WELKER®

INSTALLATION, OPERATION, AND MAINTENANCE MANUAL
WELKER® INJECTION PUMP

MODEL
SS0-9

DRAWING NUMBER
AD243BR & AD243DG

MANUAL NUMBER
IOM-058

REVISION
Rev. C, 11/07/2014

TABLE OF CONTENTS

IMPORTANT SAFETY INFORMATION
READ ALL INSTRUCTIONS

Notes emphasize information and / or provide additional information to assist the user.

Caution messages appear before procedures that, if not observed, could result in damage to equipment.

Warning messages appear before procedures that, if not observed, could result in personal injury.

This manual is intended to be used as a basic installation and operation guide for the Welker® Injection Pump, SSO-9. For comprehensive instructions, please refer to the IOM Manuals for each individual component. A list of relevant component IOM Manuals is given in the Appendix section of this manual.

BEFORE YOU BEGIN

Read these instructions completely and carefully.

IMPORTANT – Save these instructions for local inspector's use.

IMPORTANT – Observe all governing codes and ordinances.

Note to Installer – Leave these instructions with the consumer.

Note to Consumer – Keep these instructions for future reference.

Skill Level – Installation of this Injection Pump requires basic mechanical and electrical skills.

Proper installation is the responsibility of the installer. Product failure due to improper installation is not covered under the warranty.

If you received a damaged Injection Pump, you should immediately contact a Welker® representative.

Phone: 281.491.2331
Address: 13839 West Bellfort Street
Sugar Land, TX 77498

SECTION 1: PRODUCT INFORMATION

1.1 Introduction

We appreciate your business and your choice of Welker® products. The installation, operation, and maintenance liability for this product becomes that of the purchaser at the time of receipt. Reading the applicable *Installation, Operation, and Maintenance* (IOM) *Manual* prior to installation and operation of this equipment is required for a full understanding of its application and performance prior to use.*

If you have any questions, please call 1-281-491-2331.

**The following procedures have been written for use with standard Welker® parts and equipment. Assemblies that have been modified may have additional requirements and specifications that are not listed in this manual.*

1.2 Product Description

The Welker® *SSO-9* Injection Pump is designed to be incorporated into a liquid sampling system to collect and inject product into a sample container.

When incorporated into a Welker® sampling system, the SSO-9 is mounted and tubed by the manufacturer. The sampling system may be hydraulically or pneumatically operated but is electronically controlled from a Programmable Logic Controller (PLC) or other signal control system. Sampling in such systems may be performed manually or remotely by activating the solenoids, which control the valve(s) and pump action of the SSO-9. The dual-acting power pump of the SSO-9 takes a sample from the connected product line with one actuation and then injects the sampled product into an incorporated sample container with another actuation.

For this manual, the term "PLC," or Programmable Logic Controller, will be used to refer to the PLC, DCS, or other signal control system used by the customer to activate and operate the solenoid.

Welker® may custom design the SSO-9 to suit the particular application and specifications of each customer.

1.3 Specifications

The specifications listed in this section are generalized for this equipment. Welker® can modify the equipment according to your company's needs. However, **please note that the specifications may vary depending on the customization of your product.**

Table 1: SSO-9 Specifications	
Applications	Bypass Sampling or Chemical Injection
Product Compatibility	Clean Light Liquids, Gasoline, Jet Fuel, Liquid Chemicals Compatible With Seal Material, Odorant, Refined Products
Materials of Construction	316 / 316L Stainless Steel Wetted Parts, Aluminum, Viton® Others Available
Maximum Allowable Operating Pressure	1800 psig @ -20°F to 120°F (*124 barg @ -28°C to 48°C*)
Pressure Limits	**Actuation:** 30-225 psig (*2-15 barg*) **Injection:** 1800 psig (*124 barg*) **Power End:** 225 psig (*15 barg*)
Injection Volume	5cc 10cc 25cc 30cc 50cc 61.5cc 100cc 150cc 300cc
Connections	1/4" NPT
Options	Actuation Valve (Shown) Adjustable Injection Volume (Shown) Manual Switching Valve Mounting Bracket Solenoid Sulfinert® Coating on Sample Exposed Parts Valves

1.4 System Diagrams

Figure 1: SSO-9 Diagram (3-Way Ball Valve With Optional Adjustment)

No.	Description
1	Adjustment Knob (Optional)
2	Restrictor (Qty. 2)
3	Power Cylinder
4	Muffler
5	Power Cylinder Base
6	Injection End Cap
7	Injection Cylinder
8	Power End Cap
A	Purge Valve (Not Shown)
B	SSO-9 Injection Pump 3-way Ball Valve

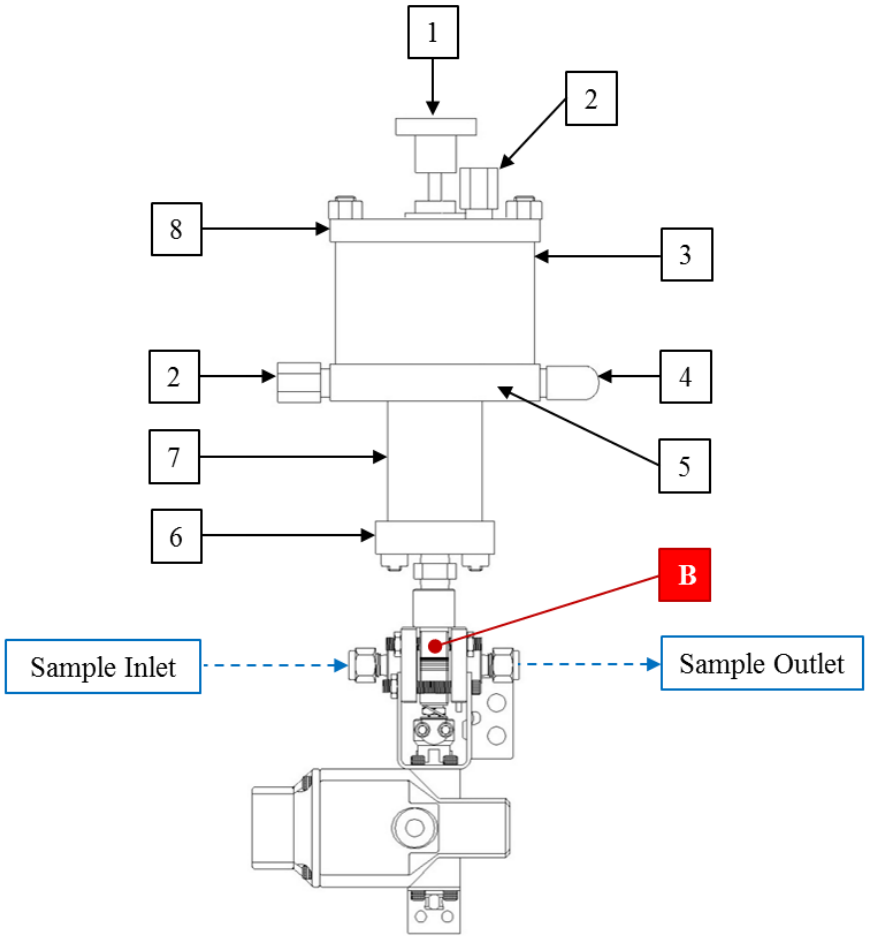
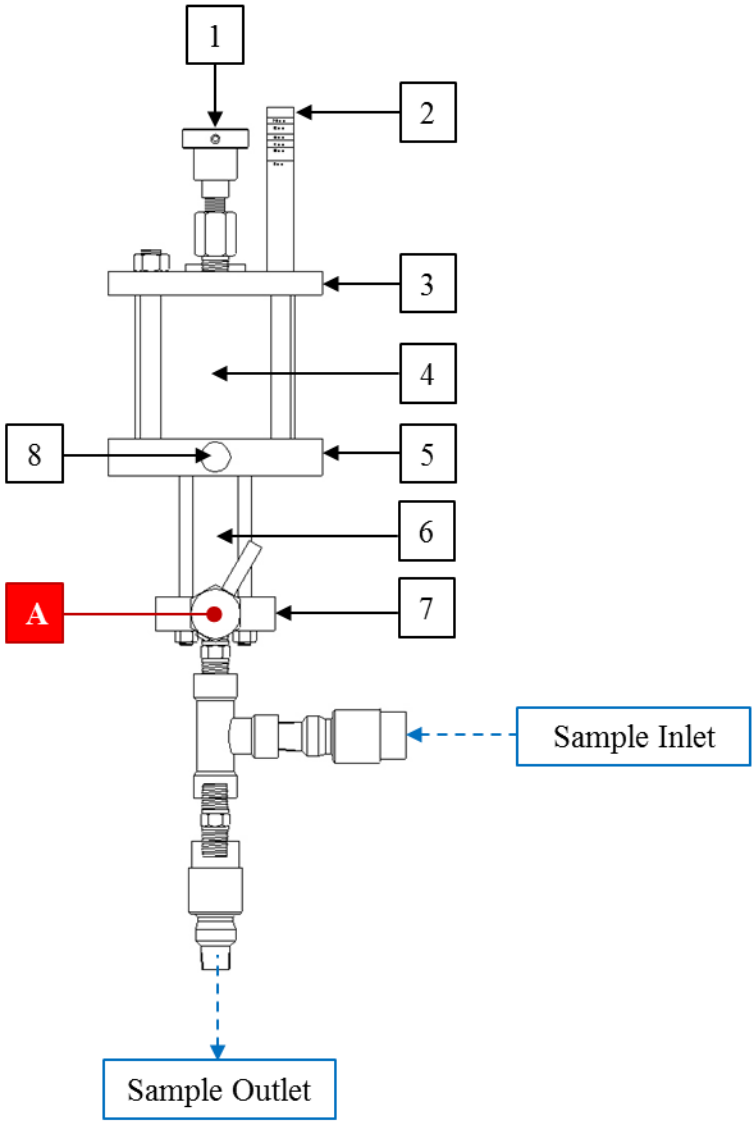


