

**Installation, Operation & Maintenance  
for SVF STANDARD Three-Piece Series “8” Ball Valves  
Threaded Ends and Welded Ends (R8, N8, B8 (Full Port) etc.)**

**Use this document for D8/T7 Diverter Products**

SVF Flow Controls, Inc. 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.

**This document includes information for both the Reduced Port and Full Port Series of Three-Piece valves. Reduced Port: R8, N8, L8, etc. , Full Port: B8 and BN8**

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

Before removing valve from pipeline 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.

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-see DISMANTLING.

**Tools**

No special tools are required for maintenance of SVF Flow Controls, Inc. valves. NOTE: Valve nuts and bolting are Metric.

**General (Storage)**

The following instructions refer to SVF Flow Controls, Inc. Series “8” ball valves as described in the SVF Flow Controls, Inc. current catalog.

When storing valves, never leave the valves in the partially opened position. Always keep the protective covers in place until the valve is ready for installation. Valve performance depends upon prevention of damage to ball surface. After removing the cover make sure that the valve is completely open and free of obstructions, dirt, particles or any materials that may cause seat or seal damage.

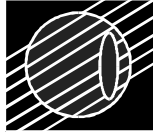
When shipped, valves contain a silicon based lubricant which aids in the assembly of the valve; silicon may be removed with a solvent if found objectionable, alternatively valves can be ordered free of lubricants.

Certain ferrous valves are phosphated and oil dipped during the course of manufacture, but the processes used are completely non-toxic.

**Threaded End Valves**

It is not necessary to disassemble threaded end valves before installation. Taper threaded fitting should not be over tightened.

In some applications threaded end valves are “back welded” on site. R8 and N8 Series are inline weldable and do not need to be disassembled to perform this.



### **Weld-End Valves**

All SVF Series "8" ball valves feature an encapsulated body seal. This means that they may be welded inline without the need for field disassembly. The only exception is valves that are supplied with BUNA or other rubber body seals. These materials do not tolerate welding temperatures. As such they must be disassembled before welding. (See *Welding of "8" Series Valves with BUNA body Seals*)

#### **Welding of "8" Series Valves with BUNA 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 remove the seats and body seals taking care not to damage them. Rotating the ball into the partially open position will assist in removing the seats.
- 4- Position the ball to CLOSED to remove it from the body.
- 5- With the soft components removed, loosely re-assemble the valve.
- 6- TACK WELD the ends to the pipeline then remove the valve center section.
- 7- Complete the welding 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.

#### **Welding of "8" Series Valves with All Other Body Seals (Except BUNA/Rubber)**

1. Place the 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. Tighten the body bolts according to the torque requirement listed for the valve size.

### **OPERATION**

SVF Flow Controls, Inc. valves provide tight shut off when used under normal conditions and in accordance with SVF Flow Controls, Inc. published pressure/temperature chart.

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

Any media, which might solidify, crystallize or polymerize should not be allowed to stand in the ball valve cavities unless regular inspection and maintenance is performed. If minimal maintenance is performed, SVF Flow Controls, Inc. offers cavity fillers and/or steam jacketed ball valves.

### **Manual Operation**

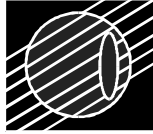
SVF Flow Controls, Inc. valves have ¼ turn operation opening in a counter-clockwise direction. When the handle is positioned across the pipeline, this indicates that the valve is CLOSED.

### **Remote Operation**

Where manual operation is impractical SVF valves may be automated for remote operation, instrument controls etc. A range of SVF Flow Controls, Inc. pneumatic and electric actuators are available.

Mechanical valve stops are removed from automated valves since end stops are an integral part of the actuator.

Operation will be in accordance with SVF Flow Controls, Inc. Installation, Operation and Maintenance Instructions for relevant actuator.



