Hose End Pressure Control Valves

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Eaton Carter Ground Fueling

Powering Business Worldwide

Hose End Pressure Control Valves – HEPCV (Direct acting)

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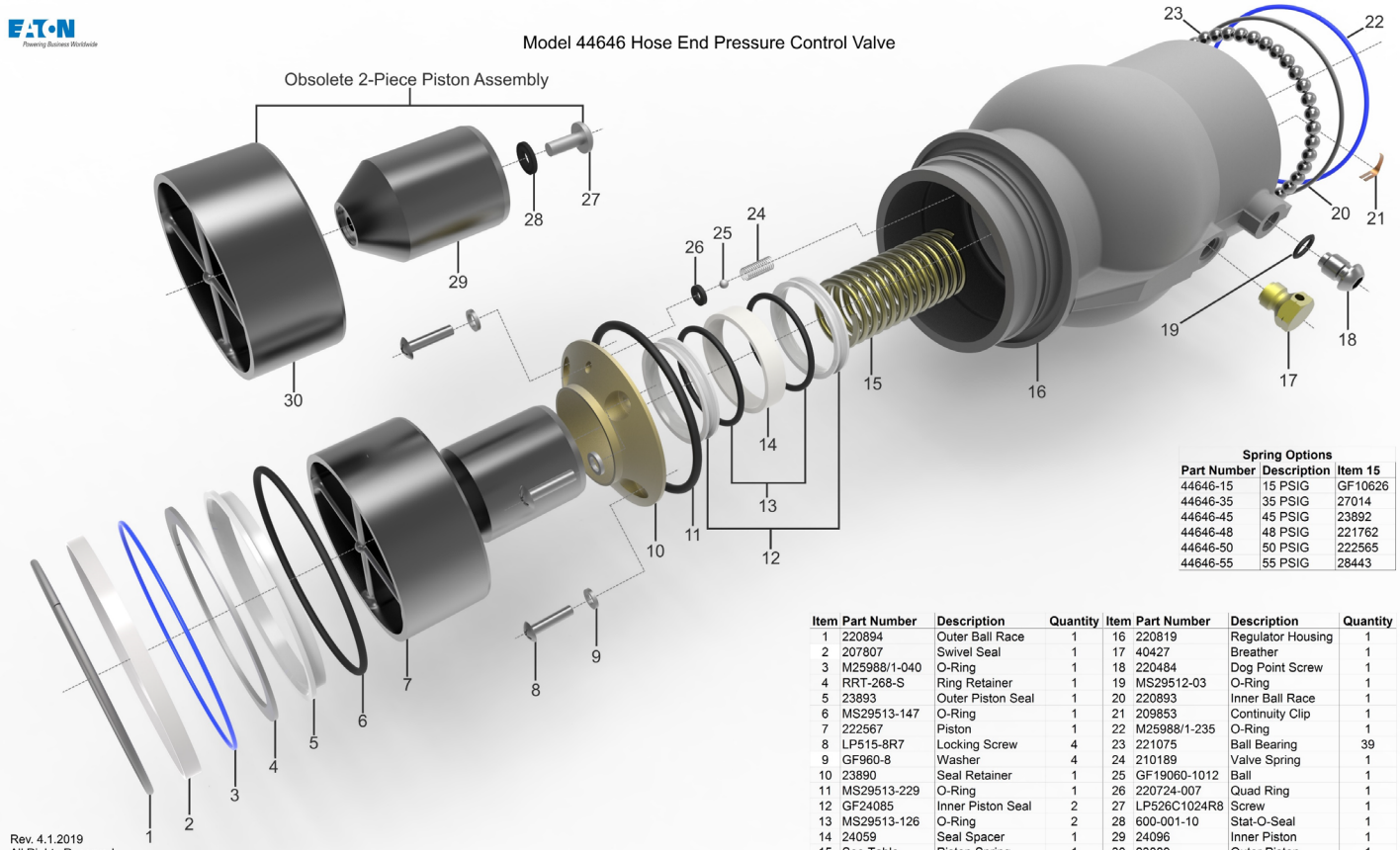
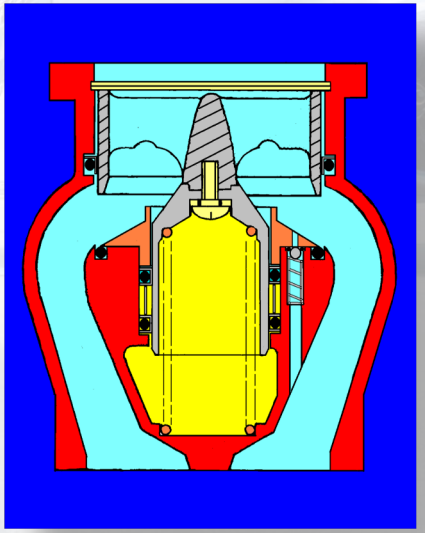


