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**Applicable Models:**

This instruction manual applies to the following VRG LHPA-SR units. To confirm suitability for additional models and/or components or to request other sizes, please contact VRG Controls or find us online at [www.vrgcontrols.com](http://www.vrgcontrols.com).

LHPA-SR-5x1-1/8

LHPA-SR-6x1.5

LHPA-SR-6x2

LHPA-SR-6x2.5

LHPA-SR-8x2

LHPA-SR-8x3

LHPA-SR-8x4

LHPA-SR-8x6

LHPA-SR-10x3

LHPA-SR-10x4

LHPA-SR-10x5

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Revisions:

REV 1: Initial release, July 2024

REV 2: Updated thrust tables, August 2024

## Introduction

The VRG Controls LHPA-SR Linear High Pressure Actuator w/ Spring Return failure mode is a high performance pneumatic actuator designed specifically for natural gas regulation. The VRG LHPA-SR is built to exact specifications in order to offer accurate and reliable performance. The LHPA-SR is easy to operate, requires minimal maintenance, and is available in a variety of configurations and sizes to fit your specific application. To best maintain accuracy, efficiency, and safety, all LHPA-SR applications should be designed and engineered with the assistance of VRG Controls factory personnel. All VRG Controls LHPA-SR units are shipped ready for installation and startup without any further adjustment. All instruction manuals supplied with the LHPA-SR should be reviewed prior to installation and startup. Only those qualified through training or experience should install, operate, or maintain VRG Controls LHPA-SR's.

VRG Controls LHPA-SR are typically shipped as a complete "regulating/control assembly" designed to control a process in a pipeline or other piping arrangement. The complete assembly is typically comprised of the following three (3) components:

1. LHPA-SR Rotary High Pressure Actuator
2. Globe Control Valve
3. Control Instrumentation and Related Accessories

Information about the LHPA-SR Linear High Pressure Actuator is covered in this manual. For information about globe valves, control instrumentation, and related accessories refer to the appropriate instruction manual for the specific product from the associated manufacturer. These documents are typically supplied as part of the job-specific Installation, Operation, and Maintenance Manual booklet supplied with the original purchase shipment. Please contact VRG Controls or your local VRG Controls sales representative for assistance in locating or obtaining replacement documentation.

## Technical Assistance

Should you have any questions, you may contact your local VRG Controls sales representative or VRG Controls technical assistance at:

VRG Controls  
1199 Flex Court  
Lake Zurich, IL 60047  
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Tel: + 1 847-778-6740  
e-mail: sales@vrgcontrols.com  
website: www.vrgcontrols.com

To facilitate requests for technical assistance, please have the following information immediately available:

- LHPA serial Number (see ID tag affixed to LHPA actuator)
- VPC or VGP Serial Number(s) (see ID tag affixed to VPC or VGP)
- VRG Controls Invoice Number (see upper right corner of first page of instruction manual)

**GENERAL SERVICE INFORMATION**

- This service procedure is offered as a guide to enable general maintenance to be performed on VRG Controls LHPA-SR Series Linear High Pressure Actuators.
- Normal recommended service interval for this actuator series is every one (1) year and every five (5) years. NOTE: Storage time is counted as part of the service interval.
- This procedure is applicable with the understanding that all electrical power and pneumatic pressure has been removed from the actuator.
- Remove all piping and mounted accessories that will interfere with the module(s) that are to be serviced.
- This procedure should only be implemented by a technically competent technician who should take care to observe good workmanship practices.
- When removing seals from seal grooves, use a commercial seal removing tool or a small screwdriver with sharp corners rounded off to prevent damage to sealing surfaces.
- Use a non-hardening thread sealant on all pipe threads.
- Apply the thread sealant per the thread sealant manufacturer's instructions.
- VRG Controls recommends that disassembly of the actuator should be done in a clean, organized area free of dust, debris and protected from precipitation when possible.
- Note that many of the necessary instruction manuals for VRG and non-VRG manufactured components are available via the VRG website at:  
[www.vrgcontrols.com](http://www.vrgcontrols.com)

**DEFINITIONS****WARNING:**

If not observed, user incurs a high risk of severe damage to actuator and/or fatal injury to personnel.

**CAUTION:**

If not observed, user may incur damage to actuator and/or injury to personnel.

**NOTE:**

Advisory and information comments provided to assist maintenance personnel to carry out maintenance procedures.

**GENERAL SAFETY INFORMATION**

- Products supplied by VRG Controls, in its "as shipped" condition, are safe if the instructions contained within this Service Instruction are strictly adhered to and executed by well trained, equipped, prepared and competent personnel.
- **WARNING: FOLLOW WARNING AND CAUTION SIGNS**
- For the protection of personnel working on VRG Controls actuators, this procedure should be reviewed and implemented for safe disassembly and reassembly. Close attention should be noted to the WARNINGS, CAUTIONS and NOTES contained in this procedure.
- **WARNING: FOLLOW COMPANY SAFETY PROCEDURES**
- This procedure should not supersede or replace any customer's plant safety or work procedures. If a conflict arises between this procedure and the customer's procedures the differences should be resolved in writing between an authorized customer's representative and an authorized VRG factory representative.
- VRG Controls recommends that actuator disassembly occurs in a clean and organized environment that is free of dust, debris, and moisture.

## TECHNICAL SPECIFICATIONS & MATERIALS

Actuator Type	Linear Piston, Spring Return
Installation and Orientation	Vertical preferred, horizontal optional
Spring Thrust Output Range	1176 - 9681 Lbs.
Supply Pressure Range	80 - 250 psi
Operating Temperature Range	-20F - 160F, low-temperature options available
Pneumatic Connections	1/2" NPT
Instrumentation Tubing	3/8" OD x .035 Wall 316SS Seamless Annealed Tubing, ASTM A269
Instrumentation Fittings	Swagelok or SSP 316 SS Dual Ferrule Tubing Compression Fittings
Supply Gas Media	Instrument Quality Natural Gas, Air, or Nitrogen
Supply Gas Moisture Content	< 7 Lb. Per 1.0 MMSF Natural Gas If excessive moisture is present, a Filter Dryer may be necessary. Model FD5 is standard issue. If excessive entrained hydrocarbons are present, a Filter Deodorizer may be necessary. Model FACD5 is standard issue. If H2S is present in supply gas, consult VRG Controls for limitations.
Supply Gas Filtration	Nominal 10 $\mu$ recommended. Model FD5 and Model FACD5 provide suitable filtration.
Supply Gas Heating Requirements	If ambient temperatures may fall below the specified temperature range, it is recommended that the LHPA Actuator be installed in a heated enclosure or building. Any heating devices utilized must be rated as "explosion proof for a hazardous environment." VRG Controls recommends the use of catalytic heaters when heat is required. The catalytic heater utilizes natural gas fuel and provides a safe, flameless heat.
Coating	Above Ground Standard Coating: SP10 Sandblast, Epoxy Primer, Polyurethane Topcoat 6-10 mil Below Ground Standard Coating: SP10 Sandblast, Coal Tar Epoxy 16 mil Thickness Custom Coatings to Match Customer Specifications Available Upon Request

## STORAGE, OPERATION, & INSTALLATION

### ACTUATOR STORAGE

- For applications where the actuator is not placed into immediate service, it is recommended that the actuator be cycled with regulated clean/dry pneumatic pressure occasionally. Indoor storage, if available, is recommended for all actuators. Care should be taken to plug all open ports on actuator and controls to keep out foreign particles and moisture.
- CAUTION: If the actuator and instrumentation must be stored outside, the assembly should be covered adequately and great care should be taken to prevent intrusion of moisture, ice, dirt, dust and other elements that might have an adverse effect on the actuator assembly and accessories. Actuators should not be stored in an atmosphere that is harmful to resilient seals. Contact factory for extended storage period.

### ACTUATOR OPERATION

- Controlled Operation: Controlled operation is accomplished by pressurizing and/or depressurizing the appropriate Actuator Cylinder inlet(s) of a spring return actuator. Do not exceed pressures indicated on actuator nameplate.
- It is important to maintain and inspect actuators on a regular basis. Instructions are provided for Annual, 5 year, and "As-needed" maintenance and inspection of the actuator. Although VRG Controls designs and manufactures products of the highest quality, all physical components are subject to wear and breakage under normal operating conditions. To prevent further damage to the actuator and the surrounding environment, adherence the maintenance and inspection procedures are recommended. See Page 14 for recommended maintenance procedures.

### ACTUATOR INSTALLATION

Since there are many valve and actuator combinations, it is not practical to include detailed instructions for all valve and actuator mounting combinations. Mountings are designed to be as simple as possible to avoid complications from actuator installation.

Actuators that are shipped from the factory installed on control valves are preset to ensure full range of valve travel with specific attention to ensure "CLOSE" end of travel accomplishes full shutoff of the control valve. It is NOT typically necessary to conduct travel stop adjustments when actuators are factory installed. There are no external stops, since the travel stops are achieved by the cylinder ends. The connecting link length is adjustable.

NOTE: The actual travel limit should be accomplished by the actuator. If the valve does not have internal stops, adjust the actuator to the full open position. Using this as a reference point, rotate the valve closed and adjust to the valve manufacturer's specifications for total rotation.

Good instrument practices are also recommended. Clean/dry regulated pneumatic pressure is essential for long service life and satisfactory operation. It should be noted that new pneumatic lines often have scale, moisture, oil and other debris in them and these lines should be purged of all foreign material to prevent damage to critical seals inside the actuator and/or control instrumentation.

## PRE-START ROUTINE & ACTUATOR SPEED CONSIDERATIONS

### PRE-START UP CHECKS

1. Inspect to ensure the unit has been mounted onto valve properly. Control valve topworks mounting bolts, stem key, setscrew(s) are installed and secured.
2. No tubing damaged or accessories dislodged during the shipping or the installation.
3. Indicated position confirms valve position.
4. All switching valves in normal operating position as per SCHEMATIC / INSTRUCTIONS

### CHECK CONNECTIONS

1. Pneumatic / hydraulic components connected as per schematic enclosed or in service manual supplied.
2. Pneumatic supply connected to the identified ports
3. Electrical connection terminals are secured.
4. Wiring as per enclosed diagram or service manual supplied.
5. When actuator is first placed into service, it should be cycled with regulated pneumatic pressure. This is necessary because the seals have been stationary, causing them to take a "set". Therefore, the actuator should be operated through several cycles to exercise the seals so as to achieve a service ready condition.

