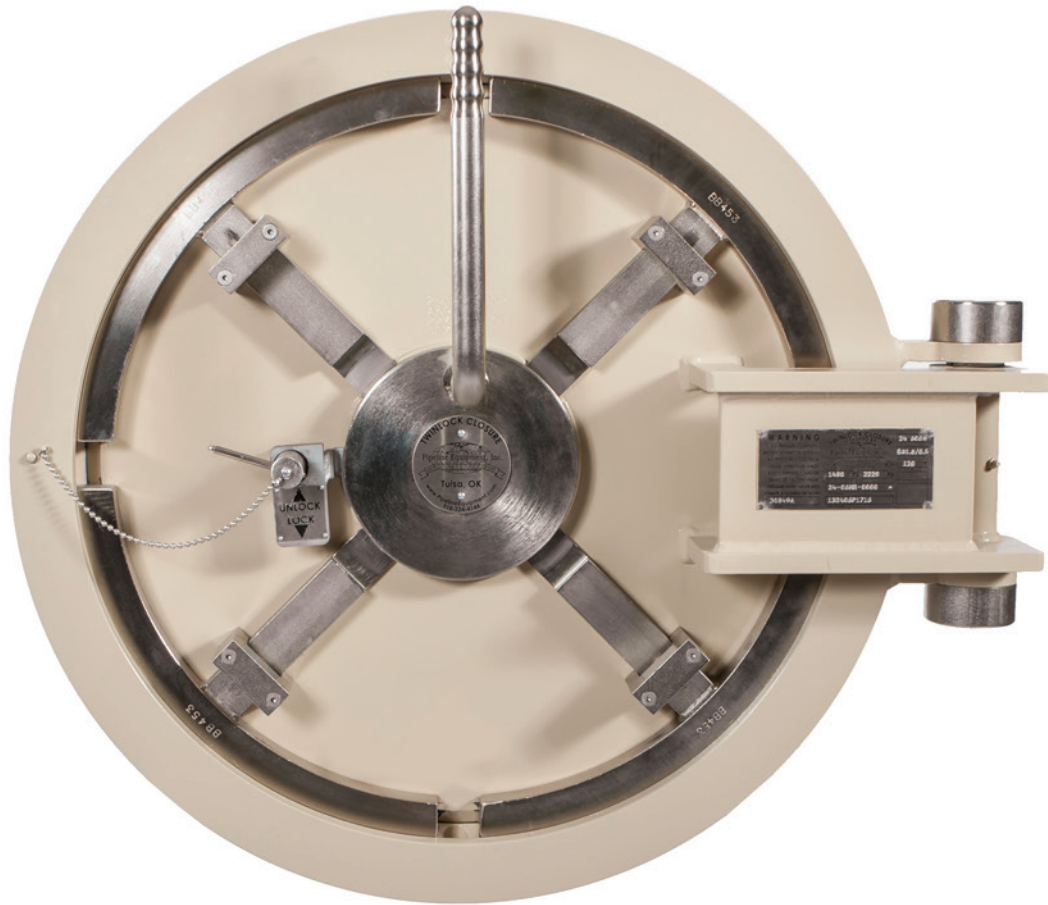


TWINLOCK

QUICK OPENING CLOSURE



OPERATION, MAINTENANCE, AND INSTALLATION MANUAL



The purpose of this manual is to provide the user with instructions on how to safely open and close, how to conduct routine maintenance, and how to install the PEI TWINLOCK Closure on a pressure vessel. Please follow these instructions, observe all safety and warning notices. Consult factory should you have any questions or concerns.

1.0 - OPENING AND CLOSING THE DOOR



Do not attempt to open the door until all internal vessel pressure is released. The vent valve(s) on vessel to which the closure is attached should remain in open position while opening and closing the door. A pressure gage should be located on the vessel to confirm there is no internal pressure.



During the opening of the door, the operator should stand to the side, opposite the hinge arm [fig 1].



When opening and closing door the operator should be properly equipped with personal protective equipment.



The opening and closing of the TWINLOCK Closure does not require the use of tools. Tools used to force the door open or closed or to tighten the pressure alert valve may cause permanent damage to the closure.



Spare O-rings should always be readily available during the opening/closing operations should the operator find the O-Ring(s) need replaced [fig 2].



