# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

## Figures 993-D and 993L-D Combination Vacuum Breaking and Air Release Valves for Sewage and Wastewater

TABLE OF CONTENTS



GA INDUSTRIES
a +GF+ brand


**234 Clay Avenue • Mars, PA 16046 USA**
**Telephone (724) 776-1020 • Fax (724) 776-1254**
**E-mail:** info-ga@vag-group.com



Manual Number 993-IOM-061426


WARNING: Cancer and Reproductive Harm – www.Prop65Warnings.ca.gov

# Section 1

# INSTALLATION, OPERATION and MAINTENANCE

## Figure 993-D and 993L-D
### Vacuum Breaking and Air Release Valves for Sewage and Wastewater

**INTRODUCTION**
This manual provides information to install, operate and maintain GA Industries dual body combination air valves to ensure a long service life. The valve is ruggedly constructed to provide many decades of dependable service with minimal maintenance.

**CAUTION**
The valve is NOT recommended for use with toxic, corrosive, or flammable fluids.

The Shop Order (SO) Number, Figure Number, size, and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

**DESCRIPTION OF OPERATION**
The Figure F993-D consists of two individual valves assembled together as shown on page 2: a Figure 991-D Vacuum Breaking Valve and a Figure 929 or 929L Short Body Air Release Valve

The Figure 992-D has a maximum working pressure of 150 PSI while the Figure F992L-D has maximum working pressure of 75 PSI.

When the pressure inside the valve is atmospheric, the vacuum breaking valve is held closed by the force of the counterweight and the air release valve is open. As liquid enters the valves, air is released through the air release valve's orifice until water rises sufficiently to lift the float and close the valve. Internal pressure assists in holding the valve closed.

The air release valve automatically opens when sufficient air has collected in the valve then closes after it has been released through its orifice.

The vacuum breaking valve remains closed as long as the internal pressure is at or above atmospheric pressure. It will start to open when the internal pressure falls below atmospheric pressure, opening as far as needed to admit air at the rate necessary to limit the vacuum. The vacuum breaking valve will close as the internal pressure returns to atmospheric and air is no longer entering the valve.
As the system re-pressurizes, the air that was drawn into the system is slowly released through the air release valve's small orifice. When all the air has been released water will lift the float inside the air release valve and close the valve's orifice

**RECEIVING AND STORAGE**
Inspect the valve upon receipt for damage during shipment. Carefully unload all valves to the ground without dropping.

Valves should remain in a clean, dry, and weather protected area until installed. After completion of shop testing the valve is drained of the test water but a small residual amount could remain so the valve should be protected from freezing during storage.

**INSTALLATION**
The Figure 993 may be shipped disassembled requiring the installer to connect the two valves at the pipe union.

The valve is typically installed at high points in the system where air naturally rises during filling and in operation and a vacuum first form during draining.

The vacuum breaking and air release valve is installed on top of the pipeline in a vertical orientation with an isolating valve between the pipeline and the air valve. The counterweight arm must be horizontal when the valve is closed.

Prior to installation ensure all debris, packing material or other foreign material has been removed from the valve.

If installed outdoors, below ground in a vault or in an unheated area, adequate freeze protection must be provided.

The valve should be installed with sufficient clearance to permit maintenance and removal of internal components.

Both the Figure 993-D and 993L-D are supplied with ANSI Class 125 flat faced flanged pipeline connection. Flat-faced flanged valves should be mated with flat-faced flanges and full-face gaskets. If ring gaskets are used the bolt material shall be ASTM

A307 Grade B (or equivalent). Higher strength bolting should only be used with full-face gaskets.

Lower heavy valves using slings or chains around the valve body and/or the lifting eyes. DO NOT LIFT BY THE AIR RELEASE VALVE or the counterweight arm. Lubricate the bolts or studs and insert around flange. Lightly tighten bolts until gaps are eliminated. Torque bolts in an alternating pattern in graduated steps. If leakage occurs wait 24 hours and re-torque the bolts but do not compress the gasket more than 50% or exceed bolt maximum torque rating.

**START-UP**

Ensure the ball valve between the two valves and the inlet isolating valve are both fully open. The air release valve does not require any calibration or adjustment prior to start-up. The counterweight(s) are typically positioned at the far end of the arm but can be moved inward to adjust the negative pressure at which the valve starts to open.

**PREVENTATIVE MAINTENANCE**

No routine lubrication or adjustments are needed. A periodic visual inspection should be conducted to ensure the air inlet screen is not obstructed and to verify there is no fluid leakage.