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## **MAINTENANCE /TROUBLESHOOTING**

### **General**

With self-wipe ball/seats and pressure equalizing slots, SVF Flow Controls, Inc. valve have a long, trouble free life, and maintenance is seldom required. But, when necessary, valves may be refurbished, using a minimal number of components, none of which require machining. SVF Flow Controls, Inc. valves are designed for easy service and assembly in the field. The following checks should 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 packing area even under a wide range of pressure and temperature fluctuations. If stem leakage is evident proceed as follows:

### **Stem Leakage 1/4" – 2 1/2" Valves**

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. Standard wrenches should only be used. Excessive force will damage the bolts.

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

### **In-line leakage**

Check that valve is fully closed. If it is, leakage will be due to damaged seat or ball sealing surfaces and it will be necessary to dismantle the valve.

NOTE: Stem leakage and leakage at body joint, if not cured by simple means described above, necessitate dismantling valve. If there is no stem leakage the stem assembly should not be touched.

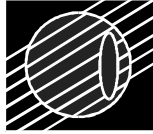
### **Leakage at pipeline joint**

#### **Threaded End Valves**

Test for tightness of threaded ends. If loose, tighten with standard wrench – excessive force will damage the end. Joint compound should be used according to standard piping practices.

#### **Weld-end Valves**

Examine welds for leak point. Correct as necessary according to the guidelines provided in this manual and according to standard welding practices.



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## REFURBISHING THE VALVE

To remove the valve body (Center Section) from pipeline, first remove the body connector bolts then remove the body from between the body connectors. (Note on **Fire Safe Valves**: The body will not slide out unless the pipeline is sprung apart sufficiently to clear body location rings fit into machined recess in both body and body connectors)

Once the body is removed proceed to removing the seats and ball. The valve seats are “position fitted” into the valve body using firm pressure. Remove the seats by rotating the ball into the mid-position. Then gently remove seats. To remove the ball, rotate it to the “closed” position and push it out.

To dismantle stem assembly, first remove the wrench nut, and wrench from stem.

Using wrench to prevent the stem from turning, remove the gland nut, disk springs, and gland, it is not normally possible to remove gland packing at this stage. Withdraw the stem through the body cavity and remove the stem thrust seal from stem or body recess. Gland packing may now be removed.

Clean all components thoroughly and examine all seating / sealing surfaces.

Inspect the surface of the ball. The ball must have no scratches across its seating surface or any damage to the port lip, as it will damage the new seats. A damaged ball must not be re-used – install a new ball.

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## Rebuilding

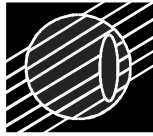
Before rebuilding, check that all the correct components are available and that they are fit for re-assembling. When rebuilding, cleanliness is essential to allow long valve life and provide cost effective maintenance.

Fit stem thrust seal to stem and insert stem through body cavity into stem hole and fully up into body recess. Fit gland packing, gland and disk springs. Disk springs are concave. Using wrench to prevent stem from turning, fit gland nut and screw down until disk springs are firmly compressed. Back off 1/16<sup>th</sup> of a turn. Note: It is often helpful to install the ball before installing the stem packing. The ball helps to support the stem

Operate stem several times and readjust. Over-tightening will only reduce the life of the stem assembly. Now fit wrench stop plate and wrench nut to stem assembly and move stem into closed position – wrench across the pipeline.

With the stem still in the closed position, the ball may be inserted into the body cavity by sliding the ball slot over the stem tang. Open the valve.

NOTE: The ball must be in the open position since a closed ball protrudes beyond the body cavity and ball will be damaged against body connectors when body is removed or rotated. Also, with the valve in the open position, the ball is retained by the stem tang and cannot fall out of the body cavity.



The seat rings and body connector seals may now be fitted.

NOTE: A trace of silicon based lubricant or clean grease (such as petroleum jelly), if compatible with the pipeline media, will ease the rebuilding by holding the seat rings and body connector seals in place. Use no grease with abrasive additives.

