



**SAE STANDARD BOLT
ASSEMBLY NUMBER 60020_IR4
INSTALLATION AND OPERATIONS MANUAL**

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IMPORTANT! READ CAREFULLY

The Pivotal Edge® is simple to operate. However, as with any powered equipment, it must be operated properly to be safe. Before using the Pivotal Edge®, read this Operator's Manual carefully. It contains valuable information that is necessary for safe operation. Observe all safety rules and become completely familiar with the controls.

For warranty service, parts and repairs or to answer any questions you may have contact us at:

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SAFETY AND WARNINGS

Note: Improper operation of powered equipment can cause serious injury or death.

Pictured below are operations and actions that require attention by the Pivotal Edge® operator. Please read and understand the manual to avoid injuries.



Warning – Rotating Equipment Hazard

The operator should be aware that the Pivotal Edge® is designed to rotate when opening and closing. Under no circumstances should a person be near the manhole when it is being opening or closing.



Warning – Pinch Point Present

During the opening and closing of the manhole cover, pinch points exist near the actuator and cover of the Pivotal Edge®. The operator must make sure that no one is near the manhole during operation.



Warning – Compressed Air

All persons working near the Pivotal Edge® should be aware that opening the cover while contents are under pressure will cause a sudden release of pressure. Tank must be depressurized before opening.



Warning – Fall/Trip Hazard

Care should be taken when servicing the Pivotal Edge® that appropriate fall protection in place.



Warning – Read Operator's Manual

Before operating the Pivotal Edge®, read and understand the safety and operating instructions.



Warning – Remote Operation

All persons working near the Pivotal Edge® should be aware that operation is controlled remotely. Under no circumstances should the operator activate the manhole when someone is on top of the trailer.

INSTALLATION / ASSEMBLY OVERVIEW

INSTALLATION OVERVIEW

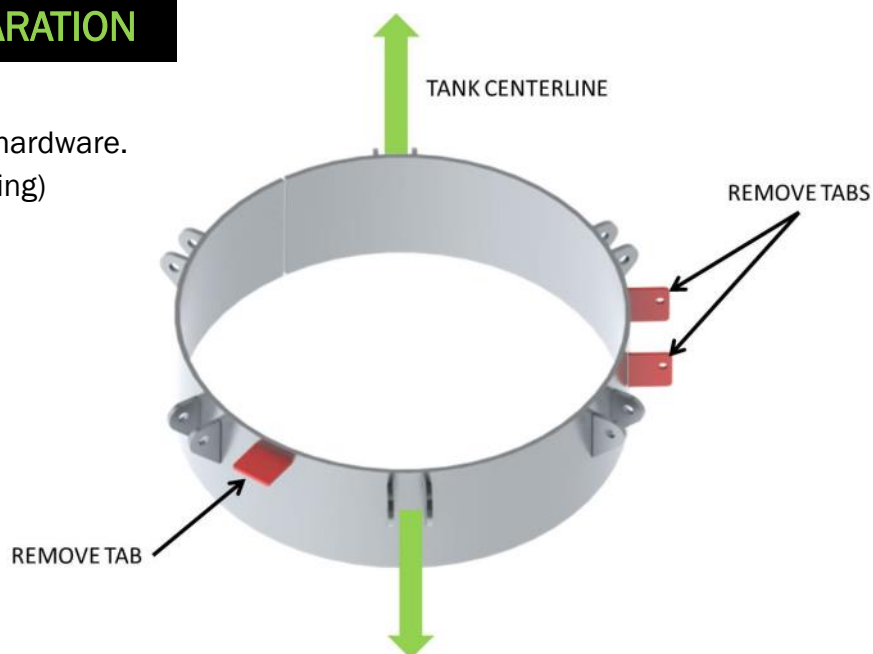
1. MANWAY PREPARATION
2. CROSS PIN MEASUREMENT AND BOLT SELECTION
3. CLEVIS NUT INSTALLATION
4. FLANGE POSITIONING
5. FLANGE BOLT TIGHTENING
6. COVER PLACEMENT AND PIVOT PIN INSTALL
7. ACTUATOR CYLINDER INSTALLATION
8. CONTROL BOX MOUNTING
9. AIRLINE ROUTING
10. SYSTEM TEST



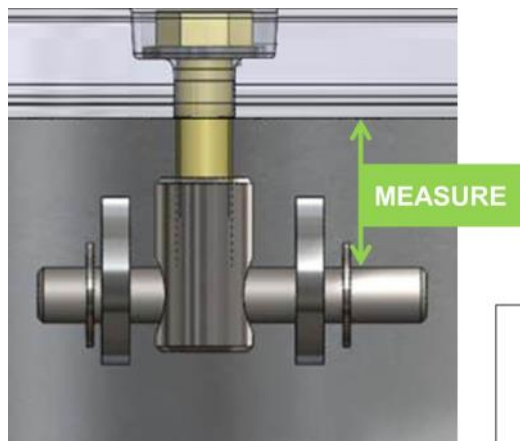
INSTALLATION GUIDE

RETRO FITTING PREPARATION

- Remove existing cover
- Remove existing latch and hardware.
- Clean top mating surface (ring)



Refer to picture below and measure distance from top of pin to top of ring to determine if the 2" bolts supplied will work or if a different length is needed. The bolts are $\frac{1}{2}$ " - 20 fine thread. Make sure the pin is raised up to the top of the tab holes when measuring.



BOLT LENGTH APPLICATION

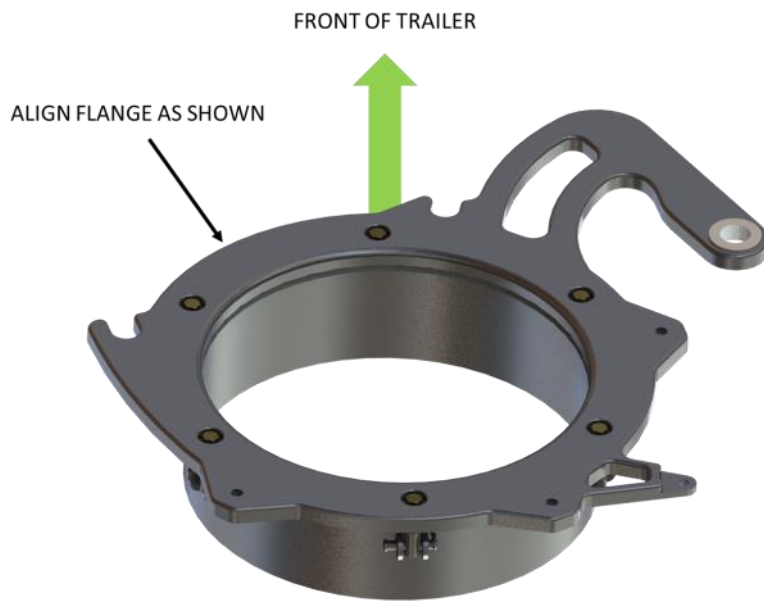
PROPER BOLT LENGTH IS CRITICAL FOR PROPER INSTALLATION!

