

ANDERSON GREENWOOD

Before installation these instructions must be fully read and understood.

The intent of these instructions is to acquaint the user with the storage, installation and operation of this product. Please read these instructions carefully before installation.

Safety Precautions

When the safety valve is under pressure never place any part of your body near the outlet of the valve.

The valve outlet and any separate drains should be piped or vented to a safe location.

Always wear proper safety gear to protect hands, head, eyes, ears, etc. anytime you are near pressurized valves.

Never attempt to remove the safety valve from a system that is pressurized.

Never make adjustments to or perform maintenance on the safety valve while in service unless the valve is isolated from the system pressure. If not properly isolated from the system pressure, the safety valve may inadvertently open resulting in serious injury.

Remove the safety valve prior to performing any pressure testing of the system.

The safety of lives and property often depends on the proper operation of the safety valve. The valve must be maintained according to appropriate instructions and must be periodically tested and reconditioned to ensure correct function.

Warning

The protection and safety of equipment, property and personnel depends on the proper operation of the safety valves described in this manual. All Tyco Valves and Controls safety valves should be kept in proper working condition in accordance with the manufacturer's written instructions. Periodic testing and maintenance by the user of this equipment is essential for reliable and safe valve operation.

All installation, maintenance, adjustment, repair and testing performed on safety valves should be done by qualified technicians having the necessary skills and training adequate to perform such work. All applicable Codes and Standards, governing regulations and authorities should be adhered to when performing safety valve repair. No repair, assembly, adjustment or testing performed by other than Tyco Valves and Controls or its authorized assemblers and representatives shall be covered by the warranty extended by Tyco Valves and Controls to its customers. The user should use only original, factory supplied OEM parts in any maintenance or repair activity involving this product.

This Maintenance Manual is provided as a general guide for the repair and maintenance of the safety valves described herein. It is not possible to describe all configurations or variations with such equipment. The user is advised to contact Tyco Valves and Controls or its authorized assemblers and representatives for assistance in situations that are not adequately covered or described in this manual.

Before removing a safety valve for maintenance, ensure that the system pressure has been fully depressurized. If an isolation block valve is used ensure that any trapped fluid between the block valve and the safety valve is safely vented.

Before disassembling the safety valve ensure that the valve has been decontaminated from any harmful gasses or fluids and that it is at a safe temperature range for handling. Fluids can be trapped in the dome space of pilot operated safety valves.

Before installation, the Installation and Operational Safety Instructions should be fully read and understood. These Instructions may be requested from the factory or are available at www.tycovalves.com.

Storage and Handling

Pressure relief valve performance may be adversely affected if the valve is stored for an extended period without proper protection. Rough handling and dirt may damage, deform, or cause misalignment of valve parts and may alter the pressure setting and adversely affect valve performance and seat tightness. It is recommended that the valve be stored in the original shipping container in a warehouse or as a minimum on a dry surface with a protective covering until installation. Inlet and outlet protectors should remain in place until the valve is ready to be installed in the system.

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Total Flow Control Solutions™

1.0 General

The Anderson Greenwood Type 96A Vacuum Breaker is designed to provide vacuum relief and access for a positive pressure relief valve, with one tank penetration (Refer to Figure 1). The outlet to the positive pressure relief valve is available with a flange size equal to the tank size connection and one equal to the next smaller size. A capped outlet is also available where a relief valve is not required.

Construction of the vacuum breaker is of aluminum and/or stainless steel with elastomer seats and seals. BUNA-N is the standard elastomer with EPR and Viton® optional. The seat plate is designed to have a dead weight loading such that opening begins at $\frac{1}{2}$ oz. [0.22 kpag] vacuum with full lift occurring at 1 oz. [0.43 kpag] vacuum. Higher vacuum openings are available.

Under positive pressure tank conditions, the seat plate is held tightly against the seat due to positive pressure acting against the inside surface of the seat plate. As tank pressure decreases and goes negative with respect to the ambient pressure, the seat plate lifts in accordance with the pressures noted above.

The elastomer seat consists of two parts: an O-ring for sealing at high positive pressures, greater than 2 psig [13.8 kpag], and a closed cell sponge seat for sealing at low pressures, less than 2 psig [13.8 kpag]. Both seats are retained in place with an adhesive.

A protective screen, 1" x 1" [25.4 mm x 25.4 mm], mesh is provided as standard at the vacuum inlet to prevent foreign particles from being ingested into the breaker when the seat pallet is open, relieving tank vacuum.

