CVS CONTROLS

INSTRUCTION MANUAL

CVS Controls Series 1061 Rotary Pneumatic Piston Actuator

The CVS Series 1061 Piston Actuator is a pneumatic actuator used for on/off service or throttling applications to control rotary valves such as the CVS V-Ball Series, butterfly valves or eccentric disc valves.

The CVS 1061 may be used for push down to close or push down to open service.

The flexibility of several mounting options of the CVS Series 1061, along with the compact design makes this actuator suitable in many applications.

CVS Series 1061 Actuator

SPECIFICATIONS

Actuator Size:
68, 80

Pressure Connections:
1/4" NPT internal, and for pipe vent(optional)
3/4" NPT internal connection

Recommended Cylinder Operating Pressure:
Minimum – 20 psig without positioner, with positioner recommended cylinder operating pressure is 5 psi above the actuator requirement

Maximum Allowable Pressure:
Size 68 – 85 psig
Size 80 – 150 psig

Maximum Break Torque:
Size 68 – Up to 13600 lbf•in
Size 80 – Up to 45000 lbf•in

Valve Shaft Rotation:
90 degrees without travel stop, or 60 degrees with travel stop (optional).

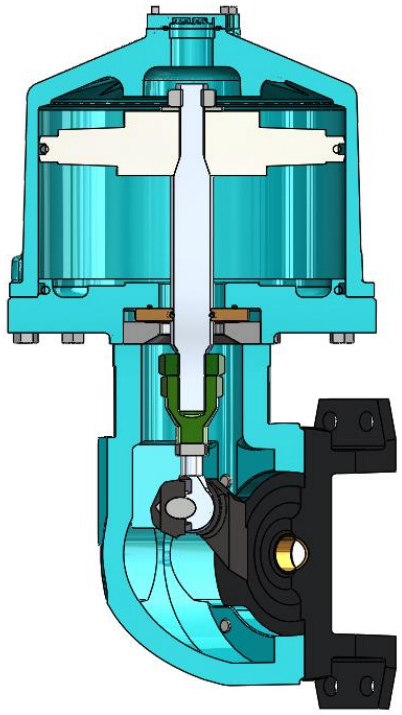
Valve Shaft Diameters: (in)
Size 68 – 3/4, 7/8, 1, 1-1/4, 1-1/2, 1-3/4, and 2
Size 80 - 1-3/4, 2-1/2 and 2

Materials:
Cylinder and Cylinder Flange – Aluminum
Housing Cover – Cast Iron
Piston – Aluminum (standard)
Piston Rod – Stainless Steel, Chrome Plated
Lever – Ductile Iron
O-Rings – Nitrile
Sliding Seal – Aluminum
Housing and Mounting Yoke – Cast Iron
Mounting Yoke Bushing - PTFE and Steel

Standard Material Temperature Capabilities:
-30°F to 180°F (-34°C to 82°C)

Approximate Shipping Weight:
Size 68 – 123 lbs (56kg)
Size 80 – 246 lbs (122kg)