Step 1. Measure as shown in the image to the left.

If your measurement (in inches) is...	Then use...
>1 1/4 To 1 1/2	1 3/4" bolt and 1 washer
>1 1/2 To 1 3/4	2" bolt and 1 washer (supplied)
>1 3/4 To 2	2 1/4" bolt and 1 washer
>2 To 2 1/4	2 1/2" bolt and 1 washer
>2 1/4 To 2 1/2	2 3/4" bolt and 1 washer
>2 1/2 To 2 3/4	3" bolt and 1 washer
>2 3/4 To 3	3 1/4" bolt and 1 washer
>3 To 3 1/4	3 1/2" bolt and 1 washer
>3 1/4 To 3 1/2	3 3/4" bolt and 1 washer
>3 1/2 To 3 3/4	4" bolt and 1 washer
>3 3/4 To 4	4 1/4" bolt and 1 washer

INSTALLATION GUIDE

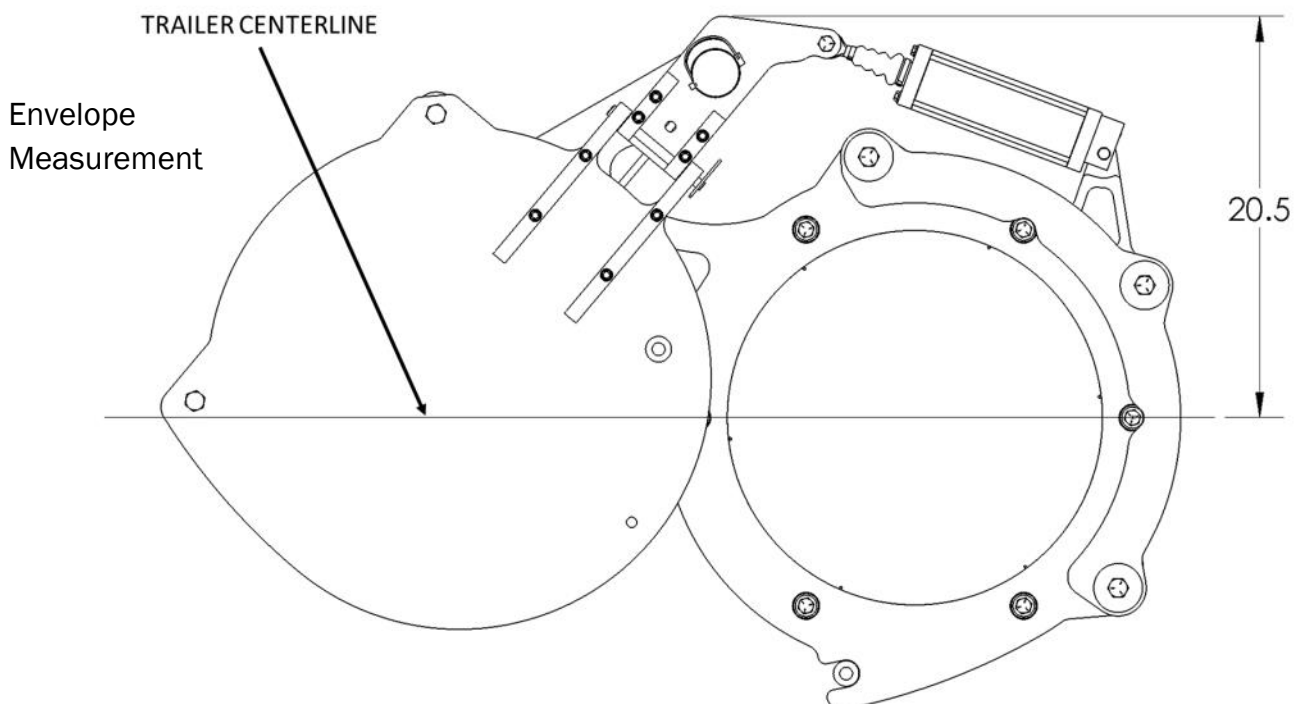
FLANGE POSITION



BASE FLANGE AND COVER

- Align hole 6 to the front of trailer, centering flange over the ring.
- Install clevis nut, cross pin and hair pin.

NOTE: Once hardware is properly tightened, rotating the pins **SHOULD NOT BE POSSIBLE**.



INSTALLATION GUIDE

- Using a torque wrench, tighten the bolts beginning with 5 ft/lbs or 6.77Nm.
- Increase by increments of 5 ft/lbs or 6.7Nm until a torque setting of between 15 ft/lbs - 25 ft/lbs or 20.33Nm - 33.90Nm is achieved. When tightening the hardware, always use a “star” pattern sequence (Fig. 2).
- Typically the inside edge of the gasket will be flush with the inside of the flange opening.