Depending on the nature of the fluid, wastewater air valves may become clogged with sediment or grease and require periodic cleaning. To facilitate such cleaning, the sewage air release valve used in GA Industries Figure Numbers 993F-D and 993LF-D vacuum breaking and air release valves were supplied with “backflushing attachments.”

Follow the backflushing instructions for the Figure 929 sewage air release manual in Section 3.

**REPAIR INSTRUCTIONS**

Instructions for the inspection, troubleshooting and repair of the two valves utilized in the GA Industries Figure 993-D and 993L-D are provided in the sections for each valve.

**REPLACEMENT PARTS**

Genuine replacement parts are available from your local GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
Telephone: 724-776-1020
Fax: 724-776-1254
E-mail: quotes-ga@vag-group.com

Please have the nameplate data available when ordering parts.

**WARRANTY:**

The Warranty for GA Industries valves is included in our Terms and Conditions which can be found here: https://gaindustries.com/terms

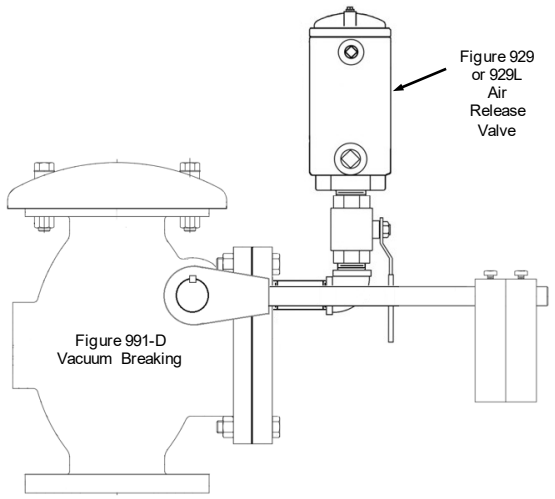



Figure 993-D and 993L-D

# Section 2

# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

## Figures 991-D and 991-U
## Drawing EAV-7080, 3” to 20”
## Wastewater Vacuum Breaking Valves

TABLE OF CONTENTS



GA INDUSTRIES
a +GF+ brand


**234 Clay Avenue • Mars, PA 16046 USA**
**Telephone (724) 776-1020 • Fax (724) 776-1254**
**E-mail:** info-ga@vag-group.com



Manual Number 220-IOM-022321


WARNING: Cancer and Reproductive Harm – www.Prop65Warnings.ca.gov

# INSTALLATION, OPERATION and MAINTENANCE

## Figures 991-D and 991-U
## Wastewater Vacuum Breaking Valves

**INTRODUCTION**
This manual will provide the information to properly install, operate and maintain the valve to ensure a long service life. The Figure 991 Vacuum Breaking Valve is ruggedly constructed to provide years of trouble-free operation with minimal maintenance.

**CAUTION**
The valve is NOT recommended for use with toxic or highly corrosive fluids, fuels or fluids containing hazardous gases

The Shop Order (SO) Number, Figure Number, size and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

**DESCRIPTION OF OPERATION**
The Figure 991 Vacuum Breaking Valve is counter-weighted rubber-seated valve specifically designed for use with fluids containing stringy solids and debris. It is normally closed and opens to open to admit air when the pressure inside the valve falls a pre-set amount below atmospheric pressure. It opens as far as needed to admit air at the rate necessary to limit further vacuum formation. The valve will close when the internal pressure recovers to atmospheric and remain closed when the pressure inside the valve is above atmospheric.

**RECEIVING AND STORAGE**
Inspect the valve upon receipt for damage during shipment. Carefully unload all valves to the ground without dropping.

The valves should remain in a clean, dry, and weather protected area until installed. For long term storage (greater than 6 months) the rubber surfaces of the seat should be coated with a non-toxic lubricant such as "SuperLube" made by Synco Chemical. Do not expose the rubber parts to sunlight or ozone.

**INSTALLATION**
Figure Numbers suffixed with “D” (e.g., 991-D) indicate the valve has an ANSI Class 125 flanged pipeline connection, Figure Numbers suffixed with “U” (e.g., 991-U) indicate the valve has an ANSI Class 250 flanged connection.

The valve must be installed in a vertical orientation and plumb. The counterweight arm must be horizontal when the valve is closed.

Prior to installation ensure all debris, packing material or other foreign material has been removed from both ports.