Travel Indicator:
Standard graduated scale and pointer

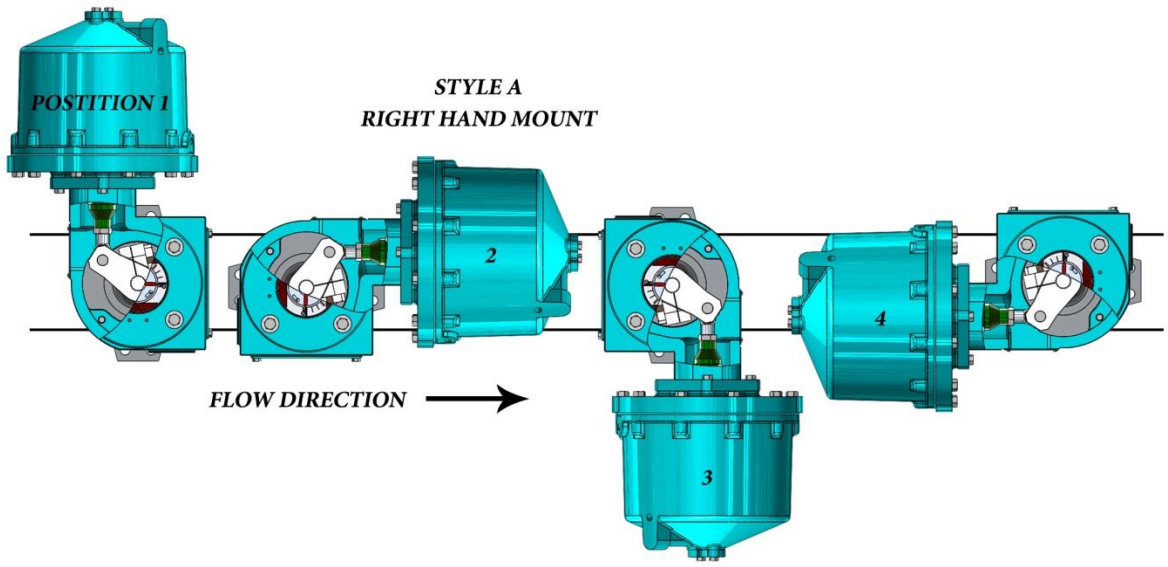


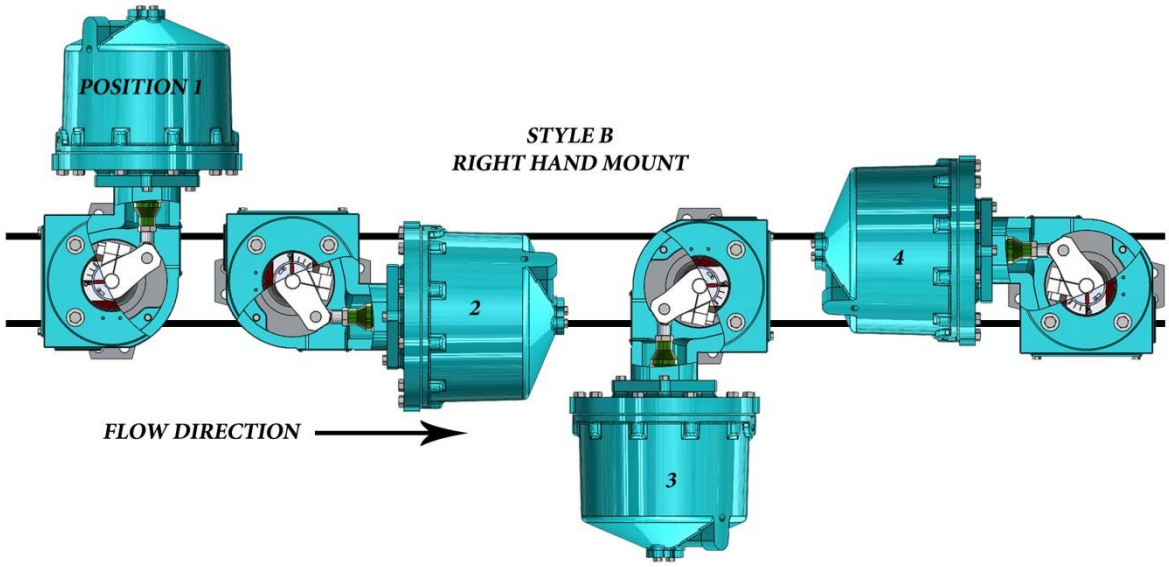
CVS Series 1061-68 Sectional View

90 Degree Rotation Piston Air Displacement

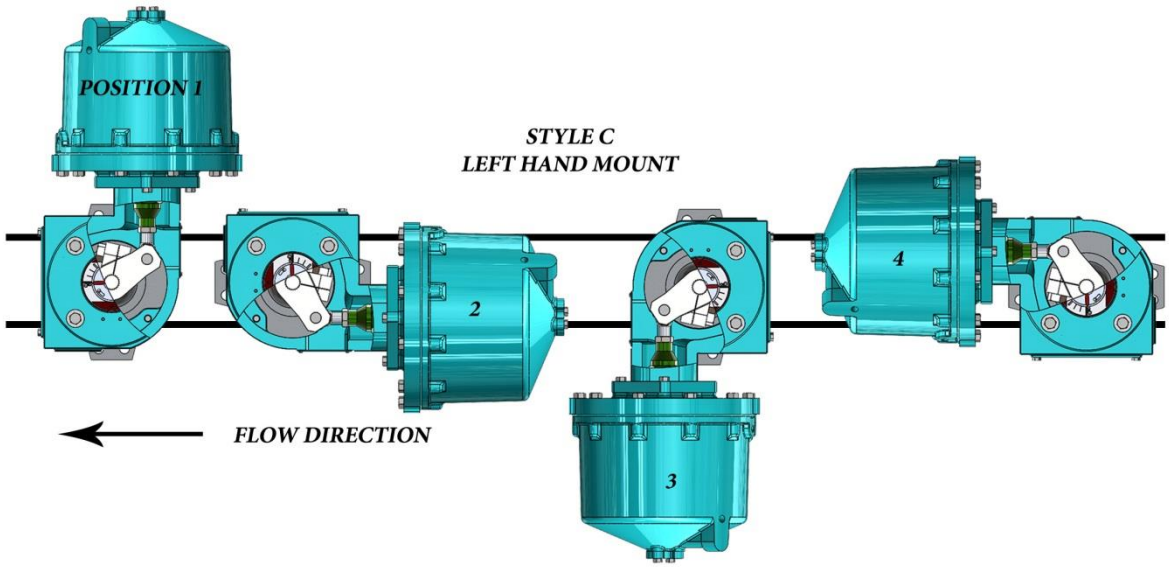
Size	Piston Up		Piston Down	
	Inch^3	cm^3	Inch^3	cm^3
68	434	7110	440	7210
80	788	12900	794	13000

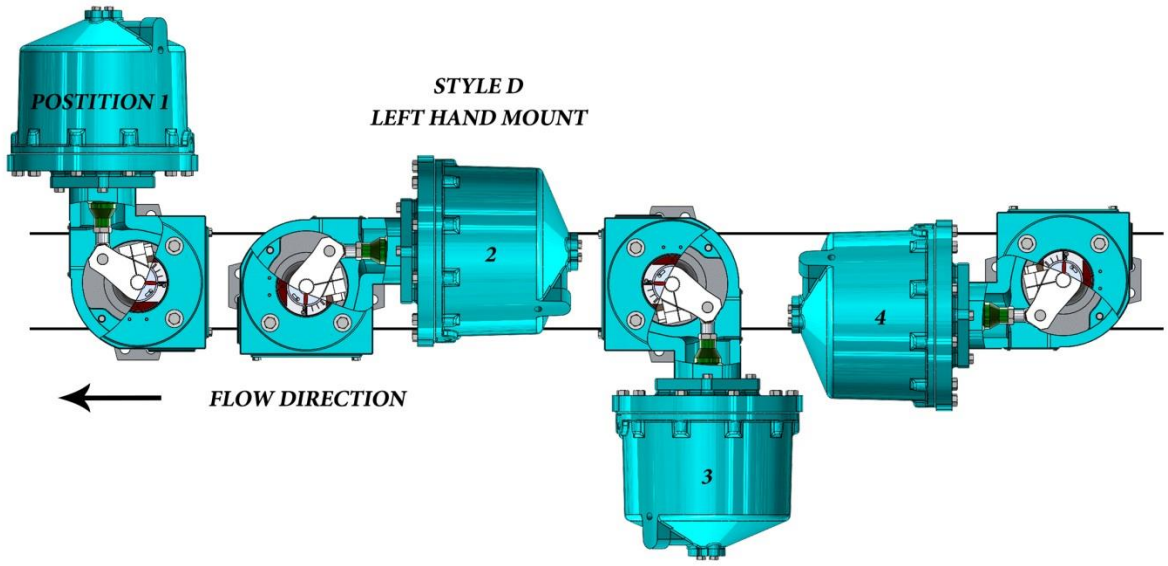
MOUNTING STYLE AND POSITIONS – Right Hand Mount





MOUNTING STYLE AND POSITIONS – Left Hand Mount





INSTALLATION

The CVS Series 1061 Actuator standard mounting position is left or right hand mount and vertical in a horizontal pipeline installation. Refer to the previous page for all options within to mount the actuator. Left or Right hand mount is determined by the direction of flow in the pipeline in relation to the side the equipment is mounted.

Typically, a CVS 1061 Actuator will be shipped as part of a control package with a control valve. Should the actuator be shipped separately or required field installation onto an existing valve, refer to the following instructions.

