

**!!!CAUTION! Safety Precautions!!**

**Before beginning installation or maintenance be sure to read and understand this entire manual.**

**Always use protective gear.**

**MAINTENANCE**

**GENERAL**

*SVF CleanFLOW* ball valves have a trouble-free life, and maintenance is seldom required. But when necessary, the valve may be refurbished, using a small number of components, none of which require machining. *SVF* valves are designed for easy servicing. The following checks should, however, help to extend valve life or reduce operation problems.

**Notice:**

**Flow Pattern Indication**

**GENERAL**

*SVF CleanFLOW SMC9* Multiported ball valves have a visual indicator etched to the top of the valve stem. This indicator shows the flow porting when using the valve and should be used when re-installing the ball after maintenance.



**STEM LEAKAGE**

Examine the Belleville washers (Disc Springs) for damage. If in good condition, tighten the packing nut until the Belleville washers are firmly compressed, then back off 1/16<sup>th</sup> of a turn. If Belleville washers are damaged, dismantle the stem down to the *follower*, fit new Belleville washers with their outer edges touching, and replace using new gland nut. Any further maintenance requires rebuilding of the valve.

**LEAKAGE AT BODY JOINT**

Check for tightness in the body connector bolts. If loose, tighten body bolts evenly and diagonally across each other, alternatively until proper torque is achieved.

If there is still leakage, this will be due to damage of the seal or back-face of the seat area and will require rebuilding the valve.

**!!!CAUTION! Safety Precautions!!!**

Before performing maintenance on any valve, NOTE that:

Media flowing through a valve may be corrosive, toxic, flammable, or of 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.

Check line gauges to ensure that no pressure is present at the valve (or actuator).

Ensure that any media is released by operating valve slowly to the half-open position.

Ideally, the valve should be decontaminated when the ball is in the half open position AND while still in the line.

#### **AUTOMATED VALVES**

Disconnect all electrical sources and supply air pressure sources from automated valves.

NEVER open or in any way tamper with an electric actuator, solenoid or any other electrically operated field device before checking and understanding the area rating. Terms like: NEMA-7, Hazardous Area Rating, Class and Division Statements all indicate that the area is specially classified and is potentially hazardous and that THE IGNITION OF HAZARDOUS ATMOSPHERE IS POSSIBLE.

**DO NOT** perform maintenance on any automated valve assembly that utilizes a Spring Return actuator before determining that the supply air pressure has been completely exhausted. Spring Return actuators utilize the powerful mechanical force of the springs to operate the valve upon loss of air.

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.

Under normal conditions the SVF family of valves can provide a 10 year service life span. For valve operation or service that exceeds the normal service life span and outside the normal operating conditions, a periodic examination of valve integrity is required. Consult SVF for valve design and manufacturing parameters.

If these valves are used in a partially open (throttled) position for extended periods, seat life may be reduced.

Always refer to the SVF Corrosion Resistance Guide for materials selection of pressure containing components.

Refer to the Pressure/Temperature chart and ANSI B16.34 for service limitations.

**Identifying Valves and Components**

SVF valves and actuators are supplied with permanently affixed or etched labels to identify them by size and materials of construction. The part numbering system is shown below.

**HOW TO ORDER**

**Part Numbering System for SVEleanFLOW Series SMC9**

Series SB7

EXAMPLE							
2"	SMC9	66	66	A	T	ETO	
SIZE	STYLE	BODY+END	BALL+STEM	SEAT	BODY SEAL	END CONNECTION	FLOW PATTERN*
1/2	SMC9 = Multiport	6-STAINLESS 316L	6-STAINLESS 316L	A-TFM	T-TFE	TR- TRICLAMP	T1
3/4							T2
1							T3
1 1/2							T4
2						ETO- EXTENDED TUBE	L1
2 1/2							L2
3							L3
4							L4

**Result:** 2" SMC96666ATETO-T1  
 \* The complete part number includes "FLOW PATTERN" column.



SVF Flow Controls, Inc.  
 SMC9-6666-AT-TR  
 2" - 1500

## Performing Maintenance

**SVF** High Purity Ball Valves (*CleanFLOW* Series SMC9) are comprised of a center section (Body) and three ends. This design also means that a valve may be supplied with two identical ends or with different ends. For instance, a valve may be supplied with an extended tube end (ETO) on one end and a Tri-Clamp fitting (TR) on the other.

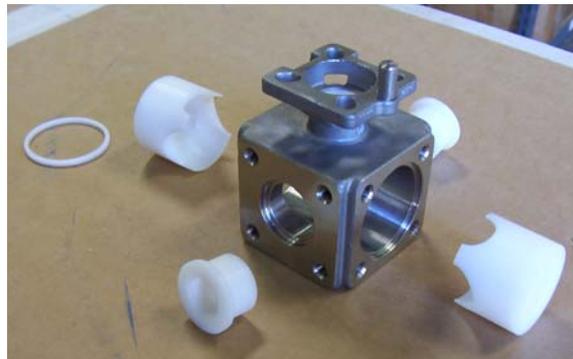
All **SVF** High Purity Ball Valves are permanently labeled at the factory with the appropriate part number and may also be furnished with special tagging as required by the end user.

**SVF** recommends that all valves be maintained on a work bench in a clean area. This means that the center section should be removed entirely from the ends/line for repair.