Spring Options		
Part Number	Description	Item 15
44646-15	15 PSIG	GF10626
44646-35	35 PSIG	27014
44646-45	45 PSIG	23892
44646-48	48 PSIG	221762
44646-50	50 PSIG	222565
44646-55	55 PSIG	28443

Item	Part Number	Description	Quantity	Item	Part Number	Description	Quantity
1	220894	Outer Ball Race	1	16	220819	Regulator Housing	1
2	207807	Swivel Seal	1	17	40427	Breather	1
3	M25988/1-040	O-Ring	1	18	220484	Dog Point Screw	1
4	RRT-268-S	Ring Retainer	1	19	MS29512-03	O-Ring	1
5	23893	Outer Piston Seal	1	20	220893	Inner Ball Race	1
6	MS29513-147	O-Ring	1	21	209853	Continuity Clip	1
7	222567	Piston	1	22	M25988/1-235	O-Ring	1
8	LP515-8R7	Locking Screw	4	23	221075	Ball Bearing	39
9	GF960-8	Washer	4	24	210189	Valve Spring	1
10	23890	Seal Retainer	1	25	GF19060-1012	Ball	1
11	MS29513-229	O-Ring	1	26	220724-007	Quad Ring	1
12	GF24085	Inner Piston Seal	2	27	LP526C1024R8	Screw	1
13	MS29513-126	O-Ring	2	28	600-001-10	Stat-O-Seal	1
14	24059	Seal Spacer	1	29	24096	Inner Piston	1
15	See Table	Piston Spring	1	30	23889	Outer Piston	1