The valve may be installed back into the pipeline by sliding the body in between the body connectors. The pipeline should, however, be sprung apart sufficiently to clear valve body and avoid damage to seat rings, body connector seals and body connector sealing face.

Locate body on centerline of pipework, fit body connector bolts and nuts, and by tightening, pull together body and body connectors. Connector flanges will be metal to metal, standard wrenches should only be used – excessive force will damage the bolts. (See Torque Requirements Page 6)

**TEST:** If practical, perform a leakage test at this time.

## Spare Parts Kits

### Example: Ordering a Spare Parts/Repair Kit

REPAIR KIT	VALVE SERIES	SIZE	SEAT/SEAL
RK-	R8-	05 = 1/2"	TT
	N8-	07 = 3/4"	NG
	L8-	10 = 1"	RT
	B8-	12 = 1-1/4"	DB

Spare Parts Kits are available from SVF Flow Controls, Inc. and consist of the following:

- (A) 2 seat rings, 2 body connector seals for 1/4" – 4" valves.
- (B) 1 stem thrust seal, 2 packing gland for 1/4" – 2" valves, 1 set of Belleville washers
- (C) 1 stem thrust seal, 3 gland-packing rings for 3" and 4" valves.

**When ordering Spare Parts Kits, please be sure to specify type and size of valve and seating material required.**

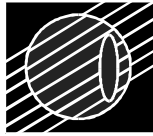
When repairing a valve use only SVF Flow Controls, Inc. authorized spare parts including; bolts and nuts, etc. In addition to maintenance kits, spare parts available from SVF Flow Controls, Inc. They are: balls, stems, and glands. If additional parts are required (body and ends) it is normally recommended that the complete valve be replaced.

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, Inc.

### **DISMANTLING (Replacing Seals) Inline Maintenance**

If the valve is closed or not in fully open position as suggested, refer to Safety precautions before proceeding.

During dismantling, do not assume that the valve is totally decontaminated. Harmful fluid, etc. may still be trapped in the valve cavities.



To remove valve from pipeline, extract body connector bolts and slide the body out from between the body connectors. In most cases it is unnecessary to remove the body completely from the pipeline. Remove all but one of the body connector bolts, and with this remaining bolt slackened, the body may be rotated out from the line using the remaining bolt as a hinge.

## TORQUE REQUIREMENTS (For Re-Assembly)

### STEM NUT/PACKING

VALVE SIZE	THREAD	TORQUE Nm	TORQUE Lbf. In.
1/2"-3/4"	3/8"-24	4.0	35.0
1"-1.25"	7/16-20	9.0	80
1.5"-2"	9/16-18	13	115
2.5"	M20x2.5	30	265
3"-4"	1"-14	60	530

### BODY BOLTS

"R" SIZE	"B" SIZE	BOLT SIZE	BOLT LENGTH (in.) UNDER SHOULDER	Bolt Hex Flats (For wrench)	TORQUE (CARBON) Lbf. In.	TORQUE (S.S.) Lbf. In.
1/2"	3/8"	M6	1.77	10mm	80	80
3/4"	1/2"	M6	1.97	10mm	87	80
1"	3/4"	M8	2.56	13mm	195	168
1-1/4"	1"	M8	2.95	13mm	195	168
1-1/2"	1-1/4"	M10	3.35	17mm	399	345
2"	1-1/2"	M10	3.74	17mm	399	345
2-1/2"	2"	M10	4.72	17mm	399	345
3"		M10	CF	CF	399	345
4"		M12	CF	CF	665	576

BOLT MATERIALS: CARBON STEEL ISO 898/1 GRADE 8.8, STAINLESS ISO 3506 GRADE A2, A4

### BODY BOLTS P3 (HIGH PRESSURE)

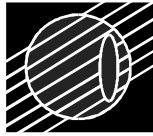
VALVE SIZE	THREAD	TORQUE Nm	TORQUE Lbf. In.
1/2"-3/4"	5/16 - 18	18	160
1"-1.25"	3/8-16	40	355
1.5"-2"	7/17-14	85	753

