

## INSTALLATION, OPERATION & MAINTENANCE FOR SVF SERIES “8” BALL VALVES



### GENERAL

SVF Ball valves have been designed and engineered to provide long lasting and trouble-free service when used in accordance with the instructions and specifications herein.

The following instructions refer only to SVF Series “8” Ball Valves, except K8 Ball Valves.

Keep protective cover in place until moment of installation. Valve performance depends upon preventing of damage to ball surface. Upon removal of cover, make sure that the valve is completely open and free of obstruction.

If requested, valves can be shipped from the factory containing a silicon-based lubricant which aids in the assembly of the valve. This may be removed with a solvent if found intolerable.

Certain ferrous valves are phosphate and oil dipped during the course of manufacture, but they are completely non-toxic, and the valves are safe to use for edible or potable products.

### STORAGE:

All manual valves are shipped in the fully open position with protective end caps (covers). Keep all protective packaging, flange covers, or end caps attached to the valves during storage. To avoid damage to the seat due to contact with the balls edge, leave the valve in the **fully open or closed position** during storage. It is recommended to keep the valves in a clean and dry environment until ready for use.

### !!!CAUTION! Safety Precautions!!!

Before removing valve from pipeline

NOTE that:

Media flowing through a valve may be corrosive, toxic, flammable, a contaminant or harmful nature. Where there is evidence of harmful fluids having flowed through the valve, the utmost care must be taken. It is suggested that the following minimal safety precautions be taken when handling valves.

1. Always wear eye shields.
2. Always wear gloves and overalls.
3. Wear protective footwear.
4. Wear protective headgear.
5. Ensure that running water is readily accessible.
6. Have a suitable fire extinguisher ready if media is flammable.
7. Be sure that you are aware of the fluid that has been passing through the valve before opening or dismantling any valve. Require MSDS information.

By checking line gauges ensure that no pressure is present at the valve. Ensure that any media is released by operating valve slowly to half open position. Ideally, the valve should be decontaminated when the ball is in the half open position.

These valves, when installed, have body connectors which form an integral part of the pipeline and the valve cannot be removed from the pipeline without being dismantled.

Valves and accessories must not be used as a sole support of piping or human weight. Safety accessories such as safety relief (overpressure) valves are the responsibility of the system designer.

It is the user/system designer’s responsibility to use insulation in high temperature applications. Refer to OSHA documents for more details.

## INSTALLATION, OPERATION & MAINTENANCE FOR SVF SERIES “8” BALL VALVES

### INSTALLATION

The valve may be installed for flow or vacuum in either direction, unless specified by a flow direction tag, i.e. V8 series. Carefully exclude pipe sealants from the valve cavity. When installing, use standard gaskets suitable for the specific service. Tighten flange bolts or studs evenly.

**Note: When valve is equipped with flange end connections, be sure to support the valve adequately throughout the installation process. Flange weight will exert undesirable loads on the valve body bolts.**

### OPERATION

SVF ball valves provide tight shut off when used under normal conditions and in accordance with SVF’s published pressure/temperature chart. If these valves are used in a partially open (throttled) position seat life may be reduced.

SVF ball valves have ¼ turn operation closing in a clockwise direction. It is possible to see when the valve is open or closed by the position of the lever handle. When the lever handle is in line with the pipeline, the valve is open.

Any media which might solidify, crystallize, or polymerize should not be allowed to stand in the ball valve cavity unless regular maintenance is provided. SVF offers a steam jacketed ball valve option for these applications.

### TORQUE REQUIREMENTS

Torque ratings are subject to variations depending on the length of time between cycles and the media in the system.

Breakaway torque is that force which must be exerted to cause the ball to begin to open. Operating torque requirements will vary depending on the length of time between cycles, media in the system, line pressure and type of valve seat.

### MAINTENANCE

SVF ball valves utilized self-wiping ball/seats design providing a long, trouble free life, and maintenance is seldom required. When necessary, valves may be repaired, using a small number of components, none of which require machining.

SVF ball valves are designed for easy service and assembly in the field. The following checks will help to extend valve life or reduce plant problems.