### FACTORS THAT DETERMINE THE ACTUATOR SPEED OF OPERATION

1. Supply Gas Line Length
2. Supply Gas Line Size
3. Supply Gas Line Pressure
4. Torque Requirements of the Valve
5. Size of the Actuator
6. Setting of Speed Controls
7. Limiting Flow Capacity of Control Instrumentation

Due to the interaction of these variables, it is difficult to specify a "normal" operating time. Faster operating time may be obtained by using one or more of the following:

1. Larger Supply Lines
2. Higher Supply Pressure\*
3. Higher Capacity Control Instrumentation
4. Alternate Piping Configuration of Control Instrumentation
5. Volume Booster Assemblies
6. Quick Exhaust Valves

\* Not to exceed maximum operating pressure of actuator or control components

Slower operating time may be obtained by using flow control valves to meter the exhaust. Excessive exhaust flow metering may cause erratic operation.

## PRODUCT MODEL NUMBER DERIVATION

Actuator Bore (in.)	X	Actuator Stroke (in.)	Actuation Mode	Spring Size	Failur Mode	Transmitter
5		1 1/8	SR (Spring Return)	10	FO (Fail Open)	BALF (Balluff)
6		1 1/2	DA (Double Acting)	20	FC (Fail Close)	TPWRK (Topworx)
8		2		22		SLDO (Soldo)
10		2 1/2		30		WSTL (Westlock)
12		3		40		
14		4		42		
		5		50		
		6		52		
		8		60		
				62		

### Example

LHPA- 10x3-sr50-FC-BALF: Linear high pressure actuator, 10" bore, 3" stroke, spring return with size 50 spring, fail close, Balluff travel indicator

### NOTE

1. CHK suffix indicates Check Valve
2. 22, 42, 52 and 62 springs are for Surge Control applications only.



## HOW IT WORKS

In a spring-return actuator, a pneumatic signal is applied to one side of a cylinder in order to shift the position of a piston. Linkages connect the piston to a plug that is raised and lowered in order to open or close a globe valve. A spring resists the motion of the cylinder such that when the pneumatic signal is removed from the cylinder, the spring pushes the cylinder back to its position prior to the application of the signal.

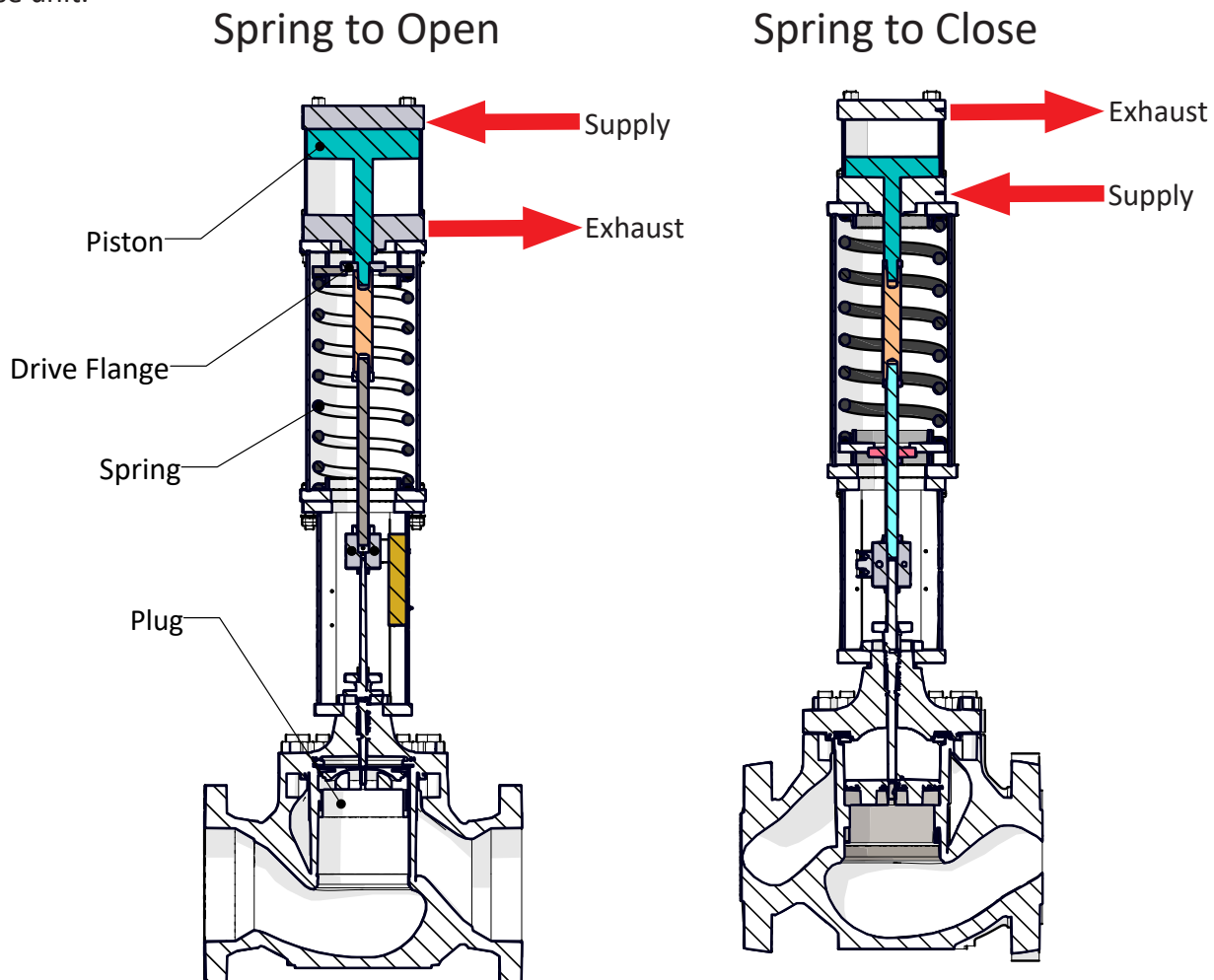
Pictured below are the two configurations of LHPA-SR units: Spring to Open, and Spring to Close. The Spring to Open unit will open upon loss of power gas, and the Spring to Close unit will close upon loss of power gas.

Note that the drive flange is located at the top of the cylinder in the Spring to Open unit, and is located at the bottom of the cylinder in the Spring to Close unit.

In the Spring to Open unit, pneumatic signal is applied to the top of the cylinder in order to close the valve. The drive flange is pushed down, compressing the spring and closing the valve. Upon loss of power, the restoring force of the spring will raise the drive flange and piston, opening the valve.

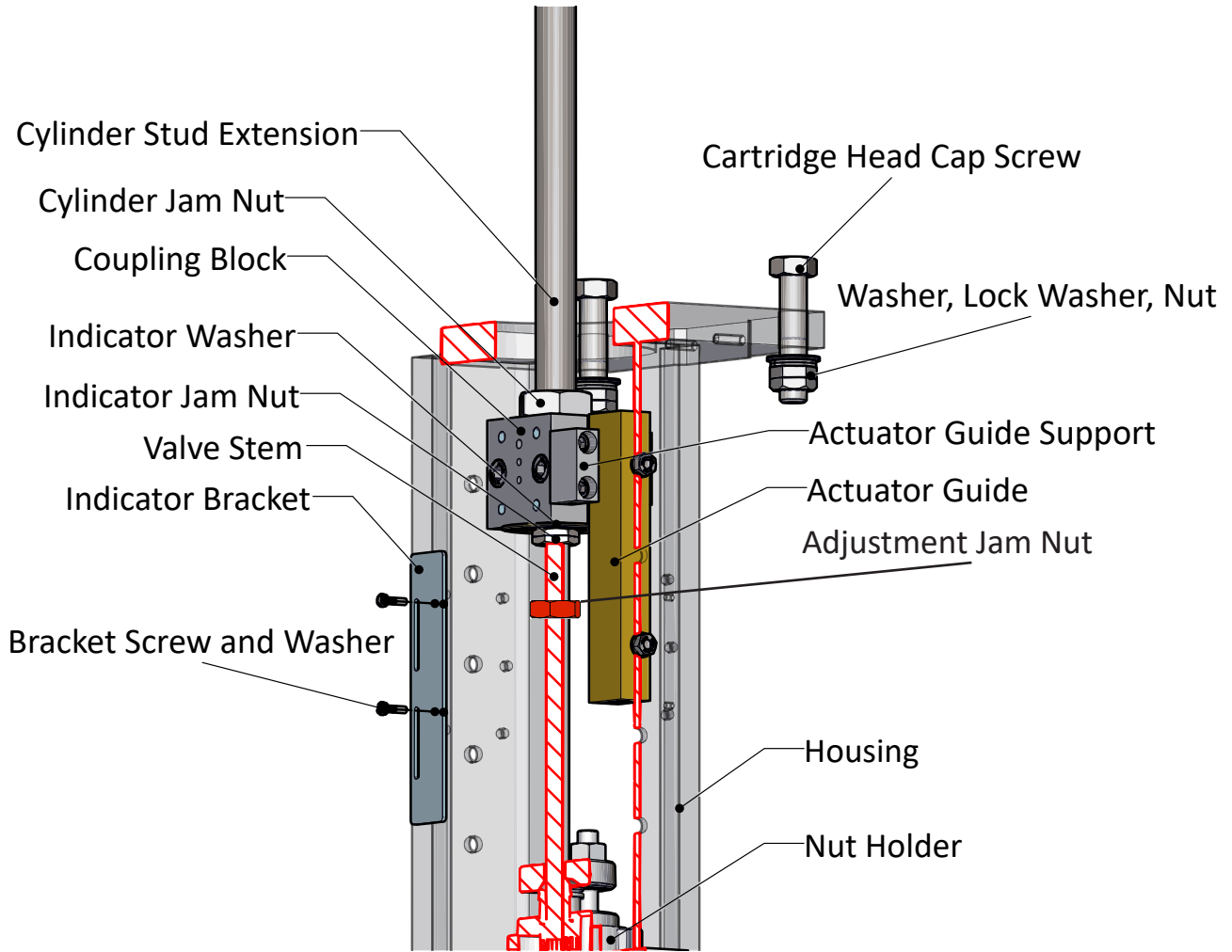
In the Spring to Close unit, the drive flange is located on the bottom of the spring. To open the valve, pneumatic signal is applied to the bottom of the cylinder, raising the piston and plug. The drive flange moves upward, and the spring is compressed. Now, the restoring force of the spring is in the downwards direction. Upon loss of power gas, the spring pushes the drive flange and piston down, closing the valve.

