A & H Enterprises, Inc.
11812 NE 116th Street
Kirkland, WA 98034 USA
TEL: +425.883.4040
FAX: +425.823.1962
www.amflow.com
EMAIL: ah@amflow.com

INSTALLATION & SERVICE MANUAL

AMFLOW® AM7B
Flow Control Valve

Part Number: 00000159-0501

NOTE
Reference the “As Built” data sheet supplied with order for specific valve configuration.

Explanation of Graphic Symbols

DANGER AND/OR WARNING
The exclamation point within an equilateral triangle surrounded by red is intended to alert the user to the presence of important operating and maintenance instructions that may cause personal injury or harm to the system.

CAUTION AND/OR IMPORTANT
The exclamation point within an equilateral triangle that is solid yellow with an exclamation point is intended to alert the user to use caution or contains important information.

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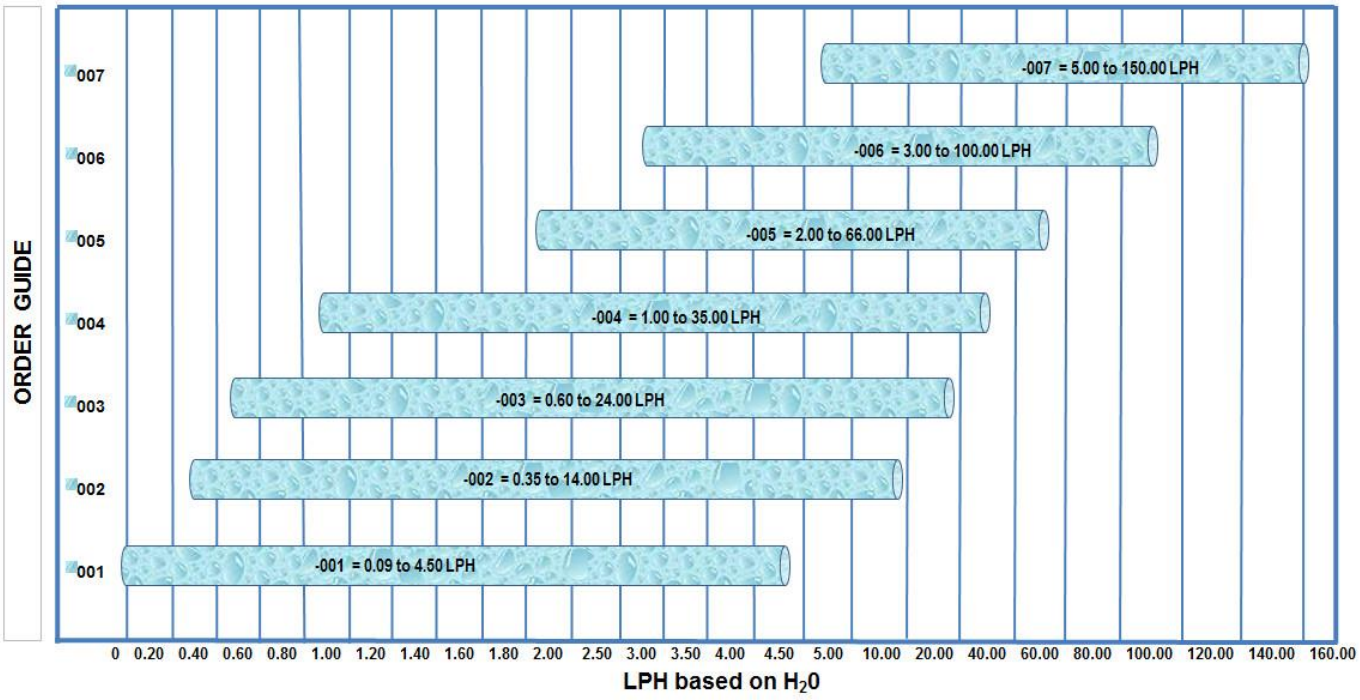
SECTION 1: INFORMATION

1.01 DESCRIPTION

The ***Amflow®*** AM7B Flow Control Valve is an adjustable device for flow regulation from 0.09 to 150 LPH. It is easily adaptable for automation.



The ***Amflow®*** AM7B Flow Control Valve is designed to be mounted in a stainless steel panel with a minimum thickness of 2mm. The mounting hole should be from 34mm to 38mm in diameter.

Incorporated into the ***Amflow®*** AM7B Flow Control Valve is a purge port that allows the user to direct a high flow stream of chemical across the fixed orifice in order to flush any chemical residue that might accumulate over time. This feature reduces the necessity of opening the valve and cleaning the jet manually. The purge port is located 180- degrees from the inlet port. The inlet and outlet ports are at a 90-degree orientation to each other. The body section that contains the outlet port can be rotated 180-degrees to change the relative port orientations to facilitate installation requirements.

1.02 DESIGN FEATURES

- Construction: 316L Stainless Steel
- Operating Pressure: 20-bar (300 PSI) to 690-bar (10,000 PSI)
- Operating Temperature: -15°C (5°F) to 200°C (392°F)
- Standard Inlet & Outlet Ports: 1/4" BSPP
- Turndown Ratio: Up To 40:1 at 10-bar Δp
- Weight: 8.6 lbs. (3.9 Kg)
- Ceramic components for high pressure control
- Low maintenance
- Very low torque is required for adjustment

1.03 SAFETY INFORMATION

⚠ SAFETY INFORMATION

Usage

- Use valve only within range of pressure and temperature conditions indicated on product data sheet.
- Do not use with chemicals which are incompatible with 316L or with seal materials.
- Equipment is certified for Group 2 Category II.
- Equipment should not be used in systems requiring a higher level of certification.

Faults and Damage

The safety features and integrity of valve may be compromised by any of the following:

- External damage to valve body.
- Exposure to pressure loads in excess of maximum rated pressure.
- Maintenance performed by improperly trained personnel.

Protection from Pressure Releases

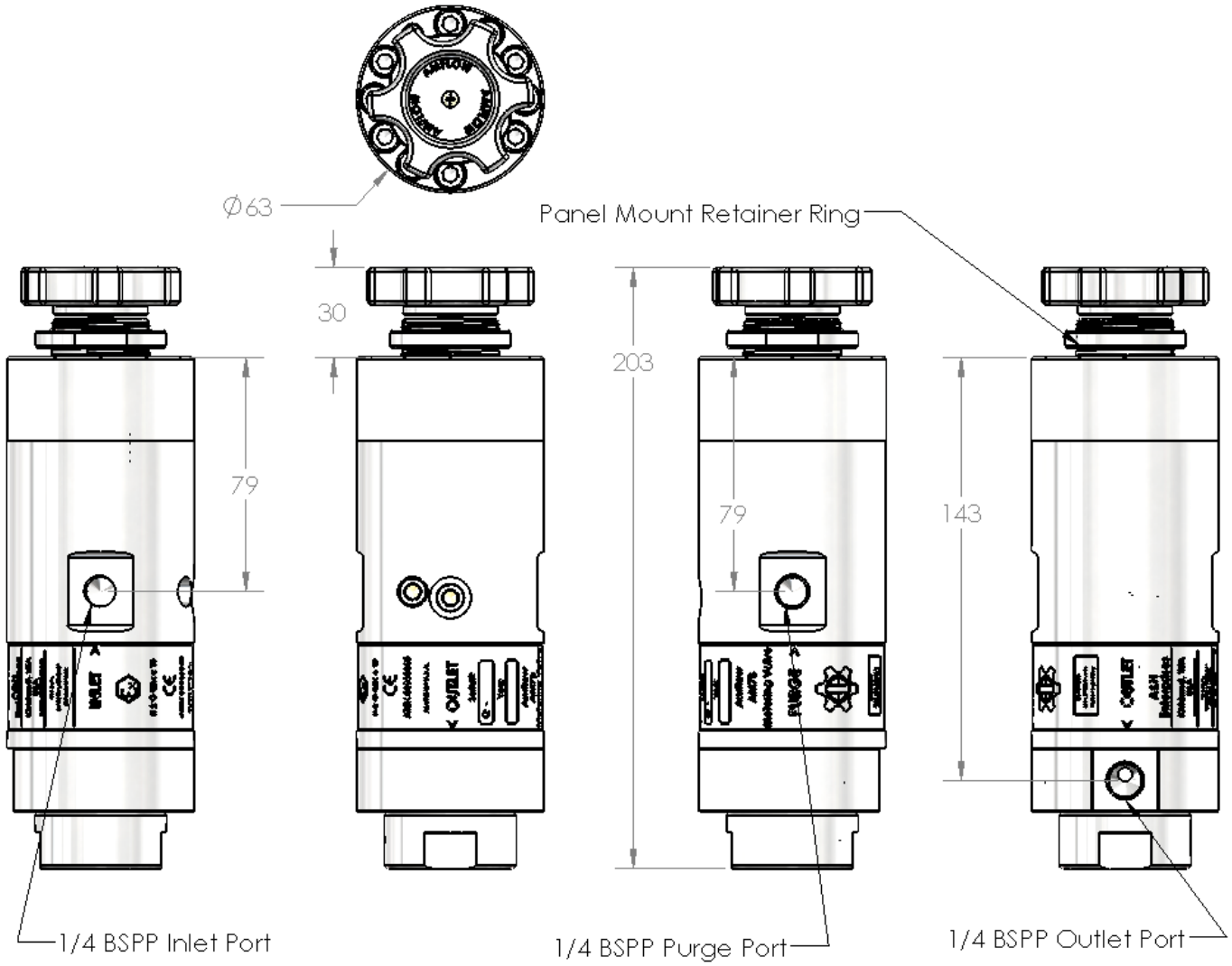
- To avoid injury due to release of high pressure, use only adaptors and fittings rated to withstand appropriate pressure.
- Confirm that all adaptors and fittings are securely connected.
- To avoid a violent release of pressure, slowly bleed off pressure before attaching or removing valve from pressure line.