Fig. 2

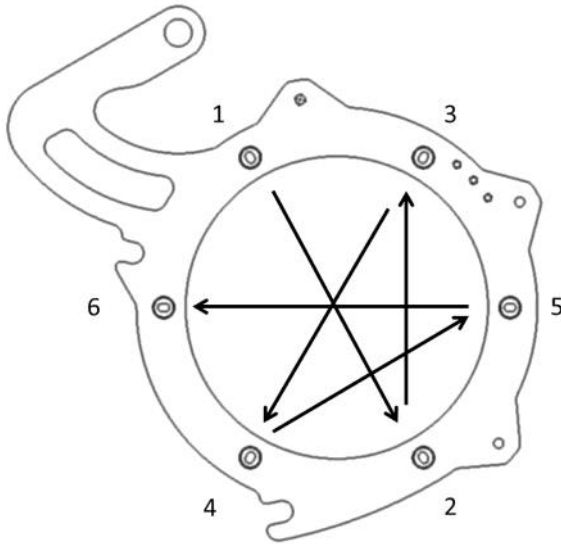
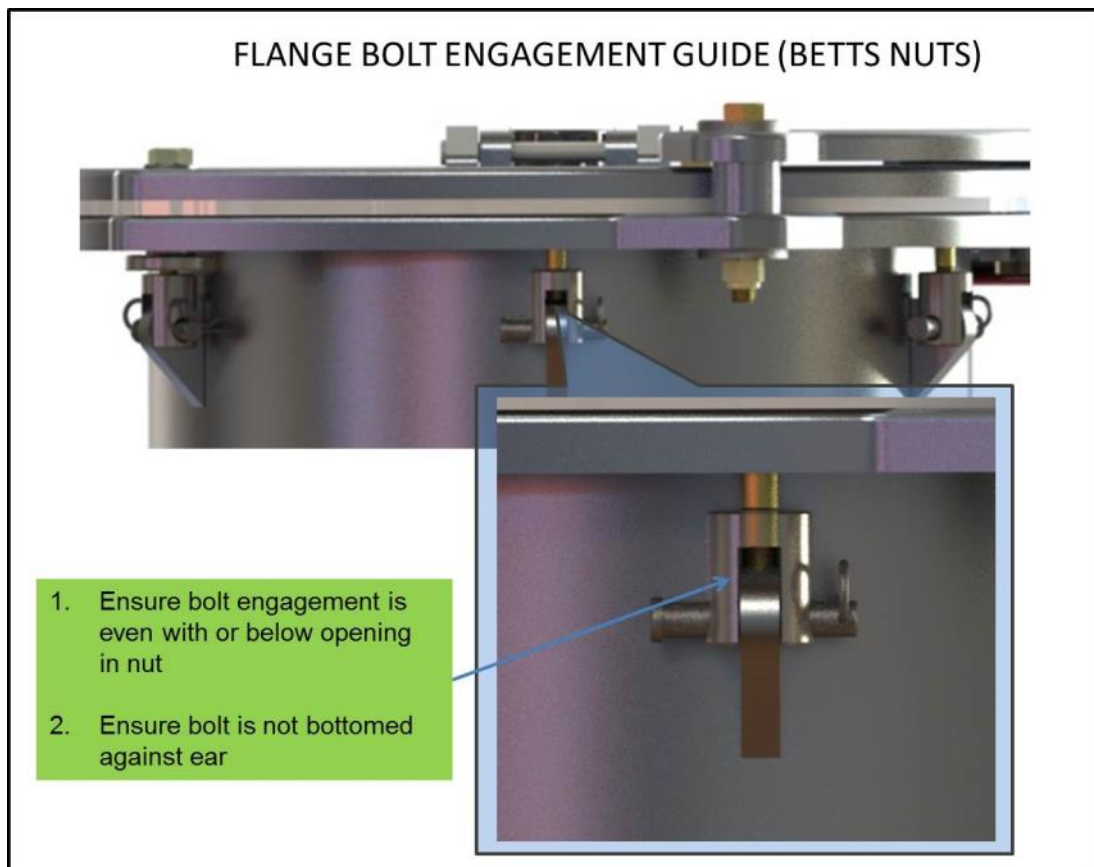
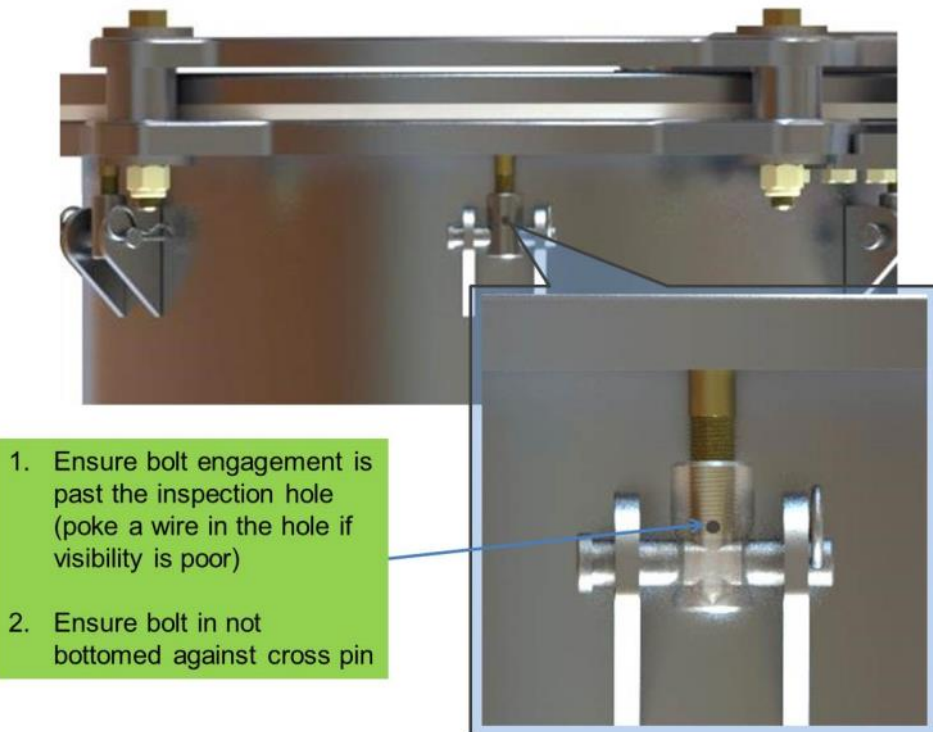


Fig. 3



INSTALLATION GUIDE

FLANGE BOLT ENGAGEMENT GUIDE (STANDARD CLEVIS NUTS)



HINGE PIN CONNECTION

Fit the pivot bracket (PN# 60003) to the flange. Insert the hinge-pin with one thrust washer on the bottom of the flange and one on the top of the cover. Apply anti-seize on the threads of the hinge-pin. Hand tighten the castle nut and insert the lock pin to hold the hinge pin. (If necessary loosen to the first available hole.) Check the cover for smooth operation.