If installed outdoors, below ground in a vault or in an unheated area, adequate freeze protection must be provided.

An isolating valve should be installed between the valve and the pipeline or system to facilitate maintenance.

The valve is not designed to support adjacent equipment; piping loads should not be imposed on the valve and large valves should be properly supported. Ensure mating flanges are square and parallel to the valve flanges before tightening flange bolts.

Flat-faced flanged valves should be mated with flat-faced flanges and full-face gaskets. If ring gaskets are used the bolt material shall be ASTM A307 Grade B (or equivalent). Higher strength bolting should only be used with full-face gaskets.

Lower heavy valves using slings or chains around the valve body and/or the lifting eye. Do not lift by the “cowl” or counterweight arm. Lubricate the bolts or studs and insert around flange. Lightly tighten bolts until gaps are eliminated. Torque bolts in an alternating pattern in graduated steps. If leakage occurs wait 24 hours and re-torque the bolts but do not compress the gasket more than 50% or exceed bolt maximum torque rating.

**VALVE CONSTRUCTION**
The standard Figure 991 has a cast iron body, bronze or stainless steel body seat, stainless steel hinge shaft and cast iron disc with a rubber disc seat. Refer to the List of Materials submitted for the order if non-standard materials were provided.

Refer to Page 4 for details of construction and parts location.

**START-UP**
The valve generally does not require any calibration or adjustment prior to start-up. The counterweight(s) should be initially placed at the far end of the arm and secured by tightening the set screw (31A).

The valve should smoothly swing open as air flow through the valve increases. The amount of opening depends on the flow velocity through the valve and can be observed by watching the external counterweight arm. The valve is "full ported" at about 25 degrees of swing but can swing open as much as 60 degrees.

**PREVENTIVE MAINTENANCE**
Figure 991 Vacuum Breaking Valves require no scheduled lubrication, adjustment or preventive maintenance.

A monthly inspection should be performed for the first 6 months of operation to ensure the valve is functioning properly and there is no external fluid leakage or audible evidence of water leaking backwards through the closed valve.

Thereafter, a quarterly visual inspection should be performed.

**TROUBLESHOOTING**

- Shaft packing leakage
  Tighten packing gland nuts equally just enough to stop leakage, no more than ½ turn at a time. DO NOT OVER-TIGHTEN! Replace packing if necessary.
- Leakage past seat when closed
  Inspect valve for debris, clean
  Inspect seating surfaces for damage, replace as necessary
- Leakage past cover or flange gaskets
  Tighten cover or flange bolts

**WARNING**
Removing the valve from the line or disassembling the valve while there is pressure in the valve body may result in injury or damage to the valve

**WARNING**
Follow all applicable safety regulations and codes and read and understand all instructions before undertaking disassembly.

**DISASSEMBLY**
All Figure 991 valves can be serviced while the body remains connected to the pipeline. A skilled technician should perform all work. No special tools are required.

First ensure there is no pressure within the valve and operating equipment is tagged and locked out. Refer to pages 3 and 4 for parts identification and location.

It is not necessary to disassemble the entire valve to replace the shaft packing, follow steps 1 to 3 and 5a.

1. Ensure there is no pressure within the valve and operating equipment is locked out.
2. Mark the position of the counterweight(s) on the arm. Loosen the counterweight set screw (31A) and slide the weight(s) off the arm. Loosen the counterweight arm set screws (30A) and slide the arm (30) off the shaft, being careful not to lose the key (30B).
3. Loosen and remove the gland stud nuts (16), slide off the gland (15) and remove the shaft packing (17).
4. Remove the end plate bolts (35), the end plate (34) being careful not to lose or damage the end plate seal (36) unless it is to be replaced
5. Remove the cover bolts (10) and lift off the cover (9). If necessary, carefully pry the cover off using a cold chisel between the body and cover. Be careful not to damage or lose the cover gasket (8) unless it is to be replaced.
6. Remove the shaft lock pin (18) by threading a screw into the tapped hole.
7. With the disc and disc arm properly supported, loosen the disc arm set screw (12) and pull the shaft (11) out of the valve. It may be necessary to drive out the shaft from the opposite end.
   NOTE: The outer bushing (14) and disc arm key (19) should come out with the shaft. Be careful not to lose the disc arm key. After the shaft is out, remove the inner bushing (13) from the opposite side.
8. Carefully lift the disc arm assembly out of the body. Remove the disc nut pin (6B), disc nut (6) and disc nut washer (6A).
9. Remove the seat screws (5C), the seat follower (5B) and the renewable seat (5A) or metal seat washer (5D).
10. In the unlikely event it's necessary to remove the body seat (2), the spring pins holding it into the body must be compressed until they no longer "bite" into the body. This is best accomplished by compressing the seat pins (2B) using "vice-grips" and pulling the pins in a radial direction towards the valve centerline.