Figure 2: SSO-9 Diagram (Check Valves With Optional Adjustment)



No.	Description
1	Adjustment Knob (Optional)
2	Volume Indicator Rod (Optional)
3	Power End Cap
4	Power Cylinder
5	Power Cylinder Base
6	Injection Cylinder
7	Injection End Cap
8	Screen Plug
A	Purge Valve

2.1 Before You Begin

After unpacking the unit, check the equipment for compliance and for any damage that may have occurred during shipment. **Claims for damage caused during shipment must be initiated by the receiver and directed to the shipping carrier.** Welker® is not responsible for any damage caused by mishandling by the shipping carrier.

When sealing fittings with PTFE tape, refer to the proper sealing instructions for the tape used.

2.2 Principles of Operation

SSO-9 With a 3-Way Ball Valve

Welker® recommends sampling from the SSO-9 with a 3-way ball valve into an ambient container.

1. Ensure that product is flowing to the sample inlet of the 3-way ball valve.
2. Prior to starting a sample batch, purge the system to remove any air and / or contaminants.
3. After the purge cycle is complete, sampling operations may begin.
4. Energize the solenoid of the SSO-9 for at least four (4) seconds. Supply pressure enters the back of the power piston and supplies the valve actuator with instrumentation air. The valve actuator rotates the 3-way ball valve to make the pump port common with the inlet port, drawing product into the SSO-9.
5. Once the SSO-9 has collected the pre-determined volume of sample, de-energize the solenoid of the SSO-9. Supply pressure enters the power piston and supplies the valve actuator with instrumentation air. The valve actuator rotates the 3-way ball valve to make the pump port common with the outlet port, injecting the sampled product into the sample container.
6. Sampling continues automatically according to the proportional-to-flow sampling frequency programmed into the PLC until the desired volume of sampled product has been obtained.
7. After sampling, the sampled product can be removed from the sample container for transportation to the laboratory for analysis.

SSO-9 With Check Valves

Welker® recommends sampling from the SSO-9 with check valves into a constant pressure cylinder.

1. Ensure that product is flowing to the inlet check valve.
2. Prior to starting a sample batch, purge the system to remove any air and / or contaminants.
3. After the purge cycle is complete, sampling operations may begin.
4. Energize the solenoid for the SSO-9 for at least four (4) seconds. Supply pressure enters the back of the power piston and supplies the inlet check valve with instrumentation air. Product enters into the SSO-9 through the inlet check valve.
5. Once the SSO-9 has collected the pre-determined volume of sample, de-energize the solenoid of the SSO-9. Supply pressure enters the power piston and supplies the outlet check valve with instrumentation air. Product is injected through the outlet check valve into the sample container.
6. Sampling continues automatically according to the proportional-to-flow sampling frequency programmed into the PLC until the desired volume of sampled product has been obtained.
7. After sampling, the sampled product can be removed from the sample container for transportation to the laboratory for analysis.

2.3 Installation

The SSO-9 must be installed vertically for optimal performance.

1. Prior to installing the SSO-9 with a 3-way ball valve, ensure that the valve is normally open to the sample outlet.

To check valve orientation, remove the fitting from the sample outlet, and then look inside the 3-way ball valve. If the sample outlet is common to the injection cylinder, the 3-way ball valve is normally open to the sample outlet. If the sample outlet is not common to the injection cylinder, the 3-way ball valve is normally closed to the sample outlet and must be reoriented prior to installation.

If the 3-way ball valve is NOT normally open to the sample outlet, refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* for the 3-way ball valve for instructions on correcting the valve orientation.

2. As necessary, vertically mount the SSO-9 on a fast loop with no probe. The optional mounting bracket and included hardware allow for attachment to a 2" mounting post or leveling saddle.
3. Use tubing to connect from the product outlet to the sample inlet on the SSO-9.
4. If an electro-hydraulic unit (EHUC) is used to supply the power piston with instrumentation air, remove the restrictor fitting on the SSO-9 prior to beginning operations.
5. Use tubing to connect from the sample outlet on the SSO-9 to the desired sample container.
6. Connect from the SSO-9 junction box to the PLC. Refer to industry standards for appropriate electrical connections to interface with the PLC.
7. Check all fittings for leaks and repair as necessary.

2.4 Preparing for Automatic Operation

SSO-9 With a 3-Way Ball Valve

1. Purge the SSO-9 of any trapped air. Pressurize the product line, and then slightly open purge valve A on the SSO-9. Once liquid appears, close purge valve A.
2. Check for leaks and repair as necessary.
3. From the PLC, activate the sample function so that correct collection and injection of product by the SSO-9 can be verified.
4. Visually verify the correct collection and injection of product by the SSO-9. If a flow indicator / switch, aka “bite checker,” is present, it may be used to verify product is being collected. If the SSO-9 injects into a container with a volume indicator, it may be used to verify product is being injected. Alternatively, remove the sample container lid or a fitting near the injection point and observe sample being pumped into an ambient container.

The alternative method of visual verification should only be used if the product pumped into the container can be disposed of properly.

5. Once the SSO-9 is collecting and injecting correctly, replace the sample container lid or the fitting near the injection point.
6. Check for leaks and repair as necessary.
7. As necessary, check and / or adjust the volume of the SSO-9. See *Section 2.6, Checking the Sample Volume,* for instructions.
8. The SSO-9 injection pump may now be put into operation.

SSO-9 With Check Valves

1. Purge the SSO-9 of any trapped air. Pressurize the product line, and then slightly open purge valve A on the SSO-9. Once liquid appears, close purge valve A.
2. Check for leaks and repair as necessary.
3. From the PLC, activate the sample function so that correct collection and injection of product by the SSO-9 can be verified.
4. Visually verify the correct collection and injection of product by the SSO-9. If a flow indicator / switch, aka "bite checker," is present, it may be used to verify product is being collected. If the SSO-9 injects into a container with a volume indicator, it may be used to verify product is being injected.
5. Once the SSO-9 is collecting and injecting correctly, disconnect any attached container.
6. Check for leaks and repair as necessary.
7. As necessary, check and / or adjust the volume of the SSO-9. See *Section 2.6, Checking the Sampling Volume,* for instructions.
8. The SSO-9 may now be put into operation.

2.5 Automatic Operation

1. Set the PLC to sample according to the proportional-to-flow sampling frequency equations (*Figure 3*).

Figure 3: Sampling Frequency Equations

Liquid Sampling, Proportional to Flow Collection

Equation 1: Number of Samples Needed

$$Number\ of\ Samples\ Needed\ to\ Fill\ to\ 80\% = \frac{(Cylinder\ Size\ (cc) * 0.8)}{Bite\ Size\ (cc)}$$

Equation 2: Proportional-to-Flow

$$Volume\ of\ Flow\ Between\ Sample\ Grabs = \frac{Batch\ Size\ (Total\ Volume\ to\ be\ Sampled)}{Number\ of\ Samples\ Needed\ (Eq.1)}$$

Use Equation 1 to determine the number of actuations needed. Use Equation 2 to determine how often (after what volume of flow) to take each sample.