The SMC9 has four end caps. Each is held to the body using four hex cap screws and lock washers.

Once removed the seats and seals are now accessible.

Remove the seats carefully noting that the ball is fully encapsulated by the seats.

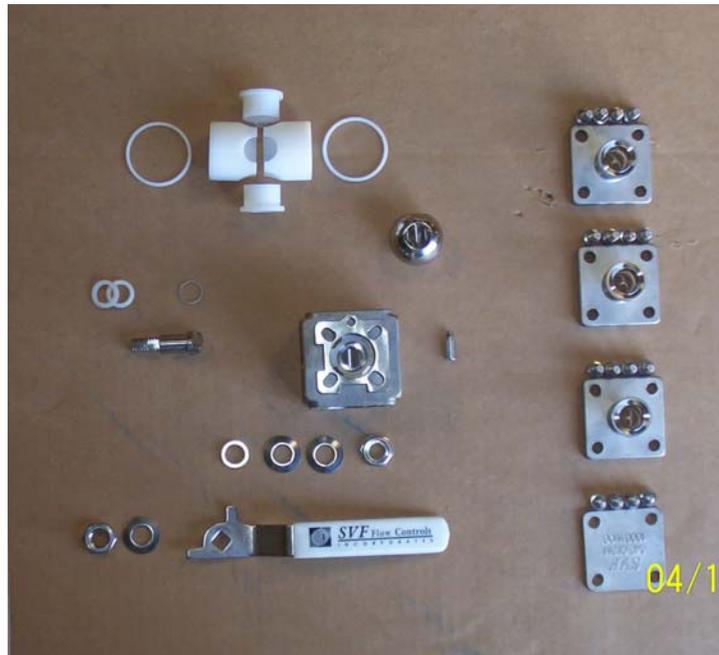


## Removing Seats and Seals

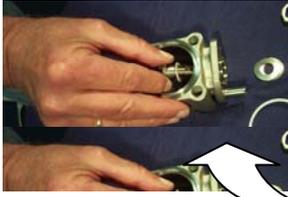
When performing a general maintenance of the valve-by replacing all of the soft components-keep in mind that the ball and stem will be re-used and should be protected from scratching and kept clean from dirt, dust and greases that will allow the attachment of deleterious particles.

### Removing Seats and Seals

- 1- After removing the end caps from the valve body, remove or pry out one of the exposed seats.
- 2- Remove or pry out each of the body seals.
- 3- To remove the ball, rotate the handle to position the ball so that the top slot on top of the ball is exposed to the end from which you removed the seat. Push the ball out of the body through the end from which the first seat was removed. Be sure to protect the ball surface from damage.
- 4- Push out the other seats.
- 5- **To complete repair, perform operations in reverse order.**



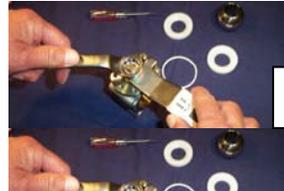
## Removing the Handle and Stem Seals



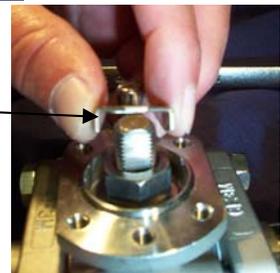
**Note:** The valve stem is installed/removed through the inside of the body cavity. This is because it features a “blow-out-proof” design.

### Removing the Handle and Stem Seals

- 1- Hold the handle in one hand, while applying a wrench to the handle retaining nut. This will keep the stem from rotating while removing the nut.
- 2- Remove handle. This will expose the packing nut and Retainer Clip. Note: The Retainer Clip will be re-used and is an important component. When in place it prevents the packing nut from rotating loose during frequent operation. This is especially important with automated valves which are generally not monitored as often as manual valves.
- 3- Remove Retainer Clip. Apply wrench to packing nut. You should reinstall the ball in this step. The ball can be used to prevent the stem from turning when the wrench is applied. Hold ball while turning wrench.
- 4- Push stem out through the body cavity. Avoid damage to stem. Save the Packing Nut, and Gland Follower Ring. Discard the Disc Springs (Belleville Washers).
- 5- **To complete repair, perform operations in reverse order.**



Note: Retainer Clip



**Stem Nut and Body Bolt Torque Tables**

<b>Table 1 - Stem Nut / Packing</b>	
<b>VALVE SIZE</b>	<b>TORQUE Lbf. In.</b>
1/2" - 3/4"	35
1"	80
1.5" - 2"	115
2.5"	265
3" - 4"	530

NOTE: In the absence of an appropriate torque wrench for this operation, a common practice is to tighten the stem nut until the disc springs are flattened and then back off 1/16<sup>th</sup> of a turn.

<b>Table 2 - Body Bolt Tightness</b>	
<b>VALVE SIZE</b>	<b>TORQUE Lbf. In.</b>
1/2" - 3/4"	80
1	168
1.5" - 2"	345
2.5"	345
3" - 4"	576

**"Interlocking" Seat**

To achieve the encapsulation of the ball, the seats on the SMC9 are "interlocking". In the picture to the right you can see how this is done. The seats at the top and bottom in the picture are One-Piece seats/seals. The other two are provided with an independent body/end seal.