Avoid Mechanical Damage

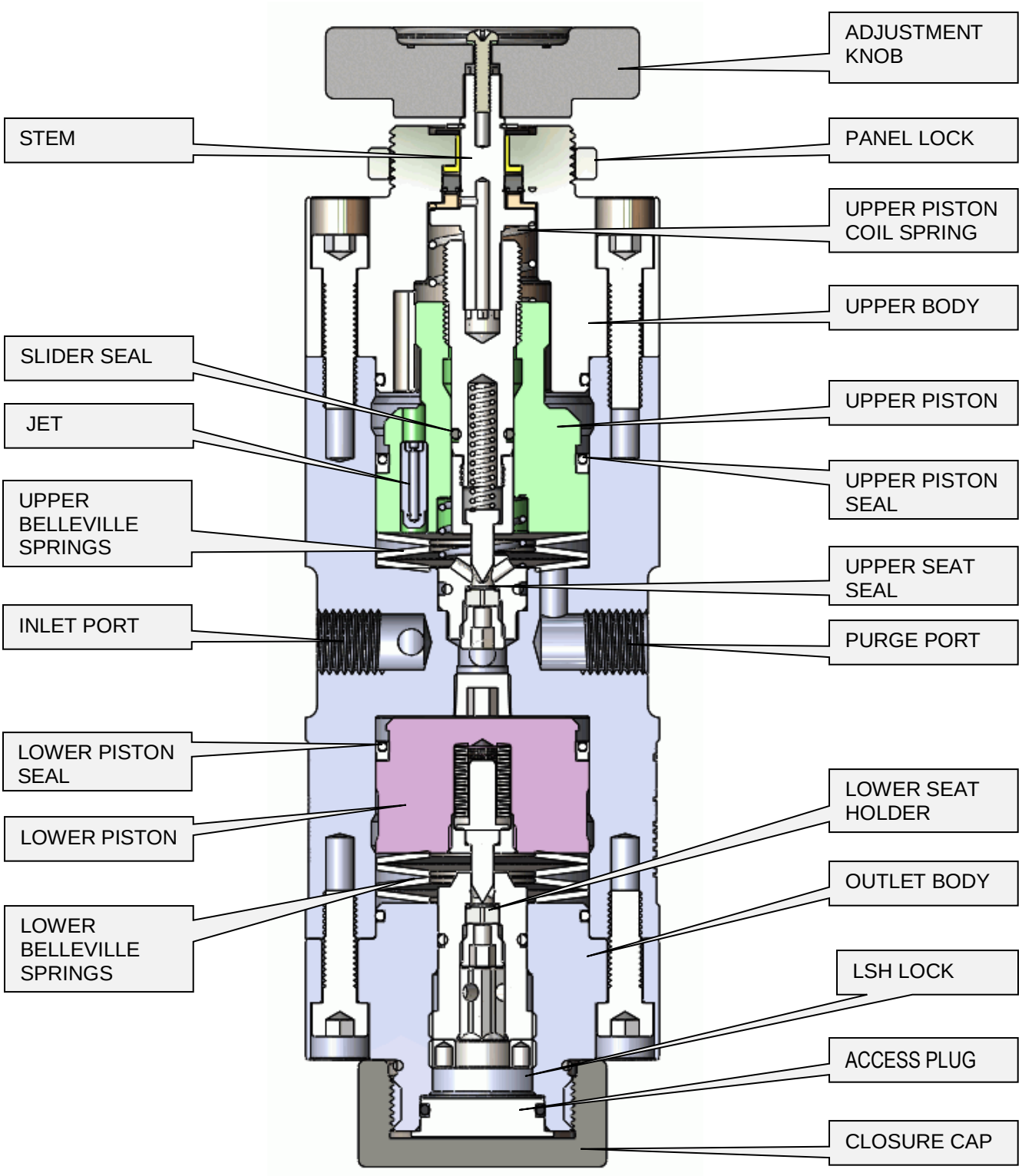
- Caution must be observed to not damage any threaded components during maintenance procedure. Such damage could compromise the pressure safety factor of valve.
- When replacing seals, care must be used to avoid damage to sealing surfaces. Damage could lead to a sudden release of pressure during operation of valve.
- Any time the ten (10) M6x20 (Item 31) or M6x25 (Item 4) SHCS are loosened or removed they should be tightened to the appropriate torque setting of 120 inch lbs. (13.6N.m) upon replacement.

END OF SECTION

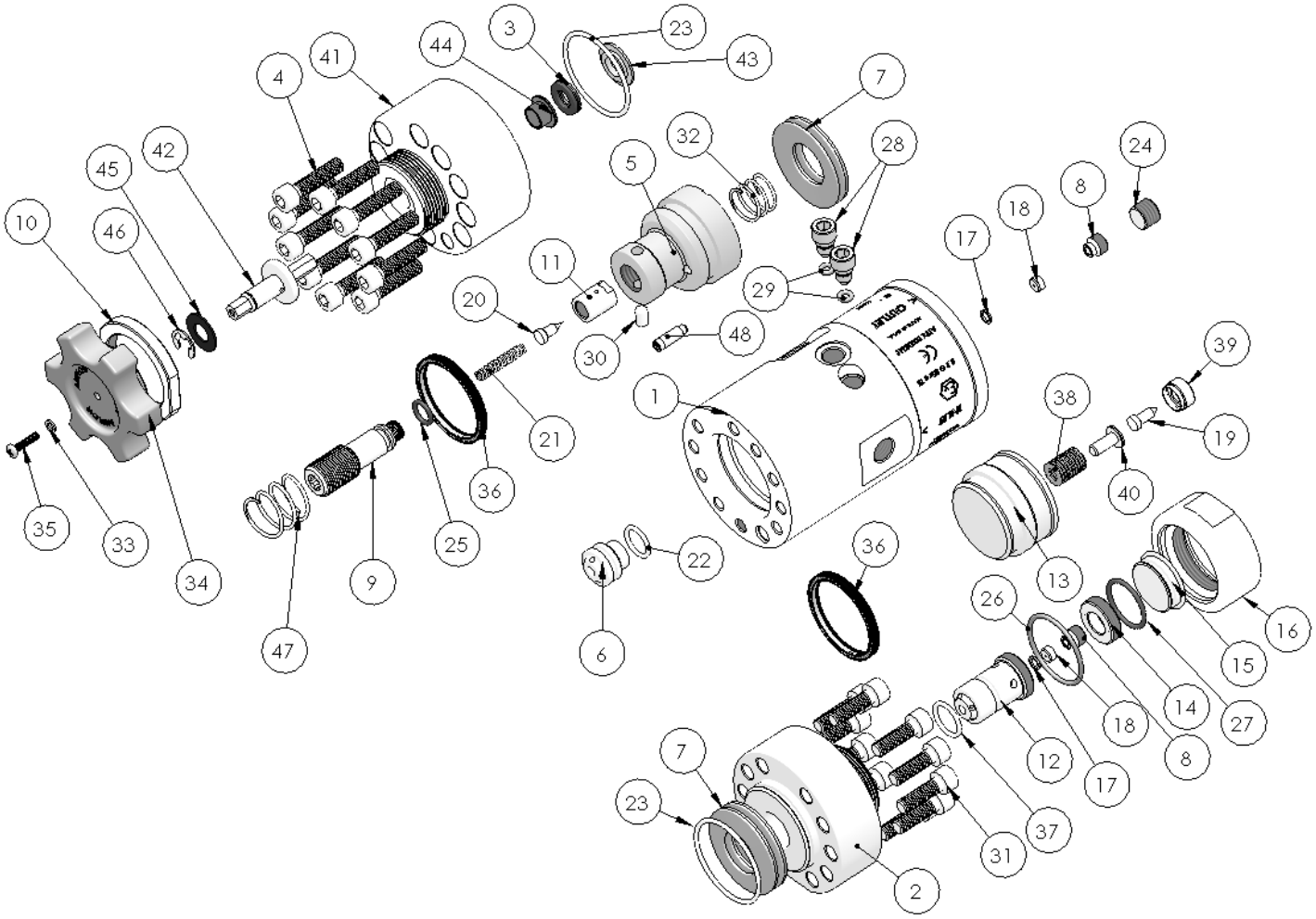
1.04 GA DRAWING



1.05 CUT-AWAY VIEW: Full Assembly



1.06 EXPLODED VIEW



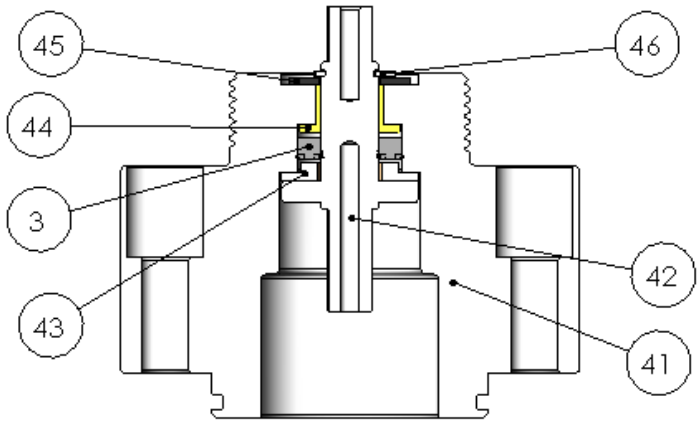
1.07 BOM

ITEM	PART	DESCRIPTION	QTY
1	00000123-0301-001	Center Body	1
2	00000125-0301-001	Outlet Body	1
3	00000009-0301-000	Stem Cup Seal	1
4	00001500-7006-025-00	M6x25 SHCS	10
5	00000132-0301-XXX	Upper Piston	1
6	00000083-0301-001	Upper Seat Holder	1
7	00001600-1500-045-00-0755	Belleville Spring	7
8	00000094-0301-001	Seat Retainer	2
9	00000136-0301-001	Slider	1
10	00000015-0301-000	Panel Lock	1
11	00000137-0301-000	Pin Retainer	1
12	00000142-0301-000	Lower Seat Holder	1
13	00000140-0301-000	Lower Piston	1
14	00000153-0301-000	LSH Lock	1
15	00000144-0301-000	Access Plug	1
16	00000145-0301-000	Cap Closure	1
17	00000092-0301-002	Seat Seal	2
18	00000093-0301-XXX	Seat	2
19	00000054-0301-XXX	Upper Pin	1
20	00000054-0301-XXX	Lower Pin	1
21	00000138-0301-000	Upper Pin Spring	1
22	00001555-2013-003	Upper Seat Holder O-Ring	1
23	00001555-2028-103	Body O-Rings	2
24	00000030-0301-000	1/8 NPT Plug	1
25	00001555-2011-104	Slider O-Ring	1
26	00001555-2024-000	Cap Closure O-Ring	1
27	00001555-2018-103	Plug Access O-Ring	1
28	00000118-0301-000	Port Access Plug	2
29	00001555-2006-003	Port Access Plug O-Ring	2
30	00000135-0301-000	Anti-Rotate Pin	1
31	00001500-7006-020-00	M6x20 SHCS	10
32	00000149-0301-000	Piston Coil Spring	1
33	00001500-8003-000-00	M3 Lockwasher	1
34	00000122-0301-000	Adjustment Knob	1
35	00001500-7103-010-00	M3 x 10 SHCS	1
36	00000146-0301-002	Piston Cup Seal	2
37	00001555-2014-003	Lower Seat Holder O-Ring	1
	00001555-2013-003	Lower Seat Holder Guide	1
38	00001997-0301-000	Lower Piston Spring	1
39	00000549-0301-000	Pin Enclosure	1