Mounting the Actuator: Refer to Assembly drawings for key numbers and part identification

NOTE: Always follow proper safety practices while performing all maintenance and installation. Wear protective safety equipment to avoid personal injury.

Ensure proper lockout procedures are followed. Relieve all process pressure from both sides of the application. If necessary, use a bypass valve. Disconnect operating lines to make sure the valve will not open or close. Relieve vent pressure on the actuator.

1. On the **Travel Indicator side** of the CVS 1061 Actuator, remove the Hex Bolts (38), and Washers (39).
2. Disconnect the Lever (13) from the Rod End Bearing (9) if it is attached, by removing the 3/4" Hex Nut and Bolt (28, 29).

***Refer to page 3 and 4 for actuator styles, lever positions and mounting orientation. Internal damage may occur if installed incorrectly by forcing the valve past the open or closed positions.**

3. On the **Valve Side of the actuator,** attach the mounting yoke (23) to the actuator and fasten the bolts. Position the actuator onto the valve shaft and secure the mounting yoke to the valve body with valve mounting fasteners. See suggested torque specifications below.

Recommended Torque values for Valve Mounting Fasteners

Valve Shaft Diameter		Valve Mounting Fasteners	
Inch	mm	lbf-ft	Nm
1/2 to 1	12.7 to 25.4	65	88
1-1/4 to 1-1/2	31.8 to 38.1	100	135
1-3/4 to 2	44.5 to 50.8	135	183
2-1/2	63.5	290	393
3 to 3-1/2	76.2 to 88.9	550	745

INSTALLATION

Connections:

4. On the **Travel Indicator side** fasten the Left Hand Threaded Hex Nut (8) onto the Piston Rod (5), as far as possible on the Piston Rod.
5. Screw the Turnbuckle (70) all the way onto the Piston Rod (5). Adjustments may be required in a later step, so hand-tightened is enough at this point.
6. Attach the Hex Nut (10) onto the rod end bearing, and thread the assembly into the Turnbuckle (70)

Apply a small amount of lithium grease lubricant to the spline of the valve shaft to ease the installation of the lever.

7. Slide the Actuator Lever (13) into place. Refer to the corresponding valve instruction manual for your application for the correct lever/shaft orientation markings. Maintain 1-3/8" (34.9mm) lever operating clearance for proper operation.
8. While holding the lever in the correct position required, secure with the Hex Bolt (31)
9. Attach the Lever to the Rod End Bearing using the Hex Nut and Bolt (28, 29). Turnbuckle adjustments may be necessary to align the two items properly.

*Apply high strength thread sealant to the Hex Bolt threads (28) prior to securing. Torque to recommended torque value as listed below.

10. Note valve disc or ball position (open or closed) and direction of rotation.

11. Correctly position the Travel Indicator (18) as noted, and install the Cover (14) using the washers (39) and Hex Bolts (38) that were removed in step 1.

Fastener Torque Specifications

Item Number	Description	Actuator Size -1061-68	
		lbf ft	Nm
41	Hex Bolt - Cylinder to Flange	75	102
35	Hex Bolt – Cylinder Cap	10	14
12	Hex Nut –Piston Rod, top	257	348
10	Hex Nut – Rod Bearing Lock nut	75	102
28	Hex Screw – Lever Attachment	200	271
41	Hex Bolt	50	68
31	Hex Bolt – Lever Position Bolt	200	271
38	Hex Bolt – Travel Indicator Side Cover	60	81
37	Hex Bolt	10	14
8	Left Hand Thread Hex Nut	260	353

CVS Series 1061 Actuator Mounting and Positions

As referenced on pages 3 and 4, the CVS Series 1061 is easily adaptable to many different styles and positons for the required application.

A common installation is with the actuator positioned vertically in a horizontal pipeline.

Style A and B are Right Hand Mount, while Style C and D are Left Hand Mount. This is determined by looking at the horizontal pipeline in the same direction as the flow.

When changing the actuator mounting position consult the appropriate valve instruction manual for the correct lever and shaft orientation. Damage may occur if installed incorrectly as the actuator may drive the valve past the fully open or fully closed positions.

The CVS Series 1061-68 Actuator housing is simply rotated 180 degrees to convert it from a Style A and D to a Style B and C Mount or vice versa. This is done by alternating the Actuator Cover (14) and the Mounting Yoke (23). When changing mounts, the Lever (13) must be removed and replaced.

Within a left or right hand mount, there are 4 different actuator positions. Refer to pages 3 and 4 for the different mounting positions.

Pressure Connection

1. Connections may be made with either 1/4" NPS piping or 3/8” tubing between the instrument and the actuator pressure connection.
2. Once the pressure connections are complete, and the valve and actuator installation are final, verify correct fail open or fail close action for the application. Ensure the valve shaft and actuator stem move freely when responding to the instrument pressure loading change on the actuator piston.

ADJUSTMENTS

The CVS Series 1061 should only require adjustments to ensure the valve is fully closed when the actuator piston is at the travel stop. Remove the assembly from the installation for accurate zero degree adjustments.

To make the turnbuckle adjustments if required, a regulated air supply is needed to stroke the actuator.

Always maintain all proper safety procedures prior to removing from pipeline to maintain or make adjustments.

1. Remove the Access Plate (44).

   *Do not remove the Cover (14), as it supports the end of the valve shaft, and does not require removal for adjustments.

2. Cycle the actuator so that the Lower Hex Nut (10) on the turnbuckle can be reached through the access plate opening. Loosen the Lower Hex Nut.
3. Cycle the actuator again until the Upper **Left Handed Thread** Hex Nut (8) may be reached through the access plate opening. Loosen Upper Left Handed Thread Hex Nut.
4. For **PUSH DOWN TO CLOSE** Operations:
   Cycle the actuator to the lower travel stop. Verify the closed position of the valve being used in the appropriate valve manual. Make adjustments to the Turnbuckle (7) until the valve is in the fully closed position. Lock the position by tightening the Upper Left Handed Thread Hex Nut (8). Bring the actuator to the upper travel stop, and tighten the Lower Hex Nut (10) on the turnbuckle. Refer to Fastener Torque Specification values listed on page 6.
5. For **PUSH DOWN TO OPEN** Operations:
   Slowly cycle the actuator to the upper travel stop. Verify the closed position of the valve being used in the appropriate valve manual. Cycle the actuator so you may reach the Turnbuckle through the access plate opening. Adjust the Turnbuckle Linkage. Cycle the actuator again to the upper travel stop, and verify the new adjustments made. Repeat the procedure until the valve is in the fully closed position while in the upper travel stop position. Tighten the upper and lower Turnbuckle Hex Nuts to lock the position using the torque values listed on page 6 - Fastener Torque Specification.
6. Reinstall the Access Plate (44). Adjust the Travel Indicator (18) as needed to reflect the prior adjustments and indicate the actuators position.

