-46) and Nuts (1-47) to remove Screen (1-45). Remove and discard Bushing (1-50) from Body (1-1).

5.0 INSPECTION

5.1 It is recommended that the following be replaced at each overhaul: Gasket (1-6), O-rings (1-17), (1-24), (1-48), (1-43); Quad Ring (1-16 or 1-16B), U-Cup Seal (1-49 or 1-49B); Seal (1-22); Diaphragms (2-5); Bushing (1-50); Balls (1-35) and Cotter Pin (3-38)

5.2 The outer diameters of the Shafts (1-18), (1-21), and Piston (1-34) should be inspected for scratches in the area that contact the seals, which might cause leakage. The piston seat in the Body (1-1) shall also be free of pits, scratches or gouges that would cause leakage. Inspect the bonded seal on the face of the Piston (1-34) to make sure it is complete and has no cracks, gouges or missing pieces. Inspect all other metal parts for dings, gouges, abrasions, etc. On all parts except the ones listed above, use 320 grit paper to smooth and remove sharp edges. The outer diameter of the Shafts (1-18), (1-21) and the Piston (1-34) can be polished to remove minor scratches by using a very fine emery cloth while the parts are rotated. **Do not** polish local areas of these diameters. Unless proper equipment is available to accomplish this it is recommended that the parts be replaced. If polishing is attempted, **do not** break through the hard-anodized surface of the Piston (1-34). If scratches are too pronounced, the parts should be replaced. Replace any part with damage exceeding 15% of local wall thickness. Use Alodine 1200 or similar chem film treatment, to touch up bared aluminum.

The flat surfaces of the Fitting (2-1) and Cover (2-2) may be polished to remove minor scratches. Use a flat plate and very fine emery cloth, being careful to keep the parts flat during polishing. Do not raise any burrs on the inside diameters that may bear on the diaphragms.

6.0 REASSEMBLY

6.1 Reassembly is accomplished in essentially the reverse order of disassembly noting the following:

6.1.2 Light lubrication of all O-rings, Quad-rings and seals, using petroleum jelly is recommended to facilitate installation.

6.1.3 When reassembling the Pilot Valve Assy (1-3) use the following procedure to assure proper diaphragm retention:

6.1.3.1 Once the Poppet (2-3), Spring (2-6), Washer (2-7) and Ring (2-10) are in place, be sure that the Pressure Pad (2-4) is placed onto the Poppet (2-3) shaft with the smaller end placed onto the shaft first. The larger flat surface should be facing away from the shaft.

6.1.3.2 The two Diaphragms (2-5) are placed such that the loops in the diaphragms are facing the Pressure Pad (2-4). [In operation, the loops always face in the direction in which the pressure from the Level Sensor or solenoid valve is applied.] Smooth out the Diaphragms (2-5) place onto the Fitting (2-1) and align the six holes in all three parts. Carefully place the Cover (2-2) onto this assembly aligning the holes.

6.1.3.3 Start the six Screws (2-8) with the Washers (2-9) in place by hand until resistance is met. Note

that if no resistance is met in attempting to hand tighten the screws, it is recommended that the Screws (2-8) be replaced. They are self-locking and some resistance should be felt.

6.1.3.4 Observing the Cover (2-2) from the top and refer to Figure 9 for the numbering sequence. Using a properly set torque wrench, tighten the number 1 screw to 1.6 in-lbs. (1.8 Kg-cm), followed by tightening screws number 5, 3, 6 and 4 in that order. Then repeat the tightening sequence to 3.2 in-lbs. (2.1 Kg-cm) and then 5.3 in-lbs. (6.1 Kg-cm) respectively.

Let the assembly stand for a minimum of 15 hours retighten the screws as above to the 5.3 in-lbs. (6.1 Kg-cm) setting.

6.1.4 When installing the Seal (1-44) onto O-ring (1-43) in Body (1-1) be sure to smooth the surface evenly with a finger.

6.1.5 Use Locktite 271 on the thread of Screw (1-34) before screwing Check Valve Assy (1-29) onto Piston (1-34). Note the thread of both parts should be cleaned with the recommended Locktite cleaning solution prior to using 271. Read the instructions on 271 before using. Torque Screws (1-34 to 13 in-lbs. (15 Kg-cm).

6.1.6 Torque Screws (1-5) to 23 in-lbs. (27 Kg-cm).

6.1.7 If the Screen (1-45) was removed and replaced, the replacement will be provided in a flat condition and it will be necessary to carefully shape it to fit the Body (1-1).

