



WARNING: Product contains sever points. Keep hands, fingers, or other appendages away from valve inlet or outlet ports during transportation, installation and maintenance.



WARNING: Product contains pinch points between the handle and handle plate. Keep hands and fingers clear.



WARNING: These products contain a chemical known to the state of California to cause cancer and birth defects or reproductive harm.

WARNING!

Failure to follow these instructions or to properly install and maintain this equipment could result in an explosion and/or fire causing property damage and personal injury or death.

Install, operate and maintain Marshall Excelsior Co. equipment in accordance with federal, state, and local codes and these instructions. The installation in most states must also comply with NFPA standards 54, 58 and 59.

Only personnel trained in the proper procedures, codes, standards and regulations of the LP-Gas industry should install, maintain and service this equipment. Be sure all instructions are read and understood before installation, operation and maintenance. These instructions must be passed along to the end user of the product.

GENERAL WARNING!

Marshall Excelsior products are mechanical devices that are subject to wear, contaminants, corrosion, and aging of components made of materials such as elastomers and metal. Over time these devices will eventually become inoperative. The safe service life of these products will reflect the environment and conditions of use that they are subjected to. **REGULAR INSPECTION AND MAINTENANCE IS ESSENTIAL.** Marshall Excelsior products have a long record of quality and service; thus, end users of the equipment may overlook the hazards that can arise from using aging devices that have outlived their safe service life.

Do not attempt to remove the bypass valve until you have bled off the system pressure. On systems with meters, the differential valve will keep liquid under pressure in the pump, meter and piping even when the hose is emptied.

Installation

On liquefied gas systems, a separate bypass valve, piped back to the supply tank is recommended by pump manufactures for maximum pump performance and longer pump life. The bypass valve must be installed in the correct position on the discharge side of the pump. (An arrow cast on the valve body indicates inlet and outlet ports.) The bypass valve will prevent excessive pressure resulting from over-speeding the pump, closing a valve in the discharge system, or pumping product into a highly restrictive receiving system. In general, size the bypass valve and its piping to accommodate the full flow from the pump when the pump's discharge line is closed and the pump is running at its rated maximum speed.

The bypass valve discharge must be piped back to the liquid or vapor section of the supply tank, never to the pump inlet. This method of piping should also be used when pumping liquefied gases from an underground tank or at high vacuum.

NOTICE

Bypass valve with welded connections

The bypass valve contains O-ring seals that will be damaged if welding is done with these O-rings installed.

Prior to welding the piping, remove the O-rings from the inlet and outlet flanges. Without the bypass valve connected to them, weld the inlet and outlet flanges to the piping. Reinstall the inlet and outlet flange O-rings.

1506 George Brown Dr. Marshall, MI 49068
Phone (269) 789-6700 Fax (269) 781-8340
www.marshallexcelsior.com

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NOTICE

At temperatures below -20° F (-28.9° C) materials have reduced impact strength. Provisions should be made to prevent tools and other objects from impacting any pressure containing components of the pumping system.

Valve Installation

When installing the Versa-Fill™ bypass valve follow the Flange installation procedure below. Refer to **(Table 1)** for guidelines on bolt torques and tightening sequences.

- Check flanges, gasket, bolts / studs and nuts for proper material and defects
- Apply a high quality lubricant or anti-seize on bolt / stud threads and nut contact surfaces
- Torque bolts in sequence according to the following increments (refer to chart for recommended torque values)
 1. Snug / hand-tight checking for even gap between flanges
 2. 30% of final torque
 3. 60% of final torque
 4. 100% of final torque
- Check for leaks at maximum working pressure before putting connection into service
- Re-Torque to final recommended torque after 24 hours (due to gasket / bolt relaxation)
- Consider providing additional corrosion protection, such as paint or protective coating, as necessary

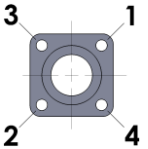
Flange Type		4-Bolt Square Type A / B
Size (Inch)		1-1/4, 1-1/2 & 2
Tightening Sequence		
Bolt / Stud	Size (Inch)	∅ 1/2
	Thread	1/2-13 UNC
	Min. Grade	8
Torque (Ft-Lb)	Lubricated	75(101.7Nm)
	Dry	100(135.6Nm)
Wrench Size	(Inch)	3/4

Table 1: Flange Installation Guide

¹ Threaded flange material and thread engagement with stud must be capable of achieving final torque
² The torque wrench used should have a minimum accuracy of 5% of full scale or 10% of indicated value
³ Xylan coated studs and bolts should be installed to the "Lubricated" torque spec. due to it's low friction

Setting Versa-Fill™ Bypass Pressure

Unless otherwise specified, the Versa-Fill™ bypass valves are **nominally** set at a 125 PSI bypass differential pressure. **Consult your pump manufacture for minimum bypass differential pressure requirements when setting your valve.** For optional spring ranges and configurations, refer to the bypass valve parts list. To check the pump's internal relief valve setting and the external bypass valve setting, follow these steps:

1. Install a pressure gauge equipped with a needle valve (ME831) or snubber (ME202, ME202SS) in the pump discharge gauge port. Install a pressure gauge (MEJ524, MEJ552) on the tank and record the tank pressure.
2. Connect the delivery hose to the receiving tank.
3. Check all valves. The shut-off valve in the pump's discharge line, and the shut-off valve in the bypass return line should be open. Shift the Versa-Fill™ bypass valve into the BY-PASS Mode

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4. Start pumping at the normal rate. Measure the speed of the pump and file in records. Make sure the supply tank outlet valve is fully open and check the direction of shaft rotation to be sure it matches the direction of the arrow on the pump.
5. Check the pressure setting of the pump's internal relief valve (when applicable) with the following procedure:
NOTE: not all pumps have internal relief valves)
6. First, gradually close the shut-off valve in the bypass return line. Then slowly close the shut-off valve in the pump's discharge line while watching the gauge pressure on the discharge side of the pump. Record the peak differential pressure (the difference between the discharge and inlet pressure) when the internal relief valve begins to open.