MAINTENANCE

Certain operating conditions may increase the need for inspections and maintenance. Included in this section are instructions for disassembly and repair if required.

NOTE* - Follow proper safety and lockout procedures at all times when servicing, maintaining, or repairing the CVS 1061 Actuator.

Ensure all pressure from the valve has been removed prior to maintenance.
When required, use a bypass valve to isolate the valve and actuator assembly from the process.
Relieve actuator loading pressure by venting the acuator.
In order to make sure the actuator does not suddenly open or close the valve assembly, disconnect operating lines providing the control signal to the actuator.

Disassembly – CVS Series 1061

Refer to assembly drawings for part identification and key numbers referenced below.

1. Remove positioner, if used in the application.
2. Remove Hex Bolts (38), and Washer (39) in order to remove the Cover (14).
3. Remove the Retaining Ring (32), and if required, the Travel Indicator (18) may be removed by first taking off the cap screw from the Hub (15).
4. Inspect the Cover Seal (46) and replace if necessary.
5. The Travel Indicator (18) may be removed by taking off the 4 Self Tapping Screws (46). Press the Bushing (16) out of the Cover (14).
6. Remove the Hex Screw (28) and Hex Nut (29) from the Rod End Bearing (9).
7. Reference the shaft and lever orientation. Loosen the Hex Bolt (31) on the Lever (13).

The actuator is now ready for removal from the valve assembly. **Never use a hammer or similar to detach the Lever (13) from the Valve Shaft. This may cause damage to the shaft as well as internal components.**

8. Remove the Cylinder Cap (21) by first removing the Cap Screws (35). Inspect Cylinder Cap O Ring (43) and replace if required.
9. Remove the Rod End Bearing (9), and Hex Nut (10)
10. Remove the Turnbuckle (7), and Left Handed Hex Nut (8)
11. Remove the Hex Bolts (41), and lift off the Cylinder (1) from the Cylinder Flange (2)
12. Lift out the Piston (11) and Piston Rod (5)
13. Inspect Piston O-ring (27), as well as Cylinder O-ring (26). Replace as required if any wear or damage is present.
14. The Piston (11) and Piston Rod (5) can be separated if needed by first removing the Hex Nut (12), and Washer (33)

Disassembly – CVS Series 1061, continued

15. Remove Hex Bolts (36) to remove the Cylinder Flange (2), Sliding Seal (4), and Seal Support Cylinder (6)
16. Inspect the O-rings (24) and (25), replace as required if any wear or damage is present
17. If required separate the Mounting Yoke from the Actuator Housing Assembly by removing the Hex Bolts.
18. Remove the mounting Yoke (23) from the valve by first removing the Hex Bolts Attaching the Mounting Yoke to The Valve Assembly.
19. Inspect the Mounting Yoke Bushing (30) for visible wear or damage and replace as required.

Please contact a CVS Controls Representative for information and replacement parts as required.

Assembly – CVS Series 1061

If the CVS Series 1061 was completely disassembled, you may proceed from step 1 below to re-assemble and install the actuator. If only partially disassembled, start from the appropriate step below.

1. If the Mounting Yoke Bushing (30) required replacement, press in a new bushing. The Bushing should be flush with the bottom recess in the Mounting Yoke. If a new mounting yoke was required, it will come with a bushing pre-assembled for ease of field repair.
2. Place the Mounting Yoke (23) over the valve shaft, and secure using the valve mounting hex bolts.
3. Refer to page 5 of this manual for recommended torque values for the valve mounting hex bolts

Note* - When reassembling the CVS Series 1061 actuator, please refer to page 6 for recommended torque values listed by description and item number.

4. Refer to page 3 and 4 of this manual for mounting style and position. Fasten the housing to the mounting yoke with the Hex Bolts.
5. Use a lithium based lubricant on the surfaces of the Sliding Seal (4). Ensure the O-Rings (24 and 25) have been installed correctly.
6. Install the Seal Support Cylinder (6), Thrust Washer (19), Cylinder Flange (2), and Sliding Seal (4). Use Hex Bolts (41) to secure.
7. Use a lithium based lubricant on the Valve Shaft, determine correct lever and Valve Shaft orientation marks and slide the Lever (13) of the CVS Series 1061 into place.
8. While holding the lever in the correct position, connect the Lever to the Valve Shaft and tighten the Hex Bolt (31).
9. Put lithium based lubricant on the sealing surface of the Piston Rod (5), and use an anti-seize sealant on the tapered end of the Piston Rod.
10. Attach the Piston (11) to the Piston Rod using a medium strength thread locking adhesive, and secure using Hex Nut (12) and Washer (33).
11. Insert the connected Piston and Piston Rod assembly through the Sliding Seal (4). Attach using the Left Handed Hex Nut (8), Turnbuckle (7), Hex Nut (10) and Rod End Bearing (9).
12. Rotate the Lever Assembly so the it aligns correctly with the Rod End Bearing.
13. Install Hex Bolt (28) and Hex Nut (29), use a medium strength thread locking adhesive and secure.
14. Install the Cylinder O-Ring (26) around the piston edge. Use a lithium based lubricant on the inside edge of the Piston Cylinder (1), and install the Cylinder onto the Cylinder Flange (2). Secure using the Hex Bolts (41).
15. Install O-Ring (22) onto the Cylinder Cap (21), and install the Cylinder Cap on top of the Cylinder Assembly using the Hex Bolts (35).
16. Install the Hub (15) and Bushing (16) into the Cover, and secure using the Retaining Ring (32).
17. Install the Travel Indicator Scale (17) and fasten using the self tapping screws.
18. Install Travel Indicator (18) and fasten with self tapping screws.

Assembly – CVS Series 1061 - continued

*Note the valve position and direction of rotation.