2. The PLC will automatically begin operation once a flow signal is received.
3. The PLC will automatically activate the solenoid to fill the SSO-9 and inject the product into the selected sample container.
4. Sampling continues automatically until the desired volume of sampled product has been obtained.
5. Once sampling is complete, sampled product collected in the sample container can be removed and prepared for transportation to a laboratory for analysis in accordance with company policy and procedure.
6. Prior to starting a new round of sampling, purge the system and the SSO-9.
7. Once the system and the SSO-9 have been purged of any contaminants, a new round of sampling may be started.

2.6 Checking the Sample Volume

SSO-9 With a 3-Way Ball Valve

If product leaks from the 3-way ball valve while checking the sample volume, maintenance is required to prevent cross-contamination. See *Section 3.2, Maintenance,* for maintenance procedures.

1. Tube from the product outlet of the SSO-9 to a graduated beaker.

This method of checking the sample volume should only be used if the product pumped into the graduated beaker can be disposed of properly.

2. Decide how many actuations will be taken into the graduated beaker to verify the sample volume.
3. From the PLC, activate the sample function so that the collection and injection volume of the SSO-9 can be verified.
4. Capture product in the graduated beaker until the pre-determined number of actuations have been taken.
5. Once the pre-determined number of actuations have been taken, stop product flow to the SSO-9.
6. Calculate the sample volume by dividing the volume of product captured by the number of actuations taken.
7. If the SSO-9 is equipped with the optional volume adjustment, adjust the collection and injection volume as necessary. To increase the volume, turn the adjustment knob counterclockwise. To decrease the volume, turn the adjustment knob clockwise.

Ensure that the jam nut is tightened to the washer seal prior to beginning sampling (*Figure 4a*). A leak check may be performed to verify that the jam nut and washer seal have been properly tightened.

SSO-9 With Check Valves

1. Connect a graduated constant pressure cylinder to the product outlet of the SSO-9.

Welker® recommends using a graduated constant pressure cylinder with a tracker magnet to ease verification of the sample volume.

2. Decide how many actuations will be taken into the graduated constant pressure cylinder to verify the sample volume.
3. From the PLC, activate the sample function so that the collection and injection volume of the SSO-9 can be verified.
4. Capture product in the graduated constant pressure cylinder until the pre-determined number of actuations have been taken.
5. Once the pre-determined number of actuations have been taken, stop product flow to the SSO-9.
6. Calculate the sample volume by dividing the volume of product captured in the graduated constant pressure cylinder by the number of actuations taken.
7. If the SSO-9 is equipped with the optional volume adjustment, adjust the collection and injection volume as necessary. To increase the volume, turn the adjustment knob counterclockwise. To decrease the volume, turn the adjustment knob clockwise.

Ensure that the bottom jam nut is tightened to the washer seal and that the top jam nut is tightened to the adjustment knob prior to beginning sampling (*Figure 4b*). A leak check may be performed to verify that the jam nuts, washer seal, and adjustment knob have been properly tightened.

SECTION 3: MAINTENANCE

3.1 Before You Begin

1. **Welker® recommends that the unit have regular yearly maintenance under normal operating conditions.** In cases of severe service, dirty conditions, excessive usage, or other unique applications that may lead to excess wear on the unit, a more frequent maintenance schedule may be appropriate.
2. Prior to maintenance or disassembly of the unit, it is advisable to have a repair kit available for repairs of the system in case of unexpected wear or faulty seals.

New seals supplied in spare parts kits are not lubricated. They should be lightly lubricated before installation. Welker® recommends Dow Corning® 111 (DC 111) or an equivalent lubricant for use with this unit.

3. All maintenance and cleaning of the unit should be performed on a smooth, clean surface.

3.2 Maintenance

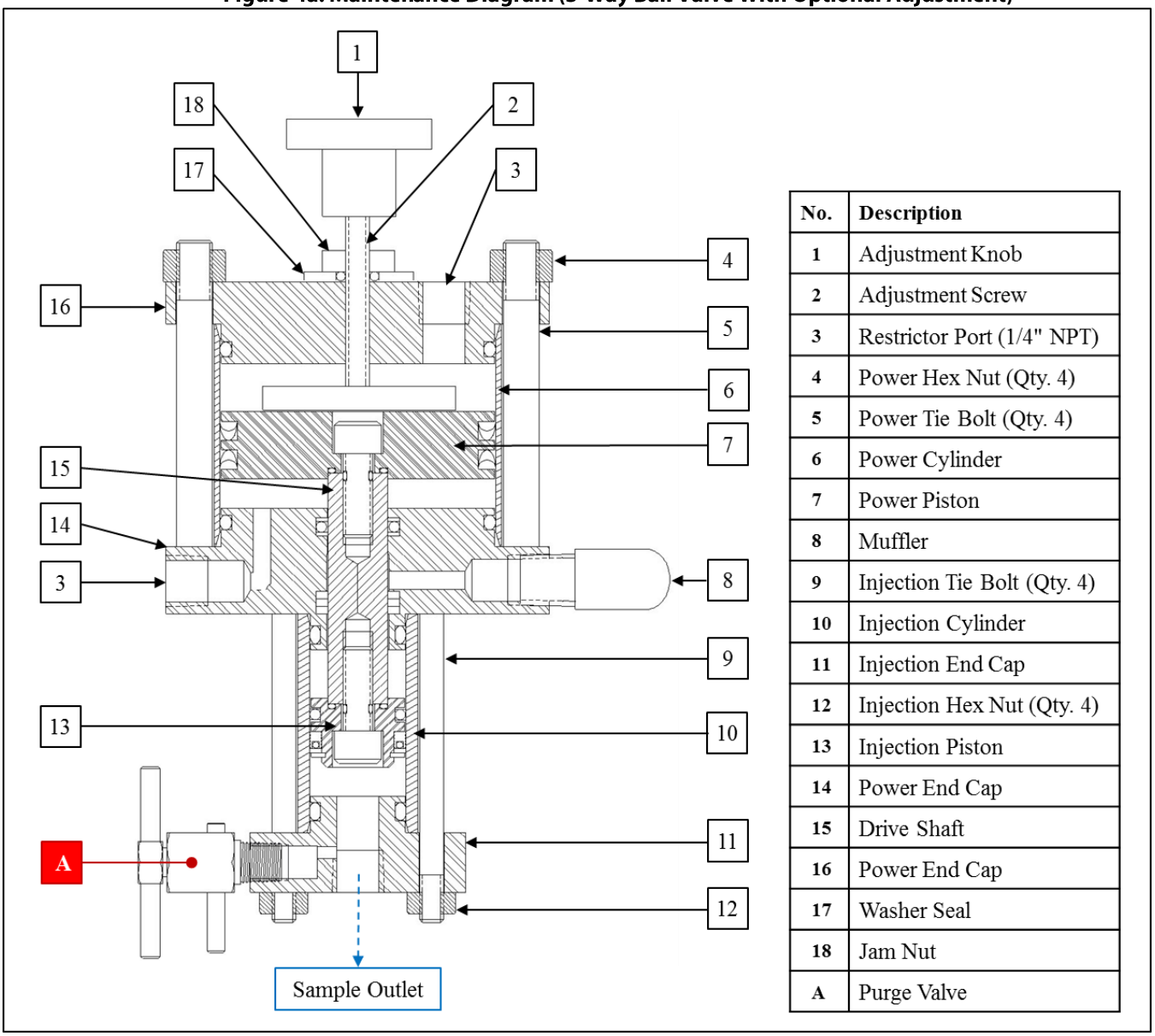
If the SSO-9 is equipped with a 3-way ball valve, Welker® recommends tagging tubing and noting how it is connected to the 3-way ball valve before removing the SSO-9 from its installation to ensure correct re-installation.

1. Prior to disassembly, ensure that the system is depressurized.
2. Ensure that the SSO-9 has been purged of all product.
3. Activate the SSO-9 to the "fill" position.
4. Ensure that the power and injection cylinders of the SSO-9 have been depressurized by loosening any tubing connected to the power cylinder or by turning off the connected pneumatic supply and then actuating the solenoid.
5. Disconnect all tubing from the SSO-9.
6. For complete and proper maintenance on the valve(s), refer to the *Installation, Operation, and Maintenance* (IOM) *Manual* of the appropriate valve(s). Valve options are stated in the *Appendix* section of this manual.

If the ball in the 3-way ball valve needs to be replaced, contact Welker® for replacement parts.