NOTICE

It is important to read the peak pressure just before the pump relief valve opens. Once the valve is open and recirculation starts, vaporization will cause the pressure to fall quickly. For more information on the relief valve settings and possible adjustments, refer to the pump manufactures IOM.

7. After the relief valve setting has been determined, reopen the shut-off valve in the pump's discharge line and the shut-off valve in the bypass return line. Continue pumping at the normal rate.
8. To check the Versa-Fill™ Bypass Valve setting, gradually close the shutoff valve in the pump's discharge line and record the gauge pressure. The difference between this reading and the tank pressure (before pumping) is the Versa-Fill™ Bypass Valve setting. (A noise is generally detected when the bypass starts to open and as the shutoff valve in the pump's discharge system is close slightly more, the pump discharge pressure will not change.)
9. Reopen the shut-off valve in the pump's discharge line and resume normal pumping operation. Record the discharge gauge pressure. The difference between this reading and the tank pressure (before pumping) is the normal system operating pressure. The Versa-Fill™ Bypass Valve setting should also be at least 15 psi (1.03 bar) higher than the normal system operating pressure. (Operating pressures nearing the bypass valve setting may allow liquid to be recirculated unnecessarily.)
10. If necessary, adjustment to the Versa-Fill™ Bypass Valve can be made by removing the valve cap and loosening the locknut.

WARNING

To increase the pressure setting, turn the adjusting bolt inward, or clockwise. To reduce the pressure setting, turn the adjusting bolt outward, or counterclockwise. Once a satisfactory pressure adjustment has been made, tighten the locknut, and replace the valve cap and tighten.

WARNING

Do not adjust the valve beyond the range of the spring being used.

Setting Cylinder Filling Position

The Versa-Fill™ bypass valves cylinder filling position or 'Forklift Cylinder mode' reduces the flowrate of product through the delivery hose to a safe rate. Follow the directions below to adjust the flow rate in Cylinder Filling (Forklift Cylinder) mode (**Figure 1**). For best results, perform these steps after the bypass pressure has been set.



WARNING: PRODUCT CONTAINS PINCH POINTS BETWEEN THE HANDLE AND HANDLE PLATE. KEEP HANDS AND FINGERS CLEAR.

- With the Versa-Fill™ bypass valve in BY-PASS mode begin pumping at the normal rate.
- Loosen (2) bolts [31] holding the lever adjusting bracket [30] in position.
- While monitoring flow, begin moving the Versa-Fill™ handle out of the BY-PASS mode into the loosened lever adjusting bracket [30]
- Adjust the angle of the handle until the desired output flow rate has been achieved.
NOTE: As a cylinder is filled and head pressure at the nozzle increases, the flow rate of delivered product will accordingly be lowered. Account for this when setting flow rate in a free flowing condition.
Note: For measurement accuracy ensure flow in the cylinder filling position is above you meter's minimum flow rate.
- Tighten (2) bolts [31].

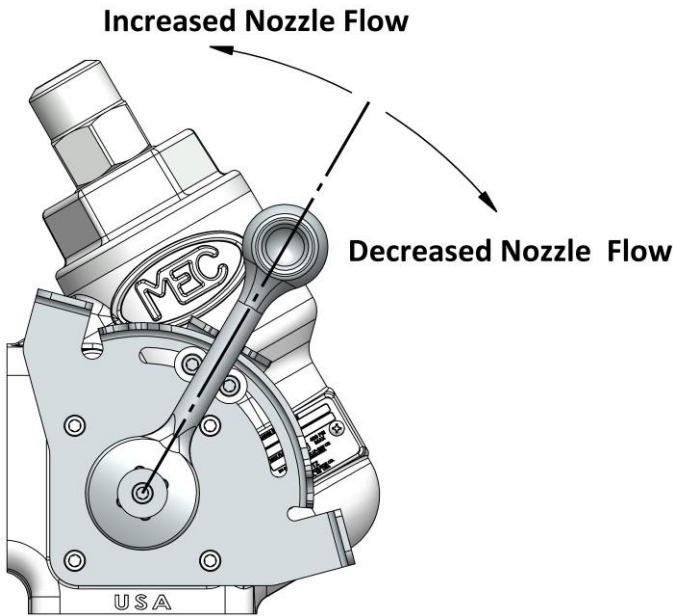


Figure 1: Setting Cylinder Filling Position

Handle Reorientation or Removal Instructions

The Versa-Fill™ bypass valve handle can be removed or reoriented (**Figure 2**) by following the directions below. See (**Figure 8**) for a detailed exploded view with part references.