SVF ball valves utilize live-loaded stem seals featuring Belleville Washers (disk springs) that maintain constant pressure on the Stem Seal area even under a wide range of pressure and temperature fluctuations. In an event of leakage, please use the following steps to examine the valve:

### STEM LEAKAGE

Examine the disk springs (Belleville washers) for damage. If in good condition tighten the gland nut until disk springs are firmly compressed, then back nut off 1/16<sup>th</sup> of a turn. If damaged, dismantle the stem down to the gland, fit new disk springs with their outer edges touching, replace and retighten using gland nut. Further maintenance necessitates dismantling of the valve.

### LEAKAGE AT BODY JOINT

Check for tightness at the body connector bolts. If loose, tighten body bolts. Excessive force will damage the bolts. (See Table A)

If there is still leakage it will be necessary to dismantle the valve and replace the body seals.

### IN-LINE LEAKAGE

Check that the valve is fully closed. If leakage occurs while the valve is in the closed position, a seat or ball sealant surface may be damaged, and it will be necessary to disassemble the valve.

**NOTE:** If stem leakage and leakage at the body joint are not fixed with these steps, it will be necessary to dismantle the valve. If there is no evidence of stem leakage, the stem assembly should not be touched.

## INSTALLATION, OPERATION & MAINTENANCE FOR SVF SERIES “8” BALL VALVES

### **WELDING OF SERIES “8” VALVES WITH BUNA “N” BODY SEALS:**

1. Prepare a clean working area
2. With the valve in the OPEN position, remove the body bolts.
3. Separate the pipe ends from the body and carefully remove the seats and body seals. Rotating the ball into the partially open position will assist in removing the seats.
4. Rotate the ball to a CLOSED position and remove it from the body.
5. With the soft components removed, loosely re-assemble the valve.
6. WELD the ends to the pipeline, then remove the valve center section.
7. Complete the welding process being careful to avoid weld splatter onto the exposed end faces.
8. When cooled, clean the pipe faces and re-assemble the valve center section.
9. Slip the center section between the pipe ends taking care not to score the end faces.
10. Replace the body bolts and tighten according to the torque values (Page 4, Table A).

### **WELDING OF SERIES “8” VALVES WITH ALL OTHER BODY SEALS (EXCEPT BUNA “N”/RUBBER):**

1. Place valve in the OPEN position.
2. Align the valve between the pipe ends and make the appropriate welds according to standard welding procedures. **NOTE: The body temperature in the seal area must not exceed 392°F.**
3. Allow the valve to cool.
4. Tighten the body bolts according to the torque values (Page 4, Table A).

**Note: WELD should be performed according to ASME B31 or equivalent standard**

### **REBUILDING**

Before rebuilding, check that all the correct components are available and that they are fit for reassembly. When rebuilding, cleanliness is essential to allow long valve life and provide cost effective maintenance. CAUTION: BODY SEALS OR STEM SEALS ARE NOT REUSABLE. Care must be taken to avoid scratching the seats and seals during installation.

NOTE: Caution must be taken with valves that have been in hazardous media. They must be decontaminated before disassembly by relieving the line pressure and flushing the line with the valve in the partially open position. Protective clothing, face shields, gloves, etc., MUST BE USED for this operation.

#### **A DISASSEMBLY OF VALVE (Removed from line)**

- 1.) Remove the End Connectors (#2) by removing the Body Bolts (#17) and Body Bolt Nuts (#18).
- 2.) Once the End Connectors (#2) have been separated from the Body (#1), remove the Body Seals (#6), Seats (#5), and Seat Retainer, if applicable (#19).
- 3.) Make sure the Ball is in the closed position, thus the Ball (#3) can be taken out easily from the Body (#1).

#### **B REMOVING STEM ASSEMBLY 1/4” – 2-1/2”**

- 1.) Remove Handle (#13) by removing Handle Nut (#15) along with the Lock Washer (#14).
- 2.) Remove the Tab Lock (#12), Jam Nut (#11), Belleville Washers (#10), Gland (#9), and Stem Seals (#8).
- 3.) Push the Stem (#6) down into the body cavity to remove. Once removed take off the Thrust Washer (#7).

## INSTALLATION, OPERATION & MAINTENANCE FOR SVF SERIES “8” BALL VALVES

### **B-1** REMOVING STEM ASSEMBLY 3”

- 1.) Remove Pipe Handle Assembly (#15 & #16) by removing Handle Bolt (#17)
- 2.) Remove the Pipe Handle Block (#15), Tab Lock, (#14), Jam Nut (#10), Belleville Washers (#12), Stop Plate (#11), Gland (#10), Stem Seal, (#9), and Stem Thrust Washer(#8).
- 3.) Push the Stem (#7) down into the body cavity to remove, once removed take off the Stem Seals (#9).