HEPCV Operation

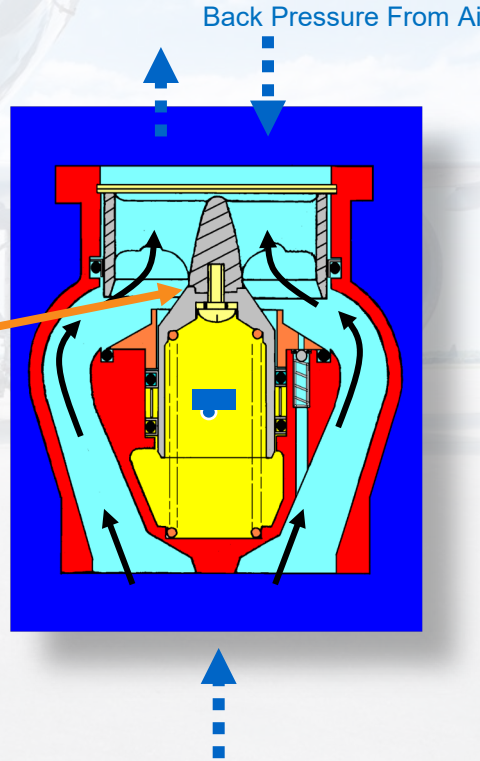
Piston Fully Open



HEPCV Operation

Piston Closing

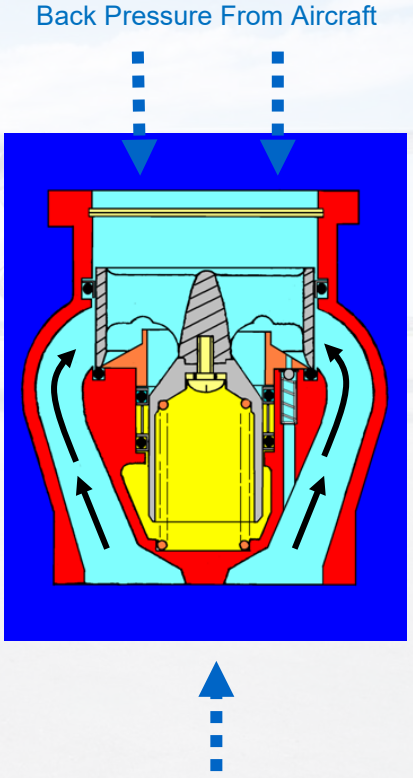
Back pressure acts upon this surface of the inner piston. The piston will start to move at about 22-26 psi



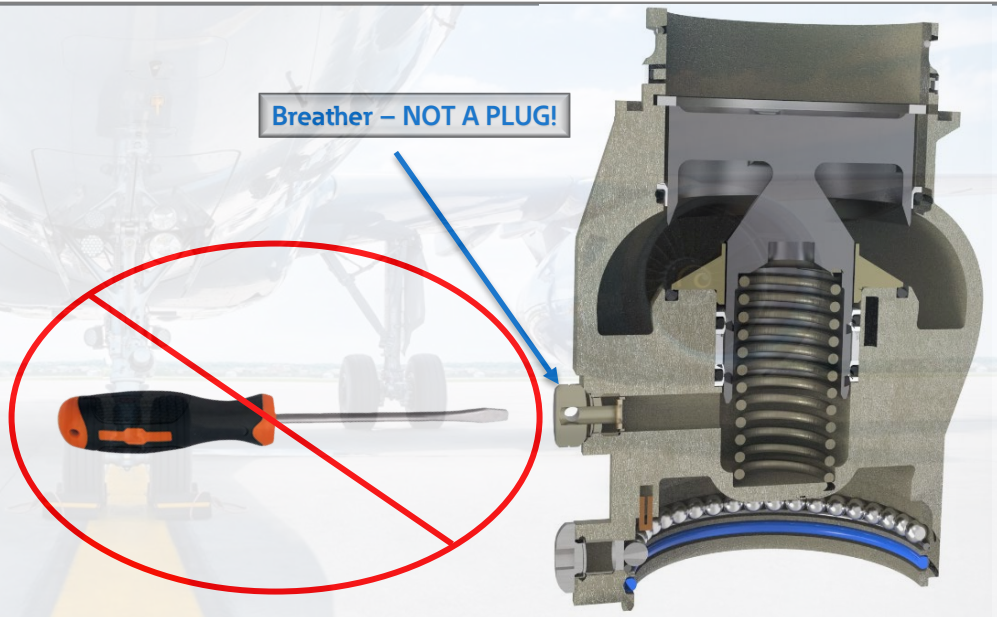
HEPCV Operation

Piston Closed

Back pressure greater than the spring rating i.e. 45 psi causes piston to close.



Using the Block out Tool



- Using the 61656 Block Out tool, remove the breather from the HEPCV.
- Insert the block out tool and rotate so that the around is pointing towards the nozzle