Spring to Open and Fail Open are interchangeably used, and configurations are field reversible.

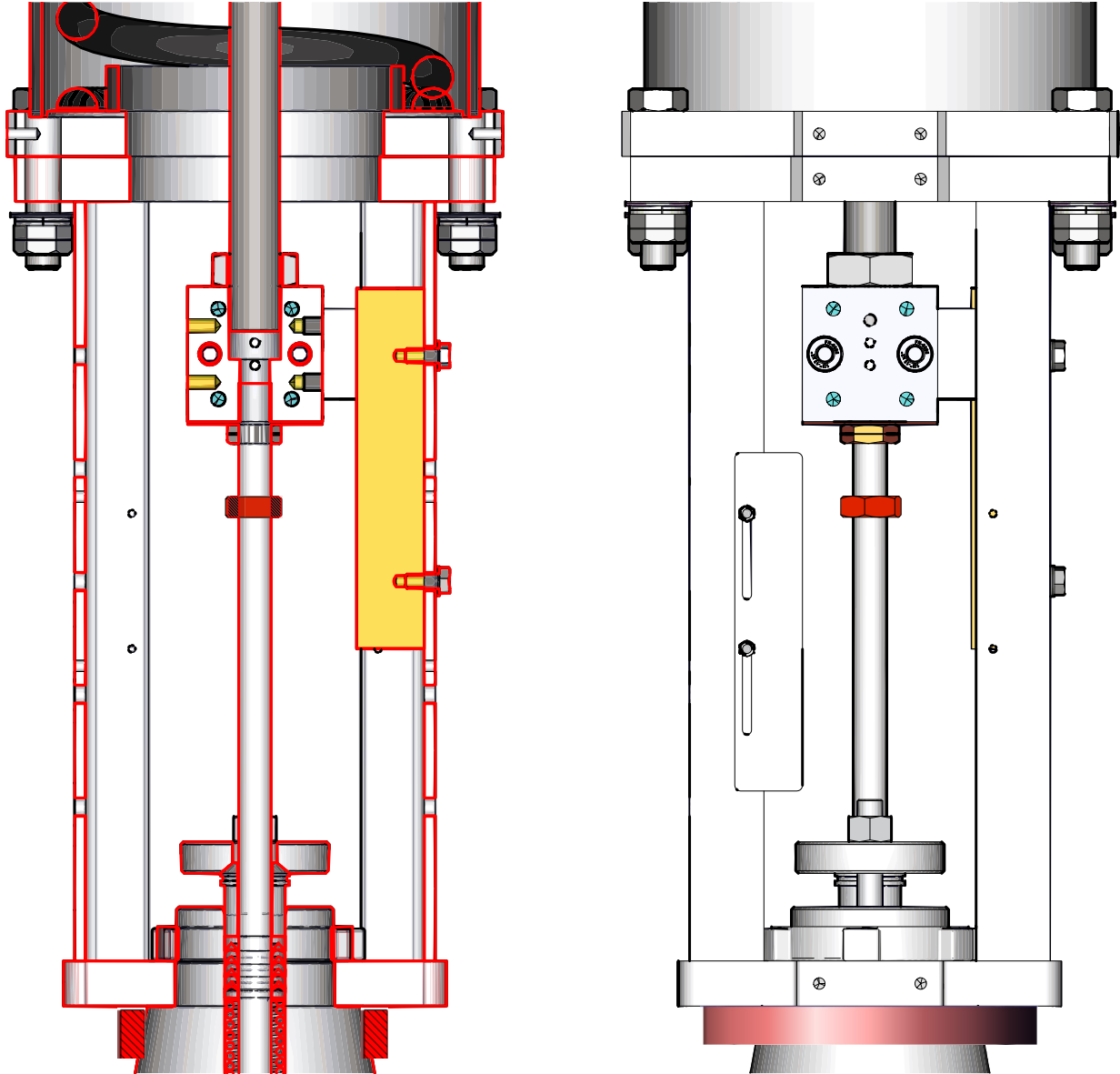




**VIEW 2: COUPLING ASSEMBLY**



### VIEW 3: VALVE & ACTUATOR INTERFACE



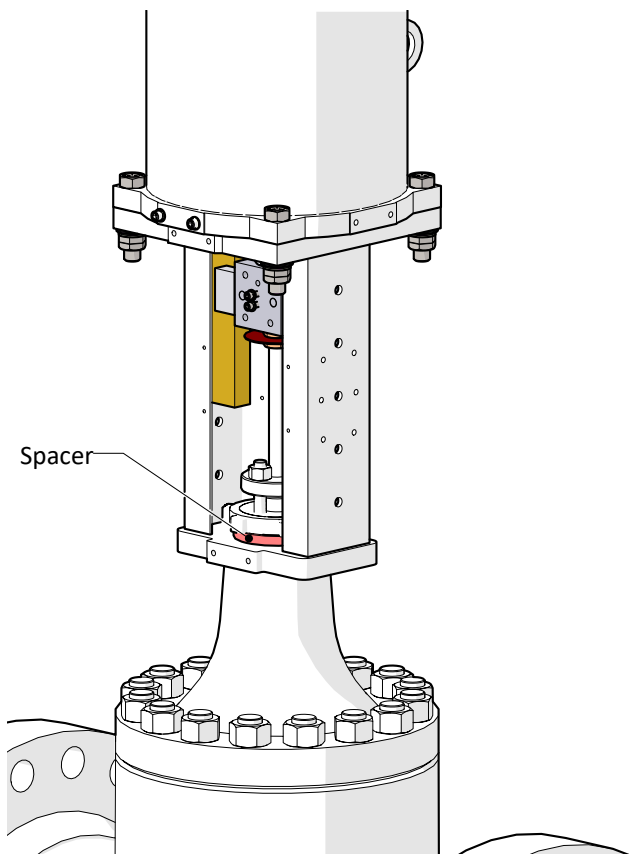
**NOTE**

- Valve stem attaches to the bottom side of LHPA Coupling Block
- Cylinder Stud Extension attaches to the top side of LHPA Coupling Block
- Guide Support and Guide Support Pins attach to the side of the LHPA Coupling Block

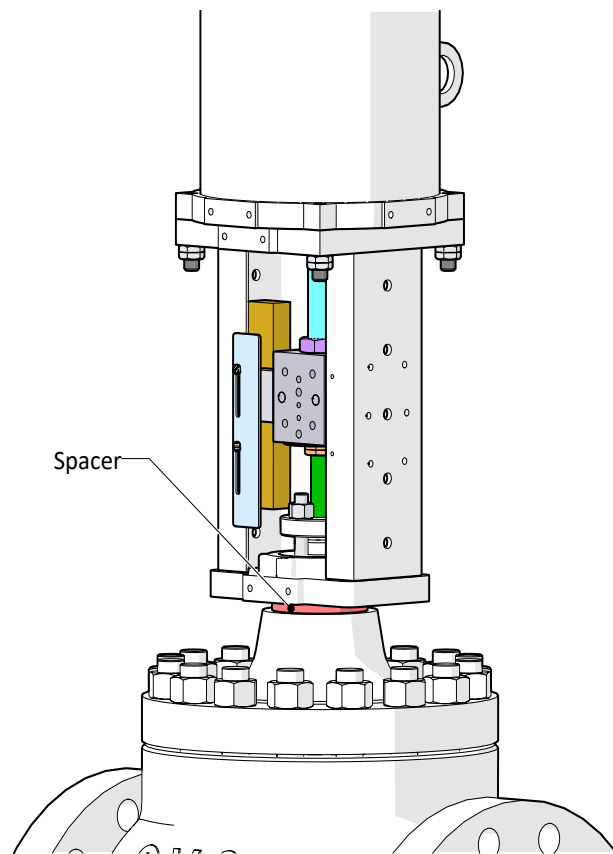
## SPACER EXPLANATION

The valve stem and cylinder rod extension must both be locked into the coupling block as shown in the previous page. At times, the length of the cylinder rod and/or valve stem is too long or too short to be locked into the coupling block, so a spacer is used. The spacer can be placed above or below the housing assembly to ensure that both the valve stem and cylinder rod fit into the coupling block.

### Spacer Above Housing



### Spacer Below Housing



# ANNUAL MAINTENANCE & INSPECTION

## Maintenance Background

VRG Controls manufactures the highest quality pneumatic cylinders in order to ensure long-life and superior performance. Over the course of normal operation, however, the actuator cylinder may wear and ultimately develop leakage through the following sealing mechanisms:

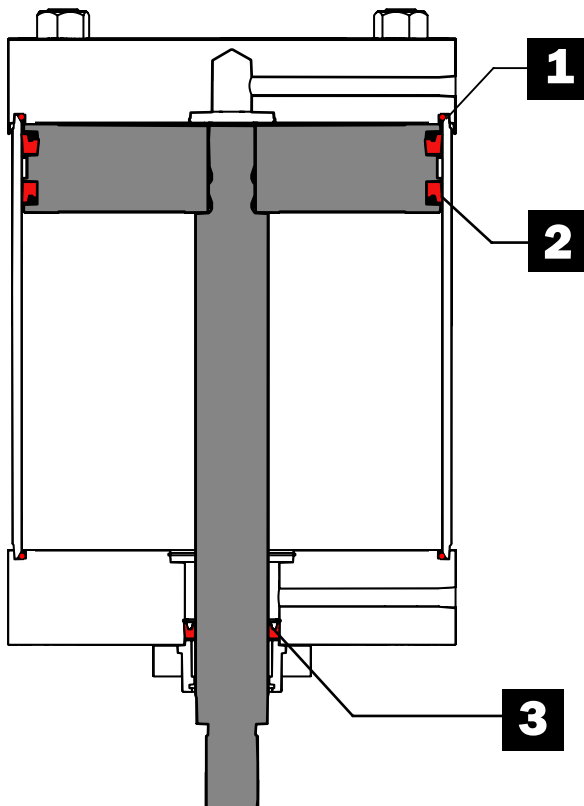
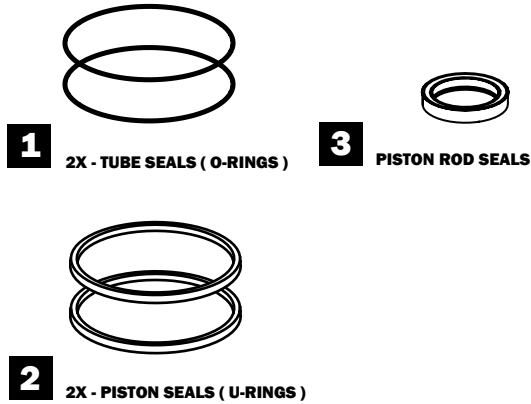


FIGURE 1 -  
CYLINDER CROSS-  
SECTION

## Causes of Cylinder Leakage

Actuator cylinder seal leakage is caused by wear over long periods of time. The actuator cylinder seals can wear and become contaminated prematurely due to excessive cycling. Used actuator cylinders may contain leakage from rusted carbon steel.