BOLT MATERIALS: CARBON STEEL ISO 898/1 CLASS 12.9

## VALVE ORDER CODE SYSTEM

1" A	R8 A	66 A	66 A	T A	T A	SE A	OPTIONS A	PRODUCT WEIGHT POUNDS
SIZE	STYLE	BODY & END MATERIAL	BALL & STEM MATERIAL	SEAT	SEAL	ENDS	OPTIONS	
1/4"	R8	4 - CARBON STEEL	3 - MONEL	T - TFE R - RTFE	B - BUNA E - EPDM	SE - SCREWED BW - BUTT WELD	(CONTACT SVF)	2
3/8"				N - NRG	V - VITON	SW - SOCKET WELD		2
1/2"			6 - 316L	K - PEEK	T - TFE	TOD - TUBE OD		2
3/4"		6 - 316		D - DELRIN	U - UHMWPE	CE - COMPRESSION ENDS		4
1"			8 - ALLOY 20	V - VX1	G - GRAPHOIL			5
1-1/4"				U - UHMWPE				7.5
1-1/2"			9 - HASTELLOY					10
2"								18
2-1/2"								30
3"								50
4"								160
6"								

\*NOTE: This same ordering scheme may be used for our Series B8, N8, L8 and all other "8" Series valves.



### Ordering Parts and Components

Note: When ordering parts, keep in mind that the “R” Series Regular Port valves and the “B” Series Full Port valves use interchangeable parts. Refer to the table below to see the valve size comparison. **(See page 5 for ordering Seal Kits).** Refer to “**VALVE ORDER CODE SYSTEM**“ (page 6) for Material and Seat codes.

SIZE	SIZE
R8	B8
1/4"	XX
3/8"	XX
1/2"	XX
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"
4"	3"

#### Center Sections (Example)

Size	Series	Materials
1"-	R8- (or N8, B8 etc.)	6066TT- (always use the 0 in position 2)

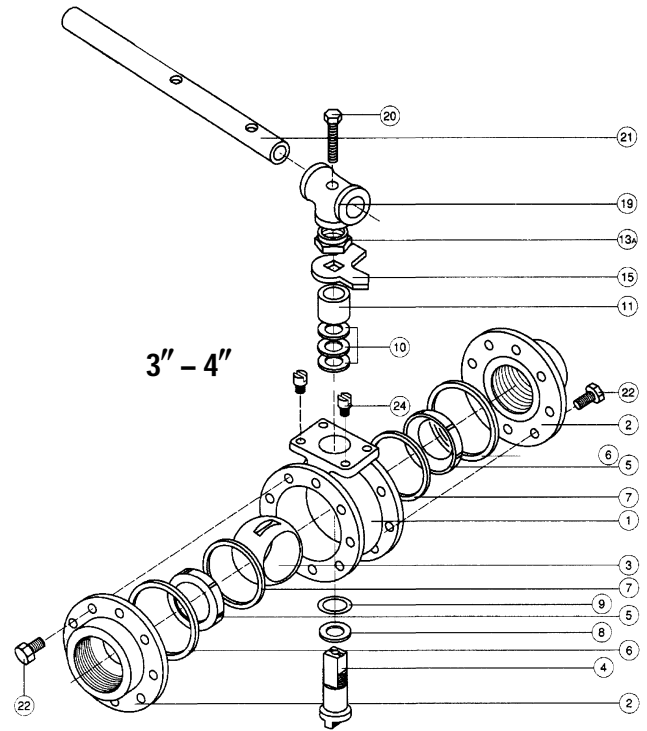
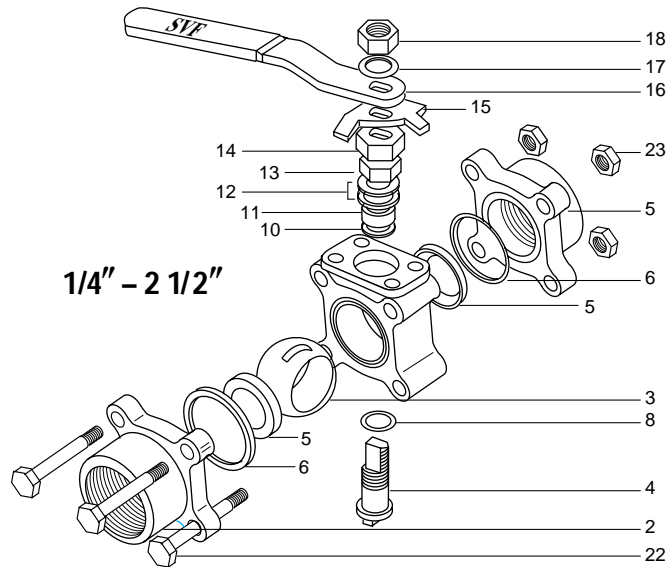
#### End Connectors (Example)