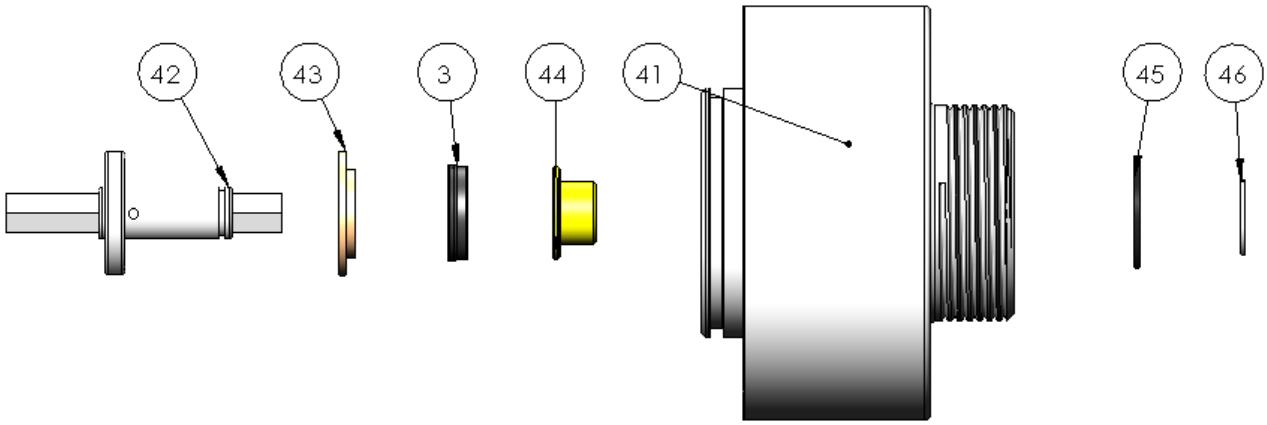
ITEM	PART	DESCRIPTION	QTY
40	00001923-0301-000	Lower Pin Spacer	1
41	00001074-0301-000	Upper Body	1
42	00001075-0301-000	Stem	1
43	00000005-0301-000	Stem Rub Washer	1
44	00001076-0301-000	Stem Bushing	1
45	00000272-0301-000	Clip Washer	1
46	00000273-0301-000	Stem Clip	1
47	00001927-0301-000	Upper Piston Coil Spring	1
48	00000516-0401-000	Jet Assy	1
49	00002091-0301-000	Lower Piston Spacer	1

END OF SECTION

1.08 CUT-AWAY VIEW: Sub-Assembly – Upper Body



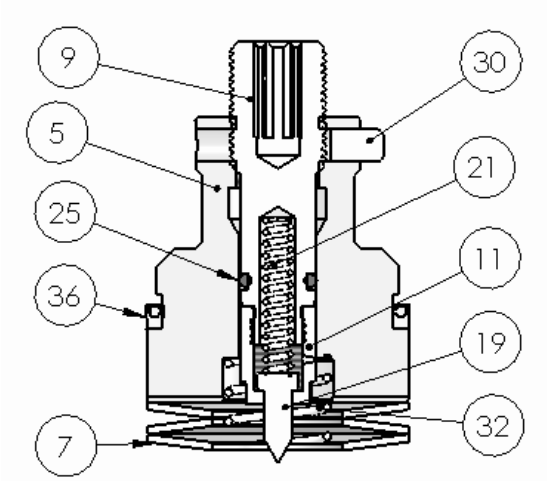
1.08a EXPLODED VIEW: Sub-Assembly – Upper Body



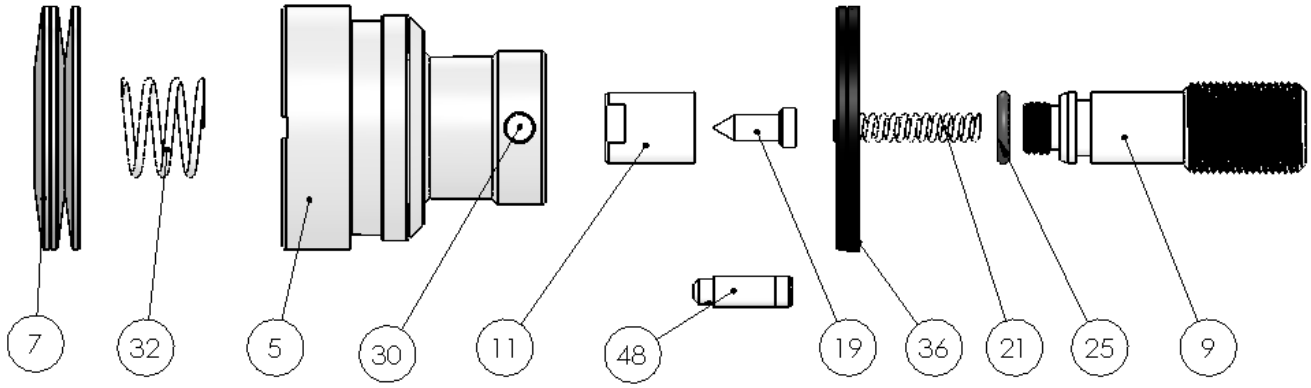
1.08b BOM: Sub-Assembly – Upper Body

ITEM	PART	DESCRIPTION	QTY
3	00000009-0301-000	Stem Cup Seal	1
41	00001074-0301-000	Upper Body	1
42	00001075-0301-000	Stem	1
43	00000005-0301-000	Stem Rub Washer	1
44	00001076-0301-000	Stem Bushing	1
45	00000272-0301-000	Clip Washer	1
46	00000273-0301-000	Stem Clip	1

1.09 CUT-AWAY VIEW: Sub-Assembly – Upper Piston



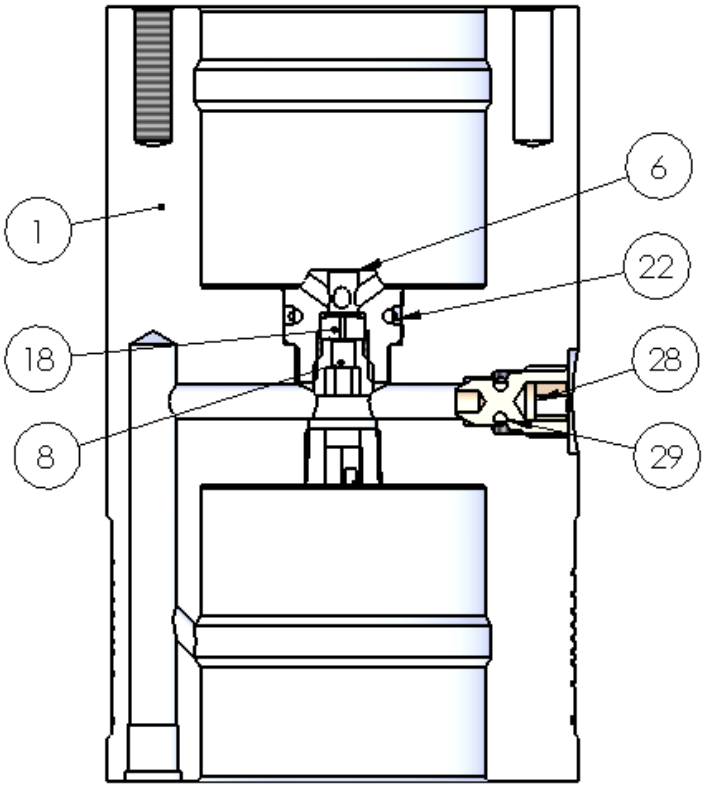
1.09a EXPLODED VIEW: Sub-Assembly – Upper Piston



1.09b BOM: Sub-Assembly – Upper Piston

ITEM	PART	DESCRIPTION	QTY
5	00000132-0301-XXX	Upper Piston	1
7	00001600-1500-045-00-0755	Belleville Spring	3
9	00000136-0301-001	Slider	1
11	00000137-0301-000	Pin Retainer	1
19	00000054-0301-XXX	Pin	1
21	00000138-0301-000	Upper Pin Spring	1
25	00001555-2011-104	Upper Slider O-Ring	1
30	00000135-0301-000	Anti-Rotate Pin	1
32	00000149-0301-000	Piston Coil Spring	1
36	00000146-0301-002	Piston Cup Seal	1
48	00000516-0401-000	AM-JET Assy	1

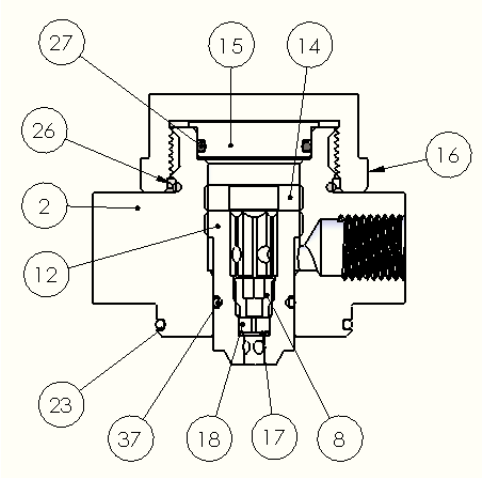
1.10 CUT-AWAY VIEW: Sub-Assembly – Center Body