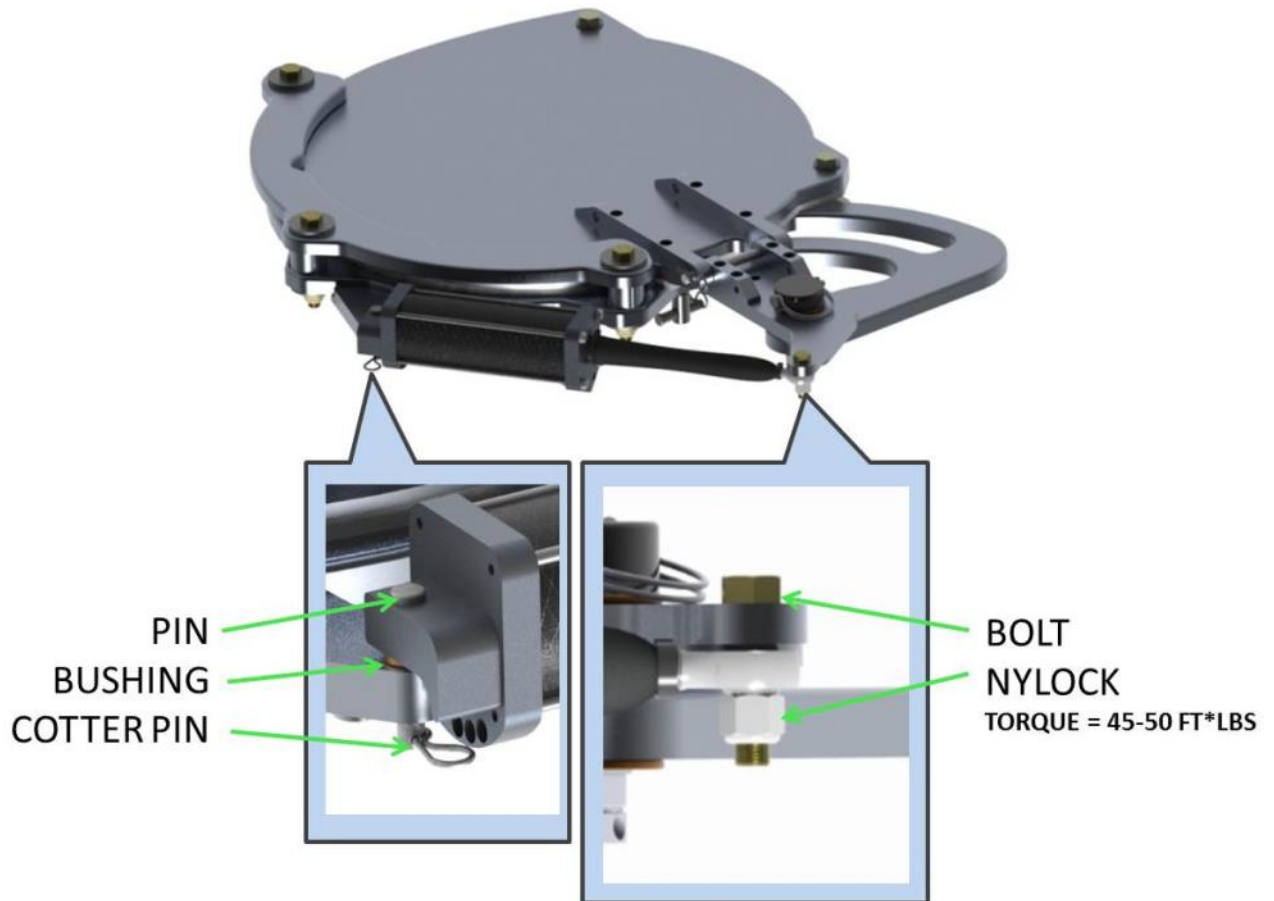
HINGE PIN INSTALL GUIDE



INSTALLATION GUIDE

CYLINDER INSTALLATION

CYLINDER INSTALLATION GUIDE



INSTALLATION GUIDE

AIR-LINE ROUTING

From the trailer air reservoir or the air line supplying air to the air ride suspension, connect the supply air to the control box using the supplied equal tee. (Fig. 8). We recommend a trailer protection valve be used. Typical connection is after the trailer protection valve that supplies air to the air ride suspension. There must be constant air to the control box for proper operation of the seal.