Size	Component	Series	Materials
1"-	End-	R8- (or N8, B8 etc.)	SS, CS, Alloy-20 etc.

#### Ball (Example)

Size	Component	Series	Materials
1"-	Ball-	R8- (or N8, B8 etc.)	SS, Monel etc.

# R8 VALVE COMPONENTS



Item #	Description	Material
1	Body	Carbon Steel 316 Stainless
2	Body Connector	Carbon Steel 316L Stainless
3	Ball	316 Stainless Alloy 20 Monel Hastelloy C
4	Stem	316 Stainless Alloy 20 Monel Hastelloy C
5	Valve Seat	TFE, RTFE, NRG Delrin, UHMWPE, PEEK, VXI
6	Body Connector Seal	TFE Buna "N" Graphoil UHMWPE
7	Retainer Ring 2 1/2"-6"	316 Stainless Carbon Steel
8	Stem Thrust Ring	NRG
9	Stem Location Ring 3"-6"	Stainless Steel
10	Stem Packing	NRG
11	Gland Packing	Stainless Steel

Item #	Description	Material
12	Belleville Washers	Stainless Steel
13	Packing Nut 1/4"-2 1/2"	Stainless Steel
13A	Packing Nut 3"-6"	Cad. Plate C. St. - Stainless Steel
14	Lock Tab	Stainless Steel
15	Handle Stop	Stainless Steel - Carbon Steel
16	Handle 1/4"-2 1/2"	Stainless Steel - Carbon Steel
17	Lock Washer	Stainless Steel
18	Handle Nut 1/4"-2 1/2"	Stainless Steel - Carbon Steel
19	Wrench Hub 3"-6"	Cad. Plate C. St. - Stainless Steel
20	Hub Bolt 3"-6"	Stainless Steel Cad. Plate C. St.
21	Wrench 3"-6"	Cad. Plate C. St.
22	Body Connector Bolt	Stainless Steel - Carbon Steel
23	Body Connector Nut	Stainless Steel - Carbon Steel
24	Stop Pin	Stainless Steel

## PERFORMANCE DATA

VALVE SIZE	APPROX. FLOW COEFF.	EQUIV. LENGTH OF SCHED. 40 PIPE feet
1/4"	8	1.9
3/8"	8	1.9
1/2"	8	1.9
3/4"	12	5.5
1"	32	3.0
1-1/4"	57	3.1
1-1/2"	80	3.9
2"	104	7.5
2-1/2"	240	5.0
3"	320	7.0
4"	580	9.5
6"	1020	18.0

Due to continuous development of our product range, we reserve the right to change the dimensions contained in this leaflet as required.

## PRESSURE-TEMPERATURE DATA