Wear Examples from the field

Troubleshooting steps for suspected out of range HEPCV

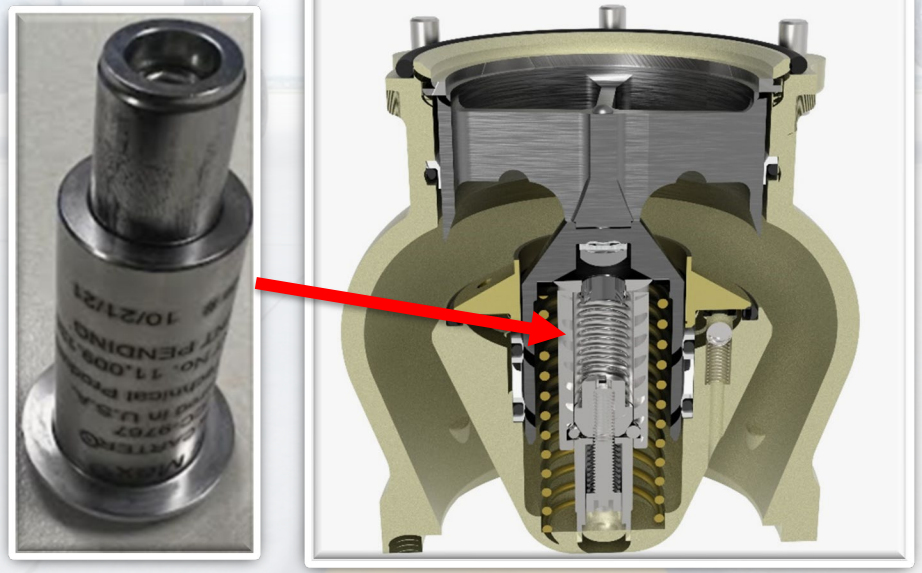
- **Check inlet pressure**. If more than 120psi then you can expect to see a higher control pressure when testing. Review with test rack operator to determine if inlet pressure can be reduced by adjusting the pump pressure, pressure relief valves, or partially closing a valve just upstream of the nozzle being tested.
- **Cycle the HEPCV**. For new HEPCVs it may be necessary to cycle the HEPCV to “break-in” the seals. To perform this, obtain max flow, close valve downstream of the nozzle to achieve at least 20psi of nozzle pressure, cycle the valve downstream of the nozzle from 20 psi nozzle pressure to fully closed and back to 20 psi nozzle pressure within 3-5 seconds. Perform this cycle at least 5-10 times. Perform your HEPCV pressure control testing procedure again to see if control pressure is now within range.
- **Leaking from the Breather** If a constant drip while fueling then suspect eh Teflon seals around the inner piston are worn or damaged. If only a ‘spit’ of fuel during a surge, this is normal operation of the valve. Fuel collects in the inner chamber of the valve as the piston moves in and out of the Teflon seals. After time this fuel will expel through the breather.

Powering Business Worldwide

The FlowMaximizer (FlowMax®)

Eaton Carter® HEPCV with Gammon Flow Maximizer (FlowMax®)

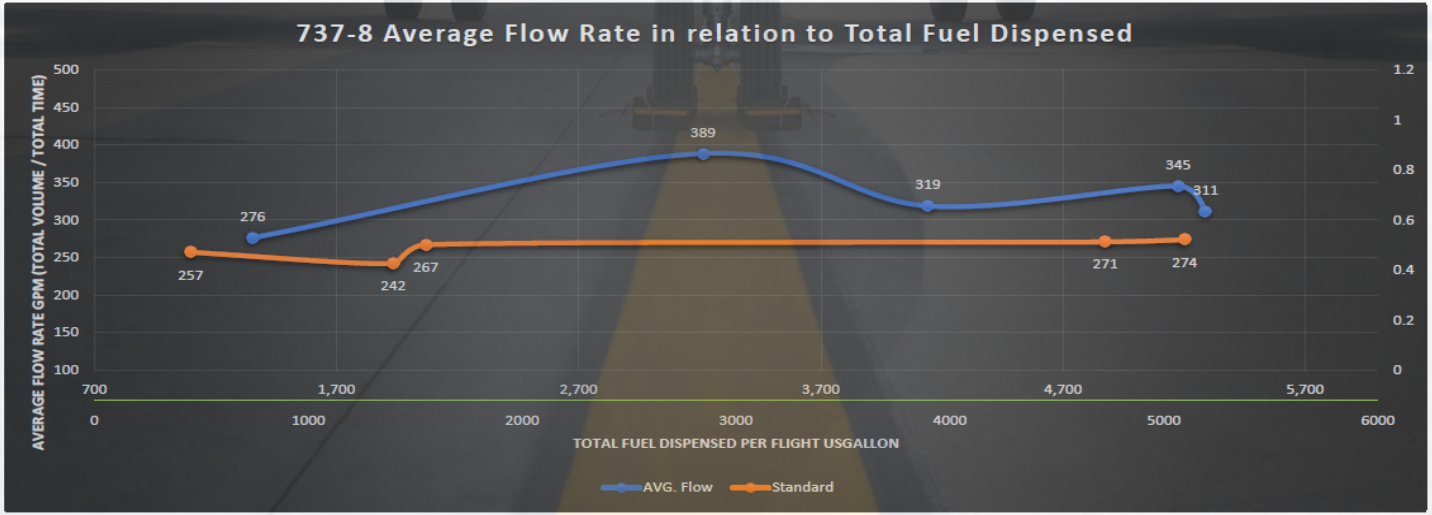
FlowMax is an innovative and cost-effective way to increase refueling performance. Eaton Carter® teamed with Gammon Technical Products® to evaluate, test, field trial, and improve the FlowMax HEPCV design. Gammon Technical products developed the FlowMax to address inherent performance issues related to the standard HEPCV design.