Actuator cylinders are sensitive to low temperature effects. Worn actuator cylinders may appear normal, but will show leakage only when ambient temperature drop to freezing or below. VRG Controls

recommends the inspection of piston rod seals and control instrumentation every year, along with a complete inspection of all cylinder seals.

The definition of excessive piston leakage can be seen from Table 1. The “ZERO” pressure port is defined as the NPT pressure port on the non-pressurized side of the cylinder.

Ambient Temperature	Leakage Criteria
> 40F	5-second bubble across ZERO pressure port
< 40F	>10 SCFH from ZERO pressure port

TABLE 1 -  
LEAKAGE CRITERIA

## Procedure 1: Cylinder Piston Rod Leak Inspection

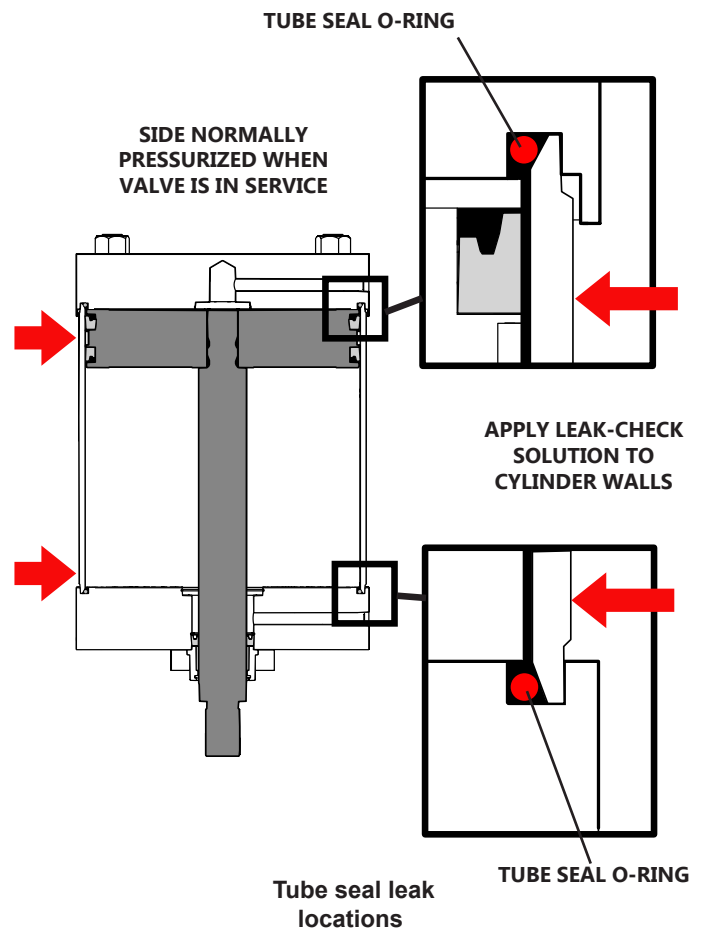
1. Apply pressure to inlet port of cylinder until full travel of piston is completed.
2. Observe the pressure of the cylinder vent port using a gauge.
3. Gauge should not be building pressure, otherwise there is a leak across the piston. The seals may need replacement, in which case refer to procedure 5.

## Procedure 2: Control Instrumentation Inspection

Refer to the Instruction manual included with each specific instrumentation application for further instruction on features and operation.

## Procedure 3: Tube Seal O-Ring Inspection

1. Pressurize the inlet side of the cylinder with at least 100 psig power supply gas.
2. Apply soap solution to the OUTSIDE perimeter of the cylinder. Any leakage should be easily visible at the locations shown to the right.
3. Follow procedure 4 to replace Tube Seal O-Rings should any leakage be found.



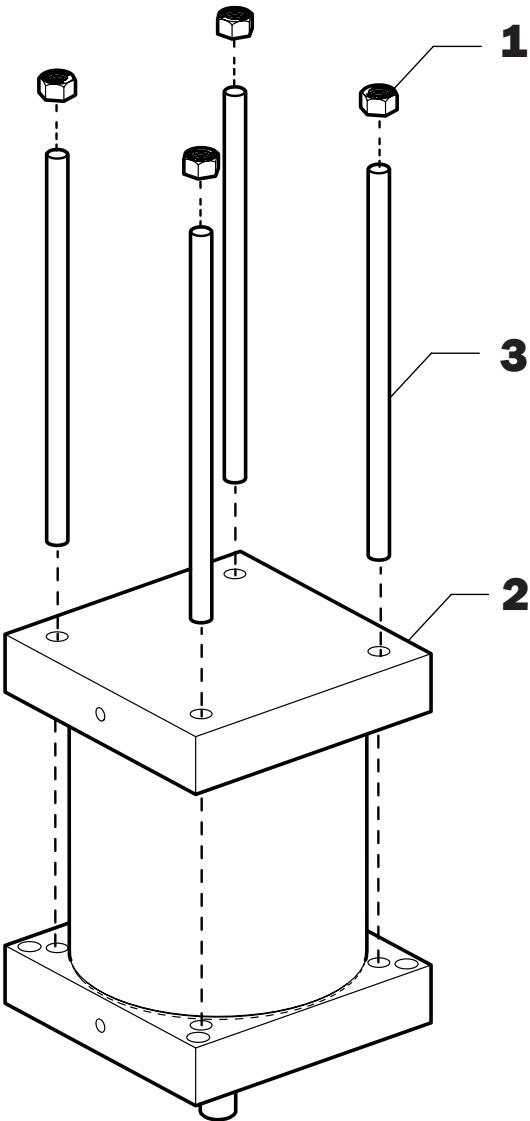
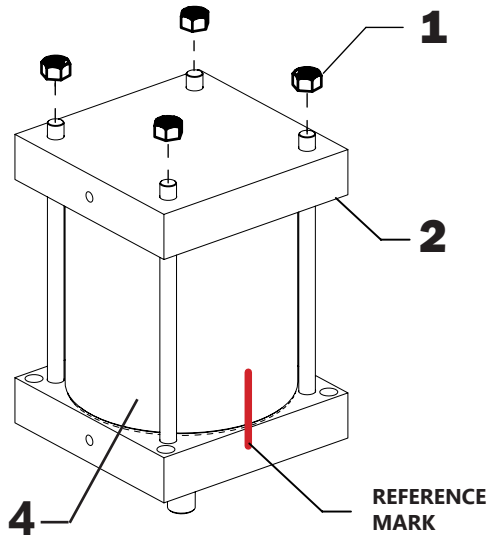
## Procedure 4: Tube Seal Replacement

**NOTE: this procedure does not require removing the cylinder from the actuator.**

1. Remove the power gas to allow the ACTUATOR CYLINDER to stroke to the spring position
2. Depressurize all instrumentation
3. Remove instrumentation tubing and instrumentation from the ACTUATOR CYLINDER.
4. Make a reference mark between BOTTOM MOUNTING FLANGE (2) and CYLINDER TUBE (4) to ensure proper realignment upon reassembly.
5. Remove 4 TIE ROD NUTS (1) from TOP FLANGE (2).

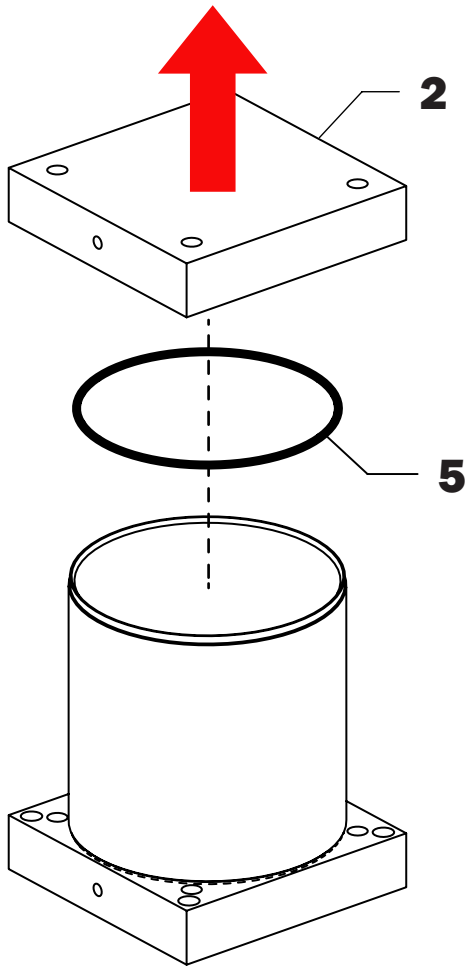
**CAUTION: TO PREVENT DAMAGE DO NOT HIT CYLINDER TUBE WALL WHEN REMOVING NUTS AND RODS!**

NOTE: If TIE ROD (3) seizes, use TIE ROD NUTS (1) for more leverage.