Inspect all parts for wear and damage. Replace damaged parts.

**ASSEMBLY**
The valve is reassembled by reversing the disassembly sequence with consideration of the following:

1a. Clean and polish all machined bearing and sealing surfaces. Apply a light coat of lubricant to assist in the assembly.

2a. Ensure the disc arm key slides inside the disc arm before installing the shaft lock pin (18). Ensure the shaft lock pin has dropped into the groove provided for it on the shaft.

3a. Install the inner and outer bushings then install the shaft packing. Install the end plate (34) with seal (36). Install and tighten the end plate bolts (35) while ensuring the end plate seal (36) remains in the groove provided for it in the end plate.

4a. Lift the disc assembly several times to ensure free closure with no metal-to-metal contact.

5a. Wrap the packing around the shaft and cut on a 45-degree angle, staggering the cuts with each ring.

6a. Tighten gland bolts evenly until packing is slightly compressed. After pressure has been introduced into the valve, re-tighten evenly until leakage stops.

7a. Ensure cover gasket sealing surfaces are clean and apply a thin coat of Permatex™ #2 to both surfaces. Tighten cover nuts in an alternating pattern. Re-tighten as needed after pressure has been introduced.

8a. Re-install the counterweight arm (30) with key (30B) and tighten counterweight set screws (30A).

9a. Slide counterweight(s) onto shaft and lock in place using set screws (31A). Lift counterweight arm and allow it to fall to ensure free movement.

**REPLACEMENT PARTS**

Genuine replacement parts are available from your local VAG/GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
Telephone: 724-776-1020
Fax: 724-776-1254
E-mail: quotes-ga@vag-usa.com

Please have the nameplate data available when ordering parts. Identify needed part(s) by Shop Order (SO) Number, Figure Number, valve size and individual part number.

**REPAIR KITS**

Soft Goods Kit includes Items 2A 5A, 8, 17 & 36

| Size | Kit Number | Part Number |
|---|---|---|
| 2" to 3" | SW3 | 2-80-24000-218 |
| 4" | SW4 | 2-80-24000-222 |
| 6" | SW6 | 2-80-24000-225 |
| 8" | SW8 | 2-80-24000-228 |
| 10" | SW10 | 2-80-24000-200 |
| 12" | SW12 | 2-80-24000-203 |
| 14" | SW14 | 2-80-24000-206 |
| 16" | SW16 | 2-80-24000-209 |
| 18" & 20" | SW1820 | 2-80-24000-212 |
| 24" | SW24 | 2-80-24000-215 |

Soft Goods AND Disc/Disc Arm Assembly Kit includes above parts plus 3, 4, 5B, 5C, 6, 6A, 6B & 12.

| Size | Kit Number | Part Number |
|---|---|---|
| 2" to 3" | SW3D | 2-80-24000-221 |
| 4" | SW4D | 2-80-24000-224 |
| 6" | SW6D | 2-80-24000-227 |
| 8" | SW8D | 2-80-24000-230 |
| 10" | SW10D | 2-80-24000-202 |
| 12" | SW12D | 2-80-24000-205 |
| 14" | SW14D | 2-80-24000-208 |
| 16" | SW16D | 2-80-24000-211 |
| 18" & 20" | SW1820D | 2-80-24000-213 |