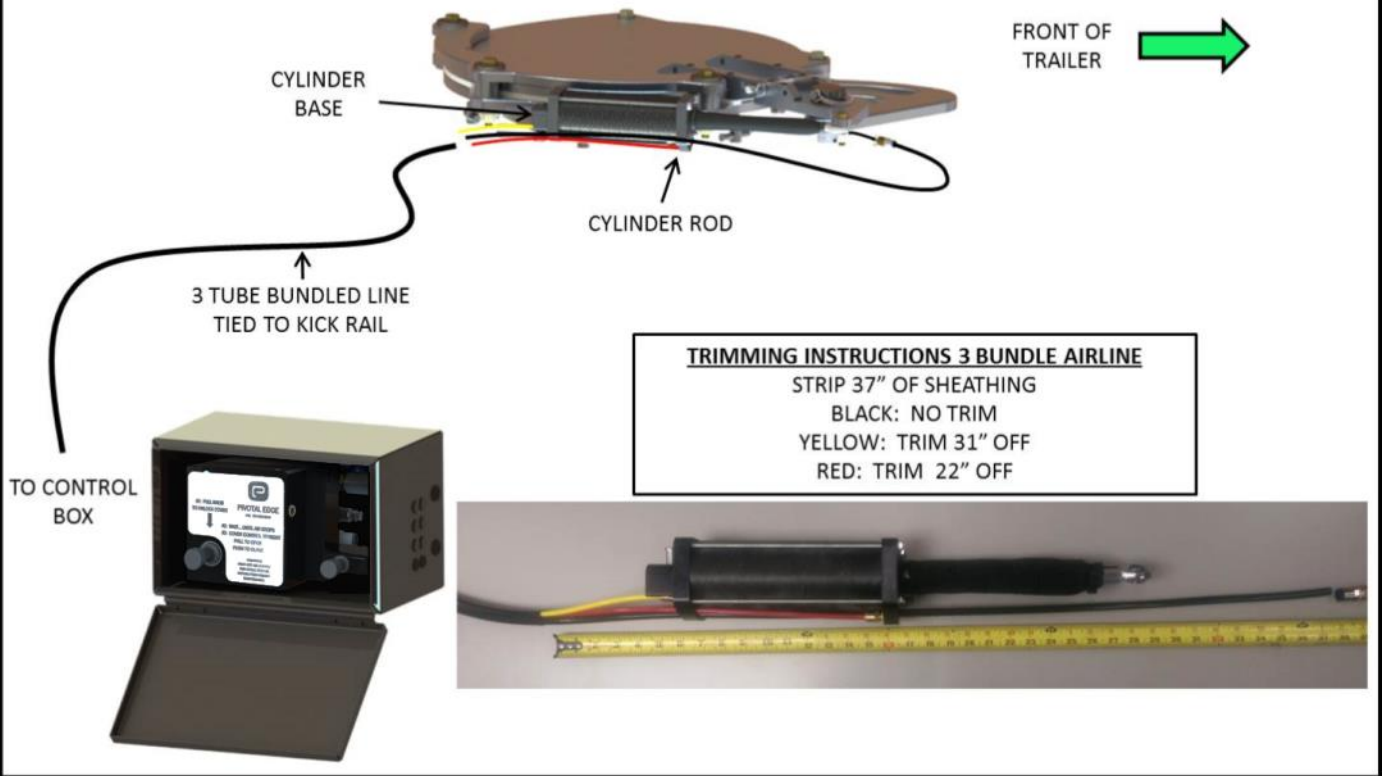


Fig.8

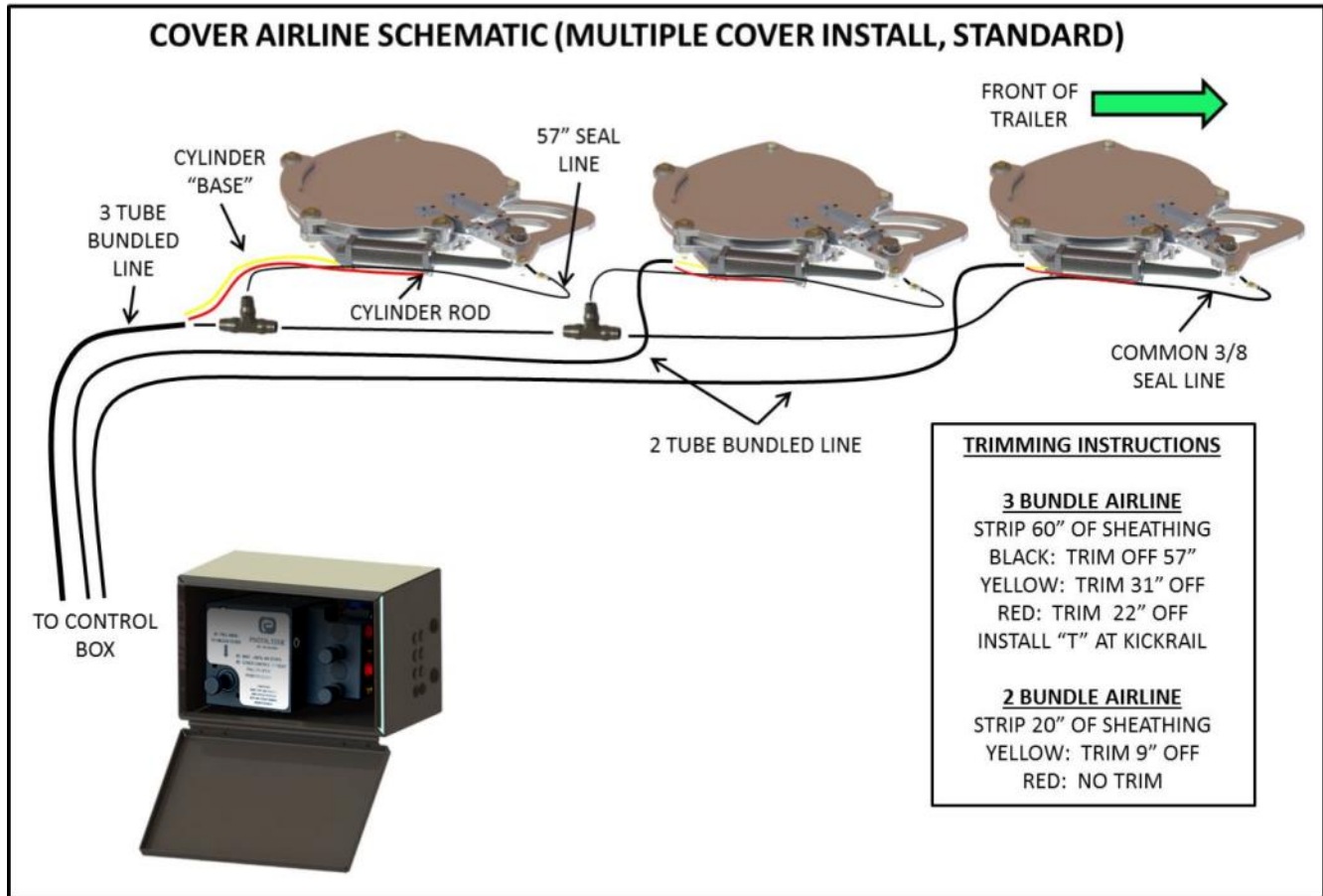


INSTALLATION GUIDE

AIRLINE SCHEMATIC (SINGLE COVER INSTALL, STANDARD)



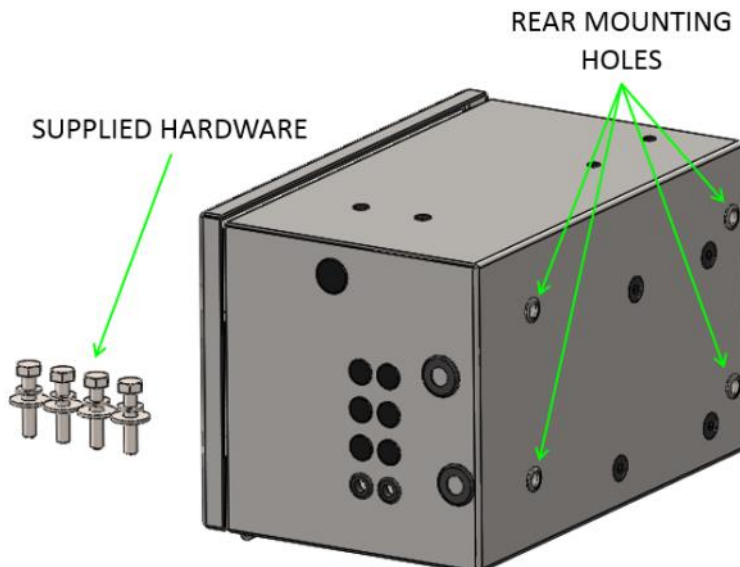
INSTALLATION GUIDE



CONTROL BOX MOUNTING

The control box has 4 holes with 1/4-20 thread in the rear of the box.