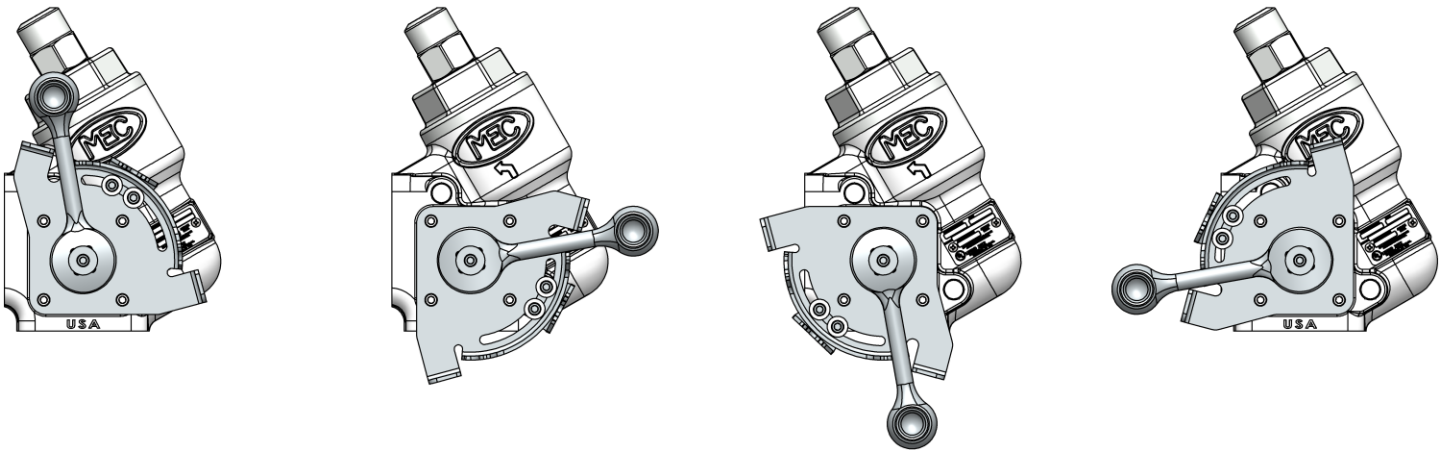


Figure 2: Possible Handle Orientations



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- Before removing the mode selection lever, move it to the “By-Pass” mode position.
- Remove Handle Screw [31] and Handle Washer[39] from spool stem [8, **Figure 10**]
- Remove the handle [38] from the spool stem [8]
- Remove the compression spring [6] and spring bearing [37] from the spool bonnet assembly [2-10]
- Remove (4) lever plate screws [36] and lever plate [34] from the handle plate spacer [35]
- Reorient the lever plate [34] to the desired position
- Reassemble handle assembly with the handle in the bypass position and the dimple on the spool stem [8] facing the outlet (**Figure 8, Detail A**). Reinstall lever plate screws [36] with a maximum of 50 in-lb torque.
- Check to confirm that the flow control valve is completely closed when the mode selector handle is in “By-Pass” mode (Figure 5)

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Right/Left Hand Conversion

The Versa-Fill™ bypass valve can be reassembled in a way such that the handle assembly is on the opposite side of the valve. All Versa-Fill™ bypass valves are shipped in the right handed configuration (**Figure 3**). The configuration can be changed by following the Disassembly and Reassembly directions below.

See (**Figure 8**) for a detailed exploded view with part references.

NOTE: All Rotary spool valves have some amount of spool weepage (product that flows past the valve in the closed position). When the Versa-Fill™ bypass valve is in the right hand configuration, the spool weepage loss is less than 0.1 GPM at 125 PSI differential pressure and is therefore the recommended configuration. Spool weepage losses in the Left Hand configuration are less than 1.0 GPM at 125 PSI differential pressure.

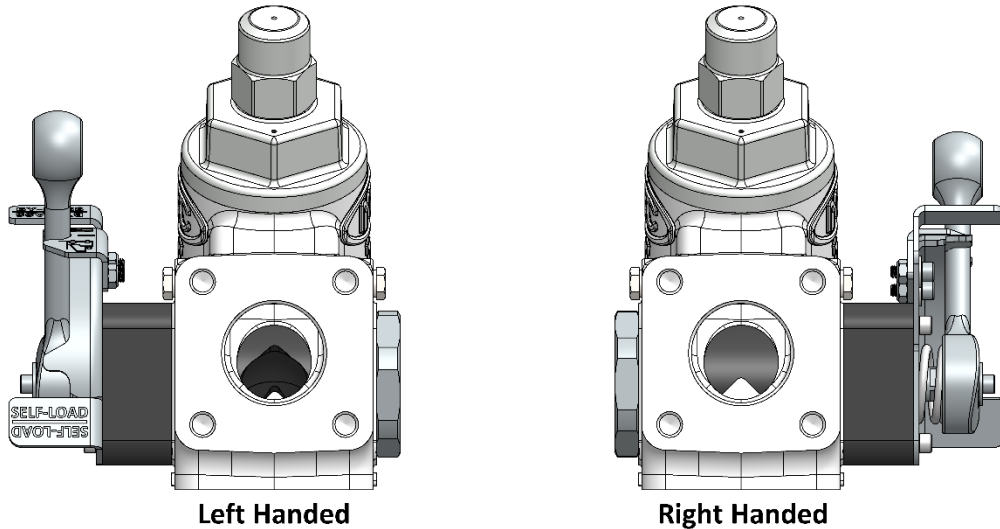


Figure 3: Left hand & Right hand configurations



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DISASSEMBLY

10. Remove handle assembly following the Handle Reorientation or Removal Instructions
20. Remove (2) set screws [16] from the body [1]
30. Remove (4) screws [42] from the body [1]
40. Remove spool plug assembly [10-12] from body [1]
***DO NOT REMOVE** spool [13-14] from body [1]
50. Remove spool bonnet assembly [2-10] from the body [1]

REASSEMBLY

10. Verify the spool's dimple is on the same side as the valve body's [1] pressure rating (**Figure 9, Detail B**)
20. Install spool bonnet assembly [2-10] onto the desired side of the body [1]. Align the flat on the spool stem with the drive screw head as shown, to ensure the stem fits properly into the Spool. See (**Figure 9, Detail C**)
30. Install spool plug assembly [10-12] into body [1]
40. Install (4) screws [42] into body [1]
50. Install (2) set screws [16] into body [1]
60. Reassemble handle assembly per Handle Reorientation or Removal Instructions

After reassembly, set the selector handle to "By-Pass" and check the **inlet port (Left Handed)** or **outlet port (Right Handed)** to confirm that the flow control valve is completely closed as shown (**Figure 4**)