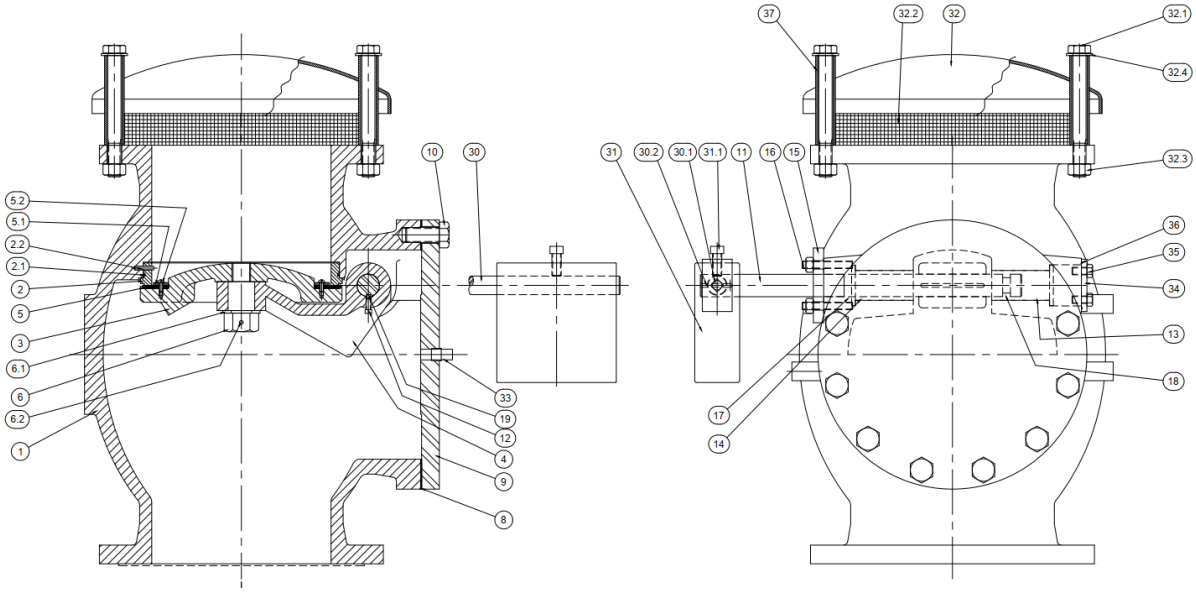
All other parts ordered individually. Consult factory for larger sizes.

**WARRANTY:**

The Warranty for GA Industries valves is included in our Terms and Conditions which can be found here: https://gaindustries.com/terms

| Part No. | Part Name | Std. Material |
|---|---|---|
| 1 | Body | Cast Iron |

| Part No. | Part Name | Std. Material |
|---|---|---|
| 2 | Body Seat | Bronze or SS |
| 2.1 | Seat O-Ring | Buna-N |
| 2.2 | Seat Pins | Stainless Steel |
| 3 | Disc with Center Pin | Cast Iron/Steel |
| 4 | Disc Arm | Ductile Iron |
| 5 | Renewable Seat | Buna-N |
| 5.1 | Seat Follower | Bronze or SS |
| 5.2 | Seat Screws | Stainless Steel |
| 6 | Disc Nut | Steel |
| 6.1 | Disc Nut Washer | Steel |
| 6.2 | Disc Nut Cotter Pin | Stainless Steel |
| 8 | Cover Gasket | Fiber |
| 9 | Cover | Steel |
| 10 | Cover Bolt (and Nut) | Steel |
| 11 | Shaft | Stainless Steel |
| 12 | Disc Arm Set Screw | Stainless Steel |
| 13 | Inner Bushing | Bronze |
| 14 | Outer Bushing | Bronze |
| 15 | Gland | Cast Iron |
| 16 | Gland Stud & Nut | Steel |
| 17 | Packing | Teflon |
| 18 | Shaft Lock Pin | Brass |
| 19 | Disc Arm Key | Stainless Steel |
| 30 | Counterweight Arm | Ductile Iron/Steel |
| 30.1 | C'weight Arm Set Screw | Stainless Steel |
| 30.2 | Counterweight Arm Key | Stainless Steel |
| 31 | Counterweight(s) | Cast Iron |
| 31.1 | Counterweight Set Screw | Stainless Steel |
| 32 | Cowl | Steel |
| 32.1 | Cowl Bolts | Steel |
| 32.2 | Screen | Stainless Steel |
| 32.3 | Cowl Nuts | Steel |
| 2.4 | Cowl Washer | Steel |
| 33 | Cover Plug (18" & 20" only) | Steel |
| 34 | Shaft End Plate | Steel |
| 35 | Shaft End Plate Screws | Steel |
| 36 | Shaft End Plate Seal | Buna-N |
| 37 | Stud Sleeve | Steel |



This page intentionally left blank.