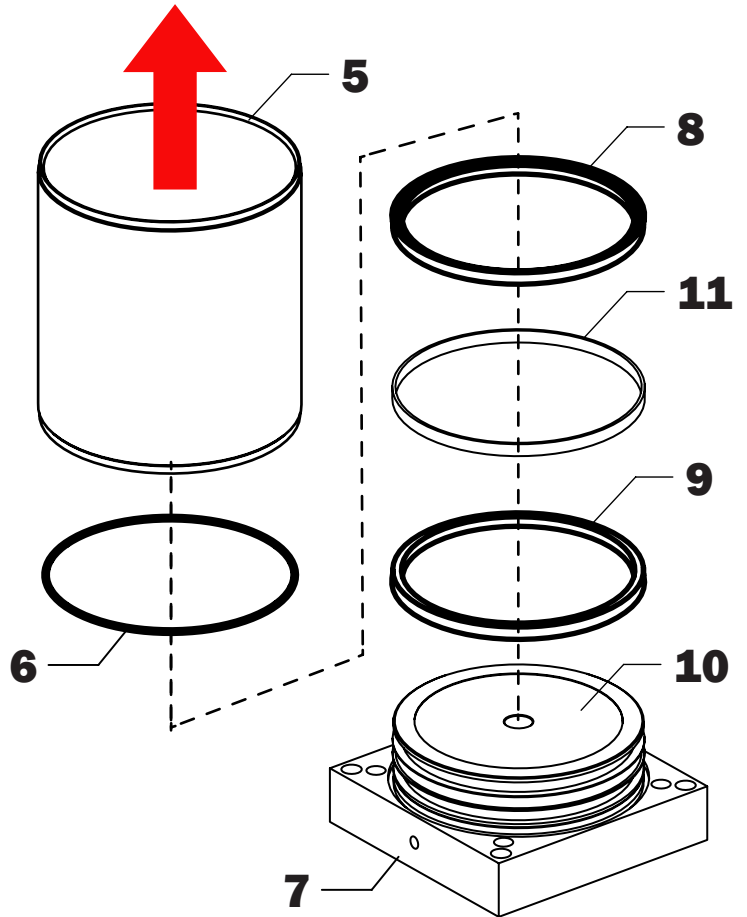




6. Remove TOP FLANGE (2) and TOP SEAL O-RING (5).



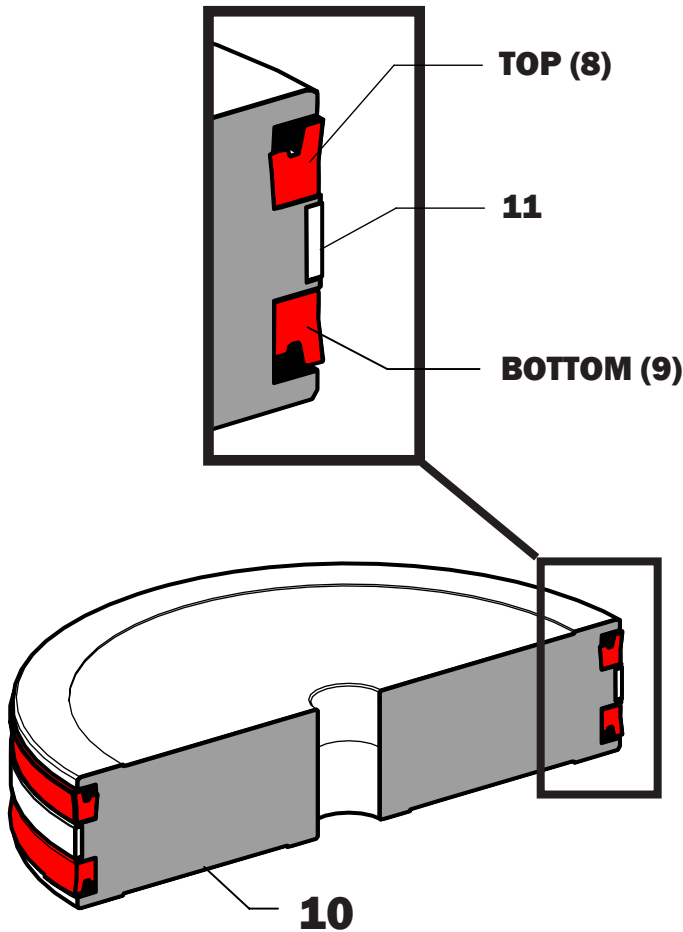
7. Remove CYLINDER TUBE (5) and BOTTOM SEAL O-RING (6) from BOTTOM MOUNTING FLANGE (7).



9. Remove any rust, dirt, or foreign material from CYLINDER TUBE (C) wall and PISTON (K) using solvent if need.

**10.** Examine actuator CYLINDER TUBE (5) wall for scratches or damage. If scratches or wearing is present on the tubing wall, it may need to be replaced.

**11.** Replace TOP SEAL O-RING (8), BOTTOM SEAL O-RING (9), and PISTON RING (11) with correct seal kit given in table XXX Correct seal and O-ring orientations are shown below.



**12.** Using a clean, lint-free cloth, apply a thin layer of STP brand lubricant to CYLINDER TUBE (5) wall, and a thin film of o-ring grease to PISTON SEALS (6,8,9).

**13.** Wipe off excess STP brand lubricant.

**14.** Reverse Steps 1 - 11 to assemble ACTUATOR CYLINDER

**15.** Tighten TIE ROD NUTS in a crossing pattern, using specified torques from the table below.

**16.** Reassemble instrumentation and tubing.

Cylinder Bore (in.)	Tie Rod Size (in.)	Tie Rod Torque (ft-lbs)	Standard Piston Rod Seal Kit #	Standard Piston Seal Kit #	PED Piston Rod & Piston Seal Kit
5	1/2" - 20	48	01-6836	01-6820	01-9947
6	1/2" - 20	48	01-6837	01-6821	01-9950
8	5/8" - 18	115	01-6837	01-6822	01-9953
10	3/4" - 16	170	01-6838	01-6833	01-9956

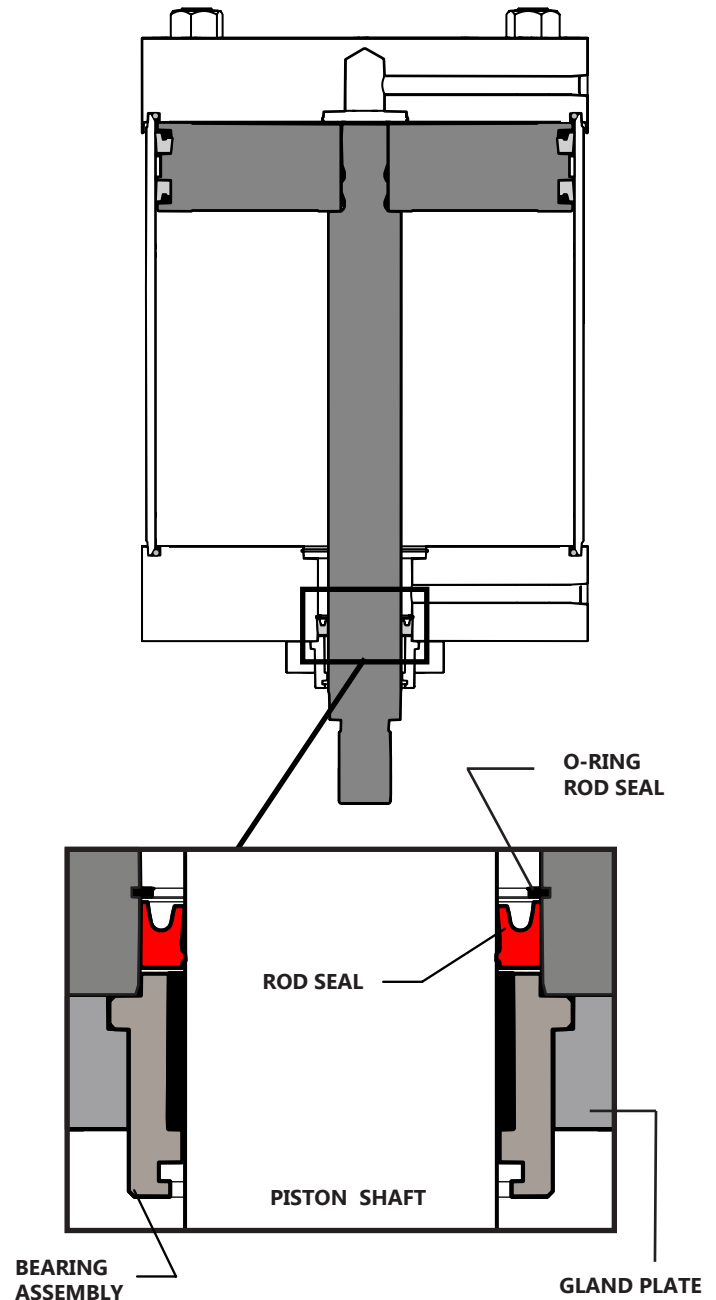
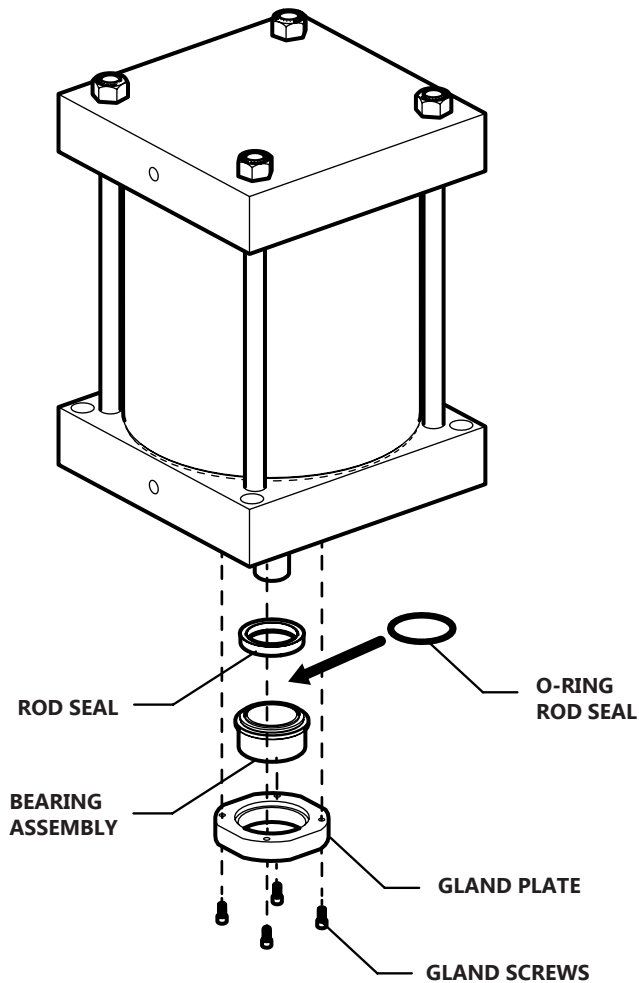
Tie Rod Nut Torque & Seal Kit Information

## Procedure 5: Piston Rod Seal Replacement

1. Depressurize all instrumentation and remove supply gas to actuator cylinder
2. Remove 2 CYLINDER COUPLING SCREWS from CYLINDER COUPLING BLOCK
3. Remove CYLINDER from VALVE STEM.
4. Remove 4 head cap screws and lock washers that attach the cylinder to the spring cartridge body.
5. Remove Cylinder from spring cartridge body
6. Remove GLAND SCREWS. GLAND PLATE and BEARING ASSEMBLY will both come out revealing ROD SEAL. Remove ROD SEAL.
7. BEARING ASSEMBLY should now be visible, and will reveal and O-RING ROD SEAL.