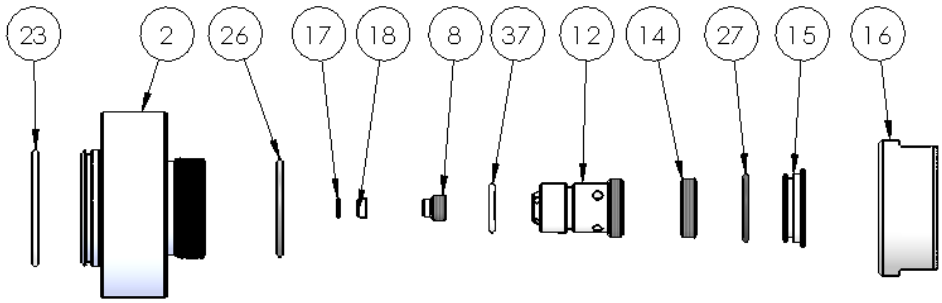
1.10a BOM: Sub-Assembly – Center Body

ITEM	PART	DESCRIPTION	QTY
1	00000123-0301-001	Center Body	1
6	00000083-0301-001	Upper Seat Holder	1
8	00000094-0301-001	Seat Retainer	1
18	00000093-0301-XXX	Seat	1
22	00001555-2013-003	Upper Seat Holder O-Ring	1
28	00000118-0301-000	Port Access Plug	2
29	00001555-2006-003	Port Access Plug O-Ring	2

1.11 CUT-AWAY VIEW: Sub-Assembly – Outlet Body



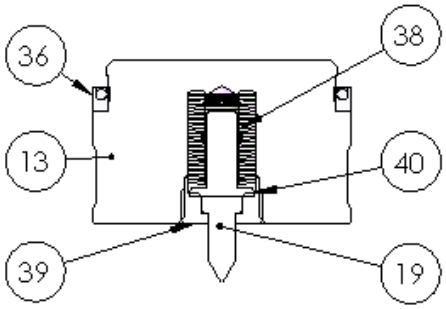
1.11a EXPLODED VIEW: Sub-Assembly – Outlet Body



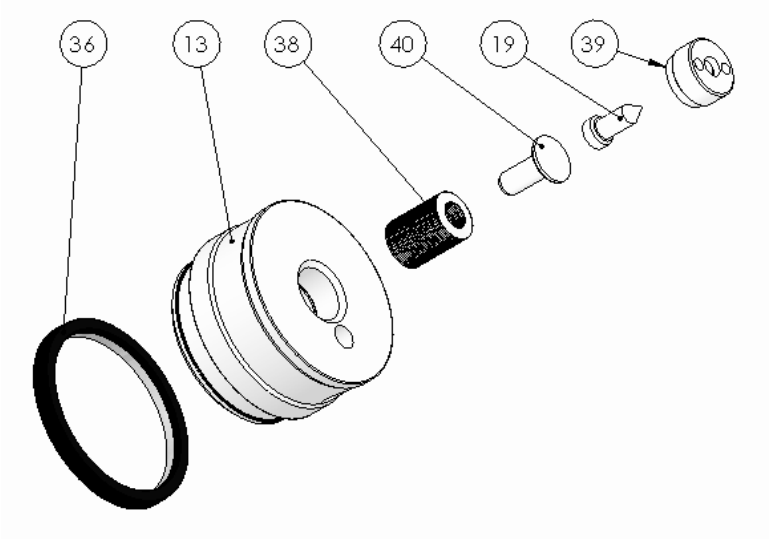
1.11b BOM: Sub-Assembly – Outlet Body

ITEM	PART	DESCRIPTION	QTY
2	00000125-0301-001	Outlet Body	1
8	00000094-0301-001	Seat Retainer	1
12	00000142-0301-000	Lower Seat Holder	1
14	00000153-0301-000	LSH Lock	1
15	00000144-0301-000	Access Plug	1
16	00000145-0301-000	Cap Closure	1
17	00000092-0301-002	Seat Seal	1
18	00000093-0301-XXX	Seat	1
23	00001555-2028-103	Body O-Rings	1
26	00001555-2024-000	Cap Closure O-Ring	1
27	00001555-2018-103	Plug Access O-Ring	1
37	00001555-2014-003	Lower Seat Holder O-Ring	1
	00001555-2013-003	Lower Seat Holder Guide	1

1.12 CUT-AWAY VIEW: Sub-Assembly – Lower Piston



1.12a EXPLODED VIEW: Sub-Assembly – Lower Piston

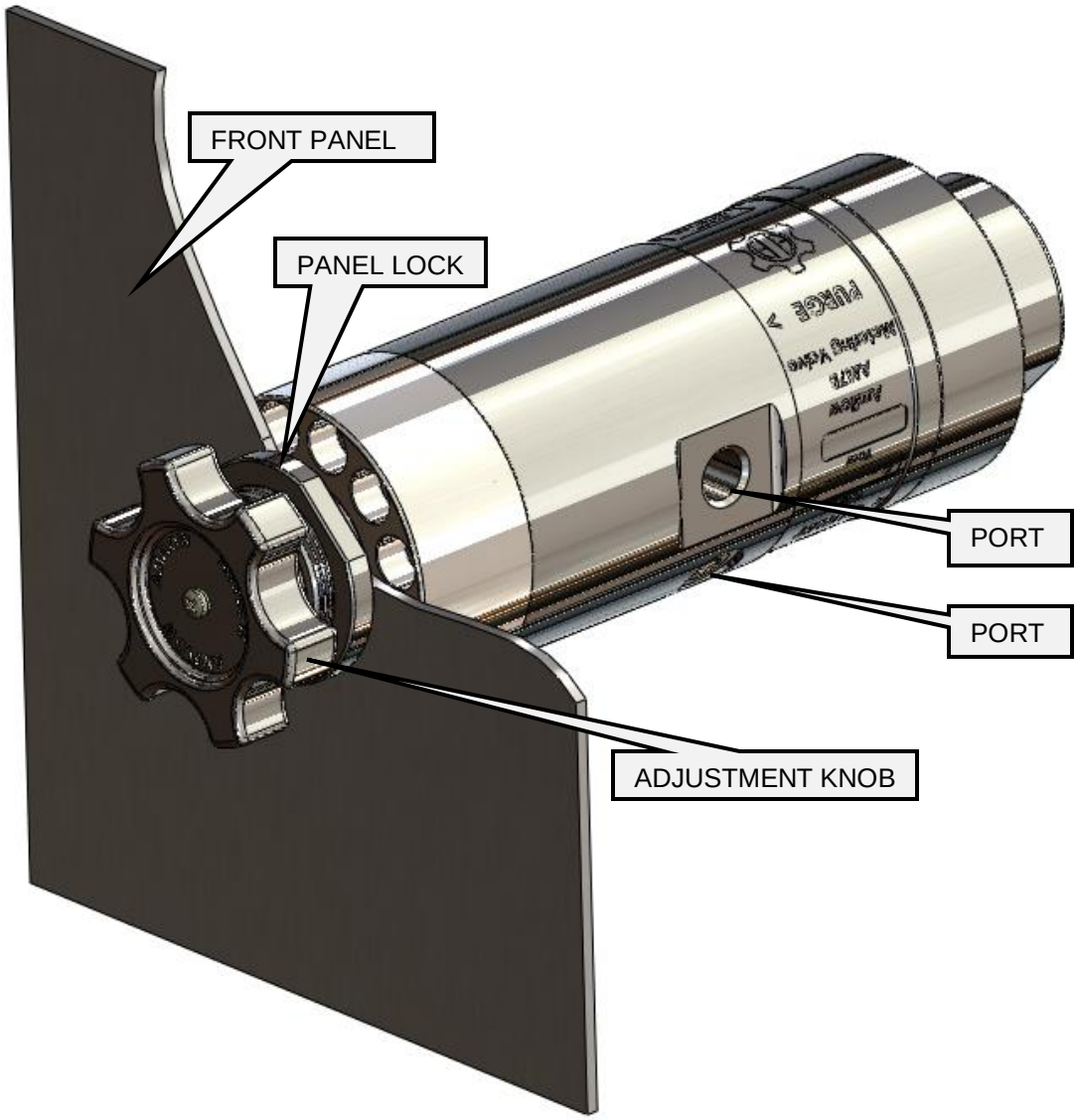


1.12b BOM: Sub-Assembly – Lower Piston

ITEM	PART	DESCRIPTION	QTY
13	00000140-0301-000	Lower Piston	1
19	00000054-0301-XXX	Pin	1
36	00000146-0301-002	Piston Cup Seal	1
38	00001997-0301-000	Lower Piston Spring	1
39	00000549-0301-000	Pin Enclosure	1
40	00001923-0301-000	Lower Pin Spacer	1

END OF SECTION

1.13 CUT-AWAY VIEW: Panel Mount



NOTE

Outlet port may be rotated 180°.
Please notify A&H Enterprises at time purchase order is placed.

1.13a PANEL MOUNT: Cut-out Dimensions

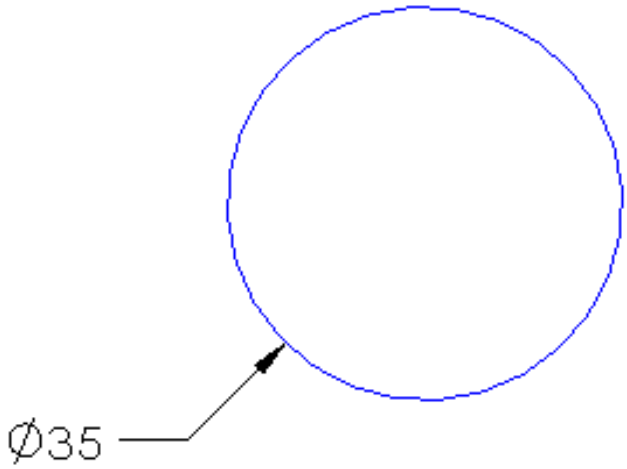


DIAGRAM 1: AM7B Mounting Panel Opening

END OF SECTION

SECTION 2: VALVE INSTALLATION

2.01 INSTALLATION PROCEDURE

ADJUSTMENT HANDLE		
10	00000015-0301-000	Panel Lock
34	00000122-0301-000	Adjustment Knob
35	00001500-7103-010-00	M3 x 10 SHCS

Step 1

- Remove ADJUSTMENT KNOB (Item 34) from valve by unscrewing M3 X 10 PHILLIPS SCREW (Item 35) and LOCK-WASHER (Item 33) located in center of ADJUSTMENT KNOB (Item 34).