# Section 3

# INSTALLATION, OPERATION AND MAINTENANCE MANUAL

# FIGURES 929 & 929SS

## SHORT BODY AIR RELEASE VALVES FOR SEWAGE & WASTEWATER

TABLE OF CONTENTS



GA INDUSTRIES
a +GF+ brand


**234 Clay Avenue • Mars, PA 16046 USA**
**Telephone (724) 776-1020 • Fax (724) 776-1254**
**E-mail:** info-ga@vag-group.com


WARNING: Cancer and Reproductive Harm – www.Prop65Warnings.ca.gov


Manual Number 929-IOM-090125 Rev A

# INSTALLATION, OPERATION and MAINTENANCE

## Figure 929 & 929SS
## Short Body Sewage Air Release Valves

**INTRODUCTION**
This manual will provide the information to properly install, operate and maintain the valve to ensure a long service life. The Air Release Valve is ruggedly constructed to provide years of trouble-free operation with minimal maintenance.

**CAUTION**
The valve is NOT recommended for use with toxic fluids, fuels or fluids containing hazardous gases

**CAUTION**
The valve will not function if used at a pressure higher than the maximum working pressure indicated on the nameplate.

The Shop Order (SO) Number, Figure Number, size and pressure rating are stamped on a nameplate attached to the valve. Please refer to the SO number when ordering parts.

**DESCRIPTION OF OPERATION**
The Figure 929 and 929SS Air Release Valves are designed to automatically vent air and sewage gas that has accumulated within the valve. These valves are usually installed at high points in the system where air tends to collect. The valves are ”normally-open” and will vent air through its orifice at the top of the valve. The float rises when water enters the valve and closes the orifice. Air from the system accumulates in the valve forcing the water level down until the float drops and opens the venting orifice. As air is released the water level rises lifting the float and re-closing the valve.

This sequence occurs as often as necessary to release air that has collected in the valve.

**RECEIVING AND STORAGE**
Inspect the valve upon receipt for damage during shipment. Carefully unload all valves to the ground without dropping.

The valves should remain in a clean, dry and weather protected area until installed. For long term storage (greater than 6 months) the rubber surfaces of the seat should be coated with a non-toxic lubricant such as "SuperLube" made by Synco Chemical. Do not expose the rubber parts to sunlight or ozone.

**INSTALLATION**
Figure 929 and 929SS are standard with 2” or 3” NPT screwed connections. A flanged pipeline connection can be provided on special order.

Consult the drawings of record to verify the configuration supplied and installed.

The valve must be installed in an upright vertical orientation, normally at a high point in the system.

If installed outdoors, below ground in a vault or in an unheated area, adequate freeze protection must be provided.

An isolating valve should be installed between the valve and the pipeline or system to facilitate maintenance (included with backflushing attachments).

Carefully screw threaded end valves onto pipe nipple using compatible thread sealant. Tighten valve using wrench flats. DO NOT OVER-TIGHTEN.

Flat-faced flanged valves should be mated with flat-faced flanges and full-face gaskets. If ring gaskets are used the bolt material shall be ASTM A307 Grade B (or equivalent). Higher strength bolting should only be used with full-face gaskets.

Lower heavy valves over the mating flange using slings or chains around the valve body. Lubricate the bolts or studs and insert around flange. Lightly tighten bolts until gaps are eliminated. Torque bolts in an alternating pattern in graduated steps. If leakage occurs wait 24 hours and re-torque the bolts but do not compress the gasket more than 50% or exceed bolt maximum torque rating.

**VALVE CONSTRUCTION**

The Figure 929 Sewage Air Release Valve has a cast iron body and cover while the Figure 929SS has a 316 stainless steel body and cover. Both have a 316SS stainless steel float and linkage mechanism and a rubber seat. Optional materials such as ductile iron body can be provided for higher working pressures. Refer to the List of Materials submitted for the order if non-standard materials were provided.

Refer to Page 5 for details of construction and parts location.

Figure 929 and 929SS have a 10 to 150 PSI working pressure range while the Figure 929L and 929SSL have a 10 to 75 PSI working pressure range.

The valve has an inlet connection at the bottom where the valve attaches to the system and a smaller outlet connection at the top through which air leaves the valve.

**WARNING**

Removing the valve from the line or disassembling the valve while there is pressure in the valve body may result in injury or damage to the valve

**PREVENTIVE MAINTENANCE**

These sewage air release valves require no scheduled lubrication or adjustment.

A periodic visual inspection should be performed to ensure the outlet piping is not obstructed and to verify there is no fluid leakage.

Depending on the nature of the fluid, sewage air valves may become clogged with sediment or grease and require periodic cleaning. To facilitate such cleaning VAG/GA Industries air valves with an “F” at the end of the Figure Number (e.g., 929F, 929SSLF) were supplied with “backflushing attachments.” Refer to the backflushing instructions on Page 4 of this manual for additional information.