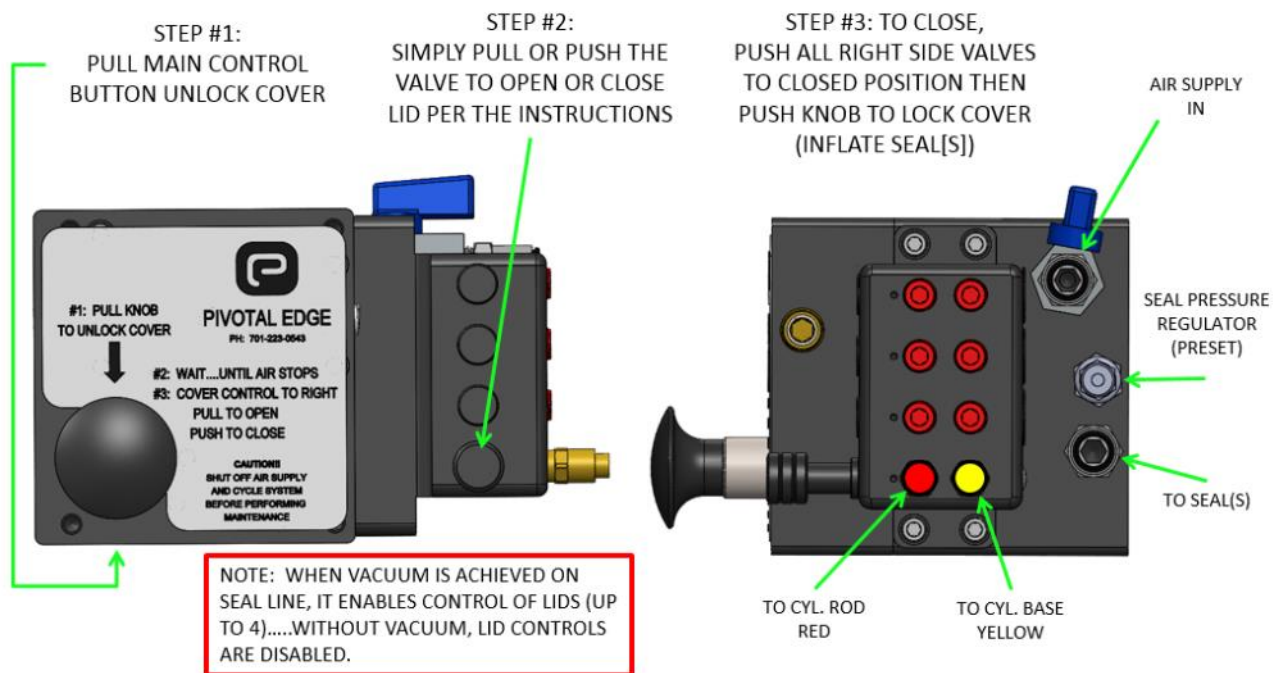
MOUNTING



INSTALLATION GUIDE

DRIVER TRAINING

PIVOTAL EDGE® VALVE AND OPERATION

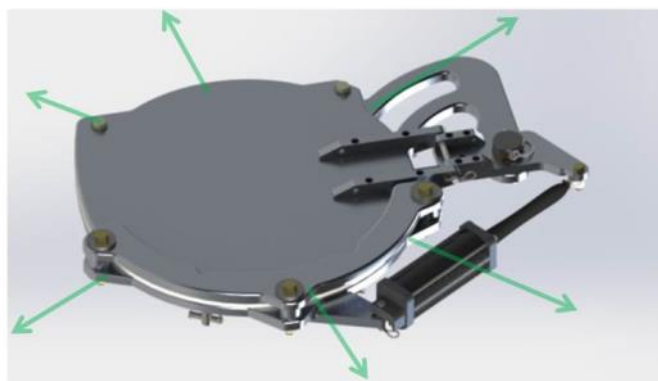


FLANGE CLEANING VIA AIR PURGE

PERFORM EVERY TIME AFTER UNLOADING!
A FAST AND EASY WAY TO KEEP YOUR LID OPERATING WELL DAY IN AND OUT!

INSTRUCTIONS:

1. AFTER UNLOAD IS COMPLETE, DECREASE TANK PRESSURE TO 2-3psi
2. PULL PIVOTAL EDGE® CONTROL BOX KNOB TO DEFLATE SEAL
THIS WILL ALLOW THE PRESSURE TO PURGE BETWEEN THE COVER AND THE FLANGE CLEARING EXCESS MATERIAL FROM THE OPENING
3. OPEN TRAILER SAFETY BLOW DOWN VALVE
4. RESEAL COVER BY PUSHING IN THE PIVOTAL EDGE® CONTROL KNOB



AIRLINE COLOR CODING

3/8" or 10mm black is supply and seal.

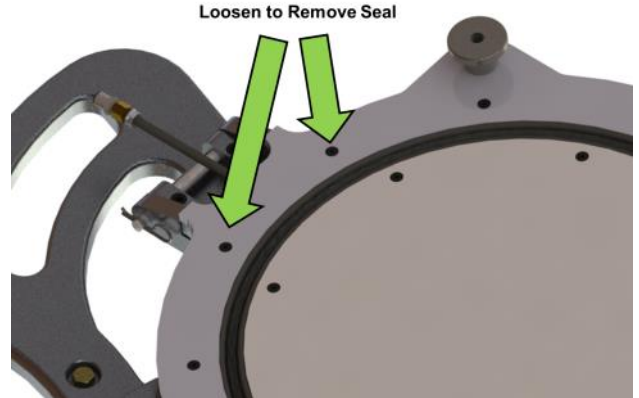


GENERAL MAINTENANCE

SERVICING THE PIVOTAL EDGE® COVER

Open the cover then close the supply air ball valve. Cycle the switches several times to relieve all accumulated pressure on the system.