Step 2

- Unscrew PANEL LOCK (Item 10) from threaded neck on UPPER BODY (Item 41).

Step 3

- Insert valve into prepared hole on mounting panel.

Step 4

- Replace PANEL LOCK (Item 10) and ADJUSTMENT KNOB (Item 34).

2.02 ⚠ INSTALLATION PRECAUTIONS

Good system design is critical to the optimum operation of the ***Amflow®*** Valves. At a minimum, the design should include:

- Isolation valves located near inlet and outlet ports of the ***Amflow®*** Valve. (The outlet isolation valve is normally a three-way valve that can be incorporated into the calibration loop.)

⚠ **IMPORTANT:** The importance of proper media filtering cannot be overstated. It is **strongly** recommended that filters be placed on both the suction side and the pressure side of pump. It is not unusual to have individual filters inline for each valve. The recommended micron size of the high-pressure filter is somewhat dependent on the specific configuration of any given ***Amflow®*** Valve. However, a 50-micron filter size is generally adequate for most applications.

- The system design should take into consideration that materials which come into contact with the injected media should not contribute to foreign matter entering into the system. This means it is unwise to use material that can be easily corroded, such as mild steels.

- A check valve located on the outlet side of each ***Amflow®*** Valve is strongly recommended. There are a number of reasons for this:
  - The first and most obvious is for safety considerations.
  - The second is to prevent a massive backflow through the ***Amflow®*** Valve.

This backflow can occur if there is a pump failure or some other system failure that would cause a loss of positive pressure across the ***Amflow®*** Valve. The ***Amflow®*** Valve is designed to accommodate some backflow conditions; ⚠ however, piston seal damage can occur if backflow is excessive. The seal is designed to fail under certain conditions in order to prevent damage that is more serious to the valve.

END OF SECTION

SECTION 3: START-UP PROCEDURE

3.01 START-UP PROCEDURE

Step 1

- Open ADJUSTMENT KNOB (Item 34) counter-clockwise to a soft "Stop".
  - ➢ Then, turn one (1) revolution clockwise.

Step 2

- Close Inlet Isolation valve of each valve in system.

Step 3

- Start pump and adjust system pressure to accommodate pressure requirements.
- Apply pressure very slowly upon initial valve start-up.

IMPORTANT
This is especially important for valves configured to flow less than 5 lph.

PROCEED with CAUTION
This is very important, especially at high system pressures, to prevent potential damage to seals and other internal components of valve.

Step 4

- VERY SLOWLY open Outlet Isolation Valve.

Step 5

- VERY SLOWLY open Inlet Isolation Valve. This allows fluid to be introduced gradually.
  - ➢ Once ***Amflow***® Valve is filled with fluid there is little risk of damage.

Step 6

- Allow sufficient time for media to flush any trapped air out of valve.

IMPORTANT
On valves that are configured to meter less that 10 lph, it is very important that at least 20 minutes be allowed for this step. Trapped air can cause the set flow rate of valve to diminish slowly.

Step 7

- Once all air is eliminated, bring system up to operating pressure

Step 8

- Turn valve ADJUSTMENT HANDLE (Item 34) to ensure that it turns easily.

END OF SECTION

SECTION 4: OPERATION

A constant flow rate is controlled by maintaining a constant differential pressure across a fixed jet located within the UPPER PISTON (Item 5).

In simple terms, the pressure on inlet side of UPPER PISTON (Item 5) is offset by pressure on the outlet side of UPPER PISTON (Item 5) combined with the force of BELLEVILLE SPRINGS (Item 7). The force added by BELLEVILLE SPRINGS (Item 7) is controlled by moving the SLIDER (Item 9) relative to the UPPER PISTON (Item 5) which has the effect of changing the location of the PIN (Item 19) relative to the UPPER SEAT (Item 18).

The following seals keep the process liquid pressure from escaping into the atmosphere:

ATMOSPHERIC SEALS:

- STEM CUP SEAL (Item 3) seals between STEM (Item 42) and UPPER BODY (Item 41).
- BODY O'RING (Item 23) seals between UPPER BODY (Item 41) and CENTER BODY (Item 1).
- BODY O'RING (Item 23) seals between CENTER BODY(Item 1) and OUTLET BODY (Item 2).
- PLUG ACCESS O'RING (Item 27) seals between OUTLET BODY (Item 2) and ACCESS PLUG (Item 15).

INTERNAL SEALS:

- PISTON CUP SEAL (Item 36) seals between UPPER PISTON (Item 5) and CENTER BODY (Item 1).
- UPPER SLIDER O'RING (Item 25) seals between UPPER PISTON (Item 5) and SLIDER (Item 9).
- UPPER SEAT HOLDER O'RING (Item 22) seals between CENTER BODY (Item 1) and UPPER SEAT HOLDER (Item 6).
- SEAT SEAL (Item 17) seals between UPPER SEAT HOLDER (Item 6) and UPPER SEAT (Item 18).
- PISTON CUP SEAL (Item 36) seals between LOWER PISTON (Item 13) and CENTER BODY (Item 1).
- SEAT SEAL (Item 17) seals between LOWER SEAT (Item 18) and LOWER SEAT HOLDER (Item 12).
- LOWER SEAT HOLDER O'RING (Item 37) seals between OUTLET BODY (Item 2) and LOWER SEAT HOLDER (Item 12).

IMPORTANT

When replacing any seal, the compatibility with fluid to be metered by valve must be considered.
It is strongly recommend using FFKM material.

Please consult manufacturer for further assistance.

END OF SECTION

SECTION 5: MAINTENANCE

BEFORE CARRYING OUT NEXT ACTIONS

1. Close down system or isolate valve to be removed.
2. Vent all pressure.

5.01 VALVE REMOVAL FROM SYSTEM

Step 1

- Disconnect tubing from Inlet and Outlet Ports.

Step 2

- Remove M3 X 10 PHILLIPS SCREW (Item 35) in center of ADJUSTMENT KNOB (Item 34).

Step 3

- Remove ADJUSTMENT KNOB (Item 34).

Step 4

- Loosen PANEL LOCK (Item 10) which holds valve to panel.

END OF SECTION

5.02 OPENING PROCEDURE: Valve

Once valve is removed from system:

Step 1

- Loosen ten (10) M6 X 25 SHCS (Item 4) which join UPPER BODY (Item 41) to CENTER BODY (Item 1).

Step 2

- Carefully pull apart UPPER BODY (Item 41) from CENTER BODY (Item 1).

Step 3

- Set aside UPPER BODY (Item 41).

Step 4

- Holding CENTER BODY (Item 1) upright; remove UPPER PISTON (Item 5).
  - ➢ It should slide apart easily.

Step 5

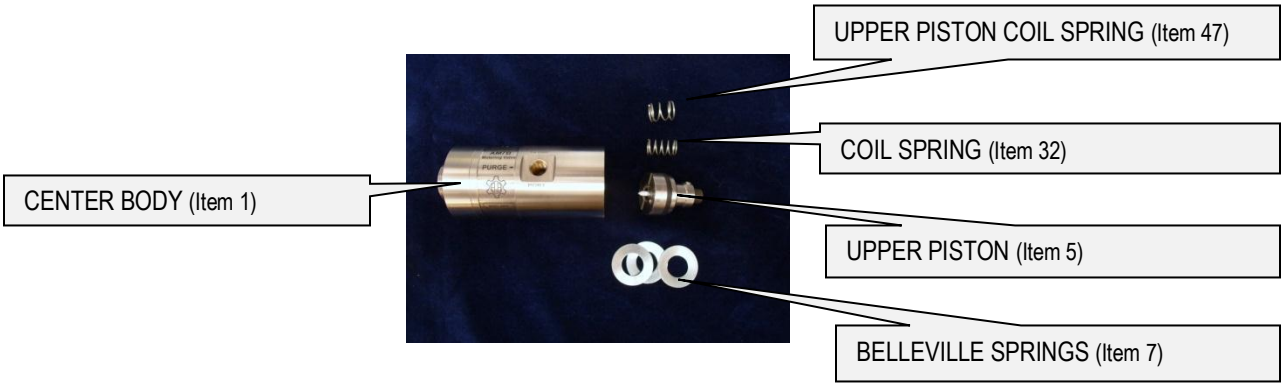
- Set aside UPPER PISTON (Item 5).

5.02 OPENING PROCEDURE: Valve, continued

Step 6

- Invert CENTER BODY (Item 1) and remove BELLEVILLE SPRINGS (Item 7).

CENTER BODY		
1	00000123-0301-001	Center Body
5	00000132-0301-XXX	Upper Piston
7	00001600-1500-045-00-0755	Belleville Spring
32	00000149-0301-000	Piston Coil Spring
47	00001927-0301-000	Upper Piston Coil Spring
➢ **Also, Ref. Section. 1.10**		



END OF SECTION

SECTION 6: REPLACEMENTS

6.01 REPLACEMENT: Upper Seat

Step 1

- Using 5mm hex wrench, remove 1/8 NPT PLUG (Item 24) located in seat access port of CENTER BODY (Item 1). Ref. PICTURE 1 & 2

PICTURE 1

PICTURE 2

NOTE
Ref. Section 1.10 for parts incorporated into CENTER BODY (Item 41).

Step 2

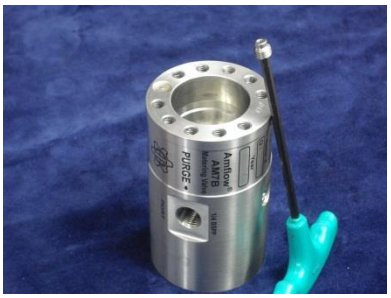
- Using 4 mm hex wrench, remove SEAT RETAINER (Item 8). Ref. PICTURE 3

Step 3

- Remove UPPER SEAT (Item 18) and remnants of SEAT SEAL (Item 17).

