

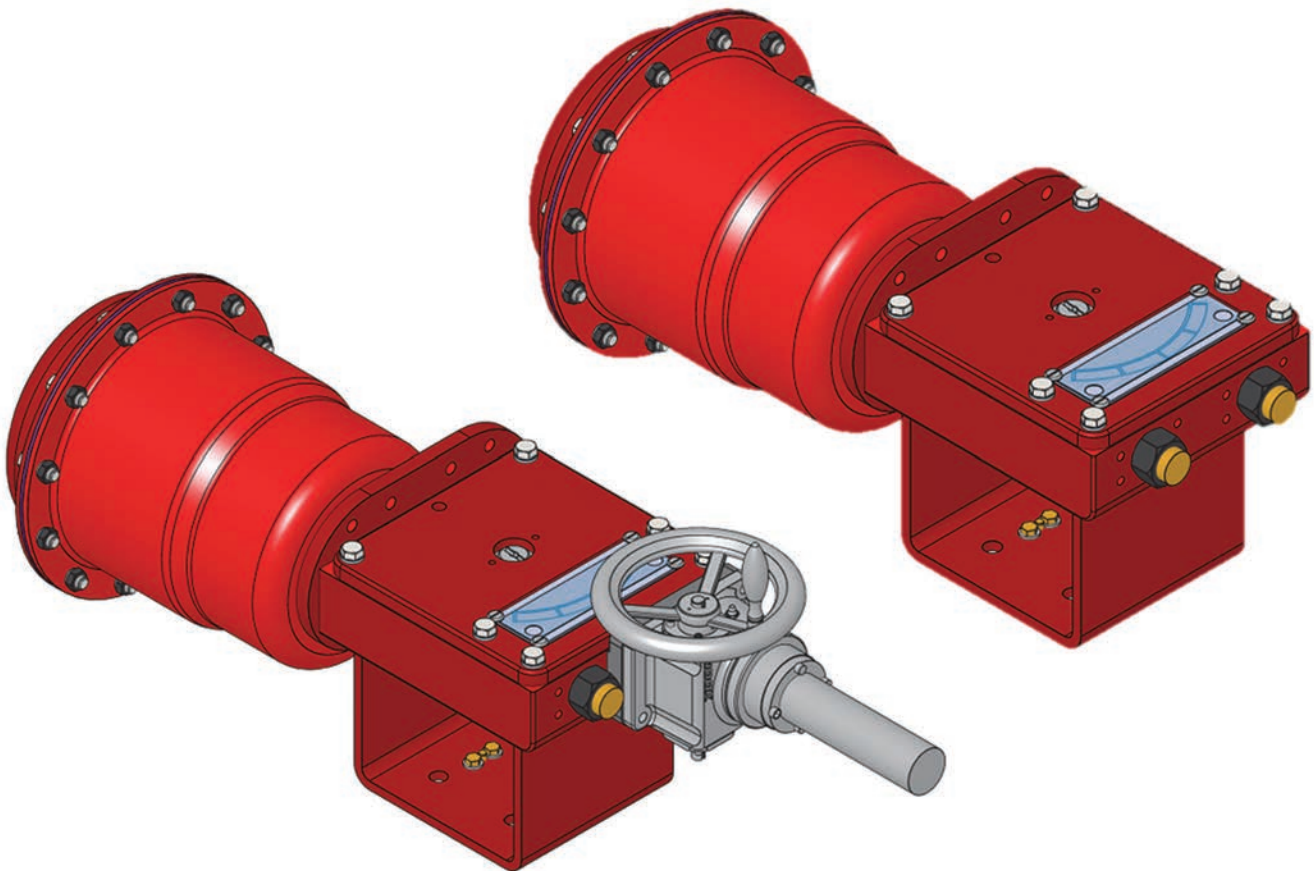
Masoneilan

a Baker Hughes business

31/32/36 Series

Rotary Valve Actuator

Instruction Manual (Rev.A)



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Safety Information

Important - Please read before installation

These instructions contain **DANGER**, **WARNING**, and **CAUTION** labels, where necessary, to alert you to safety related or other important information. Read the instructions carefully before installing and maintaining your control valve. **DANGER** and **WARNING** hazards are related to personal injury. **CAUTION** hazards involve equipment or property damage. Operation of damaged equipment can, under certain operational conditions, result in degraded process system performance that can lead to injury or death. Total compliance with all **DANGER**, **WARNING**, and **CAUTION** notices is required for safe operation.



This is the safety alert symbol. It alerts you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in serious injury.



Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.