**TESTING**

Valve operation can be easily tested. Close the inlet isolation valve and remove or loosen the pipe plug nearest the inlet to drain the water from the valve. The float should drop as the water leaves the valve. NOTE: A manual valve can be installed in place of the pipe plug to facilitate testing (valves are included with backflushing attachments).

Replace or tighten the pipe plug and slowly open the inlet isolating valve. After expelling air, the valve should close and seal tightly.

**TROUBLESHOOTING**

- Valve Does Not Close / Fluid Leakage
  Verify debris has not collected on the seat preventing tight closure

  Verify rubber orifice button and/or orifice seating surfaces are not damaged

  Verify float has buoyancy

  Verify linkage mechanism operates freely without binding or sticking

  Verify the pressure at the valve inlet it at least 10 PSI

- Valve Does Not Open
  Verify debris in the valve is not preventing the float from freely falling when fluid is drained from valve

  Verify linkage mechanism operates freely without binding or sticking

  Verify the pressure at the valve inlet does not exceed the valve’s maximum working pressure

**DISASSEMBLY**

While small valves may be more easily serviced by removing it from the line, all valves can be serviced while the body remains connected to the pipeline. A skilled technician with proper tools should perform all work. No special tools are required.

Disassemble the valve only as far as needed to replace damaged or worn parts.

First ensure there is no pressure within the valve. Remove the cover bolts (16) and lift off cover (2) with float and linkage attached. It may be necessary to pry the cover off. Be careful not to damage or lose the O-ring (10) unless it's being replaced.

Remove the two spring pins (13) connecting the lever arm (11) and float arm (12) to the bracket (3). The float and linkage will be free from the cover.
Remove the spring pins (13) connecting the valve links (14) to the float arm (12). Remove the spring pin (13) from the pivot link (15) and the hex nut (8) and lock washer (9). Unscrew the float rod (21) from the float ball (20). It may be necessary to apply some heat to these threaded connections as they are secured with Loctite.

Remove the hex nut (8) and lock washer (9) and unscrew the orifice button (7) from the lever arm (11).

Remove the bracket screw (5) to remove the leverage bracket (3). Using a hex socket remove the orifice (4) from the cover.

Inspect all parts for wear and damage. Minor scratches and dents in the float are normal. Some floats may contain sand for added weight but if water is detected replace the float. Carefully clean the orifice of scale. Replace damaged parts.

**REASSEMBLY**
Clean all parts especially seating and sealing surfaces before reassembling valve. Worn parts should be replaced during re-assembly.

Apply Loctite© PST thread sealant to orifice (4) and thread into cover. Torque to 22 ft-lbs (maximum).

Install bracket (3), bracket screws (5) and lock washers (6) and tighten.

Thread orifice button (7) all the way into lever arm (11) and install hex nut (8) and lockwasher (9) but do not tighten. Connect the lever arm (11) and float arm (12) to the bracket (3) using two spring pins (13).

Adjust the orifice button (7) so that the end of the lever arm (11) nearest the orifice button is about 1/16" (1.6mm) farther from the cover than the opposite end when the orifice button (7) is gently resting on the orifice (4). Secure by tightening hex nut (8).

Install valve links (14) and spring pins (13) to connect the float arm (12) to the lever arm (11).

Apply Loctite 263 to one end of float rod threads and Install lock washer (9) and float rod (21) into float ball (20) and tighten. Apply Loctite 263 to the threads on the other end of float rod. Install pivot link (15), lock washer (9) and hex nut (8) on opposite end of float rod (19) and tighten. Attach pivot link (15) to float arm (12) using spring pin (13).

Verify free movement of linkage mechanism and that the orifice button (7) presses against the orifice (4) when the float rises and pulls away when allowed to fall.

Lubricate and place O-ring (10) in cover (2) and carefully place cover (2) on body (1) ensuring o-ring is retained. Install the cover bolts (16) and tighten in an alternating pattern.

Carefully introduce pressure and check for leaks.

**BACKFLUSHING INSTRUCTIONS**

| Follow all local cross-connection and safety codes and regulations! |
|---|

To determine if a GA Industries sewage air valve needs cleaning or backflushing:

- Close the inlet isolating valve then slowly open the ½" flushing ball valve (if installed) or slowly remove the pipe plug at the top of air valve to relieve internal pressure.
- Open the 1" blow off ball valve (if installed) or remove the pipe plug near the bottom. Liquid should freely drain from the valve body. If it does not, then the valve is likely in need of cleaning or backflushing.