7.0 TEST

7.1 The following test procedures will be accomplished after overhaul:

7.2 Test conditions

7.2.1 Test media shall be Stoddard Solvent, Odorless kerosene, JP-4, Jet A or equivalent.

Functional Test

7.3.1 Connect inlet to a pressure source of at least 50 psig and apply a minimum of 10 psig to the pilot port to allow the valve to bleed of trapped air. This should be accomplished in a tank that can collect the pilot and any flow from the main piston. If a basic 64129 is being tested it will be necessary to loosen the Plug (1-4) sufficiently to allow the valve to open and bleed trapped air.

7.3.2 Remove the pressure from the pilot port or tighten the Plug (1-4) after all air has been bled from the valve. The main piston should close to seal the inlet. Leakage at a rate of at least 10 cc/min can be expected. If the valve does not close to a leakage rate of approximately that then either the pressure supply source is inadequate to represent a normal loading condition or there is a gross leakage from either the main piston seals. Observe to see if the source of leakage can be found and replace any seals as appropriate.

7.3.3 With no pressure applied to the valve use a spring pull scale to check that the valve can be opened with a minimum pull of 90 lbs. (41 Kg).

8.0 ILLUSTRATED PARTS CATALOG

Table 1.0 tabulates the parts and sub-assemblies comprising both the 64129 and 64129A Valves. The item numbers of the table are keyed to Figures 1-4.

TABLE 1

64129 3" Internal Valve

Fig.	Item	Part Number	Description	Units/ Assy	Coupler Option	Spares/10 Units/Yr.
1	1	221150	Body	1	All	-
	1A	90692A347	Pin	1	All	-
	2	221151	Cap	1	All	10
	3	GF814-10D	Plug	1	Basic	-
	4	47097	Pilot Valve Assembly	1	A	
	5	GF35206-247	Screw	8	All	-
	6	MS29512-10	Gasket	1	All	10
	7	221487	Cam	1	All	-
	8	98306A159	Pin	1	All	-
	9	GF24665-1013	Cotter Pin	1	All	10
	10	9433K113	Spring, Extension	1	All	2
	11	220676	Lever	1	All	-
	12	GF18153-9	Screw	1	All	-
	13	GF21042-4	Nut	1	All	-
	14	30325T27	Clip, Wire Rope Assembly	1	All	-
	15	220688	Bushing	1	All	-

Fig.	Item	Part Number	Description	Units/ Assy	Coupler Option	Spares/10 Units/Yr.
1	16	Q4114-366Y	Quad-Ring	1	All	10
	16B	Q4114-514AD	Quad Ring (Viton)	1	B	10
	17	MS29513-121	O-ring	1	All	10
	18	220686	Shaft	1	All	-
	19	GF171651	Pin, Spring	2	All	-
	20	47283	Piston Assembly	1	All	-
	21	221379	Shaft	1	All	-
	22	5710-194-60	Washer	1	All	-
	23	91650A420	Ring, Spiral Retaining	1	All	-
	24	MS29513-109	O-ring	1	All	10
	25	221380	Washer, Split	2	All	-
	26	GF16995-16	Screw	6	All	-
	27	220672	Orifice	1	All	-
	28	47388	Piston Assembly	1	All	-
	29	47390	Housing Assy, Check Valve	1	All	-
	30	221381	Housing, Check Valve	1	All	-
	31	Z-7	Spring, Compression	6	All	-
	32	221024	Pin	6	All	-
	33	47281	Piston Assembly	1	All	-
	34	GF16995-18	Screw	6	All	60
	35	9613K17	Ball	6	All	-
	36	220673	Pin	1	All	-
	37	220722	Washer, Retaining	1	All	-
	38	GF24665-86	Cotter Pin	1	All	-
	39	220690	Link	2	All	-
	40	TA-2210	Spring	1	All	-
	41	221023	Retainer	1	All	-
	42	220682	Spring	1	All	-
	43	M25988/1-239	O-ring	1	All	10
	44	220687	Seal	1	All	10
	45	220671	Screen	1	All	-
	46	GF515C4-5	Screw	2	All	-
	47	GF20365D440	Nut	2	All	-
	48	MS29513-154	O-ring	1	All	10
	49	666-112	U-Cup Seal	1	All	10
	49B	666-112VITON	U-Cup Seal (Viton)	1	B	10
	50	5406-04-02	Bushing	1	All	10
		KD64129-1	Kit - Seal replacement for 64129 Basic Valve (with Nitrile seals and ***no*** Pilot Valve. Contains items 1-6, 1-9, 1-16, 1-17, 1-24, 1-35, 1-38, 1-43, 1-44, 1-48, 1-49.			
		KD64129-3	Kit - Seal replacement for 47097 Pilot Valve Assy. Contains items 1-6, 2-5.			
		KD64129-5	Kit - Converts 64077(A) to 64129(A). Contains items 1-9, 1-16, 1-17, 1-20, 1-43, 1-44, 1-49.			
		KD-64129-6	Kit - Converts 64129 (with Nitrile seals) to 64129B (with flourocarbon (Viton) seals. Contains items 1-9, 1-16B, 1-17, 1-48, 1-49B.			
		KD64129-7	Kit - Seal replacement for Basic 64129B (with fluorocarbon (Viton) seals and ***no*** Pilot Valve. Contains items 1-6, 1-9, 1-16B, 1-17, 1-24, 1-35, 1-38, 1-43, 1-44, 1-48, 1-49B.			
		KD64129-9	Kit - Converts 64077A to 64129AB. Contains items 1-9, 1-16B, 1-17, 1-20, 1-43, 1-44, 1-48, 1-49B.			