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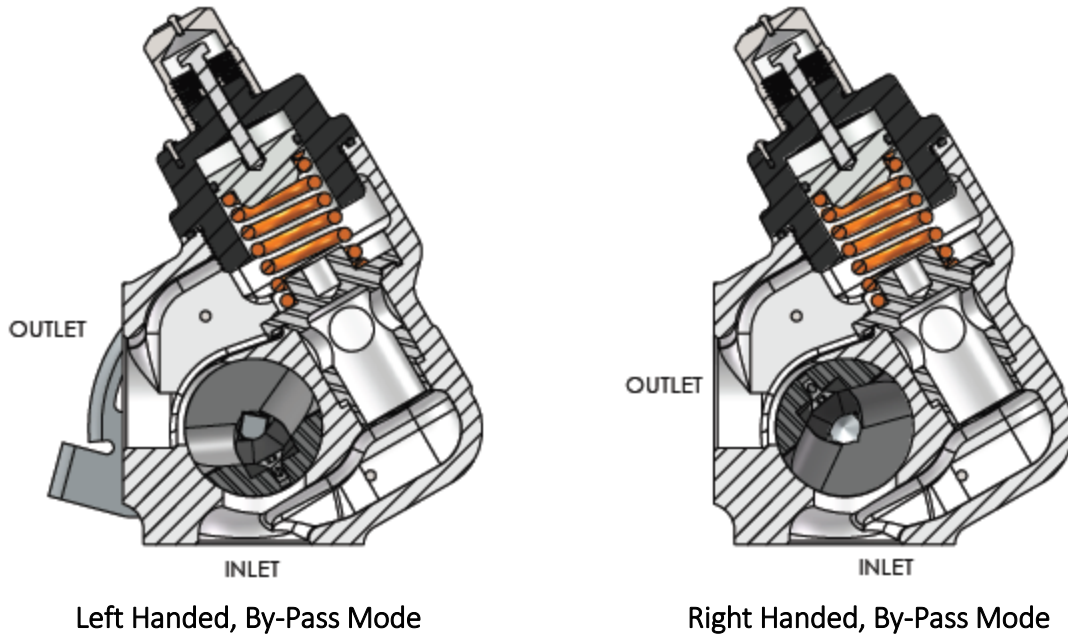


Figure 4: Spool Orientation

OPERATION

The Versa-Fill™ Bypass Valve provides versatile filling capabilities. The quick acting mode selection lever is connected to an integral, full-port flow control valve allowing precise, repeatable flow control. It has three primary operating modes: By-Pass mode, Self-Load/Evacuation mode and Cylinder Filling mode, all within a single valve; this provides simplicity in controls for the operator, eliminating the need for additional costly valves and piping system, extending pump life, and maximizing transfer efficiencies.

By-Pass Mode

The By-Pass mode allows full flow back to the tank when differential pressure exceeds the set pressure, just like a standard bypass valve. This works to protect your pump and reduce the need for expensive repairs. In By-Pass mode, the integral flow control valve is closed so that pump output is directed to the delivery hose, maximizing transfer efficiency. To select By-Pass mode, move the mode selector lever to “BY-PASS” (Figure 5).

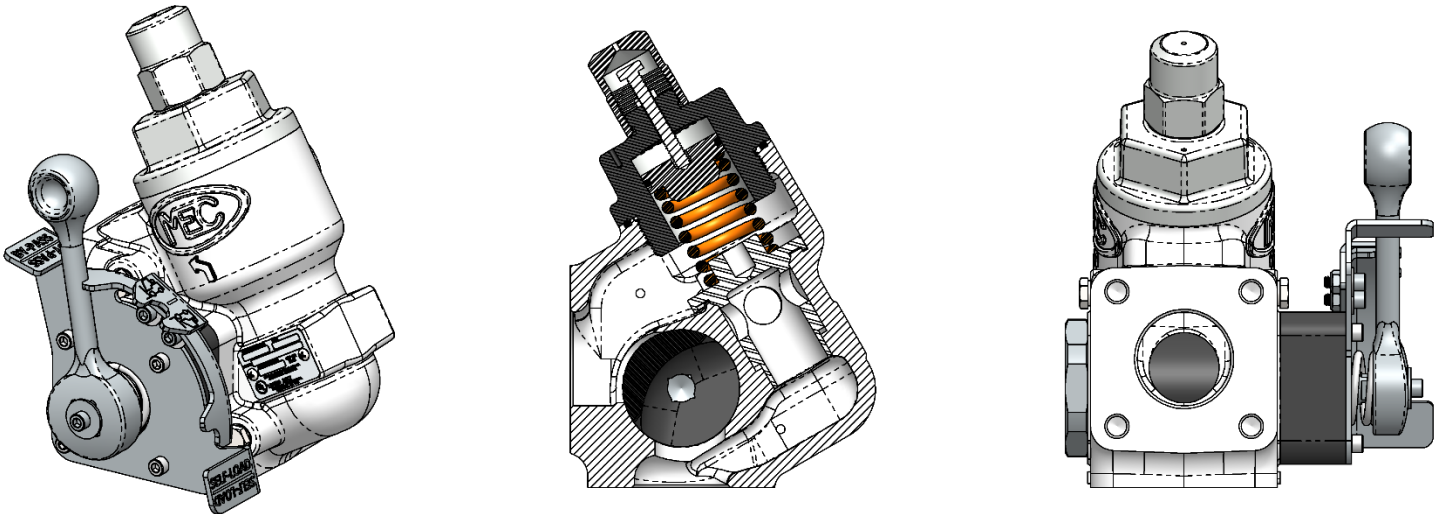


Figure 5: By-Pass Mode, Right hand configuration shown

Self-Load/Evacuation Mode

The SELF-LOAD mode allows product to be efficiently withdrawn from residential or agricultural tanks, as well as to self-load product in the event of a power failure at the bulk storage facility. The integral full-port flow control valve is fully open directing

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pump output back to the truck tank and creating low pump inlet pressure, or suction. This enhanced functionality can be added to new trucks and to existing fleets without the cost or complexity of adding a “manual loop line”. To select Self-Load mode, move the mode selector lever to “SELF-LOAD” (**Figure 6**).