When used without the safety alert symbol, indicates a potentially hazardous situation which, if not avoided, could result in property damage.

Note: Indicates important facts and conditions.

About this Manual

- The information in this manual is subject to change without prior notice.
- The information contained in this manual, in whole or part, shall not be transcribed or copied without Baker Hughes's written permission.
- Please report any errors or questions about the information in this manual to your local supplier.
- These instructions are written specifically for the **Masoneilan™** Model 31/32/36 Series Rotary Actuator, and do not apply for other valves outside of this product line.

Useful Life Period

The current estimated useful life period for the Model 31/32/36 Series Rotary Actuator is 25+ years. To maximize the useful life of the product, it is essential to conduct annual inspections, routine maintenance and ensure proper installation to avoid any unintended stresses on the product. The specific operating conditions will also impact the useful life of the product. Consult the factory for guidance on specific applications if required prior to installation.

Warranty

Items sold by Baker Hughes are warranted to be free from defects in materials and workmanship for a period of one year from the date of shipment provided said items are used according to Baker Hughes recommended usages. Baker Hughes reserves the right to discontinue manufacture of any product or change product materials, design or specifications without notice.

Note: Prior to installation

- The actuator must be installed, put into service and maintained by qualified and competent professionals who have undergone suitable training.
- Under certain operating conditions, the use of damaged equipment could cause a degradation of the performance of the system which may lead to personal injury or death.
- Changes to specifications, structure, and components used may not lead to the revision of this manual unless such changes affect the function and performance of the product.

1. General

1.1 Product Description

The following instructions are designed to guide the user during the installation and maintenance of Model 31/32/36 Series Rotary Actuator.

The Model 31/32/36 actuator is a modular design that can be utilized on Model 35002 Series **Camflex™**, 36005 Series **V-Max™**, 37002 **Minitork™**, and 39003/39004 High Performance Butterfly Valve Series, along with many other rotary control valves. This manual details the assembly instructions for mounting on similar type rotary valves.

The Model 31/32 is the spring-diaphragm version and the Model 36 is the double-acting piston version.

1.2 Serial Plate

This plate is usually fixed on the side of the actuator yoke. It indicates the valve type, model number, serial number, pressure class, pressure shell material, actuator pressure supply, and other necessary information. Many valves also include a QR code located on serial plates, as shown in Figure 1, which can be scanned to access the valve details through Baker Hughes ValvCentral, including as designed conditions, bill of material, and full service history.

1.3 After Sales Service

Baker Hughes has a highly skilled After Sales Department available for start-up, maintenance and repair of our equipment. Contact the nearest Baker Hughes local representative or After Sales Department. Valve and Actuator serial plates including QR codes can help to access service history and local service partner for support.

1.4 Spare Parts

For maintenance, always use only original spare parts obtained through your local Baker Hughes representative or Spare Parts Department.

When ordering spare parts, the model and serial numbers indicated on the manufacturer's serial plate must be provided to the Baker Hughes representative. Recommended spare parts can also be accessed through QR codes located on valve and actuator serial plates.

1.5 Valve and Actuator Accessories

The actuator is installed on a valve. There is a particular instruction manual for each valve model, as well as for all other accessories installed on the actuator assembly. Consult the appropriate valve instruction and operations manual for more details on the particular installation.

Note: *This manual describes all standard options of the Model 31/32/36 series rotary actuators. In order to meet the particular requirements of your application, Baker Hughes may have developed a special option covered by an Appendix to the present manual. If this is the case, the instructions of this Appendix always prevail over the general manual instructions.*

Masoneilan® Control Valves

ASSEMBLED IN: _____

Cv: _____ MODEL NUMBER: _____

FAIL POSITION VALVE: CLOSED ☐ OPENED ☐ LOCKED ☐ YEAR: _____

RANGE: _____ SUPPLY: _____

CLASS: _____ DN/NPS: _____

PRESS/TEMP LIMIT: _____

BODY MATERIAL: _____

SERIAL NUMBER: _____

TAG/ITEM NO.: _____

QR Code: [QR Code]

Figure 1: Serial Plate

2. Installation

2.1 Cleanliness of Piping

Before installing the valve and actuator in the line, clean piping and valve of all foreign material such as welding debris, scale, oil, grease or dirt. Gasket surfaces must be thoroughly cleaned to insure leak-free joints.

2.2 Isolating By-Pass Valve

To allow for in-line inspection, maintenance and removal of the valve and actuator without service interruption, provide a manually operated stop valve on each side of the control valve and a manually operated throttling valve in the by-pass line.