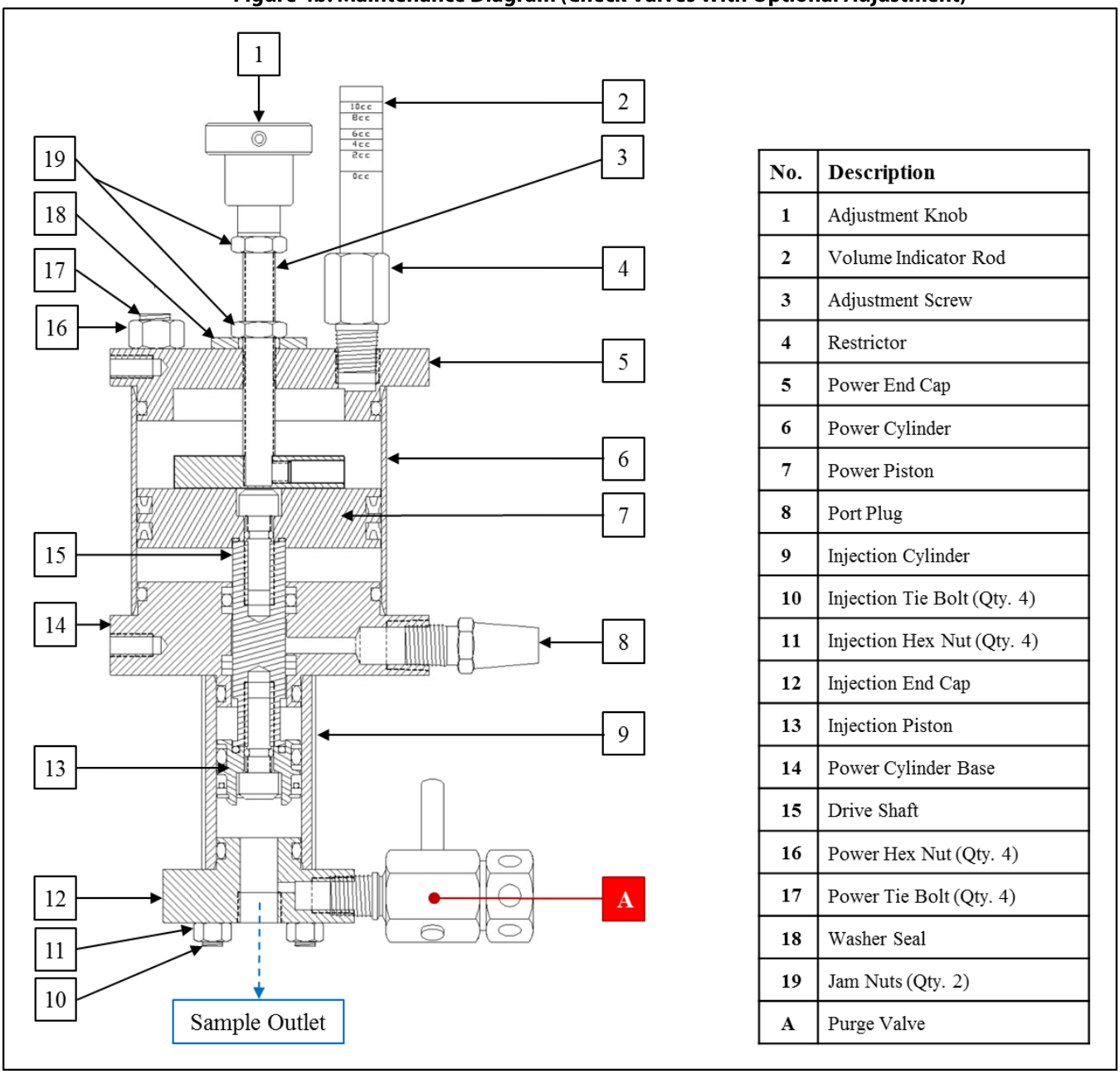
If maintenance is performed on the 3-way ball valve, ensure that it is normally open to the sample outlet prior to reinstallation.

Figure 4a: Maintenance Diagram (3-Way Ball Valve With Optional Adjustment)



No.	Description
1	Adjustment Knob
2	Adjustment Screw
3	Restrictor Port (1/4" NPT)
4	Power Hex Nut (Qty. 4)
5	Power Tie Bolt (Qty. 4)
6	Power Cylinder
7	Power Piston
8	Muffler
9	Injection Tie Bolt (Qty. 4)
10	Injection Cylinder
11	Injection End Cap
12	Injection Hex Nut (Qty. 4)
13	Injection Piston
14	Power End Cap
15	Drive Shaft
16	Power End Cap
17	Washer Seal
18	Jam Nut
A	Purge Valve

Figure 4b: Maintenance Diagram (Check Valves With Optional Adjustment)

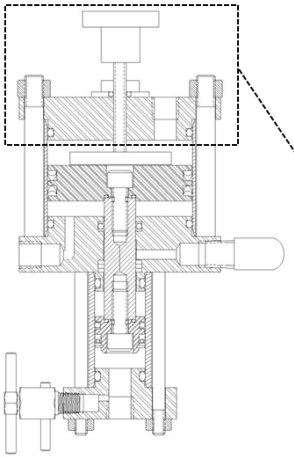


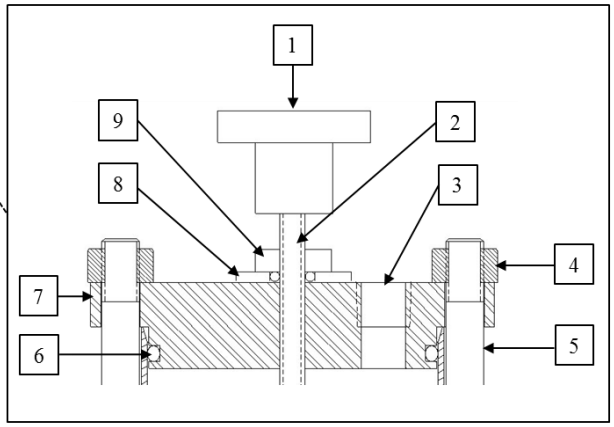
No.	Description
1	Adjustment Knob
2	Volume Indicator Rod
3	Adjustment Screw
4	Restrictor
5	Power End Cap
6	Power Cylinder
7	Power Piston
8	Port Plug
9	Injection Cylinder
10	Injection Tie Bolt (Qty. 4)
11	Injection Hex Nut (Qty. 4)
12	Injection End Cap
13	Injection Piston
14	Power Cylinder Base
15	Drive Shaft
16	Power Hex Nut (Qty. 4)
17	Power Tie Bolt (Qty. 4)
18	Washer Seal
19	Jam Nuts (Qty. 2)
A	Purge Valve

7. Remove the power hex nuts and the power tie bolts from the power end cap.
8. Remove the injection hex nuts and the injection tie bolts from the injection end cap.
9. Separate the power cylinder from the injection cylinder.
10. Remove the power end cap and the power cylinder base from the power cylinder.
11. Carefully slide the power cylinder off the power piston, taking care not to damage the honed surface of the cylinder.
12. Remove the injection end cap from the injection cylinder.
13. Carefully slide the injection cylinder off the injection piston, taking care not to damage the honed surface of the cylinder.
14. Remove the power and injection pistons from the drive shaft.