### **C** INSPECTION

- 1.) The ball and the surfaces of the seats should be free of pit marks and scratches. Light marring from the action of the ball against the seats is normal and will not affect the operation of the valve.
- 2.) The stem and stem housing should be free of pit marks and scratches.

### **D** REASSEMBLY

- 1.) Apply an adequate amount of lubricant compatible with the media being handled around the Ball (#3), Seats (#4), Body Seals (#5), Stem (#4), and Thrust Washer (#7).
- 2.) For stem reassembly, disassembly procedure should be followed in reverse order.
- 3.) When stem assembly is complete, tighten Jam Nut (#11) according to the values in Table A.
- 4.) With the Stem (#4) in the closed position, insert the Ball (#3) into Body (#1) so that stem slot engages with the tang at the base of the stem.
- 5.) Make sure the Body Seals (#5) rests squarely on the center seal surface of the Body (#1).
- 6.) Insert Seats (#4) into the Body (#1). Make sure seats rest firmly on back surface of each recess.
- 7.) Merge the End Connectors (#2) with the Body (#1).
- 8.) Insert and tighten the Body Bolts (#17)

diagonally, in accordance with the cross-pattern procedure shown on page 6 for sizes 1/4” to 2-1/2” or page 7 for size 3”.

- 9.) In the final assembly step, ensure that the Body Bolts (#17) are tightened according to torque values in Table A.

### **TORQUE SPECS**

Certain precautions need to be followed when tightening bolts down to their corresponding torques to help prevent bolt galling. There are two passes each bolt must undergo during the process, first pass and the final pass. Once every bolt has met the first pass requirement, the final pass can be initiated.

**TABLE A: TORQUE REQUIREMENTS (in-lbs.)**

| Valve Size | Bolt Pattern | Body Bolts      |            |              |            | Stem Nuts |
|------------|--------------|-----------------|------------|--------------|------------|-----------|
|            |              | Stainless Steel |            | Carbon Steel |            |           |
|            |              | First Pass      | Final Pass | First Pass   | Final Pass |           |
| 1/4”       | 4            | 48              | 80         | 53           | 88         | 35        |
| 3/8”       | 4            | 48              | 80         | 53           | 88         | 35        |
| 1/2”       | 4            | 48              | 80         | 53           | 88         | 35        |
| 3/4”       | 4            | 48              | 80         | 53           | 88         | 35        |
| 1”         | 4            | 101             | 168        | 117          | 195        | 80        |
| 1-1/4”     | 4            | 101             | 168        | 117          | 195        | 80        |
| 1-1/2”     | 4            | 207             | 345        | 240          | 400        | 115       |
| 2”         | 4            | 207             | 345        | 240          | 400        | 115       |
| 2-1/2”     | 4            | 207             | 345        | 240          | 400        | 115       |
| 3”         | 8            | 207             | 345        | 240          | 400        | 530       |

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### REPAIR KITS

Repair Kits are available from SVF Flow Controls. The tables below show what the kits consist of. When ordering a Repair Kit, please be sure to specify the type, size, and seating material of the valve.

When repairing a valve, use only SVF Flow Controls authorized spare parts including bolts and nuts, etc. In addition to maintenance kits, spare parts are available from SVF Flow Controls, i.e. Center Section Kits, Ends, Fastener Kits.

Components from a different valve series should not be used with the repair of any other valve. If the valve is altered in any way, no liability can be accepted by SVF Flow Controls.

**TABLE B: GENERAL REPAIR KIT  
(VALVE SIZE: 1/4" ~ 2-1/2")**

| Part               | Quantity |
|--------------------|----------|
| Thrust Washer      | 1        |
| Stem Seals         | 2        |
| Belleville Washers | 2        |
| Seats              | 2        |
| Body Seals         | 2        |

**TABLE C: GENERAL REPAIR KIT  
(VALVE SIZE: 3")**

| Part               | Quantity |
|--------------------|----------|
| Thrust Washer      | 2        |
| Stem Seals         | 3        |
| Belleville Washers | 2        |
| Seats              | 2        |
| Body Seals         | 2        |
| Stem Location Ring | 1        |