3. Maintenance

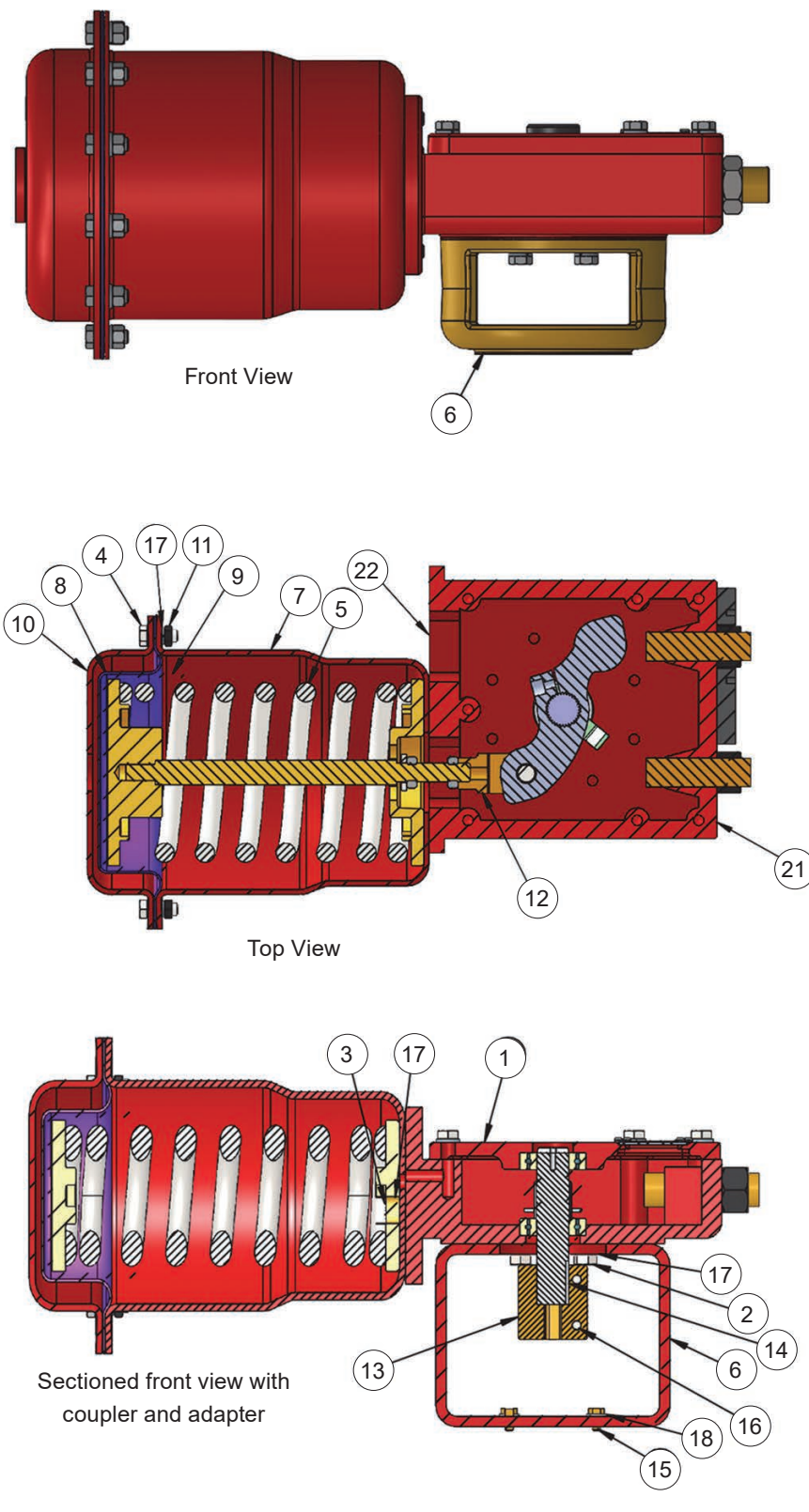


Figure 2: Main Actuator Assembly

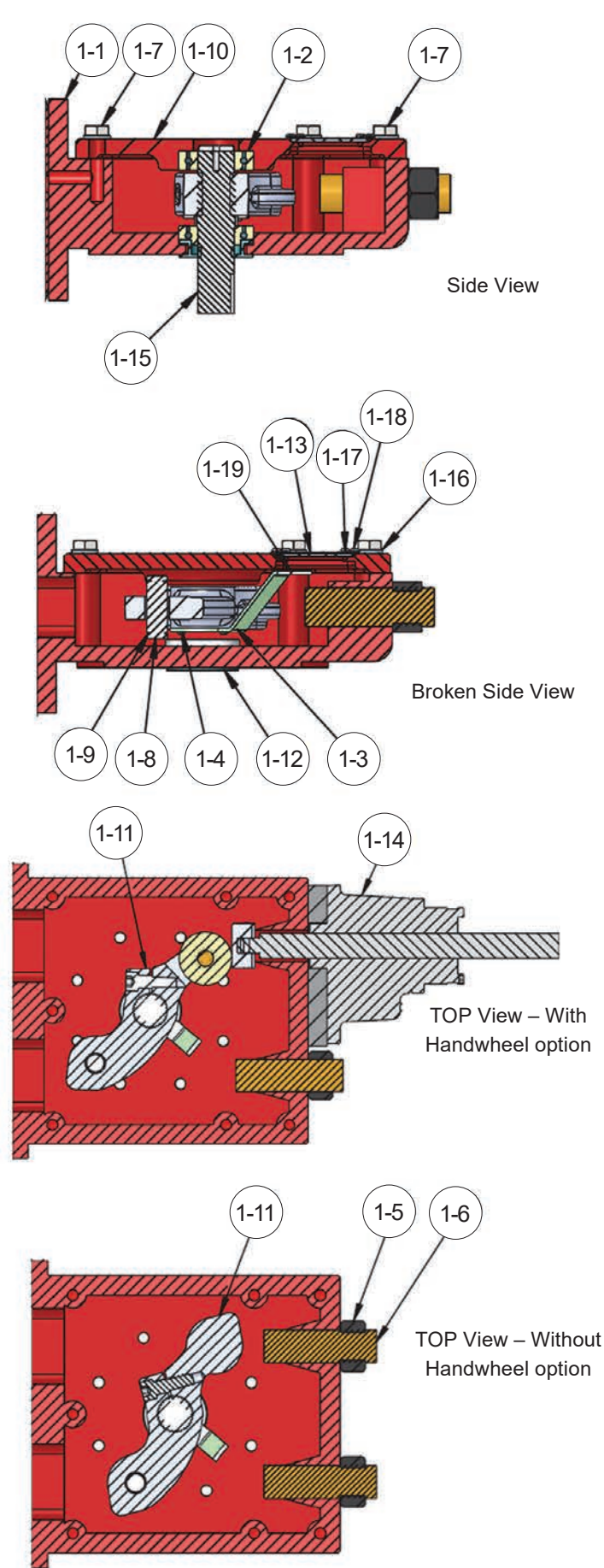
Main Assembly Parts	
Ref	Part Name
1	Actuator Housing/Linkage subassembly
2	Hex head bolt
3	Hex head bolt
4	Hex head bolt
5	Spring subassembly
6	Yoke adapter
7	Lower diaphragm case
8	Diaphragm
9	Diaphragm retainer
10	Upper diaphragm case
11	Hex nut
12	Clevis
13	Butterfly coupling
14	Square key
15	Hex head bolt
16	Set screw
17	Lock washer
18	Lock washer
19	Actuator plate
20	Information plate