TABLE 2

Fig.	Item	Part Number	Description	Units / Assy	Coupler Option	Spares/10 Units/Yr.
2		47097	Pilot Valve Assembly	1	Basic	-
	1	220433	Fitting	1	A	-
	2	220441	Cover	1	A	-
	3	220434	Poppet	1	A	-
	4	220443	Pressure Pad	1	A	-
	5	220445	Diaphragm	2	A	20
	6	220444	Spring	1	A	-
	7	220442	Washer	1	A	-
	8	LP35275-230	Screw	6	A	-
	9	GF620C6	Washer	6	A	-
	10	GF16633-4018	Ring	1	A	-

Notes: 1. All part numbers beginning with "GF" are interchangeable with those beginning with either "AN" or "MS". If the "GF" is followed by three numbers it is interchangeable with and "AN" part, otherwise it is interchangeable with an "MS" part of the same number.

2. The recommended spare parts shown above are the number required to support 10 units for one year or each overhaul whichever is sooner. These quantities do not include replacement spares for intermediate replacement of parts required by abuse or misuse of the equipment. The recommended quantities are based on the ratio of spare parts sold for each unit during a one-year period of time. The actual quantity required will vary from location to location.

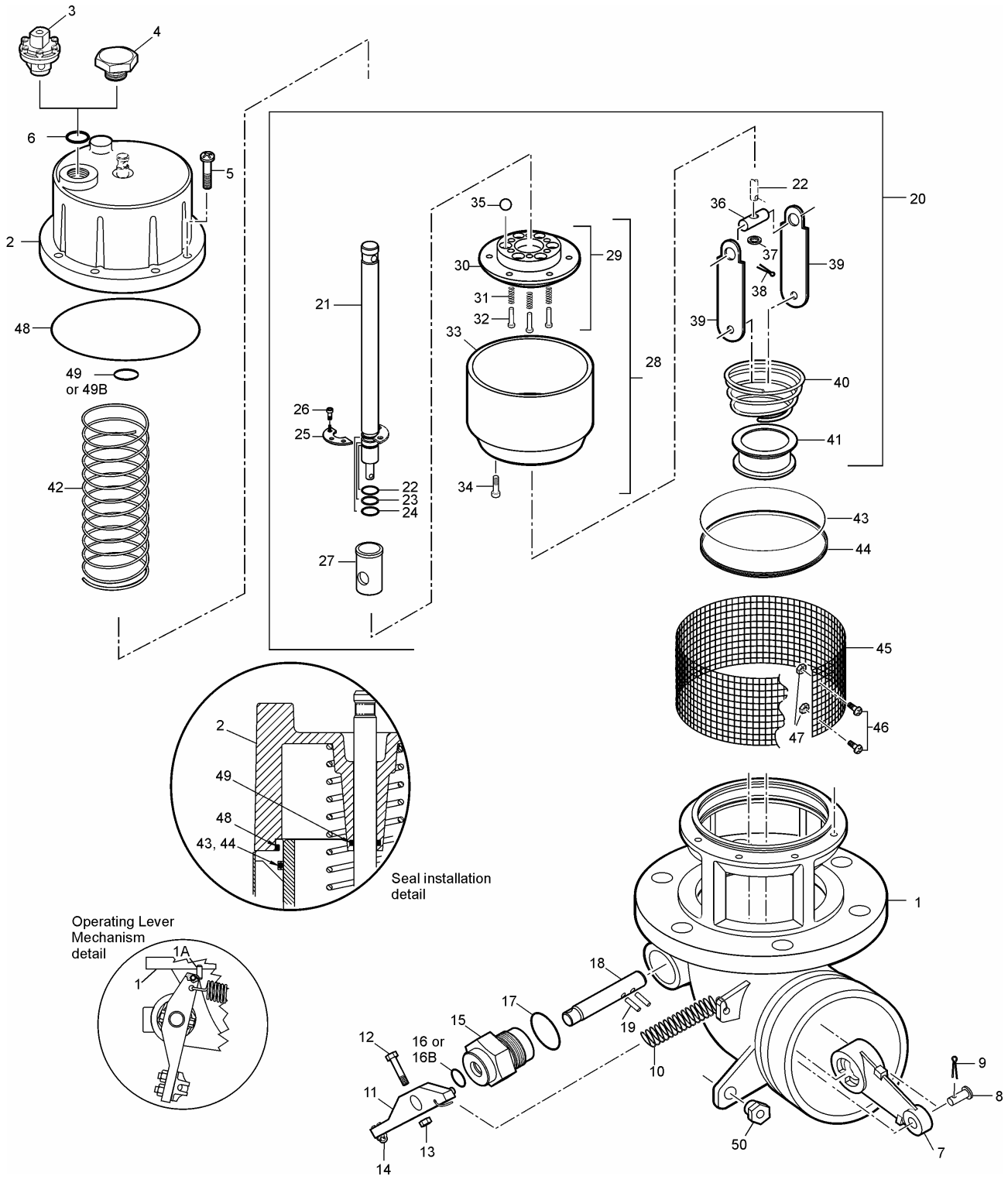


Figure 1

64129 Exploded View

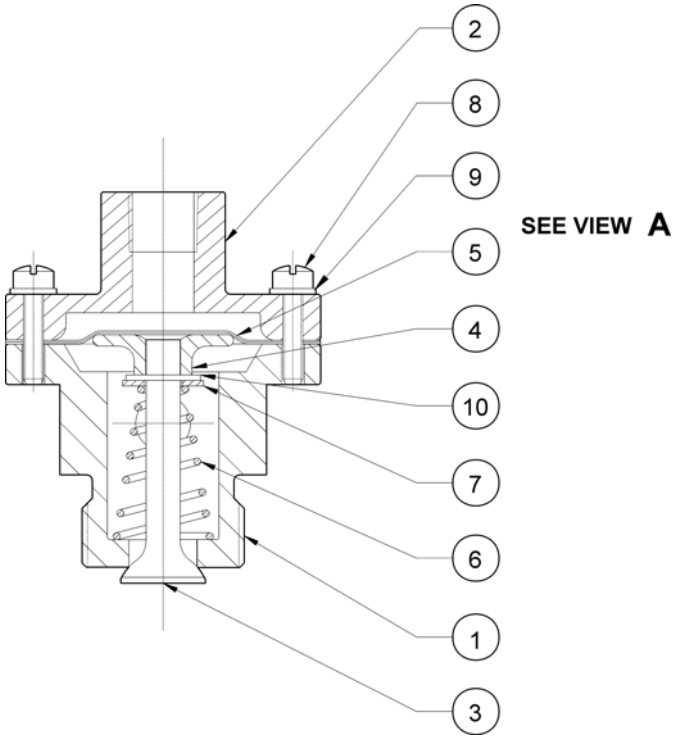
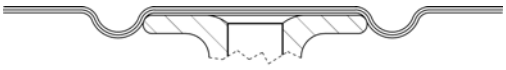


Figure 2

Pilot Valve Cross Section



VIEW A

DIAPHRAGM POSITION
PRIOR TO INSTALLING
ITEM 2, COVER

Figure 3
Diaphragm Installation Position

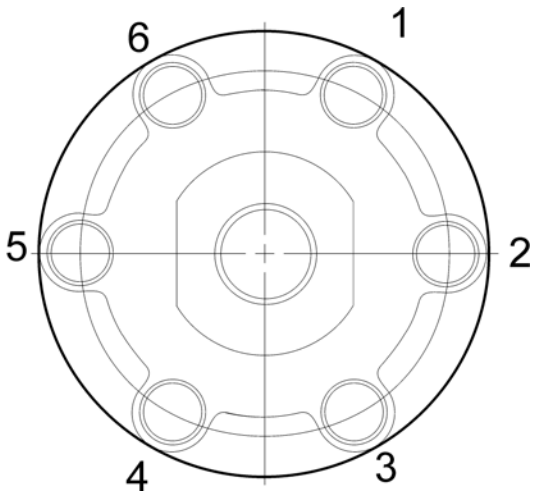


Figure 4

Top View Of Pilot – Torque Sequence

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