15. Remove the O-ring from the power end cap and wipe the O-ring groove clean.

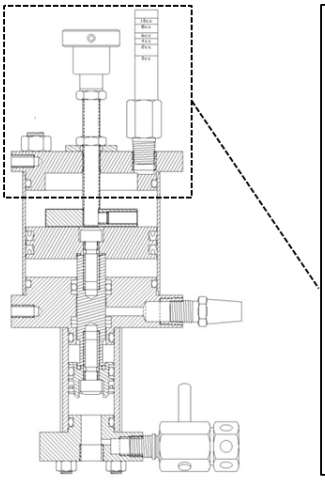
Figure 5a: Power End Cap (3-Way Ball Valve With Optional Adjustment)

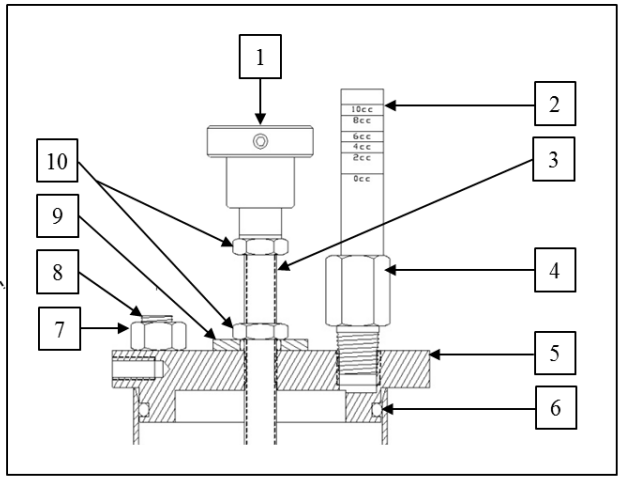




No.	Description
1	Adjustment Knob
2	Adjustment Screw
3	Restrictor Port (1/4" NPT)
4	Power Hex Nut (Qty. 4)
5	Power Tie Bolt (Qty. 4)
6	O-ring
7	Power End Cap
8	Washer Seal
9	Jam Nut

Figure 5b: Power End Cap (Check Valves With Optional Adjustment)



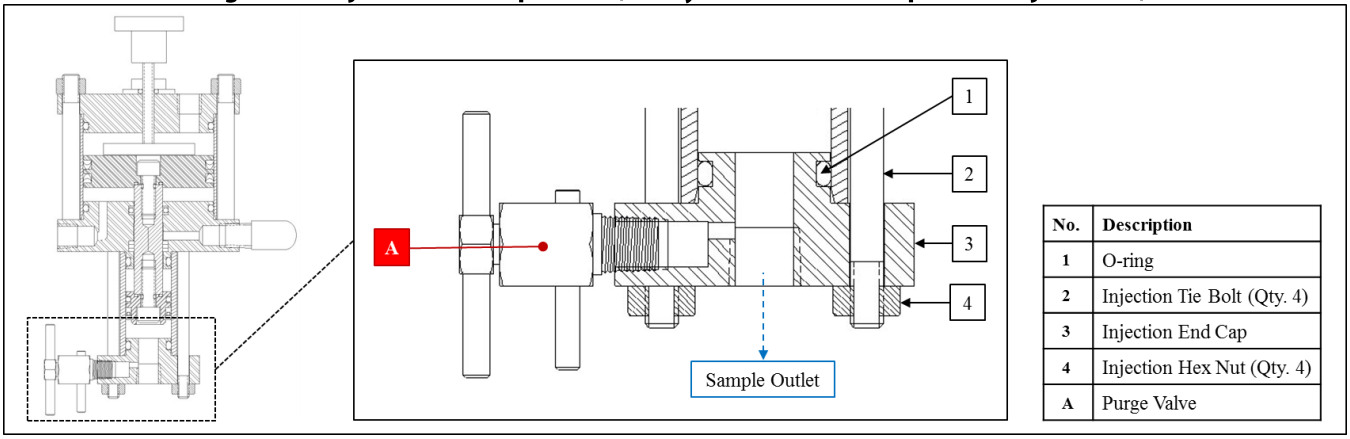


No.	Description
1	Adjustment Knob
2	Volume Indicator Rod
3	Adjustment Screw
4	Restrictor
5	Power End Cap
6	O-ring
7	Power Hex Nut (Qty. 4)
8	Power Tie Bolt (Qty. 4)
9	Washer Seal
10	Jam Nuts (Qty. 2)

16. Replace the O-ring in the power end cap.

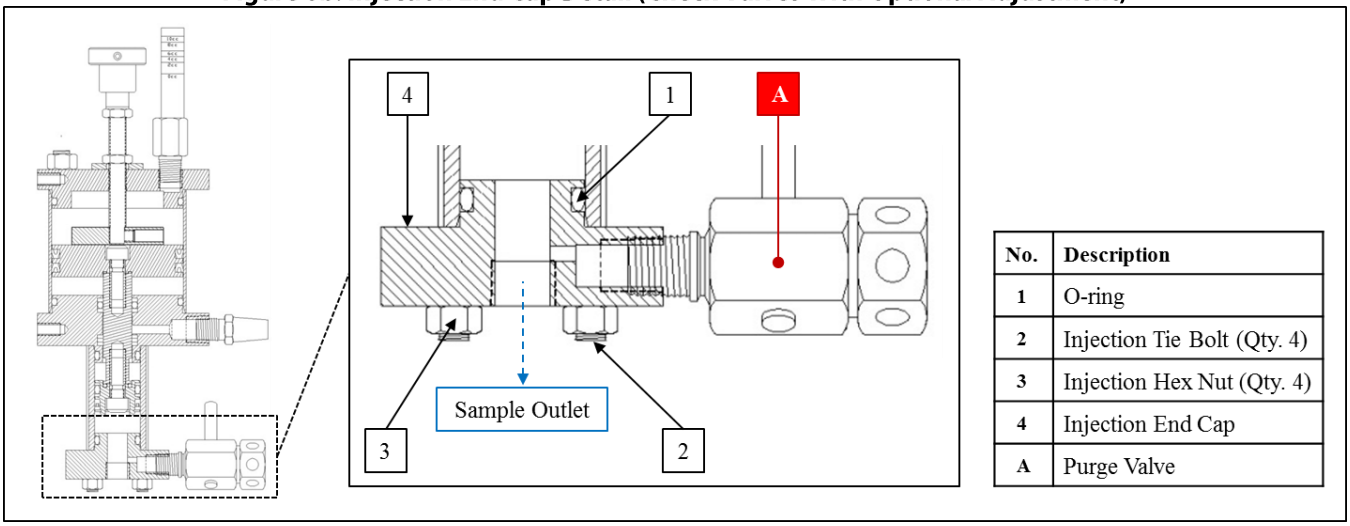
17. Remove the O-ring from the injection end cap and wipe the O-ring groove clean.

Figure 6a: Injection End Cap Detail (3-Way Ball Valve With Optional Adjustment)



No.	Description
1	O-ring
2	Injection Tie Bolt (Qty. 4)
3	Injection End Cap
4	Injection Hex Nut (Qty. 4)
A	Purge Valve

Figure 6b: Injection End Cap Detail (Check Valves With Optional Adjustment)

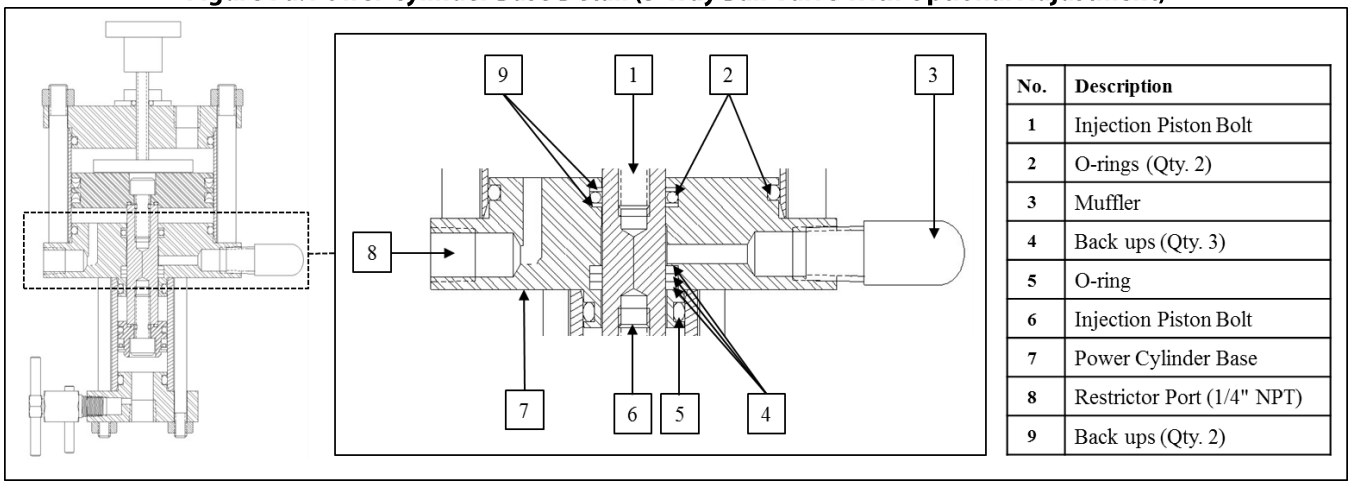


No.	Description
1	O-ring
2	Injection Tie Bolt (Qty. 4)
3	Injection Hex Nut (Qty. 4)
4	Injection End Cap
A	Purge Valve