21	Hole cover
22	Hole cover

CAUTION

THE USE OF INCORRECT DISASSEMBLY PROCEDURES MAY RESULT IN PERSONAL INJURY AND/OR DAMAGE THE EQUIPMENT PRIOR TO REMOVING DIAPHRAGM CASE:

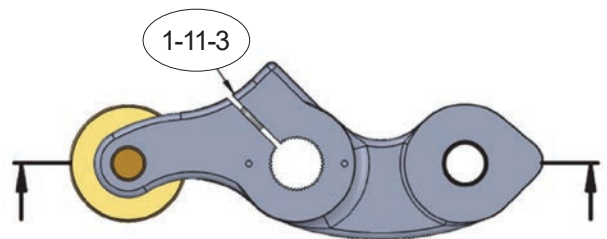
- 1) REMOVE AIR PIPING TO DIAPHRAGM CASE.
- 2) WHERE APPLICABLE SET HANDWHEEL TO FREE POSITION.
- 3) WHERE APPLICABLE BACK OFF SPRING ADJUSTOR UNTIL ALL SPRING TENSION IS RELIEVED.
- 4) SEPARATE PLUG STEM OR SHAFT FROM ACTUATOR.
- 5) REFER TO ACTUATOR INSTRUCTIONS, ACTUATOR REMOVAL SECTION.