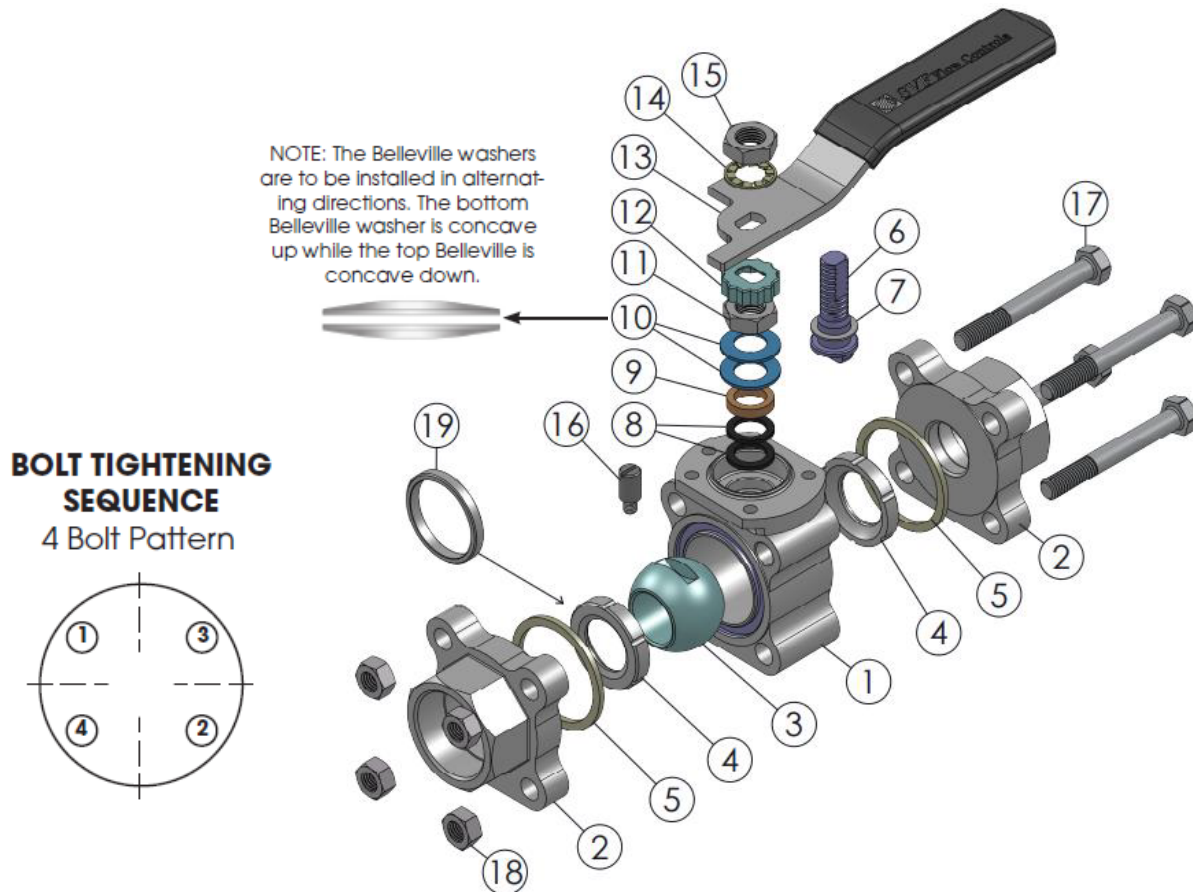
**TABLE D: SIZE COMPARISON**

| R8     | B8     |
|--------|--------|
| 1/4"   | -      |
| 3/8"   | -      |
| 1/2"   | -      |
| 3/4"   | 1/2"   |
| 1"     | 3/4"   |
| 1-1/4" | 1"     |
| 1-1/2" | 1-1/4" |
| 2"     | 1-1/2" |
| 2-1/2" | 2"     |
| 3"     | 2-1/2" |

NOTE: When ordering parts, keep in mind that Standard Port valves and Full Port valves use interchangeable parts. Refer to Table D to see the valve size comparison.