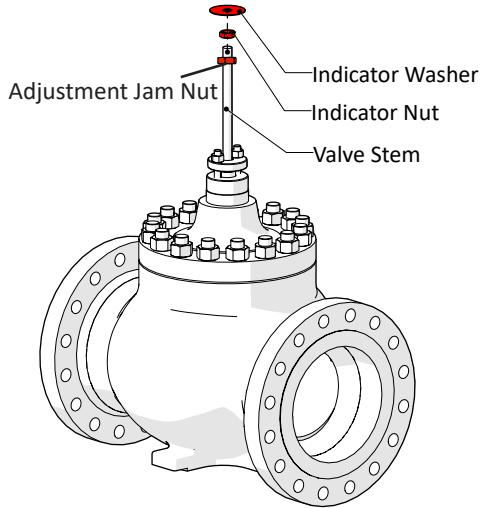
8. Using a clean, lint-free cloth, apply a thin layer of STP brand lubricant to BEARING ASSEMBLY.

9. Ensure orientation of seal is correct as pictured in figure. Reassemble O-RING ROD SEAL, ROD SEAL, MOUNTING FLANGE as show.

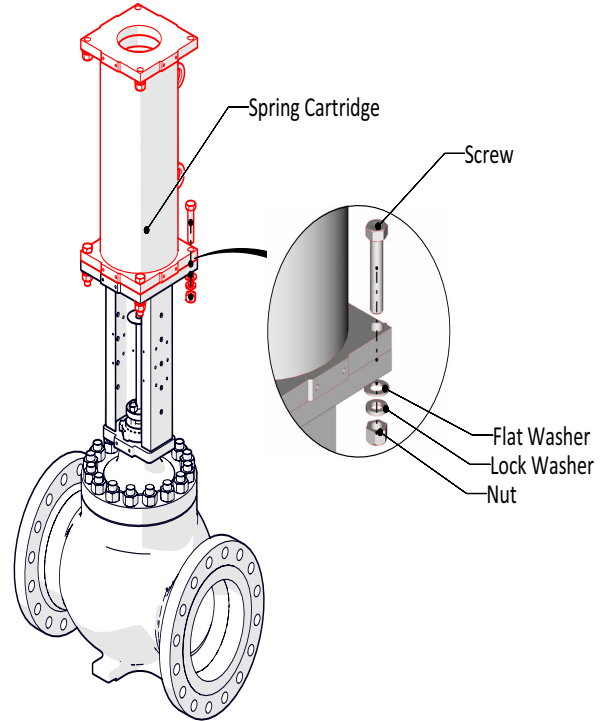


# ASSEMBLY INSTRUCTIONS

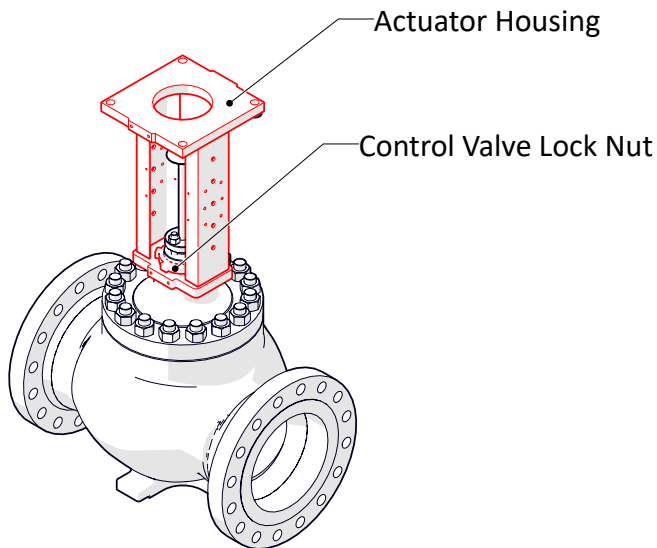
Step 1: Thread the adjustment jam nut, indicator nut and washer onto the valve stem. Ensure that the valve is in the fully open position.



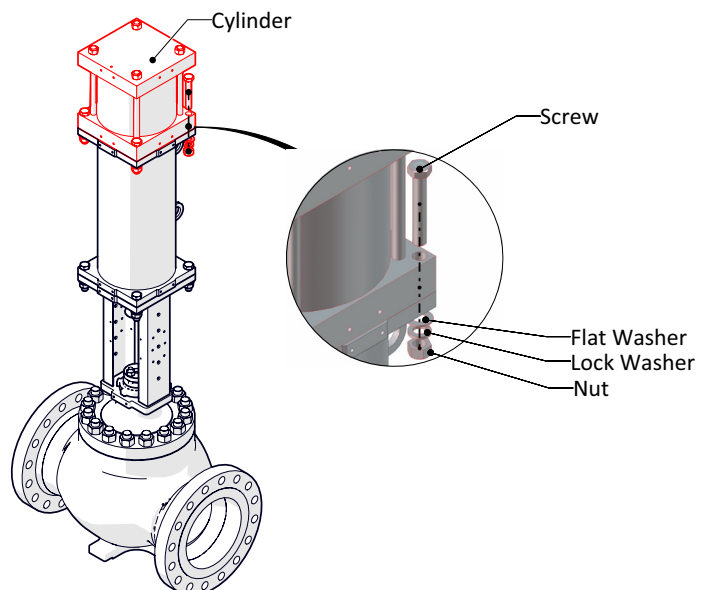
Step 3: Mount the spring cartridge onto the actuator housing. Secure using QTY 4 of the following: screw, flat washer, lock washer, and nut.



Step 2: Mount the actuator housing onto the valve. Secure the actuator housing by tightening the control valve lock nut.



Step 4: Mount the cylinder onto the spring cartridge. Secure using QTY 4 of the following: screw, flat washer, lock washer, and nut.

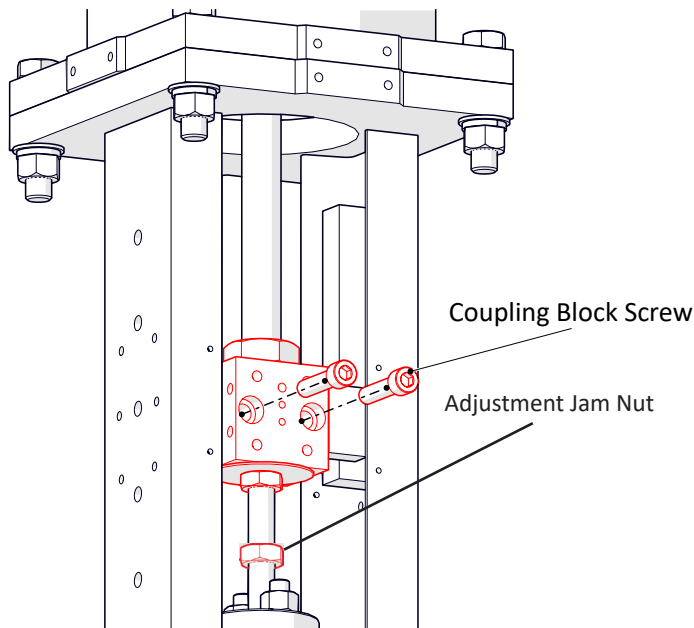


## ASSEMBLY INSTRUCTIONS

Step 5: Connect the cylinder stud extension to the valve stem. This process is different for Spring to Open and Spring to Close valves.

### SPRING TO OPEN

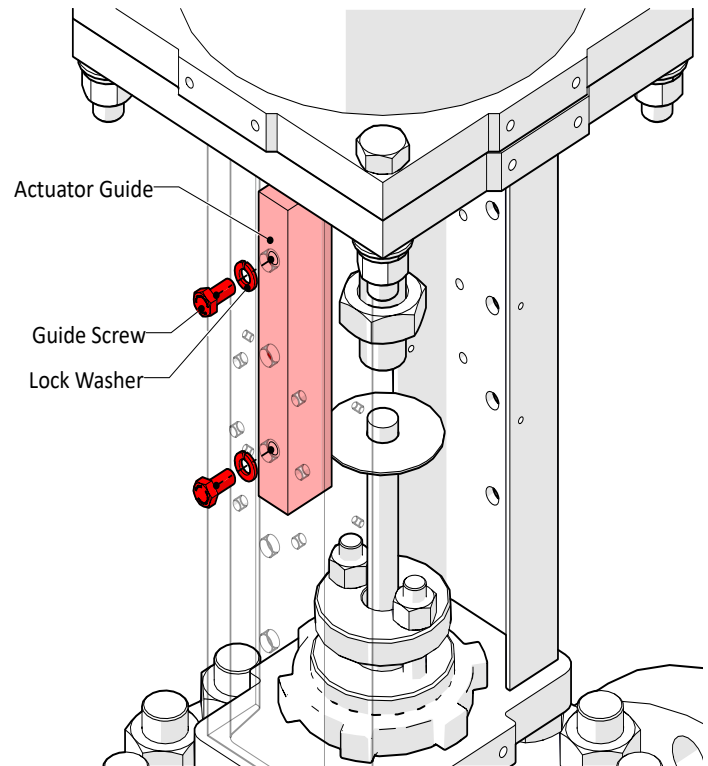
LOOSELY connect the coupling block, joining the cylinder stud extension to the valve stem. Stroke the valve to 50% open. Tighten the adjustment jam nut one turn clockwise. Close the valve and check lockup. If valve does not lockup, rotate the adjustment jam nut until lockup is achieved.