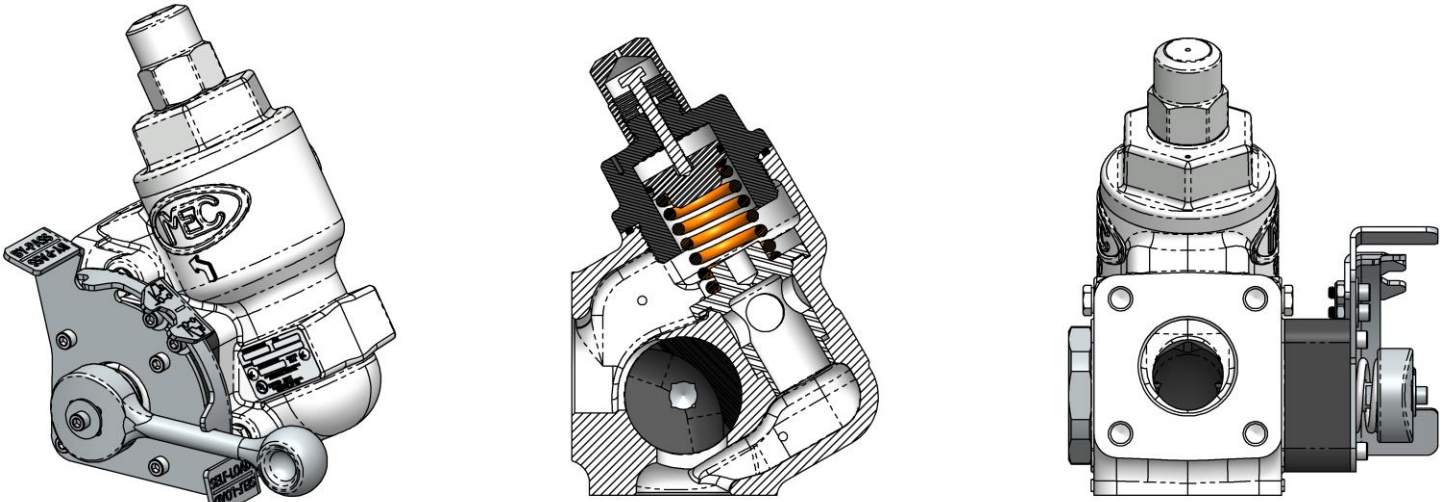



Figure 6: Self-Load Mode, Right hand configuration shown

Cylinder Filling Mode

The operational requirements for safely filling small cylinders can be quite different from those for filling large storage tanks. To prevent the safety risks of overfilling small cylinders, they must be filled at a rate that allows reaction time to stop the transfer when the fill limit is indicated in a fixed liquid level gauge. The Cylinder Filling mode allows small cylinders and tanks, such as Forklift cylinders, to be filled at a consistent and safe rate below the normal pump low limit. It is fully adjustable and can be set to match flow requirements regardless of piping variations and delivery hose restrictions. Once set, it provides consistent and repeatable performance each time the mode is selected. In the Cylinder Filling mode, the integral precision flow control valve is partially open allowing a desired fill rate for small cylinders while directing excess pump output back to the truck tank. To select Cylinder Filling mode, move the mode selector lever to “CYLINDER FILLING” () (**Figure 7**).

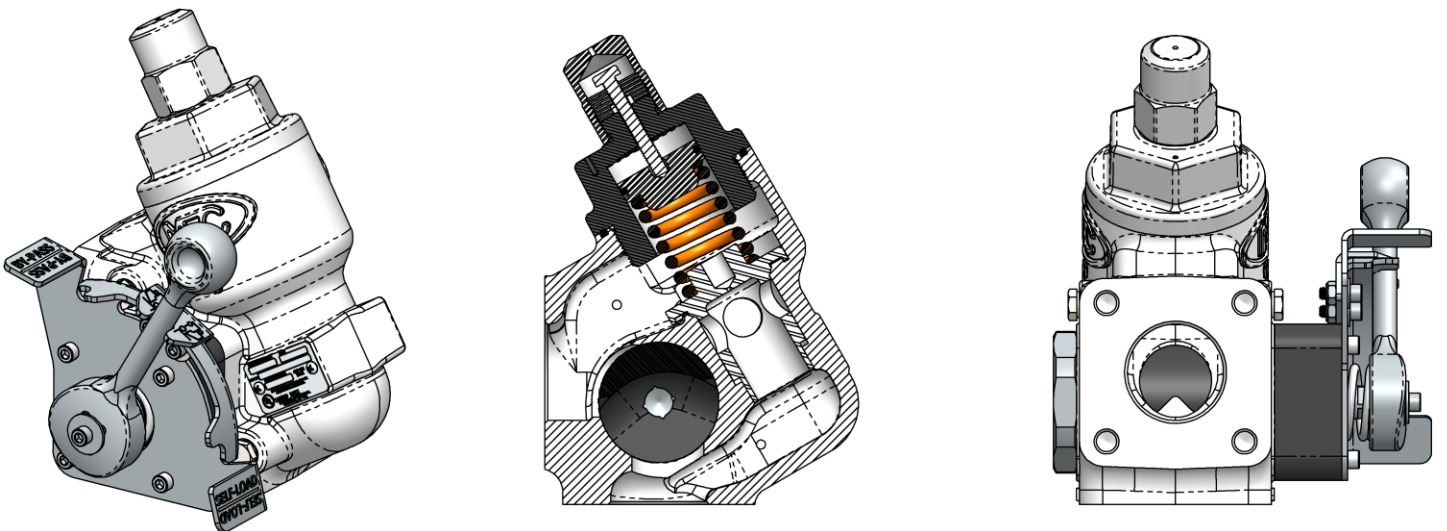


Figure 7: Cylinder Filling Mode, Right hand configuration shown

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Maintenance

The following checks should be performed weekly on valves exposed to severe service conditions such as frequent use (over 100 uses per week) or when exposed to contaminants, corrosive agents or extreme weather conditions. The checks should be performed at least monthly on all other valves.