19. Position the Travel Indicator in relation to the correct valve position previously noted.

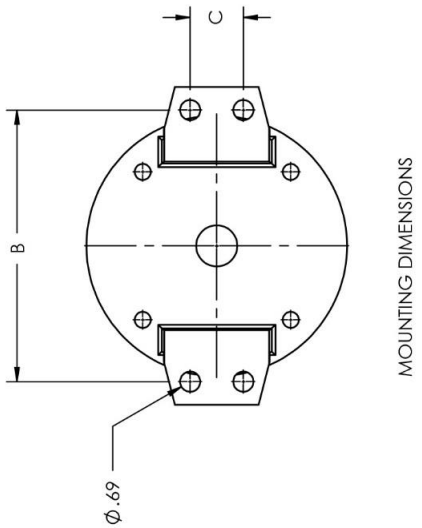
20. Replace the Cover (14) and attach using Washer (39) and Hex Bolt (38).

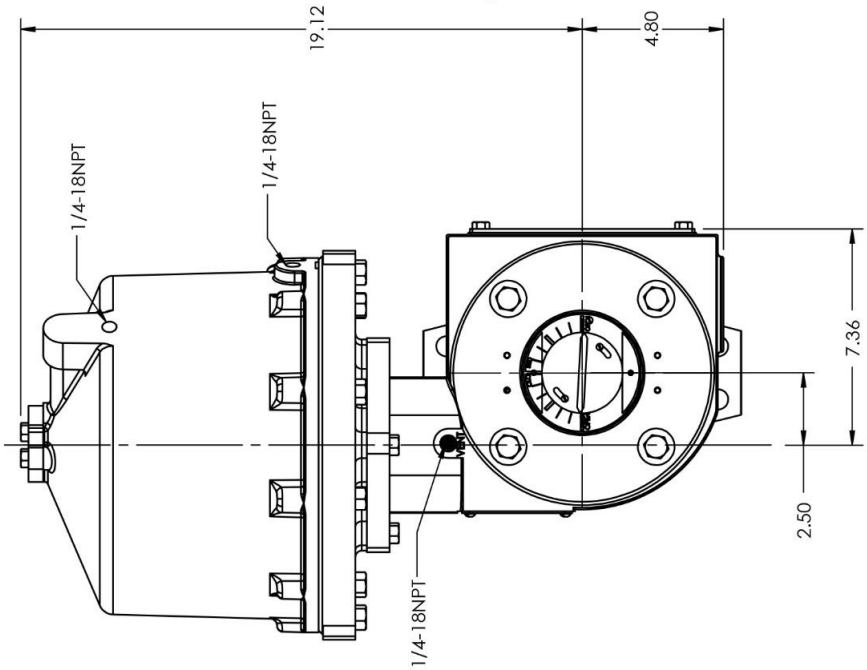
If application uses a Positioner, refer to the correct positioner manual for connections and operation.

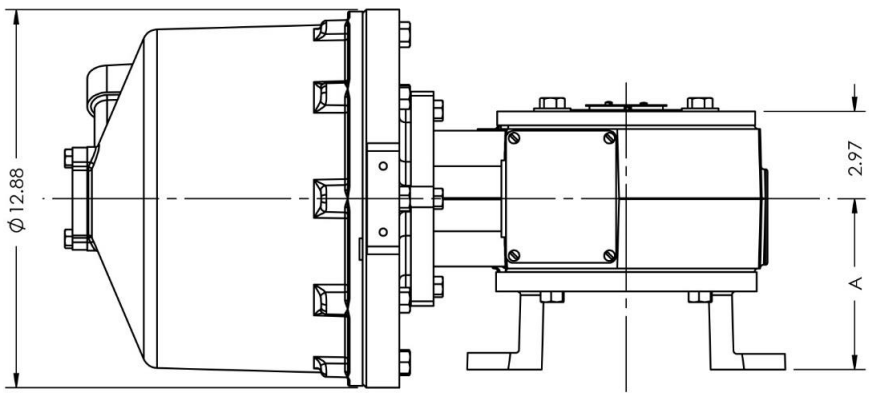
Refer back to page 7 of this manual for final Adjustment Procedures of the turnbuckle assembly for your installation.

CVS Series 1061-68 Dimensional Data (in)

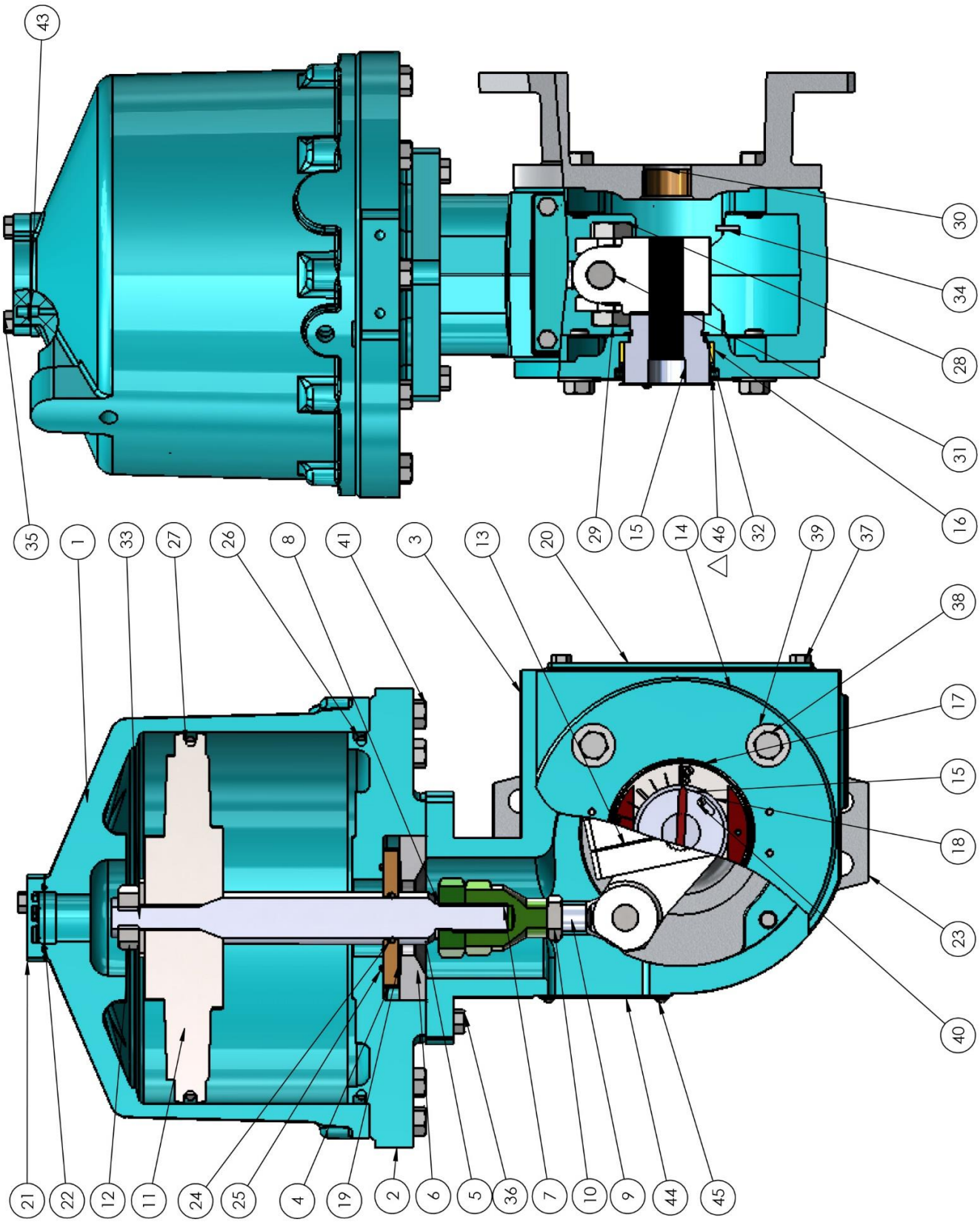
SHAFT DIA.	A	B	C
3/4	6.31	6.00	1.25
7/8	6.31	6.00	1.25
1	6.31	6.00	1.25
1-1/8x1-1/4	5.81	9.25	1.81
1 1/4	5.81	9.25	1.81
1 1/2	5.81	9.25	1.81
1-9/16x 1-3/4	11.25	10.75	2.00
1-3/4	11.25	10.75	2.00
2	11.25	10.75	2.00