**90 P.S.I.G. MAX.
SUPPLY PRESSURE**

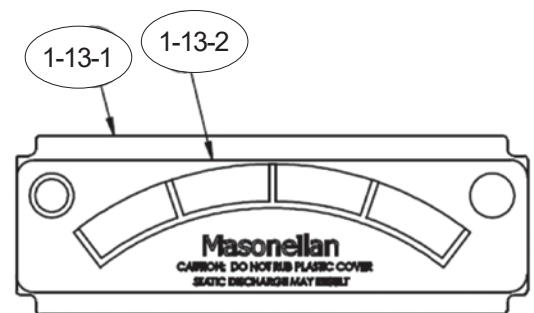


Housing/Linkage Subassembly Parts

Ref	Part Name
1-1	Housing
1-2	Ball bearing
1-3	Indicator pointer
1-4	Screw
1-5	Hex nut
1-6	Travel stop
1-7	Hex head bolt
1-8	Clevis pin
1-9	Anderton Circlip
1-10	Housing cover
1-11	Lever subassembly
1-12	Grommet
1-13	Front cover subassembly
1-14	Handwheel subassembly
1-15	Shaft
1-16	Lock washer
1-17	Lock washer
1-18	Screw
1-19	Indicator dot



Typical Lever subassembly (1-11)



Typical Front cover subassembly (1-13)

Figure 3: Housing/Linkage Subassembly

If it is necessary to disassemble the valve for cleaning, maintenance or replacement of a damaged part, proceed as follows:

3.1 Yoke and Housing Installation on Valve

- Mount the Yoke Adapter (6) onto the valve body. Models 35002 Camflex, 36005 V-Max, and 37002 Minitorik use the same cast adapter design. The adapter may be mounted in several different orientations depending upon valve type. Model 39003/39004 High Performance Butterfly valves use the optional universal type adapter and coupling arrangement.

Note: Parts 1-1 through 1-19 are shown in Figure 3: Housing/Linkage Subassembly

- Insert Grommet (1-12) into Housing (1-1).
- Mount the Housing (1-1) onto the Yoke Adapter (6) using four (4) hex head bolts (2) and lock washers (18).
- Install Indicator Pointer (1-3) onto the Lever S/A (1-11) using pan head screws (1-4).

Tip: Set the Indicator perpendicular to the lever arm for initial setting.

- Install Lever S/A (1-11) onto valve shaft, noting desired air action specified. Do not tighten lever clamp bolt (1-11-3) at this time.
- Install Bearing (1-2) into Housing Cover (1-10). The bearing is a sliding / light driving fit, no special tools should be required.
- Install Label (1-13-2) onto Front Cover (1-13-1).
- Install completed Front Cover S/A (1-13) onto Housing Cover (1-10).
- Install Travel Stops (1-6, 1-5) and/or Handwheel S/A (1-14). See Section 5 for Handwheel S/A instructions.

3.2 Spring Pack Assembly

Note: Parts 5-1 through 5-7 are shown in Figure 4: Spring Pack Subassembly

- Thread Jam Nut (5-6) onto Rod (5-4), then thread Rod fully into Piston (5-3).
- Tighten Jam Nut against Piston, securing with Loctite 262 or equivalent compound.
- Place Lower Spring Guide (5-7) into Lower Diaphragm Case (5-5) followed by Springs (5-1 and/or 5-2), next place Piston - Rod S/A (5-3, 5-4, 5-6) on Springs.

Note: In order to obtain the proper initial spring pre-load, a 0.40 inch assembly spacer must be placed on top of the Piston during assembly.

- Place Upper Diaphragm Case S/A (10) on top of the assembly spacer.
- Compress springs with either a hydraulic press or a minimum of 3 ½-13 UNC Bolts and Nuts approximately 4.5 inches long. Compress until the diaphragm case flanges meet.
- Place Washer (5-5) and thread Jam Nut (5-6) on to Rod (5-4) to retain spring pack assembly. Nut should be secured with Loctite 242 or equivalent. The nut should be hand tightened only.
- Remove tension bolts or hydraulic load, remove spring pack assembly and set aside. Use caution when handling the spring pack assembly.