FIELD 737 FUELING EVENTS – AVG Improvement 20.1%

Aircraft	Peak Flow Rate	Total Fuel	Actual Fueling Time	Nozzle Pressure at end	HECV Config	AVG. Flow
737	302	1354	4.9	38	FlowMax	276
737	435	3214	8.27	32	FlowMax	389
737	372	4142	13	13	FlowMax	319
737	390	5176	15	15	FlowMax	345
737	384	5289	17	17	FlowMax	311
						328

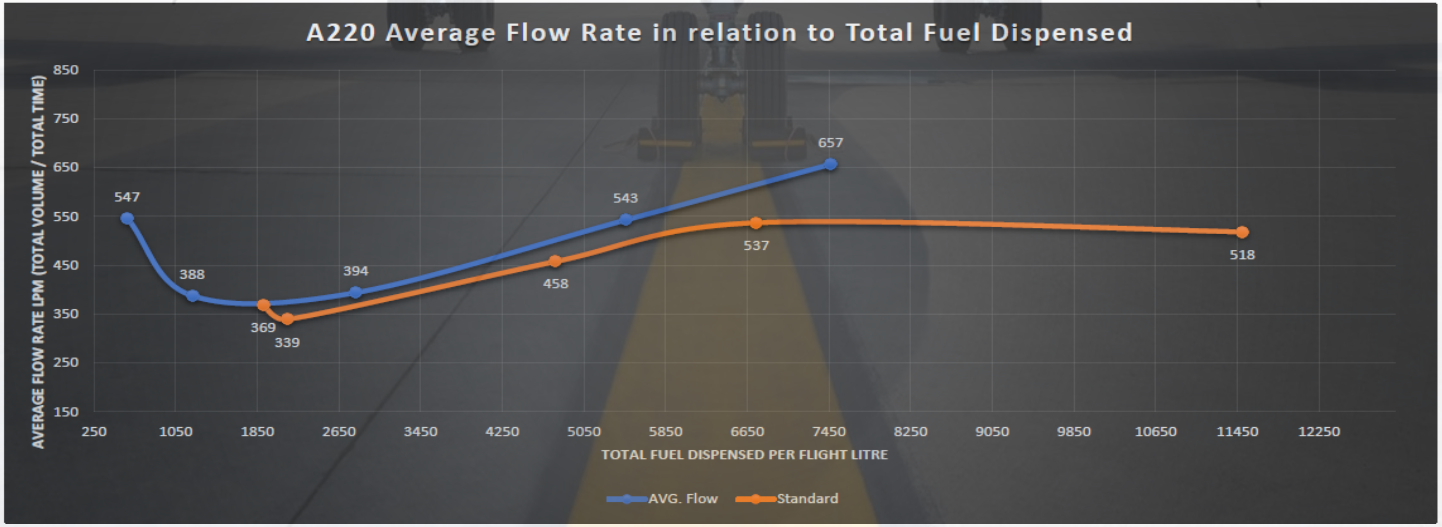
Aircraft	Peak Flow Rate	Total Fuel	Actual Fueling Time	Nozzle Pressure at end	HECV Config	AVG. Flow
737	276	1097	4.27	38	45 HEPCV	257
737	348	1934	8	29	46 HEPCV	242
737	257	2069	7.75	36	47 HEPCV	267
737	377	4874	18	41	48 HEPCV	271
737	374	5203	19	42	49 HEPCV	274
						262