To clean a GA Industries air valve equipped with backflushing attachments:

- Close the inlet isolating valve and then slowly open the ½" flushing valve to relieve internal pressure.
- Open the 1" blow off valve
- Connect the ½" flushing valve to a pressurized source of clean water using the rubber hose provided with the backflushing attachments.

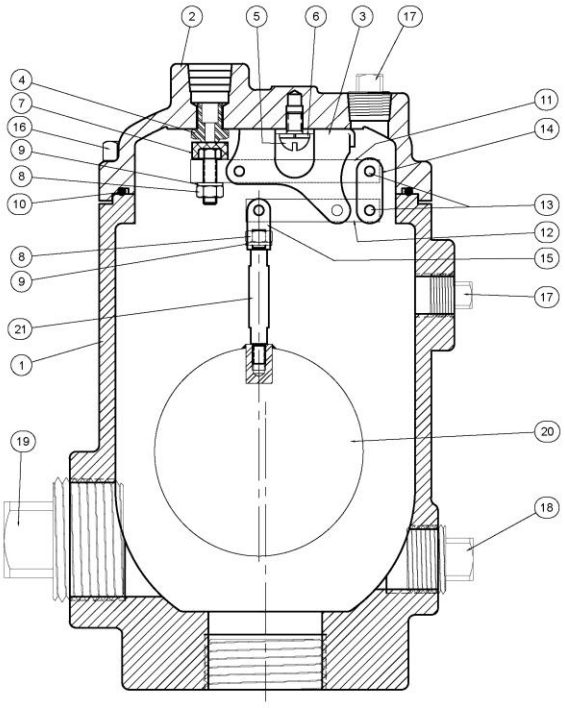
- Introduce flushing water until liquid runs freely from the blow off valve.
- Shut off and disconnect the supply of clean water and close the blow off and flushing valves.
- Slowly open the inlet isolating valve. The air release valve should exhaust air and then close tightly

**REPLACEMENT PARTS**

Genuine replacement parts are available from your local VAG/GA Industries representative or from the factory:

VAG USA, LLC
234 Clay Avenue
Mars, PA 16046 USA
Telephone: 724-776-1020
Fax: 724-776-1254
E-mail: quotes-ga@vag-group.com

Please have the nameplate data available when ordering parts.




**REPAIR KITS**

Soft Goods Kit A929 (Part Number 2-80-11000-010) contains Items 7, 8, 9 and 10

Linkage Kit AL929 (Part Number 2-80-11000-086) contains Items 3, 5, 6, 11, 12, 13, 14, 15 and 21

Other parts are ordered individually.

**WARRANTY**

The Warranty for GA Industries valves is included in our Terms and Conditions which can be found here: https://gaindustries.com/terms

**Figure 929 and 929SS Parts List**

| Item | Description | Standard Material |
|---|---|---|
| 1 | Body | Cast Iron or 316SS* |
| 2 | Cover | Cast Iron or 316SS* |
| 3 | Leverage Bracket | 316 Stainless Steel |
| 4 | Orifice | 316 Stainless Steel |
| 5 | Bracket Screw | 304 Stainless Steel |
| 6 | Lock Washer | 410 Stainless Steel |
| 7 | Orifice Button | Buna-N Rubber/SS |
| 8 | Hex Nut | 304 Stainless Steel |
| 9 | Lock Washer | 410 Stainless Steel |
| 10 | O-Ring | Buna-N Rubber |
| 11 | Lever Arm | 316 Stainless Steel |
| 12 | Float Arm | 316 Stainless Steel |
| 13 | Spring Pin | 316 Stainless Steel |
| 14 | Valve Link | 316 Stainless Steel |
| 15 | Pivot Link | 316 Stainless Steel |
| 16 | Cover Bolt | Steel or 316SS** |
| 17 | ½" Pipe Plug | Steel or 316SS* |
| 18 | 1" Pipe Plug | Malleable Iron or 316SS* |
| 19 | 2" Pipe Plug | Malleable Iron or 316SS* |
| 20 | Float Ball | 316 Stainless Steel |
| 21 | Float Rod | 316 Stainless Steel |

* Standard 316SS Figure 929SS
** 316SS cover bolts standard Figure 929SS, optional Figure 929

**VAG USA, LLC**
234 Clay Avenue • Mars, PA 16046 USA
Phone: 724-776-1020 • Fax: 724-776-1020
info-ga@vag-group.com
www.gaindustries.com

This page intentionally left blank.