18. Replace the O-ring in the injection end cap.

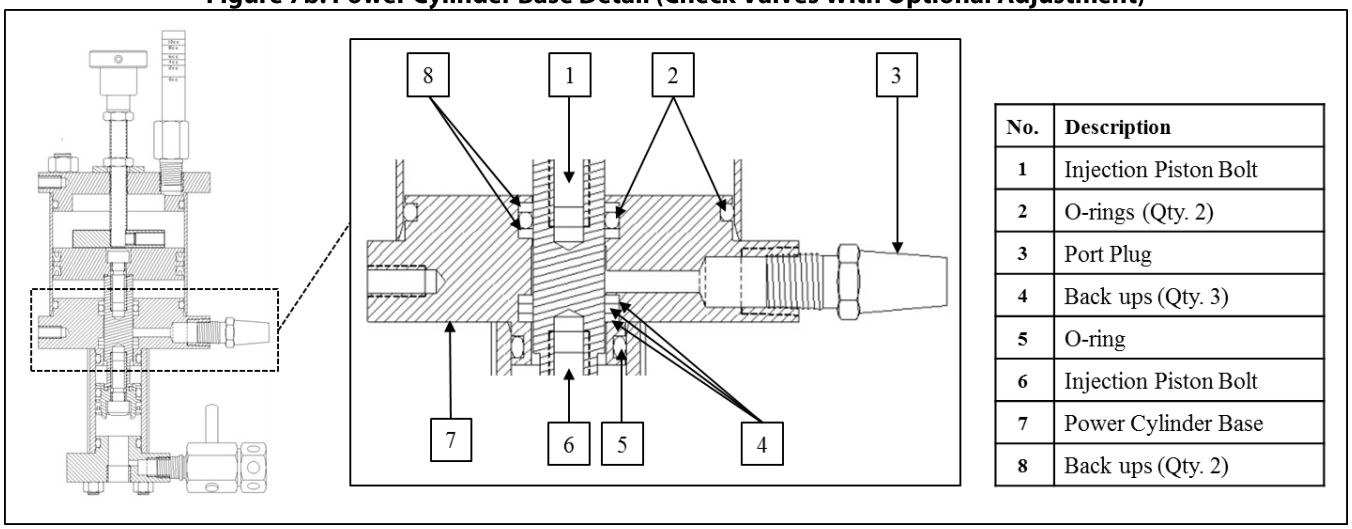
19. Remove the O-rings and back ups from the power cylinder base and wipe the seal grooves clean.

Figure 7a: Power Cylinder Base Detail (3-Way Ball Valve With Optional Adjustment)



No.	Description
1	Injection Piston Bolt
2	O-rings (Qty. 2)
3	Muffler
4	Back ups (Qty. 3)
5	O-ring
6	Injection Piston Bolt
7	Power Cylinder Base
8	Restrictor Port (1/4" NPT)
9	Back ups (Qty. 2)

Figure 7b: Power Cylinder Base Detail (Check Valves With Optional Adjustment)

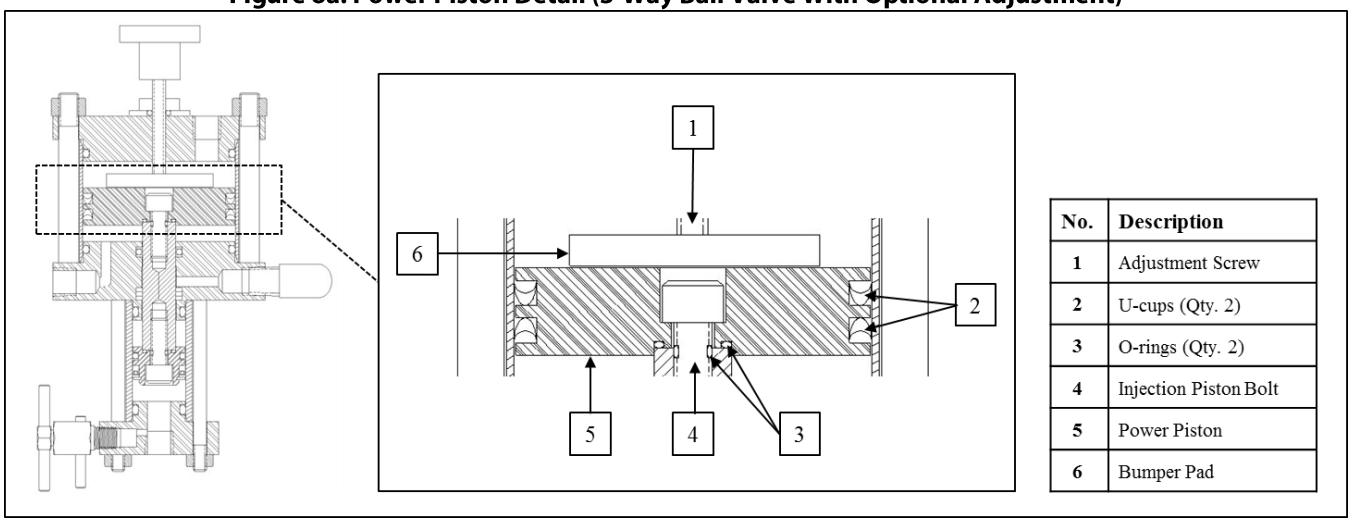


No.	Description
1	Injection Piston Bolt
2	O-rings (Qty. 2)
3	Port Plug
4	Back ups (Qty. 3)
5	O-ring
6	Injection Piston Bolt
7	Power Cylinder Base
8	Back ups (Qty. 2)

20. Replace the O-rings and back ups in the power cylinder base.
21. Closely examine the honed surfaces of the power and injection cylinders, as scratches or pits may cause the seals to leak. If scratches or pits are present, the unit may need to be repaired or replaced. Contact Welker® for service options.

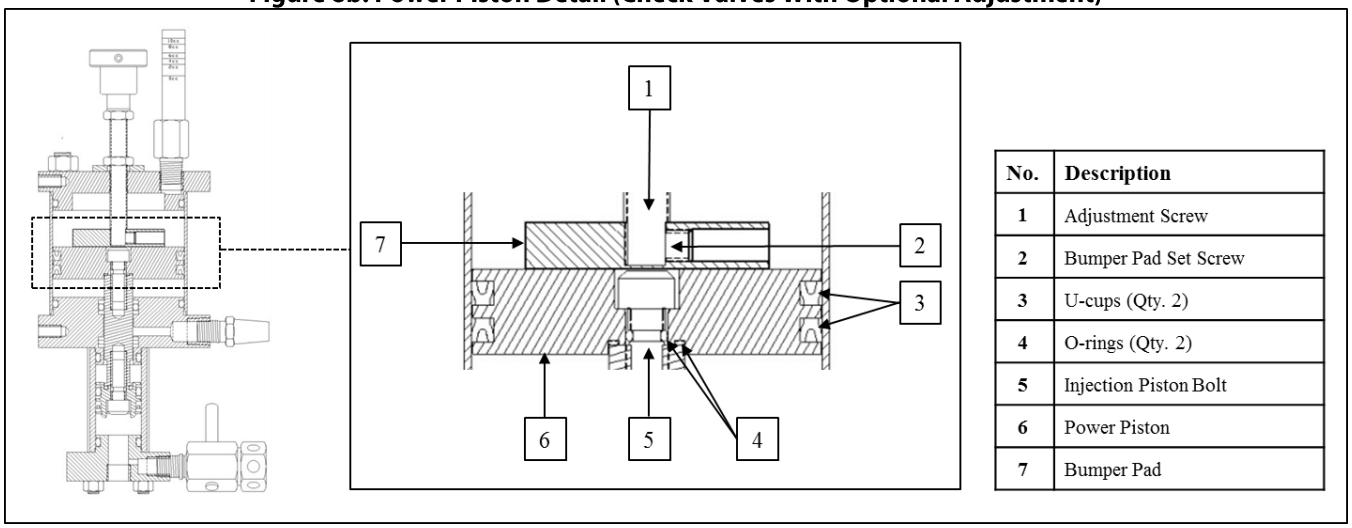
22. Remove the O-rings and U-cups from the power piston and wipe the seal grooves clean.