- Disconnect the seal air line at the quick-connect by the cover.
- Lift the cover up using equal pressure.
- Remove the 3/8" fitting and hose clamp on the end of the seal inflation tube.
- Loosen the two slider screws on either side of the seal inflation tube.
- Remove the seal.
- Clean all surfaces, check and replace any visibly worn parts paying attention to the seal groove.
- Reassemble the seal and connections. Tighten the two slider screws. Connect air line and check for clearance.



The hinge pin assembly should be checked for smooth operation.
Remove the cylinder rod eye bolt (2 3/4" wrenches)

Note:

Seal Installation: The ring that the seal seats into needs to be clean. Start by feeding the inflation tube through the hole. A small amount of soapy water on the tube and seal will help this process. Press the seal into the groove at four equal points around the seal. Work the seal into the groove using your fingers and thrust washer.

TROUBLESHOOTING

1. The operation of the cover should be smooth and easy.
 - a. If not clean buildup on and around the flange and cover. Pay attention to under the ears also.
2. Leaks when starting to pressurize the tank.
 - a. Deflate the seal by pulling the control valve knob to deflate the seal, thereby purging the tank pressure, wait a few seconds and push the knob back in to inflate the seal – no more than 4psi.
 - b. Reduce unloading pressure. Check seal integrity when possible.
3.

Tanker Operating Pressure	Required Seal Operating Pressure
2.0 Bar (29.0 PSI)	3.3 Bar or (48 PSI)
2.5 Bar (36.3 PSI)	3.7 Bar (54 PSI)

GENERAL MAINTENANCE (continued)

CLEANING

Moisture will result in product bonding between the cover and flange. Purging will not remove this hardened material and it will continue to build up over time. We recommend opening the lid and inspecting the entire surface of the flange for product buildup that needs to be scraped away. This should be done weekly at first. Then adjust accordingly to what is necessary based on your loading conditions. An air operated needle scaler is the best tool to use for cleaning product buildup.

PREVENTIVE MAINTENANCE

PIVOTAL EDGE®—PNEUMATIC HATCH (ASSEMBLY

Part No. / Task Description	Frequency			
	Pre-trip	Bi-weekly	First at 6 months	Thereafter every 12 months
Air lines and control box Check operation	X			
Cover build-up/cleanliness Conditional		X		
Remove and inspect cover			X	X

TOOLS AND MATERIALS THAT MAY BE REQUIRED

2 x Channel lock pliers, rubber or plastic hammer, anti-seize, dry lubricant, wire brush, emery cloth, small pry bar, 3/4" socket, scraper (putty knife), needle scaler.

MAINTENANCE PROCEDURE—REMOVE & INSPECT COVER

- Close the supply air ball valve and deflate the seal by pulling the control box button out. Cycle the switches several times to relieve all accumulated pressure on the system.
- Disconnect the airline at the control box for the rod, and base line.
- Disconnect the seal airline at the quick-connect by the cover.
- Remove the nut at the rod end of the cylinder (two 3/4" wrenches).
- Remove the hinge pin D ring, plastic cover and 1.5" castle nut.
- Lift the cover up using equal pressure.
- Remove the 3/8" fitting and hose clamp on the end of the seal inflation tube.
- Loosen the two slider screws on either side of the seal inflation tube.
- Remove the seal.
- Clean all surfaces, check and replace any visibly worn parts paying attention to the seal groove.
- Reassemble: the seal (see note 1) and connections, hinge pin, use anti-seize on threads, set tension hand tight loosen to closest hole if necessary, check for smooth operation prior to connecting actuator.
- Connect airline and check for clearance.
- Connect the cylinder.
- Open and close the cover by hand checking for smooth operation.
- Connect the airlines, turn on air supply and cycle the cover.

NOTE 1 Seal installation: The ring that the seal seats into needs to be clean. It is helpful to use an air powered needle scaler. Start by feeding the inflation tube through the hole, a small amount of soapy water on the tube and seal will help this process. Press the seal into the groove at four equal points around the seal. Work the seal into the groove using your fingers and thrust washer. Upon completion the seal should be flush or slightly recessed with the cover edge.

PREVENTIVE MAINTENANCE—SAE STANDARD BOLT, P/N 60020

Preventative Maintenance Parts Recommendations

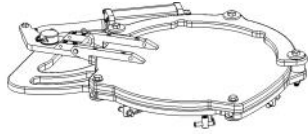
Rev IR-4

Part No.	Description	Recommended Action
60012	Slider, Outer	Visually assess and replace if necessary
60013	Slider, Inner	Visually assess and replace if necessary
102419	Inflatable Seal	Visually assess and replace if necessary
103835*	Hinge Pin Assembly	Replace as needed

***Note - 103835 contains the items listed below**

103968	Round Hinge Pin Cap (QTY 1)	Replace Every 12 months
103969	Castle Nut (QTY 1)	
103678	Hinge Pin Thrust Washer (QTY 2)	Replace Every 12 months
104019	Nylon Hinge Pin Bushing (QTY 2)	Replace Every 12 months
103950	Hinge Pin (QTY 1)	Visually assess and replace if necessary
103951	Retaining Pin (QTY 1)	
103691	Hinge Pin "D"-Ring (QTY 1)	