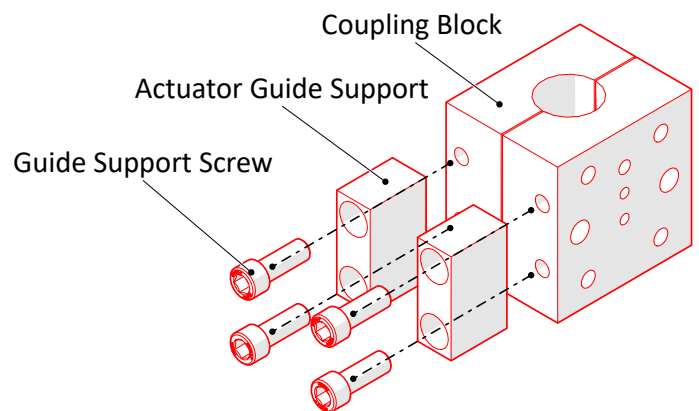
### SPRING TO CLOSE

LOOSELY connect the coupling block, joining the cylinder stud extension to the valve stem. Rotate the coupling block once clockwise to introduce a positive pressure to the valve stem packing. Check the valve for lockup. Continue rotating the coupling block until lockup is achieved.

Step 6: Remove the coupling block so that the actuator guide and guide supports can be attached. Mount the actuator guide on the interior of the actuator housing using QTY 2 of the guide screw and lock washer.

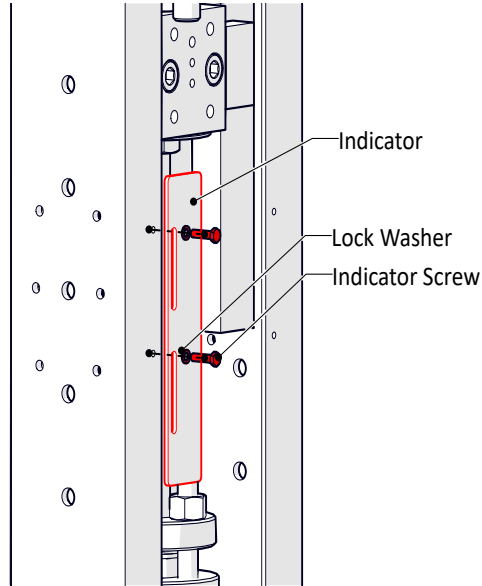


Step 7: Attach the 2 actuator guide supports to the coupling block using the guide support screws. Once the correct position of the coupling block is found, tighten the block fully.

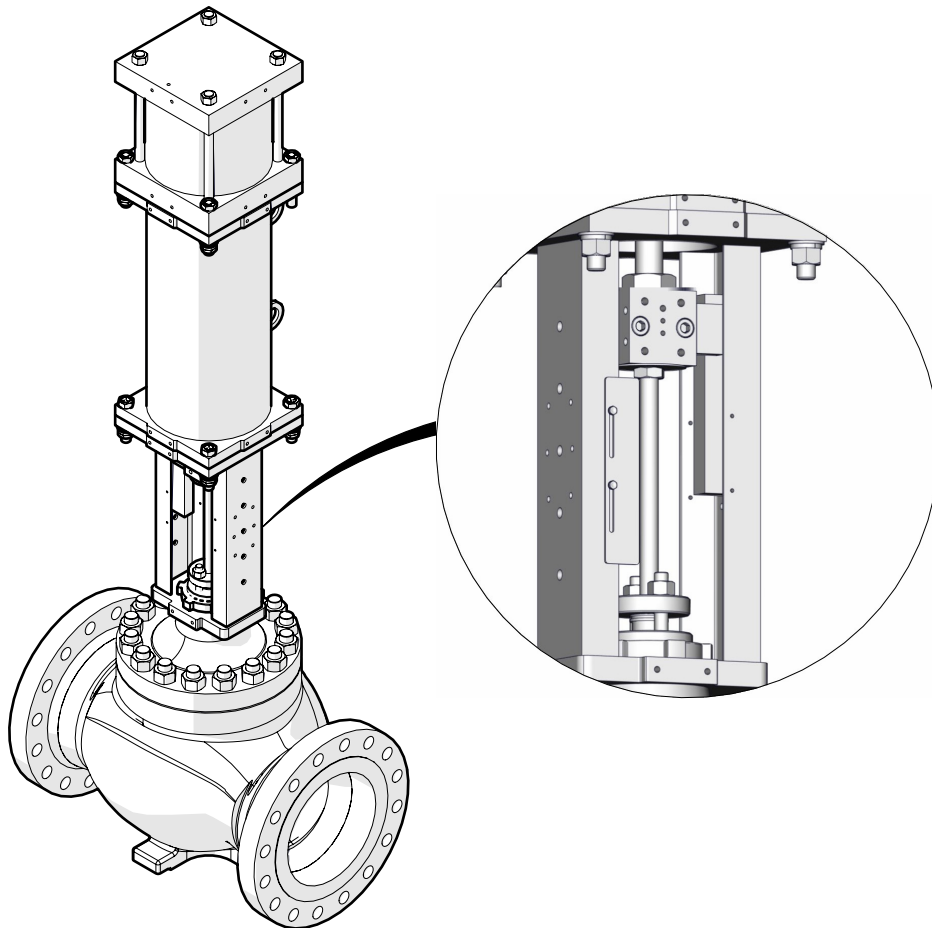


## ASSEMBLY INSTRUCTIONS

Step 9: Fasten the indicator to the operator-side of the actuator using the screw and washer. Adjust the position of the indicator based on stroke length of the actuator.



The LHPA-SR valve and actuator are now completely assembled.



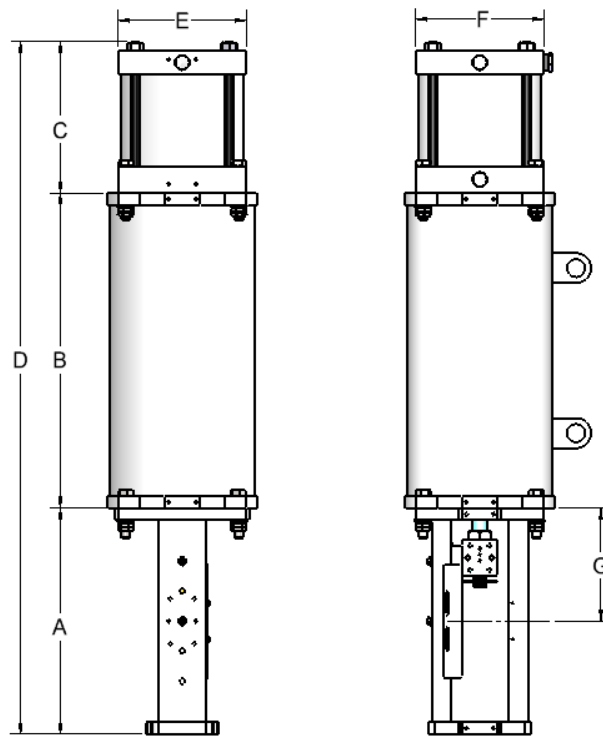
## LHPA-SR ACTUATOR THRUST TABLE

LHPA-SR Model	Spring Position	Spring Thrust (lb.)	80 psig	90 psig	100 psig	125 psig	150 psig	175 psig	200 psig	250 psig	MAOP
5x1-1/8SR10	Loaded	1176	394	591	787	1278	1769	2259	2750	3732	500
	Unloaded	1066	504	701	897	1388	1879	2369	2860	3842	
6x1.5sr10	Loaded	1176	1086	1368	1651	2358	3065	3771	4478	5892	500
	Unloaded	1029	1233	1515	1798	2505	3212	3918	4625	6039	
6x2sr20	Loaded	1998	264	546	829	1536	2243	2949	3656	5070	500
	Unloaded	1776	486	768	1051	1758	2465	3171	3878	5292	
6x2.5sr20	Loaded	1998	264	546	829	1536	2243	2949	3656	5070	500
	Unloaded	1720.5	541	824	1107	1813	2520	3227	3934	5347	
8x2sr20	Loaded	1998	2023	2525	3028	4285	5541	6798	8054	10567	400
	Unloaded	1776	2245	2747	3250	4507	5763	7020	8276	10789	
8X2SR30	Loaded	2765	1256	1758	2261	3518	4774	6031	7287	9800	400
	Unloaded	2514	1507	2009	2512	3769	5025	6282	7538	10051	
8x6sr30	Loaded	2765	1256	1758	2261	3518	4774	6031	7287	9800	400
	Unloaded	2011	2010	2512	3015	4272	5528	6785	8041	10554	
8x3sr40	Loaded	3768	253	755	1258	2515	3771	5028	6284	8797	400
	Unloaded	3297	724	1226	1729	2986	4242	5499	6755	9268	
8x4sr40	Loaded	3768	253	755	1258	2515	3771	5028	6284	8797	400
	Unloaded	3140	881	1383	1886	3143	4399	5656	6912	9425	
10x5sr40	Loaded	3768	2515	3301	4086	6050	8013	9977	11940	15867	400
	Unloaded	2983	3300	4086	4871	6835	8798	10762	12725	16652	
8x4sr42	Loaded	3454	567	1069	1572	2829	4085	5342	6598	9111	400
	Unloaded	2826	1195	1697	2200	3457	4713	5970	7226	9739	
10x3sr50	Loaded	5105	1178	1964	2749	4713	6676	8640	10603	14530	400
	Unloaded	4516	1767	2553	3338	5302	7265	9229	11192	15119	
10x4sr50	Loaded	5105	1178	1964	2749	4713	6676	8640	10603	14530	400
	Unloaded	4320	1963	2749	3534	5498	7461	9425	11388	15315	
10x5sr50	Loaded	5105	1178	1964	2749	4713	6676	8640	10603	14530	400
	Unloaded	4123	2160	2946	3731	5695	7658	9622	11585	15512	
10x5sr52	Loaded	4704	1579	2365	3150	5114	7077	9041	11004	14931	400
	Unloaded	3724	2559	3345	4130	6094	8057	10021	11984	15911	
10x5sr60	Loaded	5913	370	1156	1941	3905	5868	7832	9795	13722	400
	Unloaded	4818	1465	2251	3036	5000	6963	8927	10890	14817	
10x5sr6040	Loaded	7801	-1518	-732	53	2017	3980	5944	7907	11834	400
	Unloaded	9681	-3398	-2612	-1827	137	2100	4064	6027	9954	

Note:

1. Ensure that valve stem is rated to actuator thrust. Stem material and/or diameter may need to be changed to prevent damage from excessive forces.