Step 4

- Remove SEAT SEAL (Item 17) with sharp metal pick.



PICTURE 3

NOTE
Use Service Removable Loctite® when reinstalling SEAT RETAINER (Item 8).

Step 5

- When reinstalling UPPER SEAT (Item 18) note that one edge is chamfered.

IMPORTANT
Step 5

It is important that the chamfered edge of UPPER SEAT (Item 18) be located so that the SEAT SEAL (Item 17) will be crushed into the space between chamfer and counter-bore in UPPER SEAT HOLDER (Item 6).

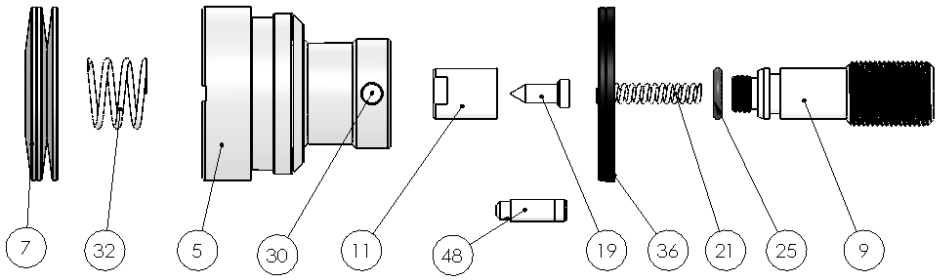
When UPPER SEAT (Item 18) has been installed, it is necessary to remove any SEAT SEAL (Item 17) that has been extruded into the fluid passageway. This can be accomplished by using a sharp metal pick.

The SEAT SEAL (Item 17) must be replaced **each time** a SEAT (Item 18) is removed as it is designed to be crushed when a SEAT (Item 18) is installed.

END OF SECTION

6.02 REPLACEMENT: Upper Pin

UPPER PISTON			
ITEM	PART	DESCRIPTION	QTY
5	00000132-0301-XXX	Upper Piston	1
7	00001600-1500-045-00-0755	Belleville Spring	3
9	00000136-0301-001	Slider	1
11	00000137-0301-000	Pin Retainer	1
19	00000054-0301-XXX	Pin	1
21	00000138-0301-000	Upper Pin Spring	1
25	00001555-2011-104	Upper Slider O-Ring	1
30	00000135-0301-000	Anti-Rotate Pin	1
32	00000149-0301-000	Piston Coil Spring	1
36	00000146-0301-002	Piston Cup Seal	1
48	00000516-0401-000	AM-JET Assy	1
➢ **Also, Ref. Section 1.09**			



Step 1

- Using a 6 mm hex wrench, unscrew and remove SLIDER (Item 9) from UPPER PISTON (Item 5).

Step 2

- Once threads of SLIDER (Item 9) are disengaged from UPPER PISTON (Item 5) remove SLIDER (Item 9).
  - ➢ There will be some friction from SLIDER O'RING (Item 25).

6.02 REPLACEMENT: Upper Pin, continued

Step 3

- Using a 6 mm hex wrench, unscrew SLIDER (Item 9) from PIN RETAINER (Item 11).
  - (Threads are right hand.)

Step 4

- Remove PIN (Item 19) and UPPER SPRING PIN (Item 21).

NOTE

1. When assembling PIN RETAINER (Item 11) to SLIDER (Item 9) use Service Removable Loctite® for small threads.

2. Recommend that the SLIDER O'RING (Item 25) be replaced at this time.
   - Reference instructions for replacement or service of SLIDER O'RING (Item 25) in Sec. 6.03

END OF SECTION

6.03 REPLACEMENT: Slider O'Ring

Step 1

- Using a pick, remove old SLIDER O'RING (Item 25) from SLIDER (Item 9).
  - Put on new O'RING (Item 25).

CAUTION

In order that SLIDER O'RING (Item 25) is not twisted, carefully put pick between SLIDER O'RING (Item 25) and SLIDER (Item 9).

Step 2

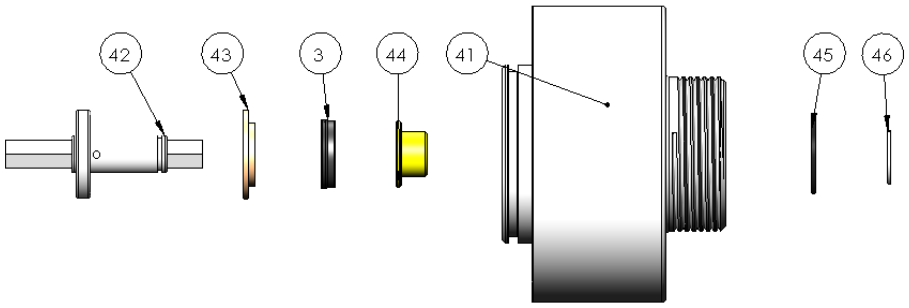
- Use a circular motion around inside diameter of SLIDER (Item 9) with pick; this will help smooth out SLIDER O'RING (Item 25).

END OF SECTION

6.04 REPLACEMENT: Stem Cup Seal

⚠CAUTION
Use care not to damage sealing surface on UPPER BODY (Item 41)
OR
seal groove for Upper Body STEM CUP SEAL (Item 3)

UPPER BODY			
ITEM	**PART**	**DESCRIPTION**	**QTY**
5	00000132-0301-XXX	Upper Piston	1
7	00001600-1500-045-00-0755	Belleville Spring	3
9	00000136-0301-001	Slider	1
11	00000137-0301-000	Pin Retainer	1
19	00000054-0301-XXX	Pin	1
21	00000138-0301-000	Upper Pin Spring	1
25	00001555-2011-104	Upper Slider O-Ring	1
30	00000135-0301-000	Anti-Rotate Pin	1
32	00000149-0301-000	Piston Coil Spring	1
36	00000146-0301-002	Piston Cup Seal	1
48	00000516-0401-000	AM-JET Assy	1
➢ **Also, Ref. Section 1.08**			



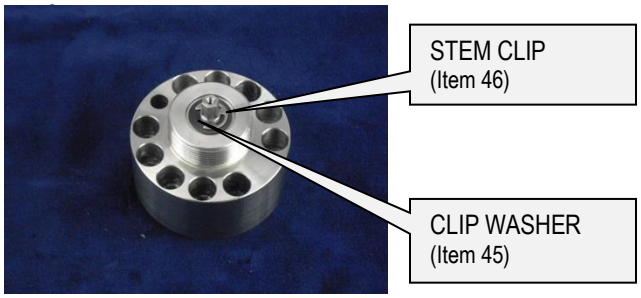
Step 1

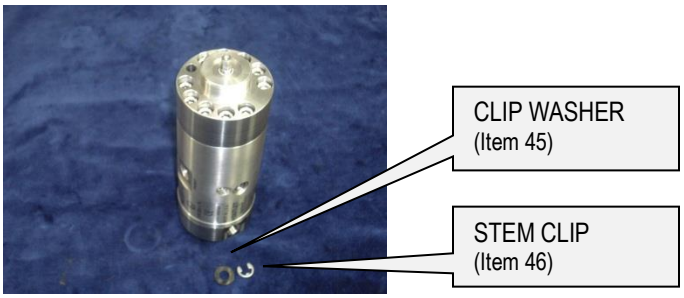
- Unscrew M3 X 10 SETSCREW (Item 35).
  - ➢ Remove M3 LOCKWASHER (Item 33), ADJUSTMENT KNOB (Item 34) and PANEL LOCK (Item 10).

6.04 REPLACEMENT: Stem Cup Seal, continued

Step 2

- Remove STEM CLIP (Item 46) and CLIP WASHER (Item 45) from STEM (Item 42).





Step 3

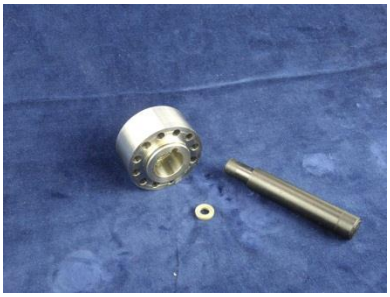
- Slide STEM (Item 42) free.

Step 4

- Using a wood or plastic pick, push STEM CUP SEAL (Item 3) out of UPPER BODY (Item 41).

Step 5

- Push STEM CUP SEAL (Item 3) into place **after** STEM (Item 42) is re-installed.



NOTE
To guarantee that STEM CUP SEAL (Item 3) is properly installed use special Cup Seal Tool (Part 00000009-1010-000) (Ref. Appendix A).

Step 6

- Recommend that BODY O–RING (Item 23) be replaced at this time.

CAUTION
When removing and/or replacing BODY O'RING (Item 23) take care to not damage seal groove of UPPER BODY (Item 41).

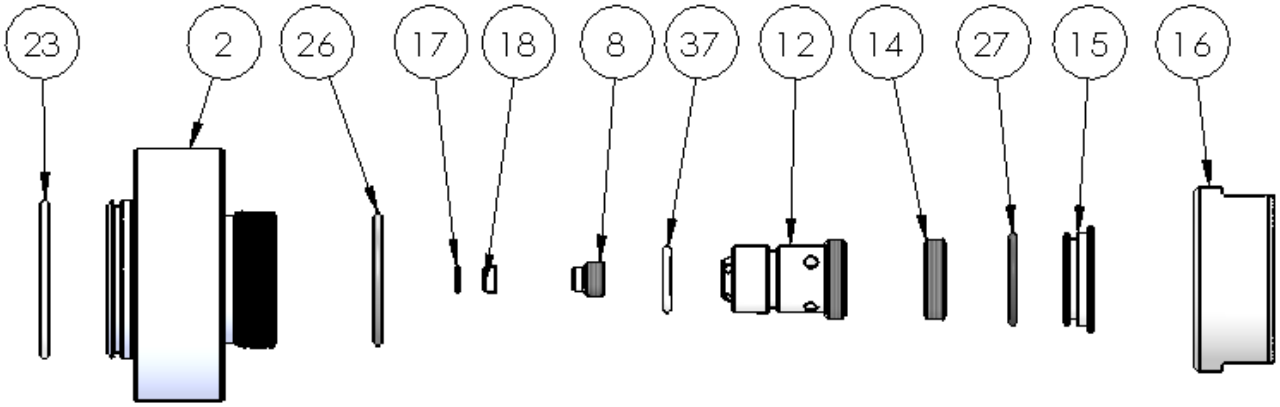
Step 7

- Re-assemble.