2.0 Vacuum Breaker Repair (See Figure 1)

2.1 Disassembly

- 2.1.0 Remove the retainer ring bolts, retainer ring and inlet screen. Remove the seat ring and seat plate/guide tube assembly, being careful not to damage the sealing surfaces.
- 2.1.1 To disassemble the seat plate/guide tube assembly, insert a .250 [6.35 mm] diameter or smaller rod through the cross drilled hole in tube to prevent it from rotating while removing the lower nut. Remove the nut, weight if used, and spacer. Remove retainer and O-ring from seat plate bolt. The guide tube may be removed from the seat plate bolt by placing the tube in a "VEE" block and driving out the spring pin with a $\frac{1}{8}$ " [3.17 mm] diameter punch.
- 2.1.2 Remove the guide rod bolt, guide rod, and guide rod seal. To facilitate disassembly insert a .250 [6.35 mm] diameter rod through the cross drilled hole.
- 2.1.3 Remove sponge seat from seat ring. The seat is cemented in place with an adhesive.
- 2.1.4 Remove O-ring seat from seat ring. The O-ring seat is cemented in a "U" shaped annular groove with an adhesive. Discard all soft goods (seats, seals and gaskets).

2.2 Repair and Assembly

- 2.2.1 Clean all metal parts. Any particles of elastomer adhering to the metal parts should be removed to facilitate proper seating and adhesion of the new seats.
- 2.2.2 Inspect seat plate sealing surface for scratches. If damaged, replace seat plate. It may be polished with fine sand-paper and crocus cloth, but it must be recoated with Teflon® to prevent adhesion of the plate to the elastomer seat.
- 2.2.3 Inspect guide tube for wear at spring pin holes. If holes are excessively worn, replace tube.
- 2.2.4 For non-lox clean valves, cement new sponge seat to seat ring using Resiweld Adhesive #7004, manufactured by H. B. Fuller Co. The adhesive is a two component epoxy base that will cure at room temperature. Blending ratio by weight or volume is one to one, "Part A" with "Part B".

The seat ring and sponge seat should be cleaned with alcohol or other suitable solvent compatible with the elastomer, before cementing. Apply adhesive to seat ring sparingly and spread uniformly in thin layer, approximately .001 to .003 [.025 to .076 mm] thick, with knife or spatula. Place sponge seat on seat ring and press in place, smoothing out all ripples. Remove any excess epoxy which may have squeezed out. Allow to cure at room temperature for 24 hours.

For lox clean valves, cement the seat to seat ring using Fluorelastomer Solution, PLV-2000 with accelerator #4, manufactured by Pelmor Laboratories Inc. This is a two component cement consisting of a base material and accelerator. It can be mixed by weight or volume. By weight, use 44 parts base material to 6 parts accelerator. By volume, use 1/2 pint [0.24 liter] base material to 225 drops accelerator. Allow to cure for 24 hours at room temperature.

NOTE: PLV-2000 Fluorelastomer can be obtained in an aerospray can with the accelerator added, so no mixing is necessary.

- 2.2.5 Cement new O-ring seat into seat ring using same procedures described in 2.2.4.
- 2.2.6 Assemble seat plate bolt to guide tube. Place tube in "Vee" block, align holes and insert spring pin.
- 2.2.7 Assemble guide tube to seat plate in the reverse order from that described in 2.1.1. Torque locknut for snug fit. Make sure the retainer and o-ring are in place for a seal around bolt shank.
- 2.2.8 Assemble guide rod to body in reverse order from that described in 2.1.2, torque bolt 18 - 24 ft. lbs. [24.4 -32.5 N@m].
- 2.2.9 Assemble internal parts and inlet screen in reverse order from that described in 2.1.0 and 2.1.1. Be careful not to damage the Teflon surface on the guide rod. Apply a light coat of lubricant to all threads before assembly.

3.0 Leak and Vacuum Set Verification Testing

- 3.1 Pressurize vacuum breaker to 150% of the positive working pressure.
- 3.2 Apply leak test solution around all bolts and sealing surfaces.
- 3.3 Reduce positive pressure to 10% of the positive working pressure and check for seat leaks using leak test solution. If seat leakage occurs the probable cause is the sponge seat not being cemented flat to the seat ring. If leakage is unacceptable, sponge seat must be replaced.
- 3.4 Reduce pressure to vacuum region and note negative pressure at which seat plate begins to lift. It should crack open, sufficiently to rattle slightly, at $1/2$ oz [0.22 kpag].

4.0 Soft Goods Repair Kit

The kits listed below are available from stock. To order, specify the base number and select the last three digits from the following table. To insure the purchase of correct soft goods kits, the order should specify the valve model number and serial number.