Figure 8a: Power Piston Detail (3-Way Ball Valve With Optional Adjustment)



No.	Description
1	Adjustment Screw
2	U-cups (Qty. 2)
3	O-rings (Qty. 2)
4	Injection Piston Bolt
5	Power Piston
6	Bumper Pad

Figure 8b: Power Piston Detail (Check Valves With Optional Adjustment)

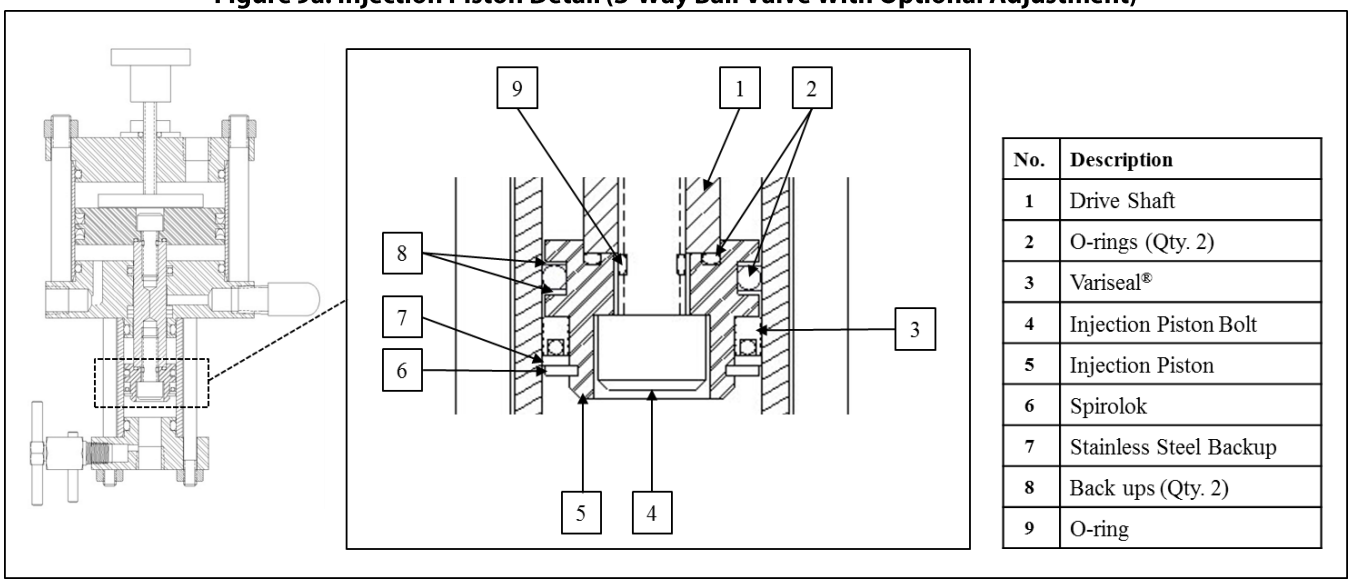


No.	Description
1	Adjustment Screw
2	Bumper Pad Set Screw
3	U-cups (Qty. 2)
4	O-rings (Qty. 2)
5	Injection Piston Bolt
6	Power Piston
7	Bumper Pad

23. Replace the O-rings and U-cups in the power piston. The U-cups should be installed so that they face opposite directions.

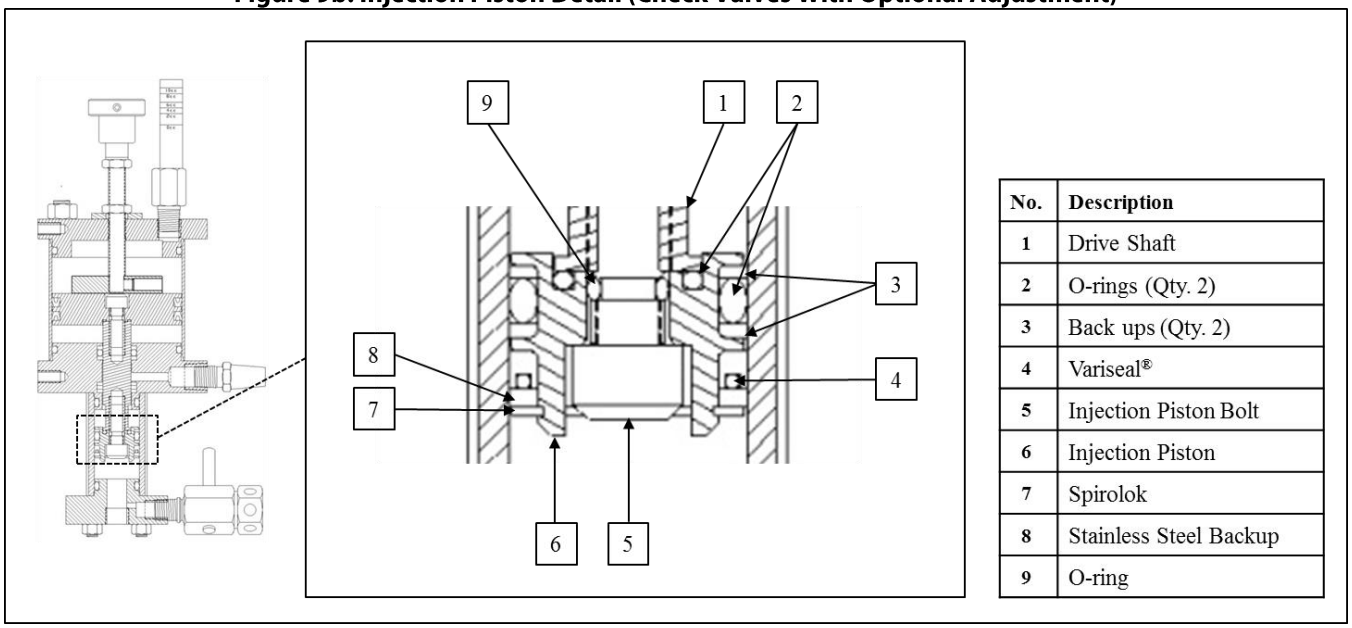
24. Remove the O-rings, back ups, Variseal®, and spirolok from the injection piston and wipe the seal grooves clean.

Figure 9a: Injection Piston Detail (3-Way Ball Valve With Optional Adjustment)



No.	Description
1	Drive Shaft
2	O-rings (Qty. 2)
3	Variseal®
4	Injection Piston Bolt
5	Injection Piston
6	Spirolok
7	Stainless Steel Backup
8	Back ups (Qty. 2)
9	O-ring

Figure 9b: Injection Piston Detail (Check Valves With Optional Adjustment)

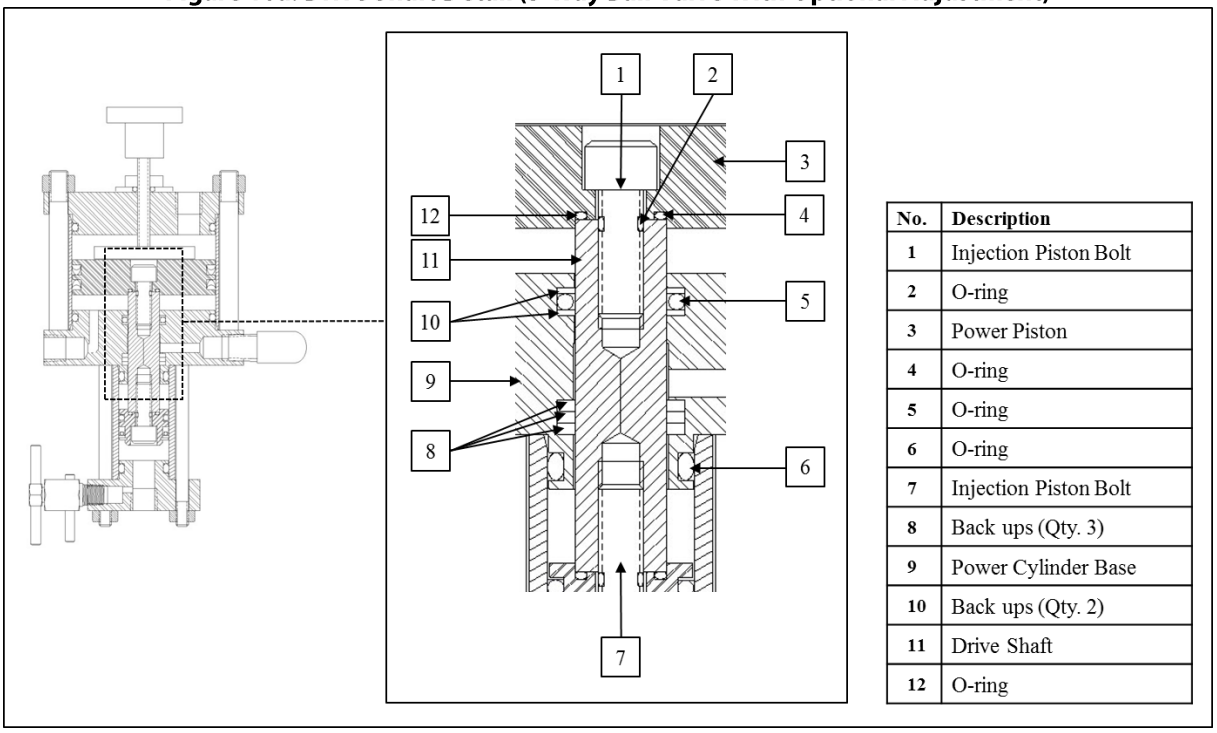


No.	Description
1	Drive Shaft
2	O-rings (Qty. 2)
3	Back ups (Qty. 2)
4	Variseal®
5	Injection Piston Bolt
6	Injection Piston
7	Spirolok
8	Stainless Steel Backup
9	O-ring

25. Replace the O-rings, back ups, Variseal®, and spirolok in the injection piston.
26. Closely examine the surface finish on the drive shaft, as scratches or pits may cause the seals to leak. If scratches or pits are present, the unit may need to be repaired or replaced. Contact Welker® for service options.