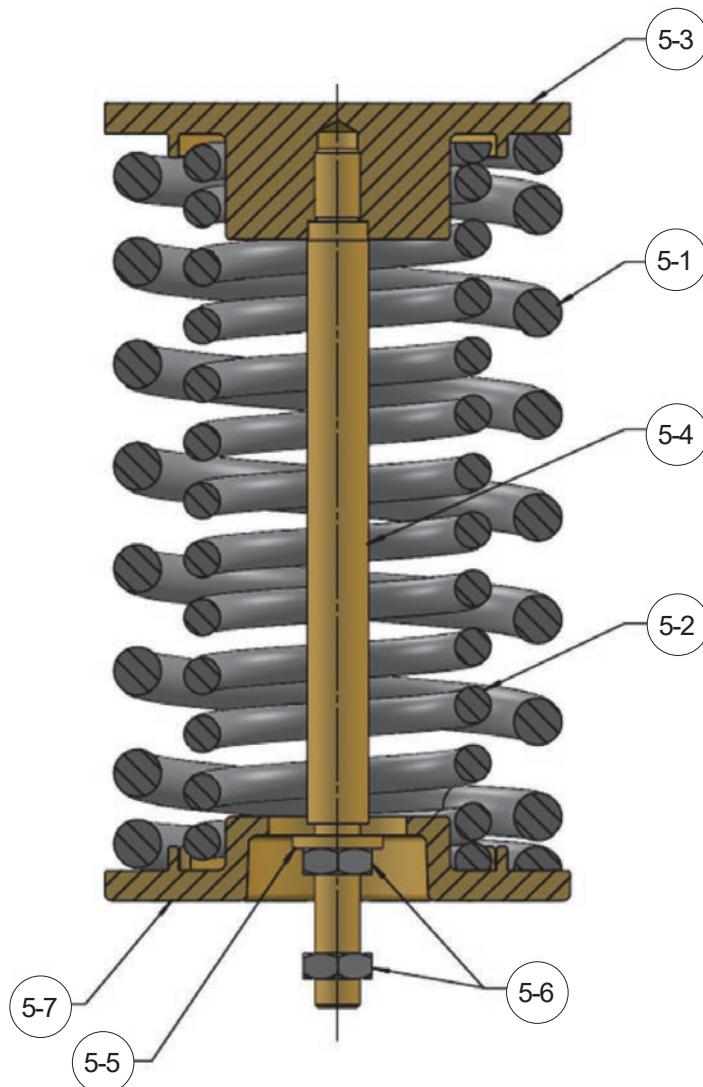


Figure 4: Spring Pack Subassembly

Spring Pack Subassembly Parts	
Ref	Part Name
5-1	Outer Spring
5-2	Inner Spring
5-3	Piston
5-4	Diaphragm power head rod
5-5	Piston rod washer
5-6	Hex nut
5-7	Lower spring guide

3.3 Diaphragm Power Head Assembly

- Install Lower Diaphragm Case (7) onto Housing / Linkage S/A (1) using five (5) hex head bolts (3) and lock washers (18).
- Thread Clevis (12) onto Rod (5-4) such that the holes in the clevis and lever are aligned for air-to-close actuators. For air-to-open actuators, allow approximately ~.25 inch travel for seating and tighten Jam Nut (5-6) against clevis.
- Install Spring Pack S/A (5) into Lower Diaphragm Case (7). Note orientation of Lower Spring Guide (5-7) relief holes. Use caution when handling spring pack assembly.
- Clean Diaphragm Retainer (9) with Isopropyl Alcohol or similar solvent to remove all dirt and grease from external surfaces.
- To hold the Diaphragm (8) in place on the Diaphragm Retainer (9), a double-sided adhesive disc or rubber cement is used. If rubber cement is used, it should be applied to both the diaphragm retainer and the diaphragm or in accordance with the manufacturer's directions for adhesive used. Recommended adhesives are: 3M High Tack adhesive transfer tape (or equal); 3M Pressure sensitive tape, double coated (or equal); Eastman 910 Cement (or equal); Goodyear Plibond Cement (or equal).
- Center and adhere the diaphragm to the top of the diaphragm retainer.
- Place the Diaphragm / Diaphragm Retainer assembly onto the Spring Pack S/A.
- Install the Upper Case S/A (10) and fasten with 12 hex bolts (4), lock washers (17), and hex nuts (11). Torque nuts to 30 lb-ft., evenly in a criss-cross pattern.
- See Sections 3.5 & 3.6 for final assembly and adjustments.

3.4 Handwheel Assembly

Note: Parts 1-14-1 through 1-14-12 are shown in Figure 5: Handwheel Subassembly

- Attach Plate (1-14-5) to Handwheel (1-14-1) with Screws (1-14-4). Note correct handwheel direction.
- Place Square Key (1-14-7) on Screw-Jack Shaft (1-14-2) and install Handwheel (1-14-1). Tighten Set-Screw (1-14-8) to hold handwheel on Shaft.
- Attach Adapter Plate (1-14-9) to Yoke (21) with (4) Socket Cap Screws (1-14-10).
- Mount Screw Jack Unit (1-14-2) to Adapter Plate (1-14-9) with (4) Hex Cap Screws (1-14-12) and Lock Washers (1-14-11).
- Thread End Button (1-14-3) onto Screw Jack Shaft (1-14-2).
- Drill through end button and jack screw shaft and insert Taper Pin (1-14-6).