CVS Series 1061-68 Assembly



CVS Series 1061-68 Assembly

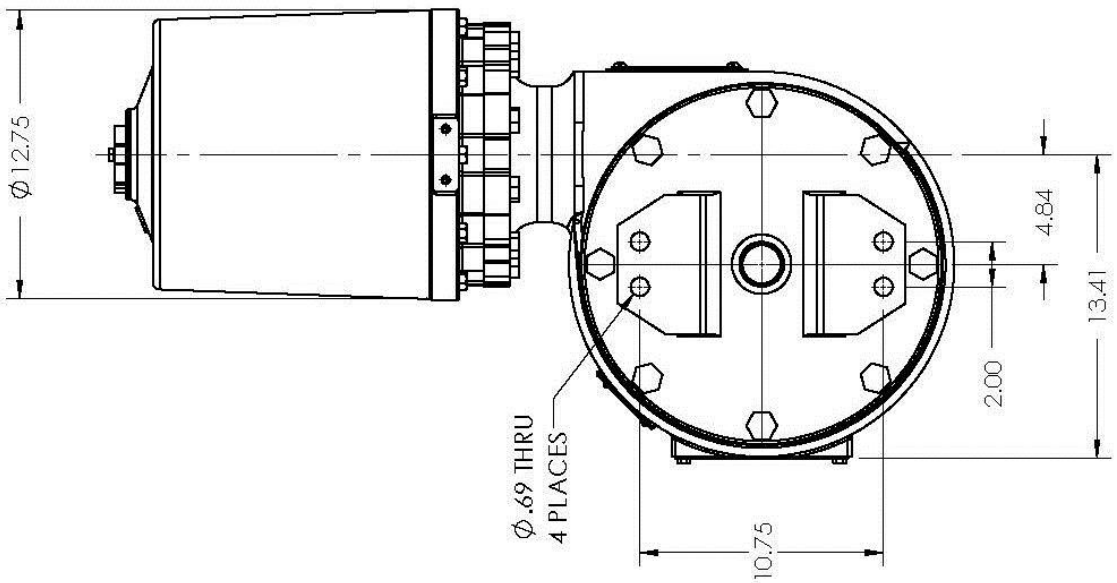
ITEM	DESCRIPTION	PART #	QTY
1	Cylinder	CVS 3K16420000A2	1
2	Cylinder Flange	CVS 44A7862X012	1
3	Housing	CVS 42A9309X062	1
4	Sliding Seal	CVS 24A7869X012	1
5	Piston Rod	CVS 24A7866X012	1
6	Seal Support Cylinder	CVS 14A7870X012	1
7	Turnbuckle	CVS 24A7868X012	1
8	1 ¼"-16 UN LH Thread Hex Nut	CVS 14A7872X012	1
9	3/4-16UNF Rod End Bearing	CVS 1R587699012	1
10	3/4-16UNF Thin Hex Nut	CVS 1A351124122	1
11	Piston	CVS 34A7865X012	1
12	1-1/8-12UNF Hex Nut	CVS 1C511724122	1
13	Lever	See Table	1
14	Cover	CVS 32A9313	1
15	Hub	See Table	1
16	Bushing	See Table	1
17	90 Degree Rotation Indicator	CVS 22A9514X012	1
18	Travel Indicator	CVS 22A9513X012	1
19	Thrust Washer	CVS 14A7871X012	1
20	Plate	CVS 22A9359X012	1
21	Cylinder Cap	CVS 22A9536X012	1
22	O-Ring (225)	CVS 10A3800X012	1
23	Mounting Yoke	See Table	1
24	O-Ring (222)	CVS 1D348306992	1
25	O-Ring (151)	CVS 13A0824X012	1
26	O-Ring (449)	CVS 1H862506992	1
27	O-Ring (449)	CVS 1H862506992	1
28	3/4 Hex Screw	CVS 12A9458X012	1
29	3/4-10UNC Hex Nut	CVS 12A9370X012	1
30	Bushing	CVS 12A9558X012	1
31	3/4-10UNC Hex Bolt	CVS 1A430224052	1
32	Retaining Ring	CVS 12A9455X012	1
33	Washer	CVS 1R908428982	1
34	Cam Plate	CVS 33A1613X012	1
35	3/8-16 Hex Bolt	CVS 1A344924052	2
36	7/16-14UNC Hex Bolt	CVS 1A418624052	4
37	5/16-18UNC Hex Bolt	CVS 1C275224052	4
38	1/2-13UNC Hex Bolt	CVS 1A340924052	8
39	1/2 Tapy B Plain Washer	CVS 1A518925072	4
40	#6-20 Self Tap Screw	CVS 1B561528982	4
41	1/2-18UNC Hex Bolt	CVS 1A453324052	10
42	Vent Screen (not shown)	CVS 0L078343063	1
43	O-Ring (011)	CVS 1C853806992	1
44	Access Plate	CVS 12A9638X012	1
45	Screw #10x24	CVS 1A340828992	4
46	Seal	CVS 12A9452X012	1