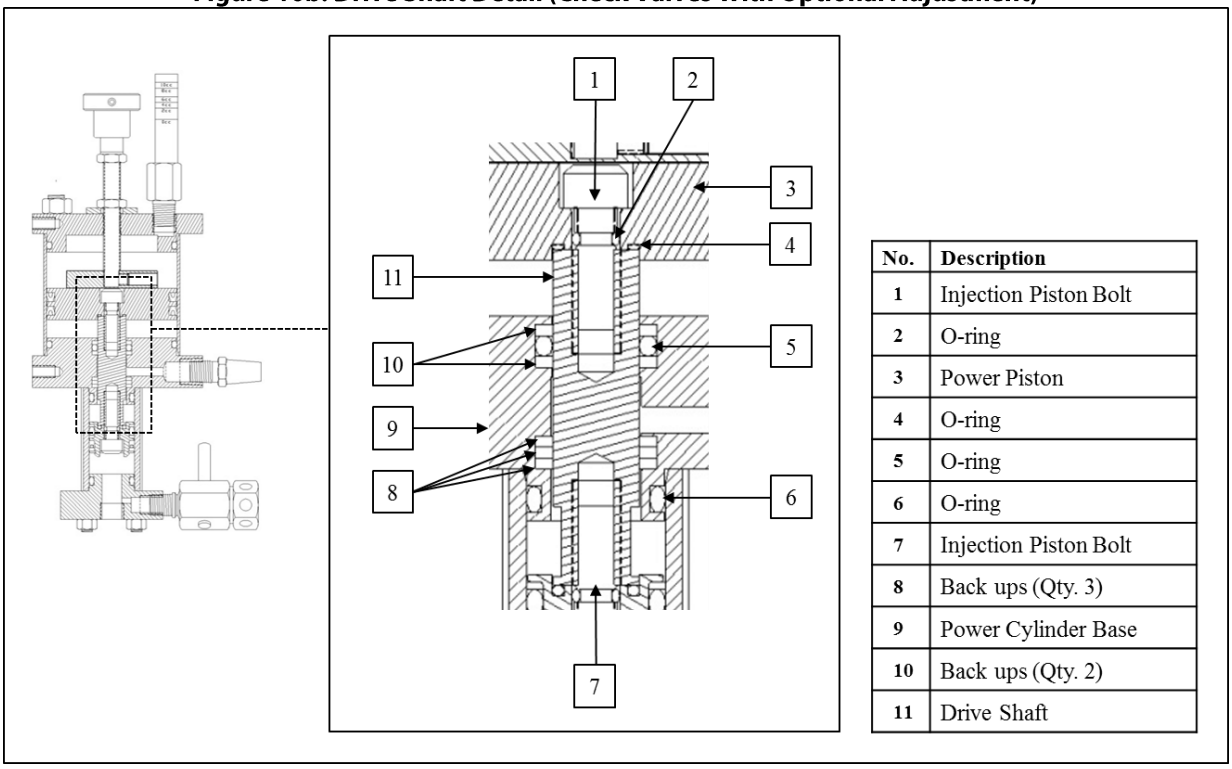
27. Remove the O-rings and back ups from the drive shaft and wipe the seal grooves clean.

Figure 10a: Drive Shaft Detail (3-Way Ball Valve With Optional Adjustment)



No.	Description
1	Injection Piston Bolt
2	O-ring
3	Power Piston
4	O-ring
5	O-ring
6	O-ring
7	Injection Piston Bolt
8	Back ups (Qty. 3)
9	Power Cylinder Base
10	Back ups (Qty. 2)
11	Drive Shaft
12	O-ring

Figure 10b: Drive Shaft Detail (Check Valves With Optional Adjustment)



No.	Description
1	Injection Piston Bolt
2	O-ring
3	Power Piston
4	O-ring
5	O-ring
6	O-ring
7	Injection Piston Bolt
8	Back ups (Qty. 3)
9	Power Cylinder Base
10	Back ups (Qty. 2)
11	Drive Shaft

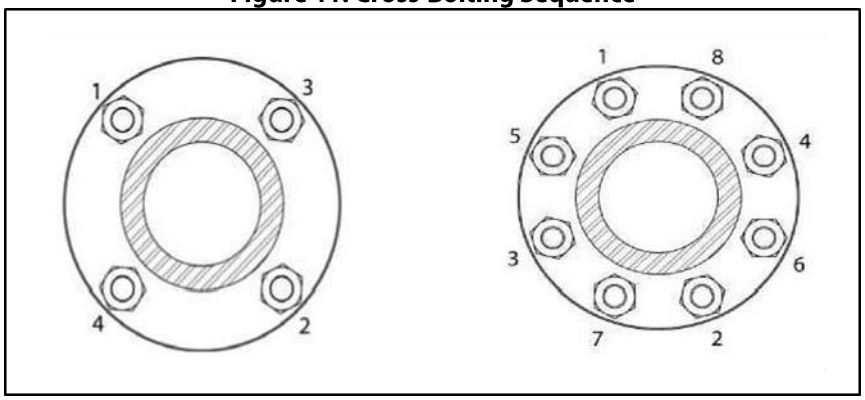
28. Replace the O-rings and back ups in the drive shaft.

29. Install the injection piston onto the wrench flat end of the drive shaft.
30. Insert the injection piston into the injection cylinder, drive shaft-end first. Take care not to damage the cylinder bore with the drive shaft.
31. Slide the drive shaft through the power cylinder base. Ensure that the wrench flat is facing down toward the product outlet.
32. Replace the power piston onto the drive shaft.
33. Tighten the pistons to the drive shaft.

> The pistons can be tightened to the drive shaft using two hex keys or a hex key and a wrench. If using two (2) hex keys, use one as a back up and the other to tighten the piston bolts against each other. If using a hex key and a wrench, hold the drive shaft steady at the wrench flat and tighten each piston bolt with the hex key.

34. Replace the injection cylinder end cap.
35. Following a cross-bolting sequence, install the injection tie bolts and tighten the injection hex nuts to 6 ft-lbs with a torque wrench (*Figure 11*).

Figure 11: Cross-Bolting Sequence



36. Slide the power cylinder onto the piston, taking care not to damage the U-cups on the power piston.
37. Push the cylinder down until it seals on the cylinder base.
38. Return the power end cap to the power cylinder.
39. Following a cross-bolting sequence, install power tie bolts and tighten the power hex nuts to 6 ft-lbs with a torque wrench (*Figure 11*).
40. Reconnect all instrument tubing.
41. Reinstall the unit following the installation instructions in *Section 2.3, Installation*, making note of the orientation of the 3-way ball valve as necessary.

APPENDIX

Attached Documents

Welker® *Installation, Operation, and Maintenance* (IOM) *Manuals* suggested for use with this unit:

- IOM-054: Welker® VL439[][][] Pneumatically Operated Ball Valve
- IOM-182: Welker® CV-K Kepner Check Valve

Other *Installation, Operation, and Maintenance* (IOM) *Manuals* suggested for use with this unit:

- None

Welker® drawings and schematics suggested for use with this unit:

- Assembly Drawing (3-Way Ball Valve With Optional Adjustment): AD243BR
- Assembly Drawing (Check Valves With Optional Adjustment): AD243DG
- Machine Drawing (3-Way Ball Valve): VL439[][][]
- Appropriate, Customer-Specific Assembly Drawing

NOTES

13839 West Bellfort Street
Sugar Land, TX 77498
Phone: 281.491.2331

welker.com