1. Handle assembly – Inspect the valve handle, lever adjusting bracket, and springs for proper operation. If service is required, have handle assembly replaced by qualified service personnel using the service instructions provided with the replacement parts.
2. Seals – Inspect the valve seals for leaks (as evidenced by bubbles) at all joints and sealing surfaces by applying Marshall Excelsior "Leak Detector" solution to all joints. If service is required, have leak repaired by qualified service personnel using the service instructions provided with the replacement parts. Remove valve from service immediately if valve seals or joints leak.

Repair kits

Seal Repair Kit (ME845-SRK)

Containing replacement packing and hardware, the seal repair kit is useful for repairing leaks around the stem seals where no physical damage is apparent.

Packing Gland Assembly (ME845-PGA)

In addition to the packing that the seal repair kit includes, the packing gland assembly also includes the spool stem and bonnet. The packing gland assembly is needed if the entire spool bonnet assembly has been damaged.

Valve Repair Kit (ME845-VRK)

The valve repair kit is a complete replacement for most critical operating components in the Versa-Fill™ bypass valve. The most notable addition over the packing gland assembly is the inclusion of the spool. Use when the spool has been damaged or the valve requires a near complete rebuild.

Handle Repair Kit (ME845-HRK)

The handle repair kits contains a complete handle assembly. Useful for converting an actuated valve into a manual valve or otherwise repairing a broken handle.

Bypass Valve Repair Kit (ME840K, ME840CK)

The standard MEC bypass valve repair kits are used to repair the bypass portion of the Versa-Fill™ bypass valve.

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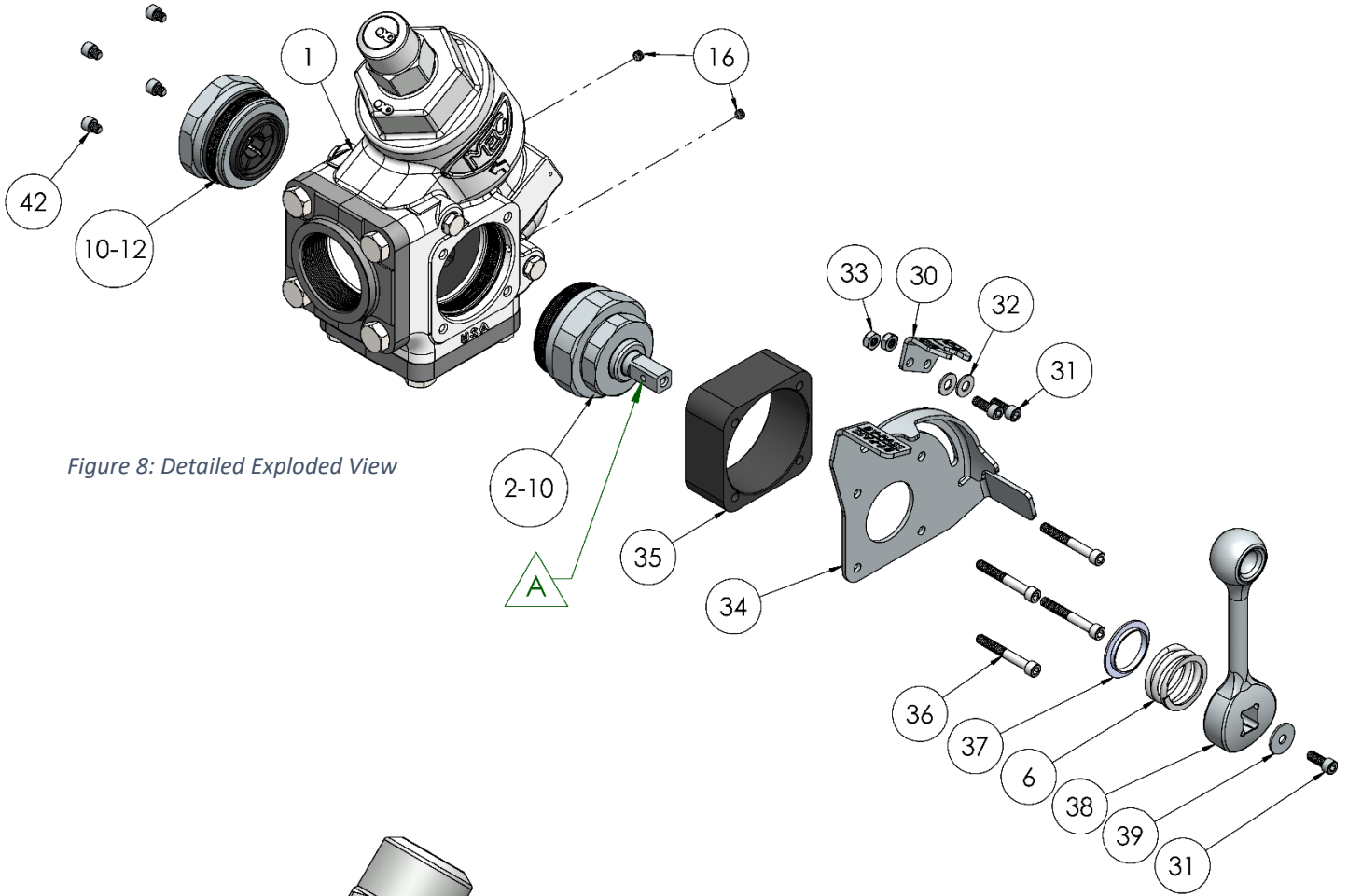