Handwheel Subassembly Parts	
Ref	Part Name
1-14-1	Handwheel
1-14-2	Screw Jack
1-14-3	Handwheel end button
1-14-4	Screw
1-14-5	Handwheel Plate
1-14-6	Taper pin
1-14-7	Square key
1-14-8	Set screw
1-14-9	Adapter Plate
1-14-10	Cap screw
1-14-11	Lock Washer
1-14-12	Hex cap screw

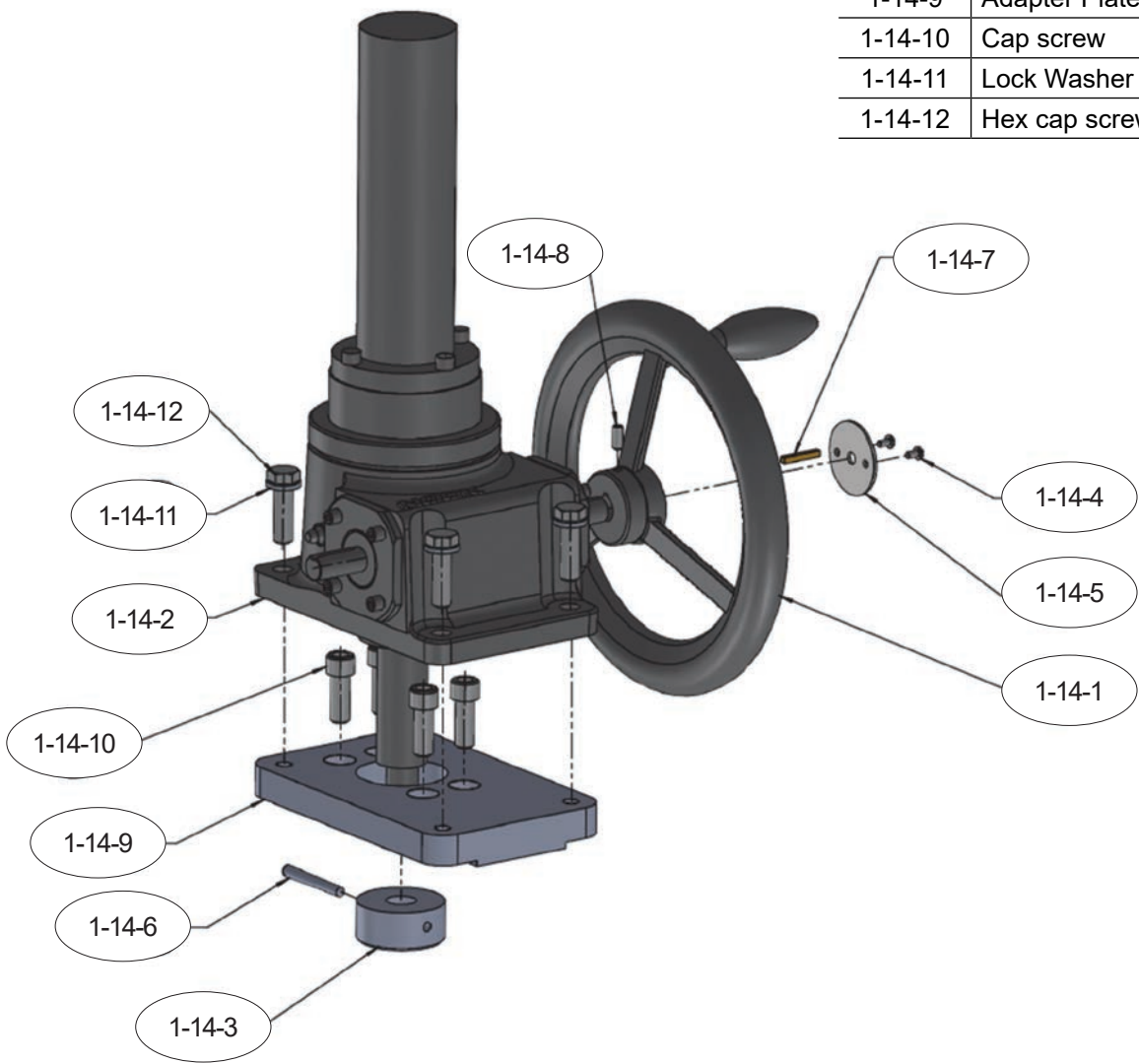


Figure 5: Handwheel Subassembly

3.5 Assembly Adjustments

3.5.1 Lever Arm Adjustments

- Reference the specific procedures in the particular valve manual for setting the basic lever location.
- On Model 31/32 actuators, prior to tightening the lever arm clamp bolt, ensure that the actuator stem is centered in the lower spring guide slot. Tighten clamp bolt.
- On Model 36 actuators, the actuator stem will self-align the lever arm on the shaft.