Bill of Materials—SAE STANDARD BOLT, P/N 60020

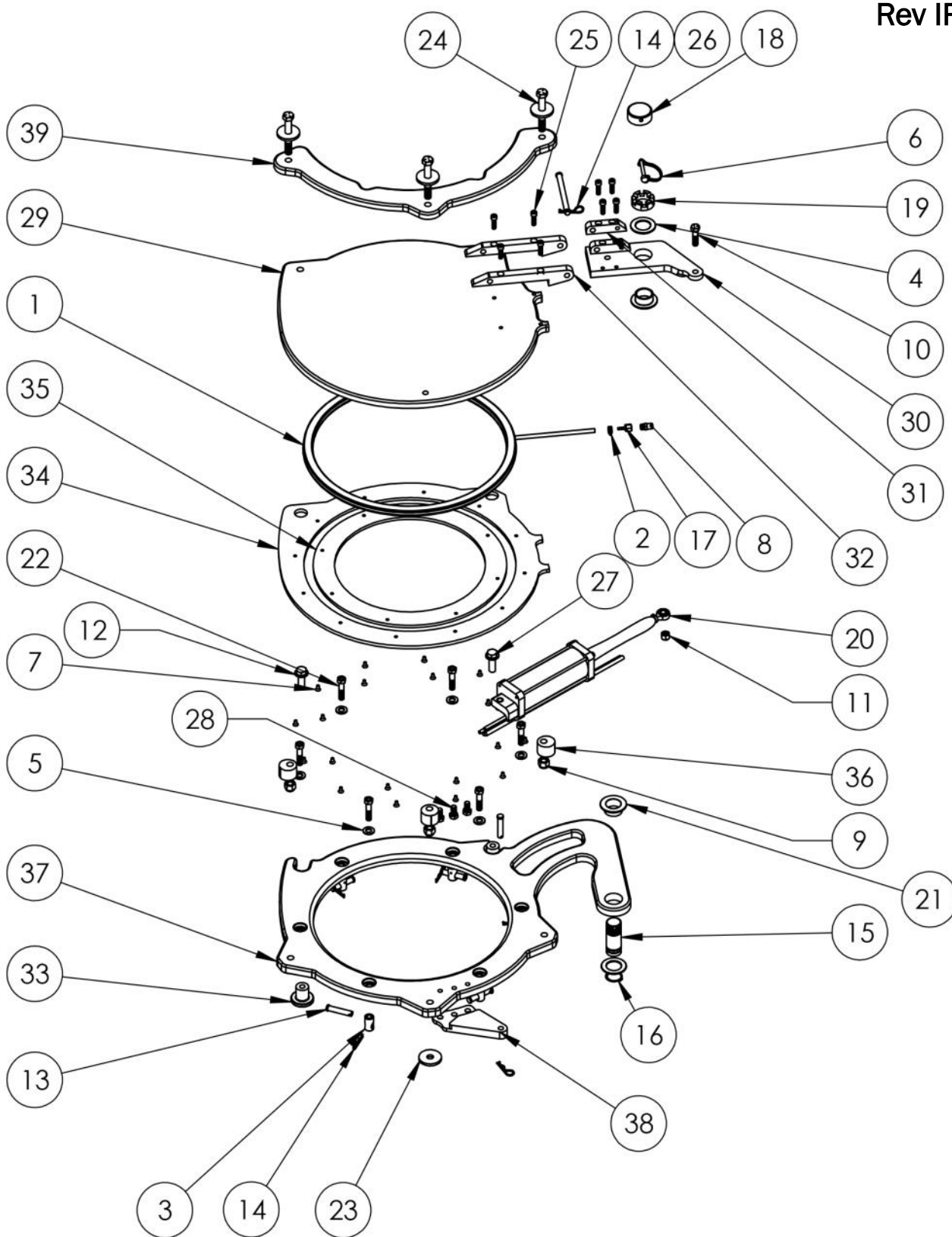


Rev IR-4

ITEM NO.	PART NUMBER	Rev	DESCRIPTION	QTY.
1	102419	B	SEAL, INFLATABLE	1
2	102502	NA	HOSE CLAMP, INFLATION TUBE	1
3	102595	A	NUT, CLEVIS 1/2" DIA	6
4	103678	NA	HINGE PIN THRUST WASHER	2
5	103688	NA	WASHER, FLAT 14MM	6
6	103691	NA	HINGE PIN D-RING	1
7	103735	NA	SCREW, CS 1/4-20 X 1/2	20
8	103743	NA	1/4 NPT X 3/8 TUBE STRAIGHT	1
9	103826	NA	NUT, NYLOC 5/8-11	3
10	103831	NA	1/2-20 X 2 HEX BOLT	1
11	103859	NA	1/2-20 NYLOK NUT	1
12	103943	NA	5/8" SAE Galvanized Washer	2
13	103948	NA	CLEVIS PIN, 1/2 x 2-1/2	7
14	103949	NA	HAIR PIN	8
15	103950	A	HINGE PIN	1
16	103951	NA	RETAINING RING, 1.5"	1
17	103952	NA	HOSE BARB TO 1/4 NPT FEM.	1
18	103968	NA	HINGE PIN CAP ROUND	1
19	103969	B	CUSTOM CASTLE NUT	1
20	103986	C	3 X 6 COMPOSITE CYLINDER	1
21	104019	NA	BUSHING, NYLON HINGE PIN	2
22	104069	NA	HEX BOLT, 1/2-20 X 1.25"	6
23	104070	O	WASHER, 5/8 x 2.25 x 1/4	6
24	104072	NA	HEX BOLT, 5/8-11 x 4.5"	3
25	104075	NA	SHCS 3/8-16 x 1.25"	8
26	104106	NA	CLEVIS PIN, 6"	1
27	104108	NA	BOLT 5/8-11X2.0 GR5	2
28	104109	NA	1/2-13 X 1.0 HEX BOLT	3
29	60002	IR-1	MACHINED COVER, 6 BOLT	1
30	60003	IR-1	PIVOT BRACKET	1
31	60004	IR-1	PIVOT ATTACHMENT	2
32	60005	IR-2	COVER ATTACHMENT	2
33	60010	B	COVER STANDOFF	2
34	60012	IR-1	SLIDER, OUTER	1
35	60013	IR-1	SLIDER, INNER	1
36	60016	IR-1	LOCK BAR STANDOFF	3
37	60019	IR-2	MACHINED FLANGE, 6 BOLT	1
38	60021	IR-2	CYLINDER MOUNT BRACKET	1
39	60022	IR-2	LOCK BAR	1

Exploded View—SAE STANDARD BOLT, P/N 60020

Rev IR-4



FACTORY TESTING

SETUP AND PRESSURE TEST PROCEDURE

Covers are visually inspected for shipping damage.

The hinge pin bushing and slide are installed. The lower flange is bolted to the test stand following the star pattern. The flange is mounted to the test stand and the mounting bolts are torqued in 5lbs increments to a torque of 15ft/lbs.

Cover setup

The seal retainer is installed and the hinge pin bushing is installed. The cover slider is mounted. The inflatable seal is installed and condition of the seal groove and seal are checked. The cover is mated to the lower flange on the test stand and hinge pin is installed.

Operation check

The cover is checked for smooth operation and clearance. Actuation is installed and connections are made to the control box. A minimum of 15 cycles are run. The cover is closed with the seal inflated to a pressure of 65 psi. Pressure is applied to the test chamber to 50 psi and the supply line is shut off.

The cover is disassembled and stamped with a serial number and put into inventory or prepared for shipping.

If you have any questions our website

www.thepivotaledge.com

will generally provide your answer.

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