Figure 8: Detailed Exploded View

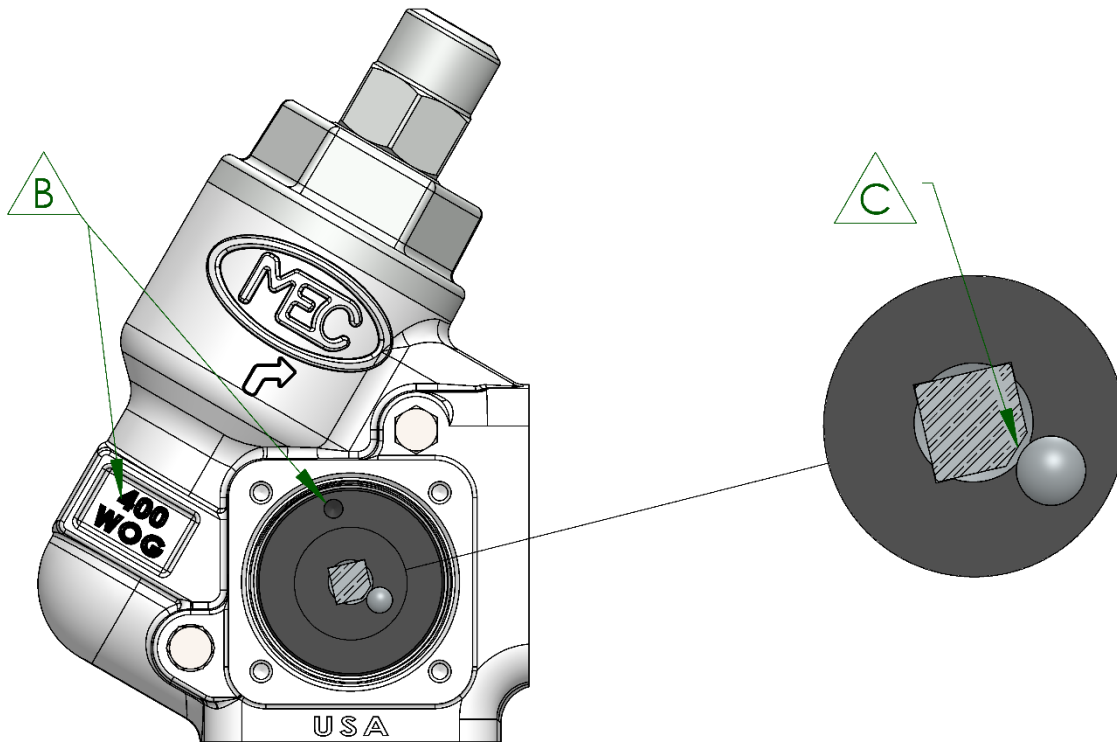


Figure 9: Spool Orientation

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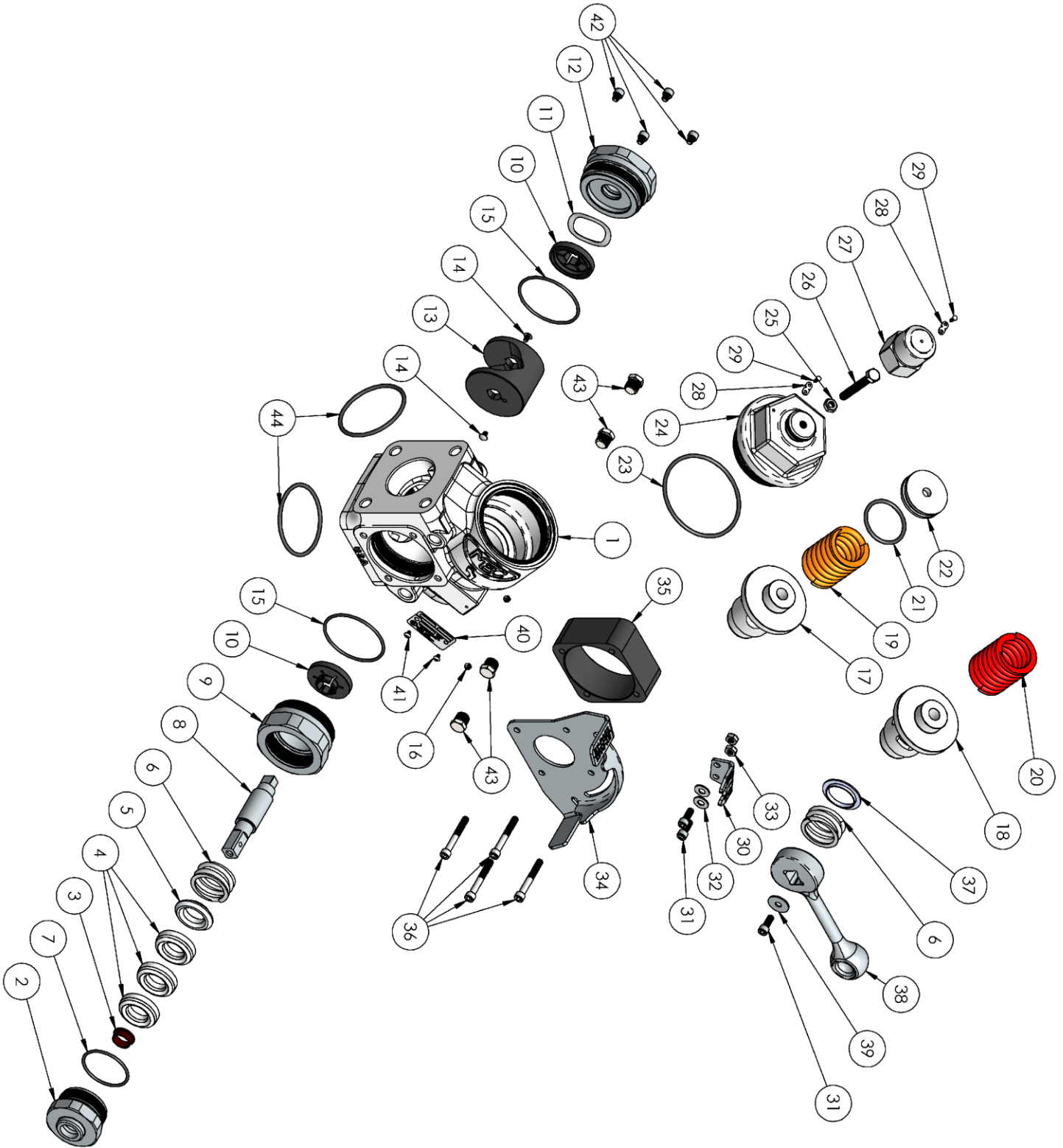