FIELD A220 FUELING EVENTS – AVG Improvement 12.1%

Aircraft	Peak Flow Rate	Total Fuel	Actual Fueling Time	Nozzle Pressure at end	HECV Config	AVG. Flow
220	400	574	1.05	40	FLowMax 48psi	547
220	420	1213	3.13	44	FLowMax 48psi	388
220	420	2817	7.15	42	FLowMax 48psi	394
220	680	5460	10.06	40	FLowMax 48psi	543
220	680	7469	11.37	42	FLowMax 48psi	657
						506

Aircraft	Peak Flow Rate	Total Fuel	Actual Fueling Time	Nozzle Pressure at end	HECV Config	AVG. Flow
220	400	1910	5.18	36	48PSI HEPCV	369
220	400	2144	6.32	40	48PSI HEPCV	339
220	680	4774	10.43	44	48PSI HEPCV	458
220	660	6740	12.55	38	48PSI HEPCV	537
220	700	11500	22.19	30	48PSI HEPCV	518
						444

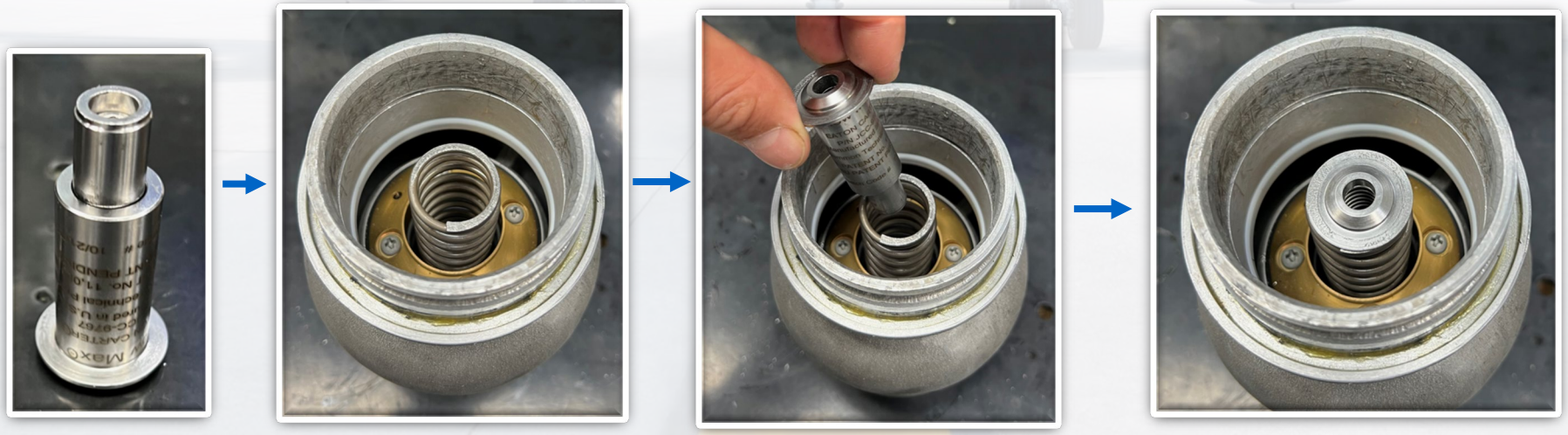


FlowMax FAQ

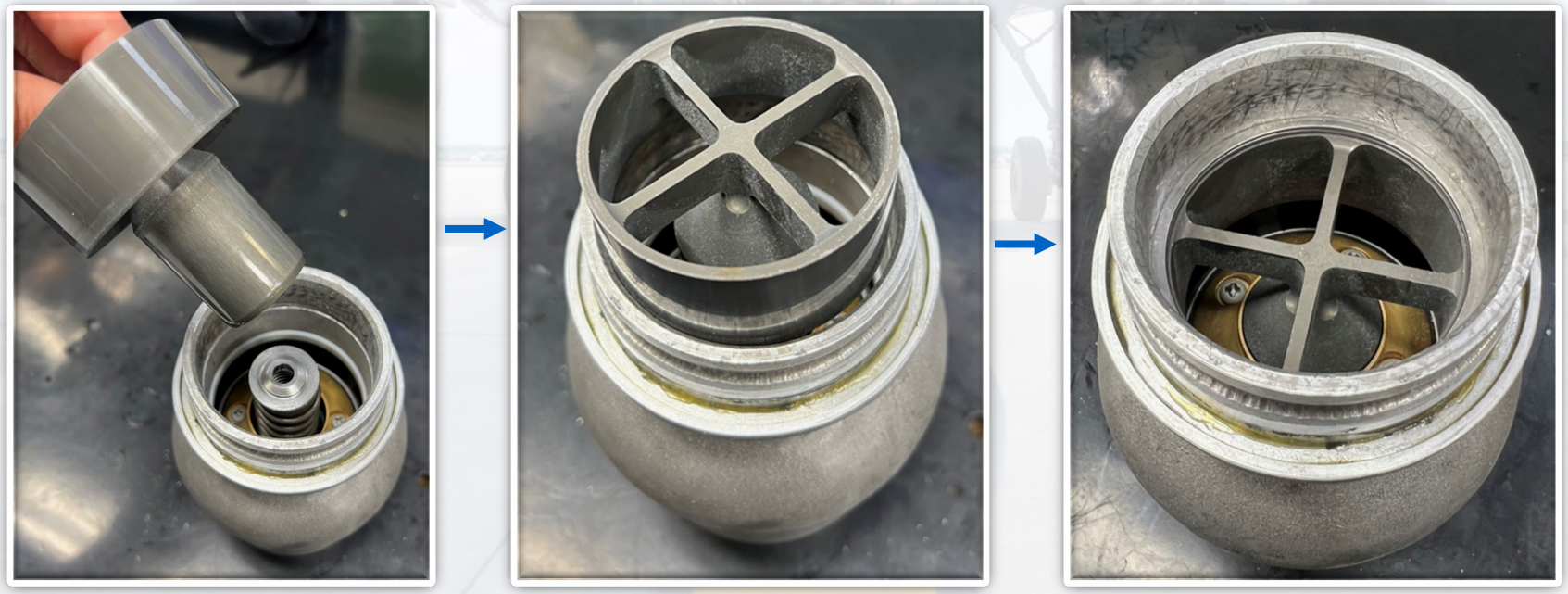
- **How can we order the FlowMax?**
  - The FLowMax can be ordered through any of our distributors worldwide. It can be ordered as a standalone device, in a rebuild kit for the HEPCV, a complete HEPCV with FLowMax installed, or when ordering a new nozzle with an HEPCV fitted w/ FlowMax..
- **Will FlowMax fit in any Carter HEPCV?**
  - Yes the device will work in all three of the Carter Brand HEPCV with spring ratings of 35psi, 45psi, 48psi, and 50PSi. It will fit into the swivel to swivel (44646) swivel to flange (47013) and the Flange to flange (60129) models
- **Does the device need to be adjusted for different spring ratings?**
  - No. As this is a mechanical device that is not affected by flow or pressure it does not need to be adjusted for different spring rating usage. The device is adjusted prior to shipment for optimal performance.
- **Does the device need to be calibrated.**
  - No. The device operates by the mechanical interaction with the piston. As the piston pushes against the device and overcomes the spring rated pressure the device collapses under that load.

Installing FlowMax

- The FlowMax is installed inside the housing along with the spring as shown in the illustration.



Installing FlowMax



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