END OF SECTION

WARNING

REMOVAL OF LOWER SEAT HOLDER FROM VALVE WILL CAUSE LOSS OF CALIBRATION
AND
THE VALVE WILL NOT FUNCTION PROPERLY UNLESS RE-CALIBRATED BY FACTORY TRAINED PERSONNEL.

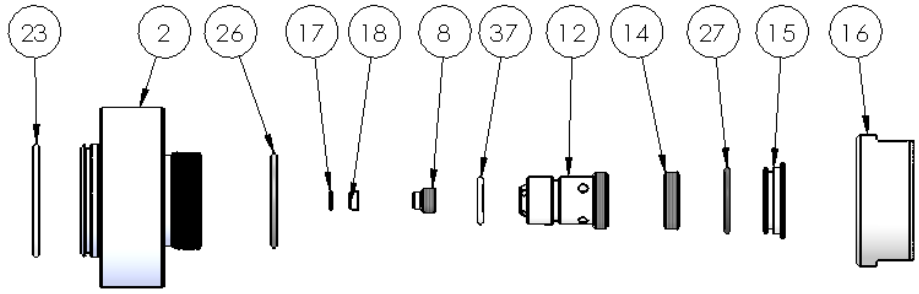


Lower seat removal by non-factory trained personnel will void any implied or stated warranty.

6.05 REPLACEMENT: Lower Seat Holder and/or Lower Seat Holder O'Ring

CAUTION
Use care NOT to scratch interior surface of LOWER SEAT HOLDER (Item 12) as this will cause valve to become inoperable.

OUTLET BODY			
ITEM	PART	DESCRIPTION	QTY
2	00000125-0301-001	Outlet Body	1
8	00000094-0301-001	Seat Retainer	1
12	00000142-0301-000	Lower Seat Holder	1
14	00000153-0301-000	LSH Lock	1
15	00000144-0301-000	Access Plug	1
16	00000145-0301-000	Cap Closure	1
17	00000092-0301-002	Seat Seal	1
18	00000093-0301-XXX	Seat	1
23	00001555-2028-103	Body O-Rings	1
26	00001555-2024-000	Cap Closure O-Ring	1
27	00001555-2018-103	Plug Access O-Ring	1
37	00001555-2014-003	Lower Seat Holder O-Ring	1
	00001555-2013-003	Lower Seat Holder Guide	1
➢ **Also, Ref. Section 1.11**			



Step 1

- To seperate OUTLET BODY (Item 2) from CENTER BODY (Item 1), remove ten (10) M6x25 SHCS (Item 4) using a 5 mm T-handle hex key.

6.05 REPLACEMENT: Lower Seat Holder and/or Lower Seat Holder O'Ring, continued

Step 2

- Using calibers, measure height from top of LOWER SEAT HOLDER (Item 12) to top of OUTLET BODY (Item 2).

NOTE
If available, a depth micrometer is more accurate and easier to use rather than calibers especially when re-assembling.

Step 3

- Using an 8 mm (or 5/16") T-handle hex key; thread LOWER SEAT HOLDER (Item 12) out of OUTLET BODY (Item 2) as shown below.

Step 4

- Remove and replace LOWER SEAT HOLDER O'RING (Item 37).

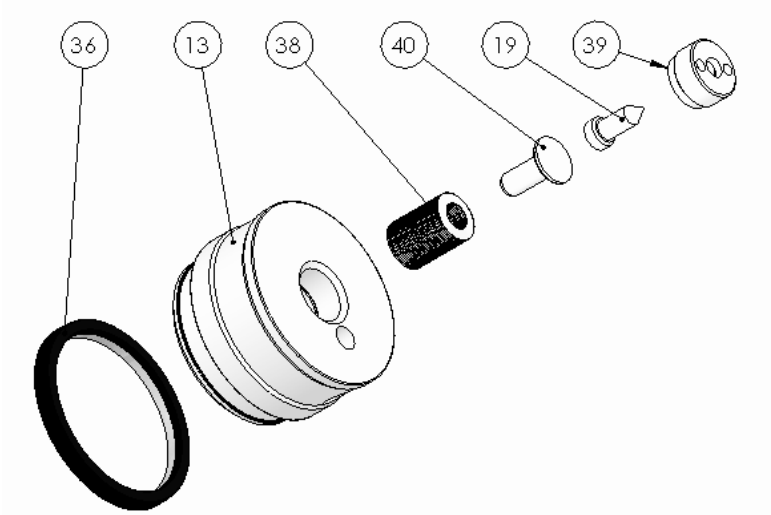
Step 5

- Re-assemble.
  - Use calibers (or depth micrometer) to ensure that LOWER SEAT HOLDER (Item 12) is at original height as measured in Step 2.

END OF SECTION

6.06 REPLACEMENT: Lower Piston Pin

LOWER PISTON			
ITEM	PART	DESCRIPTION	QTY
13	00000140-0301-000	Lower Piston	1
19	00000054-0301-XXX	Pin	1
36	00000146-0301-002	Piston Cup Seal	1
38	00001997-0301-000	Lower Piston Spring	1
39	00000549-0301-000	Pin Enclosure	1
40	00001923-0301-000	Lower Pin Spacer	1
➢ **Also, Ref. Section 1.12**			



Step 1

- The LOWER PIN (Item 20), located in the LOWER PISTON (Item 13), is accessed by removing PIN ENCLOSURE (Item 39).

Step 2

- Placing the Lower Piston Tool (Part 00000549-1012-000) (Ref. Appendix A) into the fluid port on side of LOWER PISTON (Item 13) will prevent rotation.

Ref. PICTURE 1 & 2

PICTURE 1

PICTURE 2

END OF SECTION

SECTION 7: RE-ASSEMBLY

7.01 VALVE RE-ASSEMBLY: Upper Body

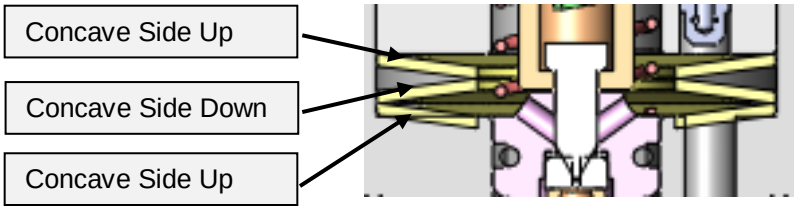
In general, to reassemble valve simply reverse order of disassembly.

- ***HOWEVER***, special attention should be taken in following area(s):

Step 1

CAUTION
Incorrect order of springs will cause valve to perform poorly.

- Ensure UPPER BELLEVILLE SPRING (Item 7) stack assembly is properly positioned within CENTER BODY (Item 1). Ref. PICTURE1
  - There are a total of three (3) springs.
  - Order of UPPER BELLEVILLE SPRINGS (Item 7) should be stacked concave to concave.



NOTE
Placement of springs

PICTURE 1

Step 2

- Attach UPPER BODY (Item 41) to CENTER BODY (Item 1).
  - These must be assembled so they remain in cylindrical alignment.

Failure to observe caution here can cause permanent damage.

Step 3

- **CAUTION:** Several items must be in proper alignment to not damage any components:
  - SLIDER (Item 9) and UPPER PISTON (Item 5) screw together so they are in middle of travel range.
  - ANTI-ROTATE PIN (Item 30) aligned with groove in UPPER BODY (Item 41).
  - STEM (Item 42) aligned with hexed slot in SLIDER (Item 9).
    This is accomplished by temporarily attaching ADJUSTMENT KNOB (Item 34) to STEM (Item 42) and rotating until stem hex and slider hex slip together.

7.01 VALVE RE-ASSEMBLY: Upper Body, continued

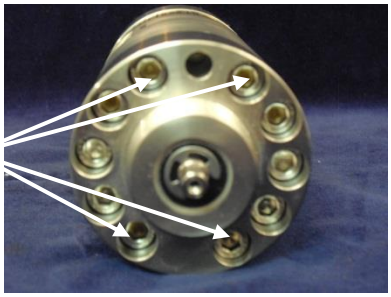
Step 4

Failure to observe caution here can cause permanent damage.

- Slightly cross tighten ten (10) M6 X 25 SHCS (Item 4), beginning with four as shown below.

IMPORTANT
This is very important in order to prevent binding.

Start-up screws for cross tightening.



- Once cross tightened, tighten all ten (10) M6x25 SHCS (Item 4) to a torque setting of 120 inch lbs. (13.6N.m).

END OF SECTION

7.02 VALVE RE-ASSEMBLY: Outlet Body

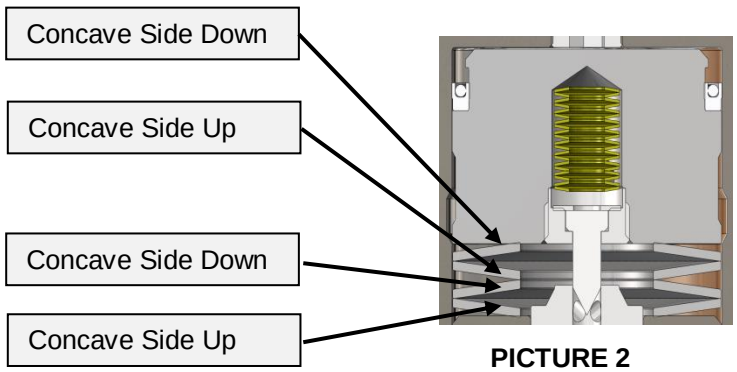
Step 1

- When re-assembling OUTLET BODY (Item 2) to CENTER BODY (Item 1):
  - Care must be taken to not damage PIN (Item 19).
  - The two body sections must be positioned square to each other in order to not bind PIN (Item 19) and LOWER SEAT HOLDER (Item 12).