Figure 8: Exploded view

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Parts List			ASSEMBLIES				REPAIR KITS					
Ref. #	DESCRIPTION	QTY	ME845-125	ME845C-125	ME845-150	ME845C-150	ME845-PGA	ME845-SRK	ME845-VRK	ME845-HRK	ME840K	ME840C K
1	BODY	1	✓	✓	✓	✓						
2	GLAND	1	✓	✓	✓	✓	✓		✓			
3	STEM BEARING	1	✓	✓	✓	✓	✓		✓			
4	V-PACK	3	✓	✓	✓	✓	✓	✓	✓			
5	VALVE SHAFT BUSHING	1	✓	✓	✓	✓	✓	✓	✓			
6	*PACKING SPRING	1	✓	✓	✓	✓	✓	✓	✓			
7	O-RING (GLAND)	1	✓	✓	✓	✓	✓	✓	✓			
8	SPOOL STEM	1	✓	✓	✓	✓	✓		✓			
9	SPOOL BONNET	1	✓	✓	✓	✓	✓		✓			
10	SPOOL BEARING DISC	2	✓	✓	✓	✓	✓	✓	✓			
11	WAVE DISC SPRING	1	✓	✓	✓	✓	✓	✓	✓			
12	SPOOL PLUG	1	✓	✓	✓	✓			✓			
13	SPOOL	1	✓	✓	✓	✓			✓			
14	DRIVE SCREW	2	✓	✓	✓	✓			✓			
15	O-RING (SPOOL BONNET & PLUG)	2	✓	✓	✓	✓	✓	✓	✓			
16	SET SCREW	2	✓	✓	✓	✓			✓			
17	POPPET, CLASSIC (ROUND HOLES)	1		✓		✓						✓
18	POPPET, STANDARD (SQUARE HOLES)	1	✓		✓						✓	
19	BYPASS SPRING 125 (ORANGE)	1	✓	✓								
20	BYPASS SPRING 150 (RED)	1			✓	✓						
21	O-RING (SPRING GUIDE)	1	✓	✓	✓	✓		✓			✓	✓
22	SPRING GUIDE	1	✓	✓	✓	✓					✓	✓
23	O-RING (BYPASS BONNET)	1	✓	✓	✓	✓		✓			✓	✓
24	BYPASS BONNET	1	✓	✓	✓	✓						
25	LOCK NUT	1	✓	✓	✓	✓					✓	✓
26	STEM	1	✓	✓	✓	✓					✓	✓
27	CAP	1	✓	✓	✓	✓					✓	✓
28	TAMPER EVIDENT TAB	2	✓	✓	✓	✓					✓	✓
29	RIVET	2	✓	✓	✓	✓					✓	✓
30	LEVER ADJUSTING BRACKET	1	✓	✓	✓	✓				✓		
31	HANDLE SCREW	3	✓	✓	✓	✓				✓		
32	WASHER	2	✓	✓	✓	✓				✓		
33	BRACKET NUT	2	✓	✓	✓	✓				✓		
34	LEVER PLATE	1	✓	✓	✓	✓				✓		
35	HANDLE PLATE SPACER	1	✓	✓	✓	✓				✓		
36	LEVER PLATE SCREW	4	✓	✓	✓	✓				✓		
37	SPRING BEARING	1	✓	✓	✓	✓				✓		
38	HANDLE MACHINED	1	✓	✓	✓	✓				✓		
39	HANDLE WASHER	1	✓	✓	✓	✓				✓		
40	NAMEPLATE	1	✓	✓	✓	✓						
41	NAMEPLATE SCREW	2	✓	✓	✓	✓						
42	BODY SCREW	4	✓	✓	✓	✓						
43	1/4" NPT VALVE PLUG	4	✓	✓	✓	✓						
44	O-RING (FLANGE CONNECTIONS)	2						✓	✓		✓	✓
45	*HANDLE SPRING	1	✓	✓	✓	✓				✓		
46	**HEX SCREW	8	✓	✓	✓	✓					✓	✓

*IDENTICAL COMPONENTS

** NOT SHOWN

OTHER OPTIONS SUCH AS FLANGE CONNECTIONS, SPRING RANGES, AND SEAL MATERIALS AVAILABLE UPON REQUEST

Table 2: BOM