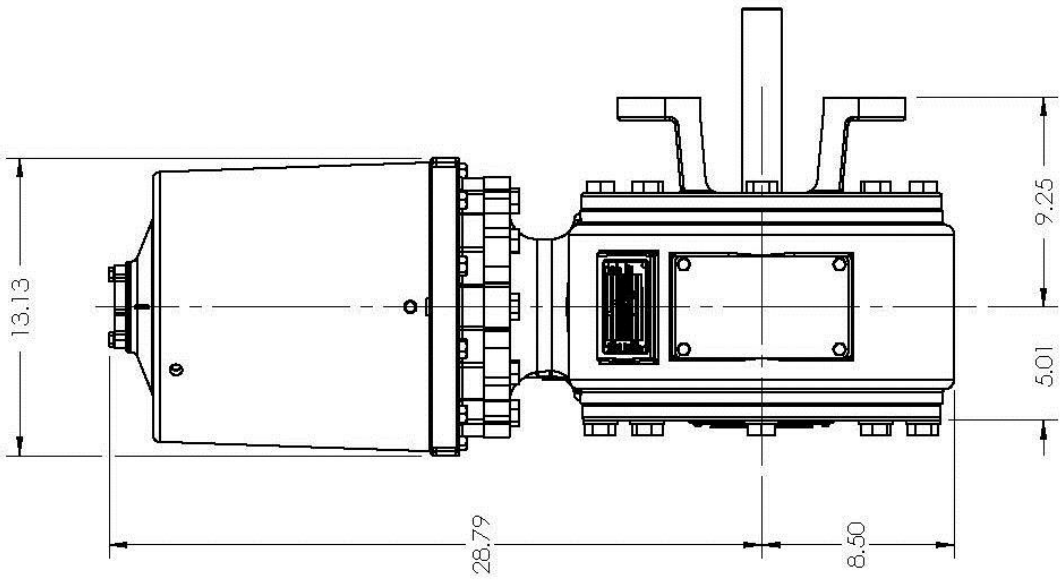
ITEM 13 – LEVER	
Shaft Dia. (in)	Part Number
3/4	CVS 32A9573X012
7/8-1	CVS 32A9574X012
1-1/4	CVS 32A9575X012
1-1/2	CVS 32A9576X012

ITEM 15 - HUB	
Shaft Dia. (in)	Part Number
3/4	CVS 22A9499X012
7/8-1	CVS 22A9420X012
1-1/4	CVS 22A9500X012
1-1/2	CVS 22A9501X012

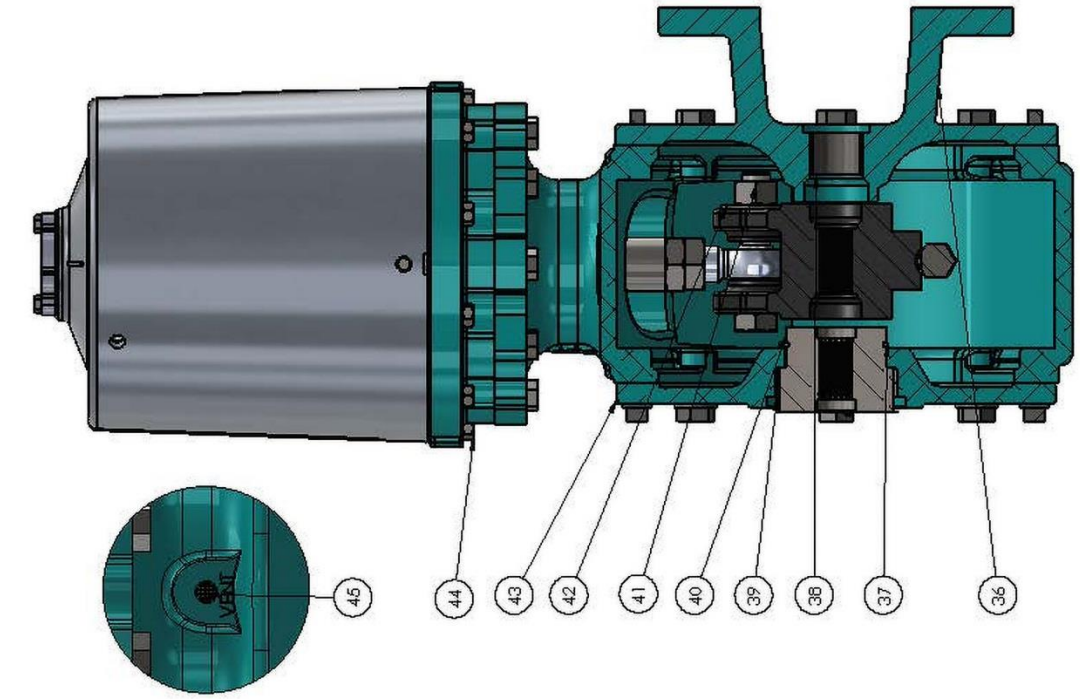
ITEM 23, MOUNTING YOKE, ITEM 30 BUSHING		
Shaft Dia	ITEM 23	ITEM 30
3/4	CVS 12A9799X0D2	CVS 12A9556X012
7/8	CVS 12A9799X0F2	CVS 12A9557X012
1	CVS 12A9799X0H2	CVS 12A9775X012
1-1/4	CVS 12A9799X0J2	CVS 12A9558X012
1-1/2	CVS	CVS