Kit Base Number: 04-4744-XXX

Type 96A Vacuum Breaker Soft Goods Kit

Material	Tank Connection			
	4"	6"	8"	12"
BUNA-N	-112	-113	-114	-115
Viton®	-116	-117	-118	-119
EPR	-906	-907	-908	-905

Item	Description
1	Body
2	Nut-Lock
4	Pin-Spring
5	Bolt-Seat Bolt
6	Rod-Guide
7	Tube-Guide
8	Bolt-Guide Rod
9	O-ring
10	Seat-Sponge
11	Plate-Seat
12	Screen-Inlet
13	Retainer-Seat Ring
14	Bolt-Retainer
15	Ring-Seat
16	O-ring, Seat Plate
17	O-ring, Seat Ring
18	Cap-Outlet
19	Stud
20	Nut
21	Gasket
23	Weight-Ring
24	Spacer
25	Retainer-O-ring
26	O-ring
27	Eyebolt

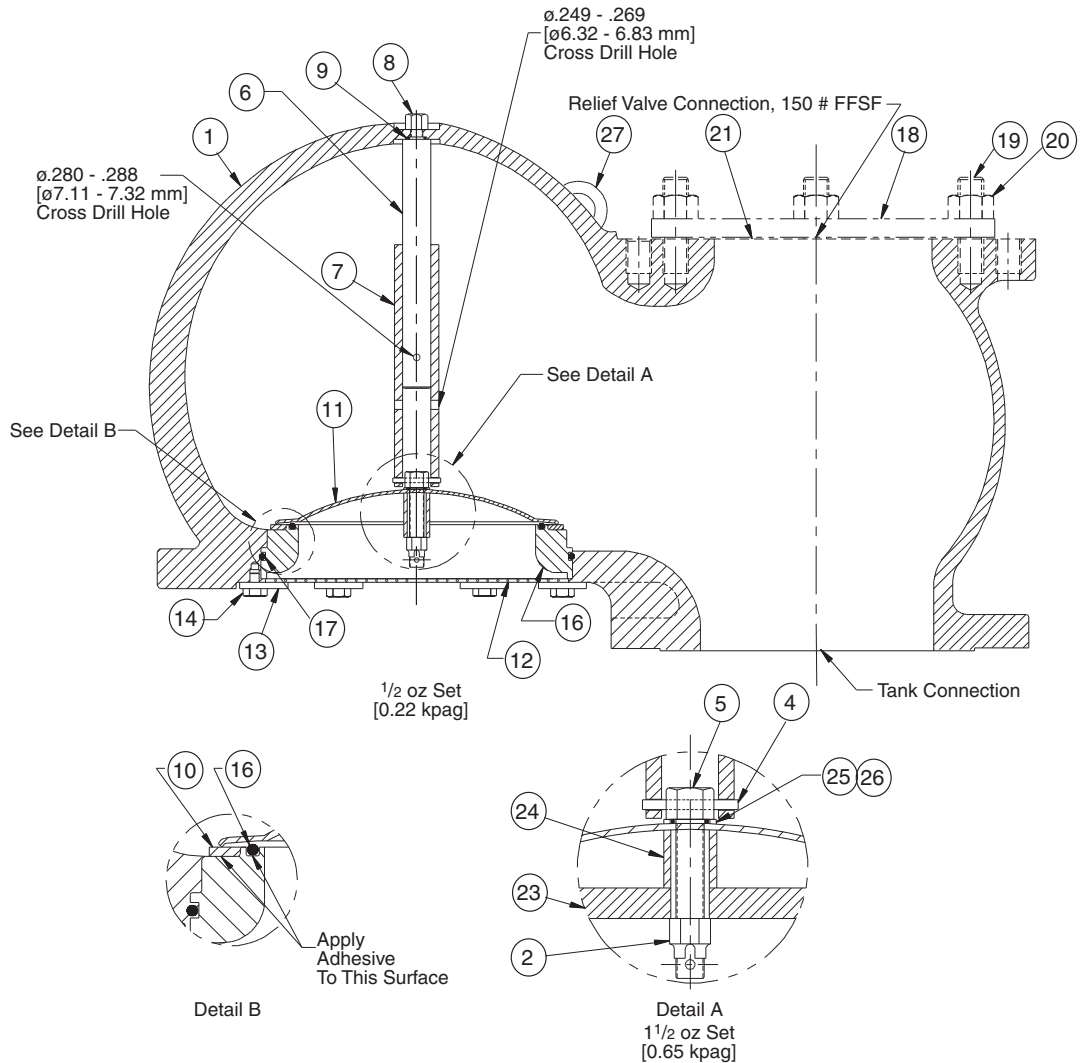


Figure 1

Tyco Valves & Controls

www.tycovalves.com

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