## MATERIALS OF CONSTRUCTION FOR SVF SERIES “8” BALL VALVES (Sizes: 1/4" ~ 2-1/2")

| Item # | Part Name            | Materials  | Recommended Spare | Wetted |
|--------|----------------------|--|-------------------|--------|
| 1      | Body                 | 316 Stainless Steel ASTM A351-CF8M, Carbon Steel ASTM A216 WCB | -                 | X      |
| 2      | End Connector        | 316 Stainless Steel ASTM A351-CF8M, Carbon Steel ASTM A216 WCB | -                 | X      |
| 3      | Ball                 | 316 Stainless Steel ASTM A351-CF8M                             | -                 | X      |
| 4      | Seat                 | TFM1600™, Delrin®, UHMWPE, PEEK                                | X                 | X      |
| 5      | Body Seals           | PTFE, Buna “N”, GRAFOIL®, UHMWPE, PEEK                         | X                 | X      |
| 6      | Stem                 | 316 Stainless Steel ASTM A276                                  | -                 | X      |
| 7      | Stem Thrust Washer   | SupraLon™, Delrin®, PEEK, UHMWPE                               | X                 | X      |
| 8      | Stem Seal            | SupraLon™, UHMWPE  | X                 | -      |
| 9      | Gland Follower       | 316 Stainless Steel  | -                 | -      |
| 10     | Belleville Washer    | 17-7 PH Stainless Steel  | -                 | -      |
| 11     | Jam Nut              | 304 Stainless Steel  | -                 | -      |
| 12     | Lock Tab             | 304 Stainless Steel  | -                 | -      |
| 13     | Lever Handle         | 304 Stainless Steel  | -                 | -      |
| 14     | Serrated Lock Washer | 304 Stainless Steel  | -                 | -      |
| 15     | Handle Nut           | 304 Stainless Steel  | -                 | -      |
| 16     | Stop Pin             | 304 Stainless Steel  | -                 | -      |
| 17     | Body Bolt            | 304 Stainless Steel  | -                 | -      |
| 18     | Body Nut             | 304 Stainless Steel  | -                 | -      |
| 19     | Seat Retainer        | 316 Stainless Steel  | -                 | -      |



## MATERIALS OF CONSTRUCTION FOR SVF SERIES “8” BALL VALVES (Size: 3”)

| Item # | Part Name          | Materials  | Recommended Spare | Wetted |
|--------|--------------------|--|-------------------|--------|
| 1      | Body               | 316 Stainless Steel ASTM A351-CF8M, Carbon Steel ASTM A216 WCB | -                 | X      |
| 2      | End Connector      | 316 Stainless Steel ASTM A351-CF8M, Carbon Steel ASTM A216 WCB | -                 | X      |
| 3      | Ball               | 316 Stainless Steel ASTM A351-CF8M                             | -                 | X      |
| 4      | Seat               | TFM1600™, Delrin®, UHMWPE, PEEK                                | X                 | X      |
| 5      | Body Seals         | PTFE, Buna “N”, GRAFOIL®, UHMWPE, PEEK                         | X                 | X      |
| 6      | Seat Retainer      | 316 Stainless Steel  | -                 | X      |
| 7      | Stem               | 316 Stainless Steel ASTM A276                                  | X                 | X      |
| 8      | Stem Thrust Washer | SupraLon™, Delrin®, PEEK, UHMWPE                               | X                 | -      |
| 9      | Stem Seal          | SupraLon™, UHMWPE  | -                 | -      |
| 10     | Gland Follower     | 316 Stainless Steel  | -                 | -      |
| 11     | Locking Device     | 316 Stainless Steel  | -                 | -      |
| 12     | Belleville Washer  | 17-7 PH Stainless Steel  | -                 | -      |
| 13     | Jam Nut            | 304 Stainless Steel  | -                 | -      |
| 14     | Lock Tab           | 304 Stainless Steel  | -                 | -      |
| 15     | Pipe Handle Block  | 304 Stainless Steel  | -                 | -      |
| 16     | Pipe Handle        | 304 Stainless Steel  | -                 | -      |
| 17     | Handle Bolt        | 304 Stainless Steel  | -                 | -      |
| 18     | Stop Pin           | 304 Stainless Steel  | -                 | -      |
| 19     | Body Bolt          | 304 Stainless Steel  | -                 | -      |

NOTE: The Belleville washers are to be installed in alternating directions. The bottom Belleville washer is concave up while the top Belleville is concave down.

### BOLT TIGHTENING SEQUENCE

8 Bolt Pattern