## LHPA-SR ACTUATOR WEIGHT & DIMENSION TABLE



MODEL	A	B	C	D	E	F	G	WEIGHT (lbs.)
5x1-1/8sr10	12 3/4"	12 1/2"	6 3/4"	32"	5 1/2"	5 1/2"	6 1/4"	135
6x1.5sr10	11 3/8"	12 1/2"	7 3/4"	31 5/8"	6 1/2"	6 1/2"	5 5/8"	163
6x2sr20	12 1/2"	16 5/8"	8 1/4"	37 3/8"	6 1/2"	6 1/2"	6 1/4"	199
6x2.5sr20	11 3/8"	16 5/8"	8 3/4"	36 3/4"	6 1/2"	6 1/2"	5 5/8"	200
8x2sr20	14 3/4"	15 5/8"	7 7/8"	38 1/4"	8 1/2"	8 1/2"	7 3/8"	345
8x2sr30	14 3/4"	18 1/2"	8 1/8"	41 3/8"	8 1/2"	8 1/2"	7 3/8"	310
8x3sr40	14 3/4"	21 7/8"	8 7/8"	45 1/2"	8 1/2"	8 1/2"	7 3/8"	304
8x4sr40 6.5" LNG	14 3/4"	21 7/8"	9 7/8"	46 1/2"	8 1/2"	8 1/2"	9"	306
8x4sr40	18"	21 7/8"	9 7/8"	49 3/4"	8 1/2"	8 1/2"	9"	311
8x4sr42	18"	23 7/8"	9 7/8"	51 3/4"	8 1/2"	8 1/2"	9"	340
8x6sr30	20 1/2"	22 1/2"	11 7/8"	54 7/8"	8 1/2"	8 1/2"	10 1/4"	310
10x3sr50 1" Stem	17 3/4"	22 1/4"	10 5/8"	50 5/8"	10 5/8"	10 5/8"	8 7/8"	338
10x3sr50 1-1/4" Stem	16 1/2"	22 1/4"	10 5/8"	49 3/8"	10 5/8"	10 5/8"	8 1/4"	338
10x4sr50	16 1/2"	23 1/4"	12 5/8"	52 3/8"	10 5/8"	10 5/8"	8 1/4"	495
10x5sr40	18 3/4"	22 7/8"	12 5/8"	54 1/4"	10 5/8"	10 5/8"	9 3/8"	445
10x5sr40CY	18"	22 7/8"	12 5/8"	53 1/2"	10 5/8"	10 5/8"	9 3/4"	487
10x5sr50	18 7/8"	24 1/4"	12 5/8"	55 5/8"	10 5/8"	10 5/8"	9 3/8"	500
10x5sr52	18 7/8"	26 1/4"	12 5/8"	57 3/4"	10 5/8"	10 5/8"	9 3/8"	505

**Notes:**

1. Fail open and fail close units have the same dimensions
2. Bigger sizing options are available upon request



## REPAIR KIT INFORMATION

Actuator Cylinder Bore	Repair Kit	Description
5	RK-0090	5" Dia Cylinder Repair Kit
5	RK-0090-LT	5" Dia Cylinder Repair Kit, Low temp. U-cups
6	RK-1095	6" Dia Cylinder Repair Kit
6	RK-1095-LT	6" Dia Cylinder Repair Kit, Low temp. U-cups
8	RK-1100	8" Dia Cylinder Repair Kit
8	RK-1100-LT	8" Dia Cylinder Repair Kit, Low temp. U-cups
10	RK-1110	10" Dia Cylinder Repair Kit
10	RK-1110-LT	10" Dia Cylinder Repair Kit, Low temp. U-cups

### Notes:

1. Includes ALL available seals and wear components for LHPA Actuator Piston Assemblies with tailrod and without tailrod
2. Suitable for ALL VRG Controls LHPA-SR Actuator Models
3. Includes following components:
  - Cylinder U-Cup Seals (2)
  - Cylinder Wear Strip
  - Cylinder Tube Seals (2)
  - Cylinder Rod Seal
  - Cylinder Rod Bearing
  - Tailrod Gland Assembly
  - Tailrod Seal
  - Tailrod Wiper Seal
  - Tailrod Gland O-Ring
4. For repair kit numbers without LT the temperature rating is -20°F to +160°F
5. For repair kit numbers with LT the temperature rating -40°F to +160°F

## FACTORY ACCEPTANCE TESTING



### VALVE INSPECTION FORM PART A

Assembly Technician Name: \_\_\_\_\_ Assembly Tech Signature: \_\_\_\_\_

Job: \_\_\_\_\_ S/N: \_\_\_\_\_ Date: \_\_\_\_\_

Valve Components	Installed (Yes/No)	Assy. Technician	Quality Control:	Type/Comments:
Valve / Actuator Model	Yes No			
Valve S/N	Yes No			
Orientation	Yes No			
Spring Return	Yes No			
Double Acting	Yes No			
Clean Sweep	Yes No			
Torque Arm	Yes No			
Key	Yes No			
Set Screw	Yes No			
Conn Link Jam Nut	Yes No			
Valve Rating	Yes No			
Valve Serrations	Yes No			
Gauge	Yes No			

Notes:

\_\_\_\_\_  
QC Inspector Name

\_\_\_\_\_  
QC Inspector Signature

# FACTORY ACCEPTANCE TESTING



## VALVE INSPECTION FORM PART B

Assembly Technician Name: \_\_\_\_\_

Assembly Tech Signature: \_\_\_\_\_

Setting Technician Name: \_\_\_\_\_

Setting Tech Signature: \_\_\_\_\_

Job: \_\_\_\_\_ S/N: \_\_\_\_\_ Customer: \_\_\_\_\_ Date: \_\_\_\_\_

Valve Components	(Yes/No)	Quality Control:	Type/Comments:
Valve Model	YES NO		
Valve S/N	YES NO		
Orientation	YES NO		
Pilot Verification	YES NO		
Vol. Booster	YES NO		
RCVC	YES NO		
Solenoid Valve	YES NO		
Sensor	YES NO		
VMO	YES NO		
Filter:	YES NO		
Filter SN.	YES NO		
Regulator Brass/SS	YES NO		
Gauge check	YES NO		
Trip Valve	YES NO		
SS Tags	YES NO		
Heater	YES NO		
Versa	YES NO		
Tubing - Leak check	YES NO		
Transmitter	YES NO		
20 ma			
12 ma ↓			
12 ma ↑			
4 ma			
Stroke time			
Valve Rating			
Gauge Number			

Part "A" Assy Tech. \_\_\_\_\_

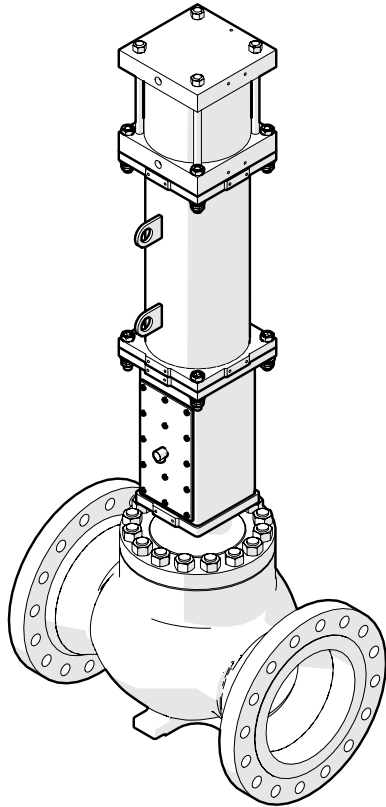
Notes:

\_\_\_\_\_  
QC Inspector Name

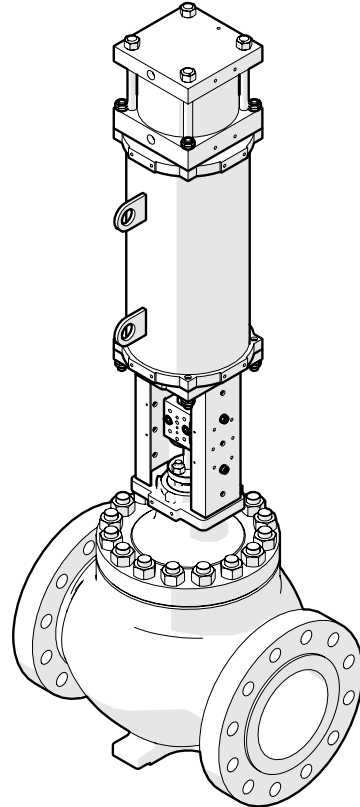
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QC Inspector Signature

**AVAILABLE OPTIONS**

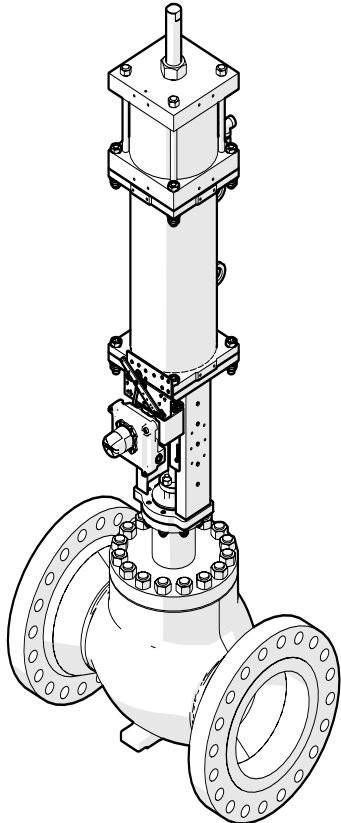
**CLOSED YOKE**



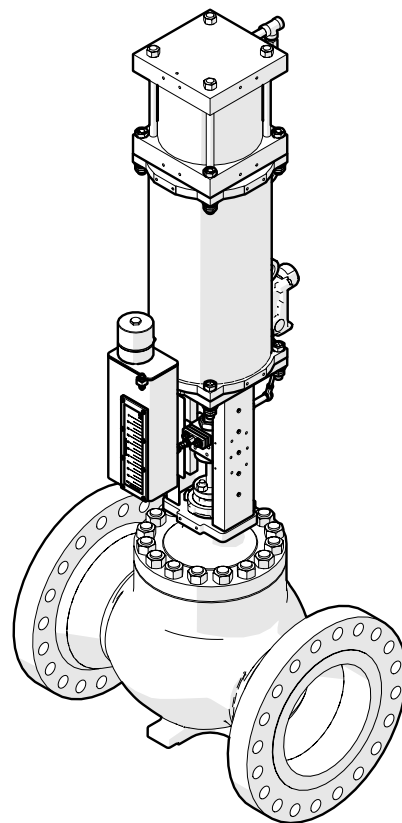
**OPEN YOKE**



**MANUAL SCREW  
(ADJUSTABLE STOP)**



**BALLUFF**



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