3.5.2 Travel Stop Adjustments

The travel stops are used to set the travel limits of the valve and/or actuator. Refer to the valve instructions for specific details on setting travel stops.

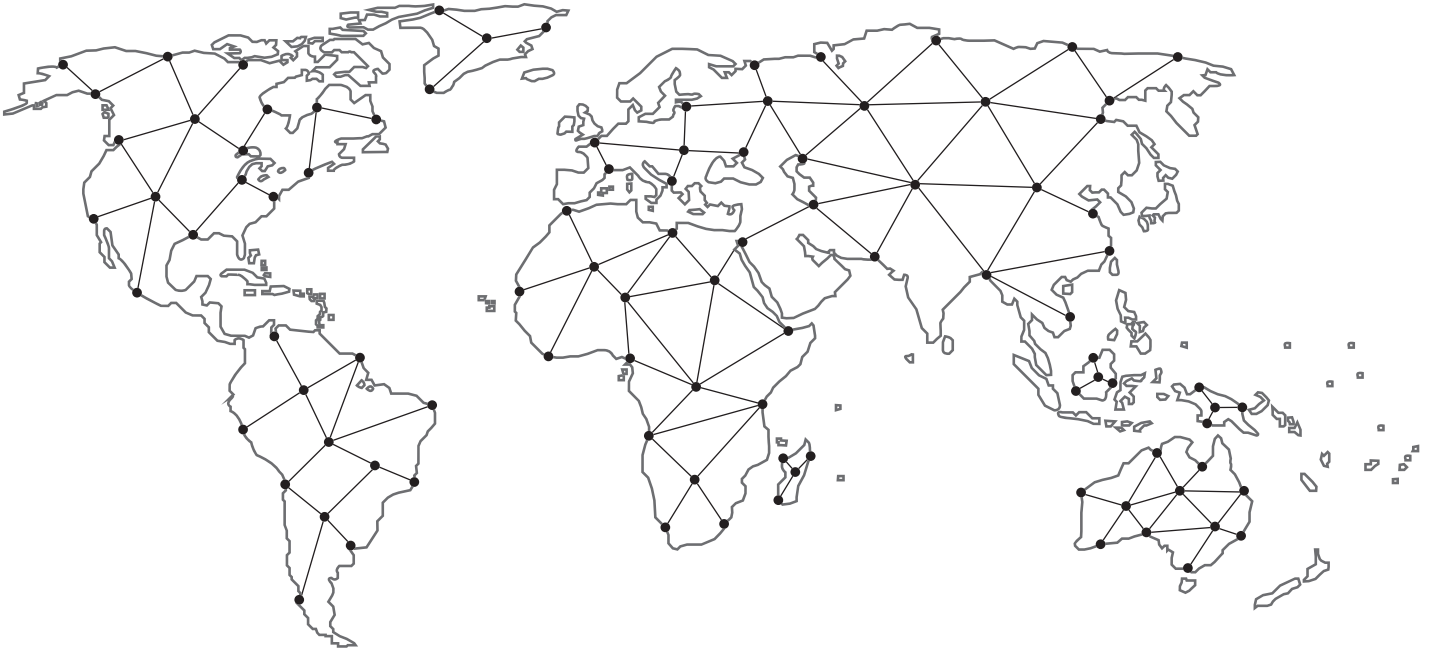
Note: Model 31/32 only, the travel stops should be adjusted so that the Jam Nut (5-6) and Washer (5-5) do not contact the Lower Spring Guide (5-7) at the extents of travel. Re-adjustment of the lever arm will be required if this occurs or the desired travel cannot be obtained in the valve.

3.6 Final Assembly and Inspection

- Attach Cover (1) to Yoke / Housing (21) with Lock Washers (1-17) and Hex Bolts (1-7).
- Stroke Actuator 3 times to verify smooth operation.
- Verify desired fail safe / air action.
- Check / adjust visual indicator.
- Check manual operation of handwheel.
- Check pneumatic connections and accessories as specified on work order.
- Verify that all warning labels are attached to the actuator.
- Ensure that the Maintenance Instructions accompany the actuator for shipment.

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