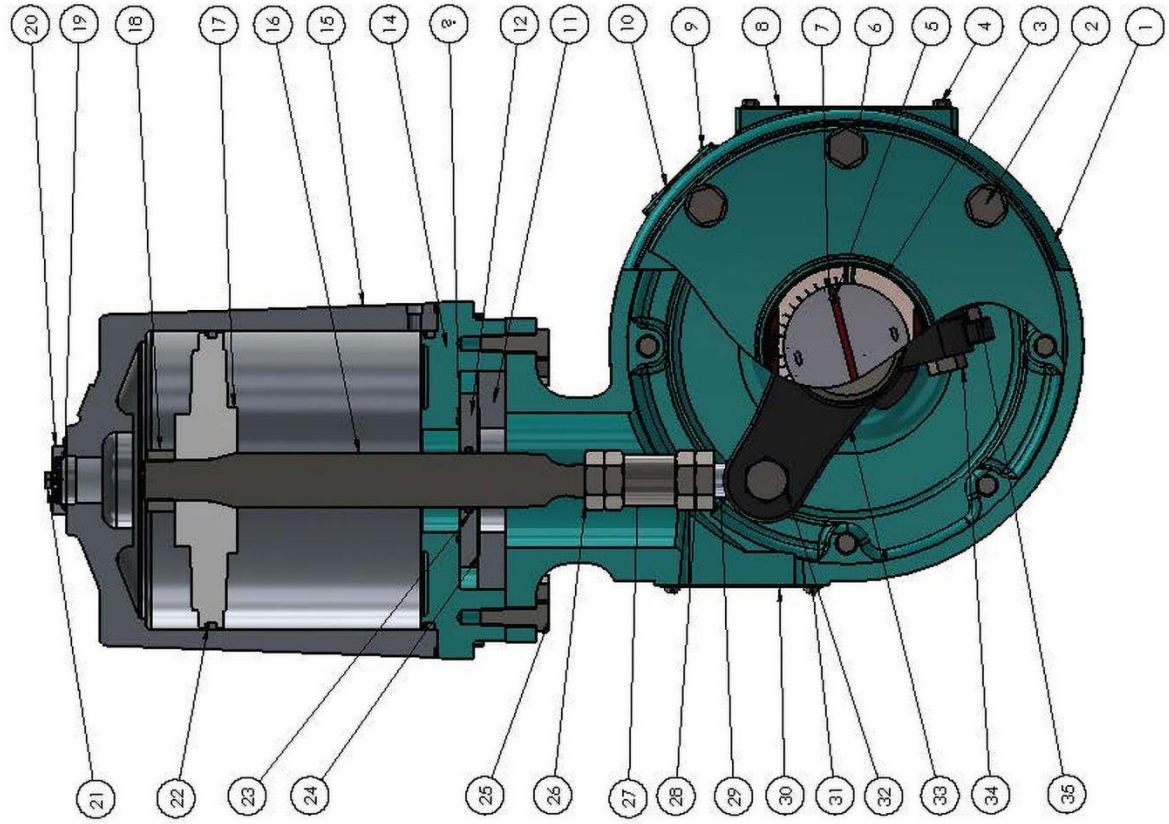
CVS Series 1061-80 Dimensional Data (in)





CVS Series 1061-80 Assembly





CVS Series 1061-80 Assembly

ITEM	DESCRIPTION	PART #	QTY
1	Housing, Size 80	CVS 54A7814X022	1
2	¾-10 UNC Bolt X 10in long	CVS 1A485728992	16
3	Travel Indicator Scale	CVS 28A8497X012	1
4	Hex Cap Screw, 5/16-18 UNC	CVS 1C275224052	4
5	#6x32 SELF TAPPING SCREW	CVS 1B561528982	4
6	WASHER, 3/4"	CVS 1A375728992	8
7	TRAVEL INDICATOR	CVS 28A8498X012	1
8	COVER PLATE	CVS 22A9359X012	1
9	DRIVE SCREW, 302 SST	CVS 1A368228982	4
10	NAME PLATE	CVS 12B6401X0A2	1
11	SEAL SUPPORT, CYLINDER	CVS 14A7810X012	1
12	SLIDING SEAL, SIZE 80/100	CVS 24A7811X012	1
13	O-RING, NITRILE, 2-243	CVS 1P233206992	1
14	CYLINDER FLANGE, SIZE 80	CVS 44A7836X022	1
15	CYLINDER ASSEMBLY	CVS 3R8531000A2	1
16	PISTON ROD, SIZE 80/100	CVS 24A7827X012	1
17	PISTON	CVS 34A7834X012	1
18	PISTON NUT, STEEL	CVS 1H872024102	1
19	O RING 1.86 ID (225)	CVS 10A3800X012	1
20	CYLINDER CAP	CVS 22A9536X012	1
21	CAP SCREW, 3/8-16UNC	CVS 1A344924052	2
22	O-RING, SIZE 449	CVS 1H862506992	2
23	O-RING, NITRILE, 2-329	CVS 1H862706992	1
24	THRUST WASHER	CVS 14A7829X012	1
25	5/8-11UNC, BOLT, 2" LONG	CVS 1A351224052	10
26	CVS 10A6301X022	HEX NUT, 1 1/4-12-LH	1
27	CVS 14A7826X012	TURNBUCKLE, SIZE 80/100	1
28	CVS 14A7825X012	HEX NUT, 1 1/2-12UNF	1
29	CVS 14A7824X012	ROD END BEARING,	1
30	CVS 14A7828X012	ACCES PLATE, SIZE 80/100	1
31	CVS 1J830228992	MACHINE SCREW	4
32	CVS 14A7831X012	HEX HEAD BOLT, 1"-8 UNC	1
33	See Table	LEVER, 1 3/4" & 2" SHAFT	1
34	CVS 1A381024052	3/4-10UNC, BOLT, 2 ½	1
35	CVS 1H734628992	SET SCREW, 1/2-13. 1 1/4	1
36	See Table	YOKE, 2" SHAFT	1
38	See Table	BUSHING	1
39	CVS 14A7815X012	BUSHING, SIZE 80, 100	1
40	See Table	HUB, 1 3/4" & 2" SHAFT	1
41	CVS 14A7842X012	HEX NUT, 1-8UNC	1
42	CVS 1R908328982	WASHER, 1"	1
43	CVS 34A7885X012	COVER, SIZE 80 & 100	1
44	CVS 1A361624052	1/2-13UNC, HEX BOLT	10
45	CVS 0L078343063	VENT SCREEN	1

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