Step 2

CAUTION
Incorrect order of springs will cause valve to perform poorly.

- Order of LOWER BELLEVILLE SPRINGS (Item 7) should be stacked concave to concave. Ref. PICTURE 2
  - There are a total of four (4) springs.



PICTURE 2

NOTE
Placement of springs.

Step 3

Failure to observe caution here can cause permanent damage.

- Slightly cross tighten ten (10) M6 X 20 SHCS (Item 31), beginning with four as shown below.

IMPORTANT
This is very important in order to prevent binding.

Start-up screws for cross tightening.

- Once cross tightened, tighten all ten (10) M6x20 SHCS (Item 31) to a torque setting of 120 inch lbs. (13.6N.m).

END OF SECTION

SECTION 8: TROUBLESHOOTING

There are a variety of reasons that can cause ***Amflow®*** Valves to perform poorly or not work. Listed below are those most commonly encountered:

a. Springs installed incorrectly
b. Defective Upper Piston Seal
c. Defective Lower Piston Seal
d. Defective Slider Seal
e. Plugged Orifice
f. Clogged Filter
g. Isolation Valve in wrong position
h. Check Valve failure
i. Viscosity of Media too high
j. Defective Upper Seat Seal
k. Differential Pressure across valve set improperly
l. Trapped air
m. Upper Pin broken
n. Lower Pin broken

PROBLEM	PROBABLE CAUSE
No flow though valve	e, f, g, h, m
Flow rate will not stabilize	a, b, c, d, j, k, l, n
Adjustment Knob feels “rough” when turned	j
Maximum flow rate not achievable	a, e, f, i
Slow drift downwards in flow rate	b, d, l, n

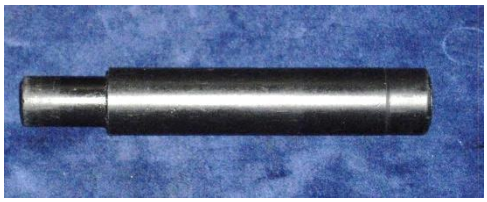
ADDITIONAL COMMENTS

NO FLOW -OR- REDUCED FLOW FROM VALVE	CORRECTIVE ACTION
DEBRIS IN JET ORIFICE	➢ Remove **UPPER PISTON SUB-ASSEMBLY**. • Check for visual debris. ➢ Clear any visual debris. • Use compressed air to clear any debris in **JET ASSEMBLY**. ➢ If problem persists, • Replace **UPPER PISTON SUB-ASSEMBLY** (PART: 00000549).
BROKEN UPPER SLIDER PIN	Replace **UPPER SLIDER PIN** (PART: 00000054).
BROKEN LOWER PISTON PIN	Replace **LOWER PISTON PIN** (PART: 00000054).
DEBRIS BLOCKING UPPER SEAT	To clear **UPPER SEAT** debris or physically remove debris, ➢ use **PURGE PORT** to clear debris.
DEBRIS BLOCKING LOWER SEAT	Physically remove debris.
***NOTE:** A complete dis-assembly of VALVE and flushing out of all passageways may be required to clear debris.	

FLOW RATE FLUCTUATION	CORRECTIVE ACTION
CHIPPED LOWER SEAT	Replace **LOWER SEAT** and **LOWER SEAT SEAL**: **LOWER SEAT** (PART: 00000093). **SEAT SEAL** (PART: 00000092).
CHIPPED LOWER PISTON PIN	Replace **LOWER PISTON PIN** (PART: 00000054).
TRAPPED AIR IN SYSTEM	Clear trapped air by; ➢ use **PURGE PORT** to clear and/or ➢ run **VALVE** fully open for a few minutes to clear remaining air in **VALVE**.
DEFECTIVE UPPER SLIDER O-RING	Visually inspect UPPER SLIDER O-RING for damage. ➢ If damaged; replace **UPPER SLIDER O-RING** (PART: 00001555-2011).
ADJUSTMENT HANDLE TURNS ROUGHLY	**CORRECTIVE ACTION**
DEFECTIVE UPPER PISTON CUP SEAL	Visually inspect **UPPER PISTON CUP SEAL** for damage. ➢ If damaged; replace **UPPER PISTON CUP SEAT** (PART: 00000146-0301-002).
DEFECTIVE UPPER SLIDER O-RING	Visually inspect **UPPER SLIDER O-RING** for damage. If damaged; replace **UPPER SLIDER O-RING** (PART: 00001555-2011).

END OF SECTION

APPENDIX A
AMFLOW® TOOLS



Part : 00000009-1010-000
CUP SEAL TOOL
Used to assemble Stem Cup Seal & Center Body

Part : 00000549-1012-000
LOWER PISTON TOOL
Used to change Pin or Lower Piston Spring

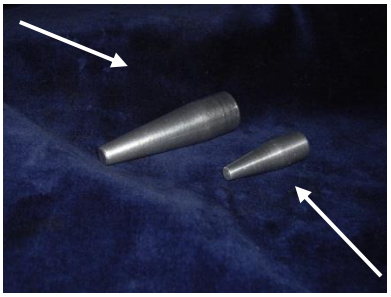
Part : 00000171-1010-000
SEAT HOLDER SEAL TOOL
Used to insert O'Rings on Upper and Lower Seat Holders

Part : 00000212-1012-000
STEM INSERTION TOOL
Used to install and remove stem and seat assemblies

Part : 00000153-1012-000
LSH LOCK TOOL
Used to install LSH Lock in Outlet Body

Part : 00000142-1113-000
DIFFERENTIAL ADJUSTING TOOL
Used to adjust low-end differential pressure

Part : 00000171-1010-000
SEAT HOLDER SEAL TOOL



Part : 00000126-1010-000
SLIDER O'RING TOOL

Used to install slider o'rings

AM7 Series and AM20 Valves

Part : 00000126-1010-000
SLIDER O'RING TOOL

NOTE:
Contact manufacturer or manufacturer's representative to purchase specialized tools.

END OF SECTION

STANDARDS

A&H Enterprises designs its products to meet the applicable **ASME,** and **API** standards for valve design and pressure vessels.

Products are also **CE** marked and **ATEX** approved for Hazardous area installations.

MEMBERSHIPS

CERTIFICATIONS

ATEX DIRECTIVE (94/9/EC)

In the interest of safety and quality, A&H Enterprises has certified its ***Amflow®*** series of valves for use in potentially explosive atmospheres as defined by the ATEX Directive (94/9/EC) as Category 2G.

ATEX
CE Ex II 2 G Ex d IIC T3
US PATENTS 5,427,139 * 5,494,070 * 6,189,564,B1 EU PATENT 1110132

To ensure the safety of all parties, the valves must be regularly checked for signs of fluid leaks. Only genuine ***Amflow®*** parts must be installed in accordance with supplied instructions, good engineering, and construction practices. The valve bodies are constructed from 316L and, therefore, must not be used with chemicals which are incompatible with 316L or with the seal materials used. The valves must not be modified in any way from the original purchased valves. The valves must only be operated in the range of pressure and temperature conditions indicated on product data sheet. This equipment is certified for Group 2 Category II. Equipment should not be used in systems requiring a higher level of certification.

LIMITED WARRANTY

Each ***Amflow®*** product is warranted to be free from defects in material and workmanship under normal use and service. The warranty period is three (3) years and begins on the date of original purchase. This warranty extends only to the original buyer and does not apply to any product which, in A & H Enterprises' opinion, has been misused, altered, neglected, contaminated, damaged by accident or abnormal conditions of operation or handling.

At A & H Enterprises' option, the A & H Enterprises' warranty obligation is limited to the replacement or repair of a defective product that is returned to A & H Enterprises within the warranty period. Merchandise returned to A & H Enterprises within the warranty period which, in A & H Enterprises' opinion, is defective by accident, improper operation or improper handling shall be subject to a charge for repair. Merchandise, free from defects, returned to A & H Enterprises shall be subjected to a 20% restocking fee within thirty (30) days of the purchase date. Written authorization is required for all merchandise returned to A & H Enterprises.

To obtain warranty service, contact A & H Enterprises to obtain return authorization information. Then send the product to A & H Enterprises with a description of the difficulty, transportation and insurance prepaid. A & H Enterprises assumes no risk for damage in transit. Following warranty repair, the product will be returned to Buyer, transportation and insurance prepaid. If A & H Enterprises determines that failure was caused by neglect, misuse, contamination, alteration, accident, or abnormal condition of operation or handling, A & H Enterprises will provide an estimate of repair costs and obtain authorization before commencing the work. Following repair, the product will be returned to the Buyer, transportation and insurance prepaid, and the Buyer will be billed for the repairs and the return transportation and insurance charges.

THIS WARRANTY IS BUYER'S SOLE AND EXCLUSIVE REMEDY AND IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OR MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. A & H ENTERPRISES SHALL NOT BE LIABLE FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES OR LOSSES, ARISING FROM ANY CAUSE OR THEORY.

Since some countries or states do not allow limitation of the term of an implied warranty, or exclusion or limitation of incidental or consequential damages, the limitations and exclusions of this warranty may not apply to every buyer. If any provision of the Warranty is held invalid or unenforceable by a court or other decision-maker of competent jurisdiction, such holding will not affect the validity or enforceability of any other provision.

REPRESENTATIVES

AMFLOW® NORGE

Norway, Sweden, Denmark, Netherlands, Germany, U.K., Italy

Prinsens vei 12
4315 Sandnes
Norway

Telephone: +47.922.19.656
Fax: +47.520.00.591
E-mail: leif.egil.pettersen@amflow.no

AMFLOW CONTROLS ASIA SDN. BHD.

Malaysia, Indonesia, Singapore, India, Thailand, Vietnam

No. 1701 Block 1, TTDI ADINA
Jalan Judo 13/45, Seksyen 13
40675 Shah Alam, Selangor
Malaysia

Telephone: (+603) 5523.8418
Mobile: (+6012) 3323.118
E-mail: amflowcontrols@gmail.com

SUDIFLOW INTERGRATED SERVICES, LTD.

Nigeria

25 Elelenwo Road
Port Harcourt,
Nigeria

Telephone: +234.803.309.1405, +705.679.4894
E-mail: sudiflow@yahoo.com