1.1 - OPENING THE DOOR

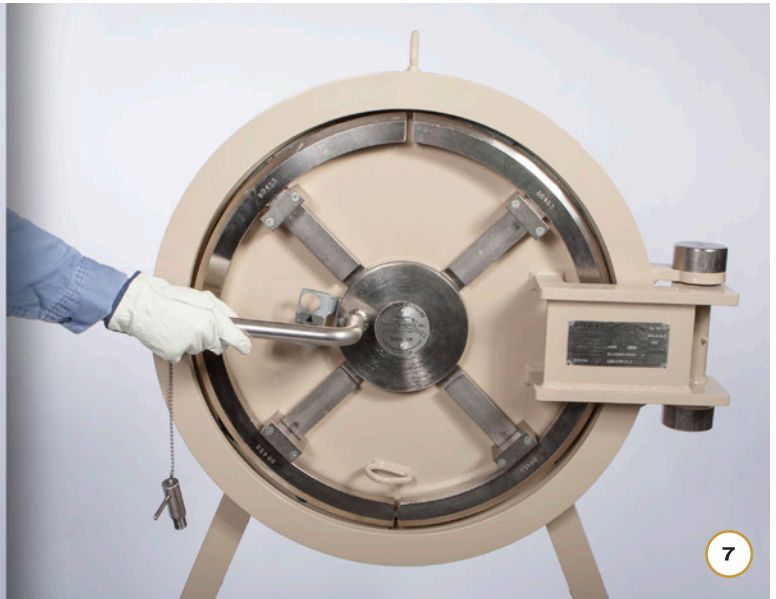
Step 1: With the internal pressure completely released using the vent valve(s) located on the vessel and with a pressure gage confirming the internal pressure is (0) PSI, manually unscrew the Pressure Alert Valve [fig 3] in counter clockwise direction. Once the Pressure Alert Valve seal is broken, should a pressure release be detected, retighten and determine the cause of this pressure release before continuing. Should internal pressure not be detected, continue to unthread the Pressure Alert Valve until it is completely free, allowing it to hang from the attachment cable [fig 4].



Step 2: With the Pressure Alert Valve completely removed, lift and hold the Safety Lock [fig 5] in upward position.



Step 3: Standing to the side opposite the door hinge, with Safety Lock in upward position, rotate door handle [fig 6] to disengage the door locking lugs [fig 7].



Step 4: With door locking lugs disengaged, use door handle to open the door [fig 8], and swing door to open position [fig 9] to gain internal access to vessel.



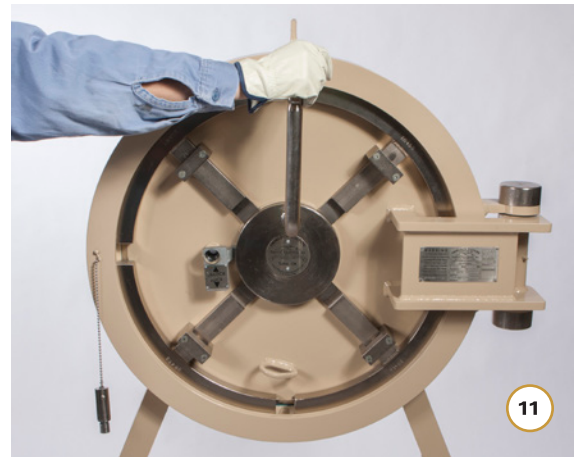
1.2 - CLOSING THE DOOR

NOTICE Refer to closure Maintenance Section to assure certain maintenance items are conducted before closing door.

Step 1: With door in open position, use door handle to close the door [fig 10].



Step 2: With the door completely closed, lift door handle to fully engage the door locking lugs [fig 11].



WARNING If the locking lugs are not easily moved into lock position, do not force handle upward. This is an indication the door may not be completely closed or properly aligned. Check to determine problem before continuing.

Step 3: With locking lugs engaged, and door handle moved to lock position, the Safety Lock should fall into the full lock position [fig 12], allowing the Pressure Alert Valve to be easily installed. Note: it may be necessary to manually push the Safety Lock into the lock position if this mechanism is not properly maintained and lubricated. There is a weather seal located behind the slidelock. This protects the latching mechanism from debris.



Step 4: With Safety Lock in locked position, re-install the Pressure Alert Valve by hand tightening only [fig 13].

The vessel to which the closure is attached can now be pressurized.



2.0 - MAINTENANCE INSTRUCTIONS

The **TWINLOCK** Closure (if properly maintained) will provide many years of service.

Surfaces Protection

All non-painted, non-plated surfaces should be protected with a thin coating of grease [fig 14] (Recommended: Mobil XHP222). Factory recommends that plated surfaces should not be painted.

All painted surfaces should be maintained properly. (**NOTE: TWINLOCK** Closures are shipped with primer only unless otherwise specified.)

O-Rings:

The closure is equipped with two pressure containment O-Rings. One O-Ring located on the Pressure Alert Valve [fig 15]. Another O-Ring is located on the outer periphery of the door [fig 16]. The O-Rings as shipped from the factory are normally Viton material, unless otherwise specified upon order placement, or if changed during their service life. It is important the O-Ring material be compatible with the pipeline product. Often when O-Rings are not compatible they may swell. This may make it difficult to close the door. We recommend that each time the door is opened that spare O-Rings should be readily available should the operator find it necessary to replace.



The O-Rings should be removed and inspected each time the door is opened [fig 17]. The O-Ring grooves should also be inspected and cleaned, with a thin film of grease applied to the groove and O-Ring [fig 18] (Recommended: Mobil XHP222). Replacement O-Rings are readily available from factory.



2.0 - MAINTENANCE INSTRUCTIONS (CONT.)

Door Alignment:

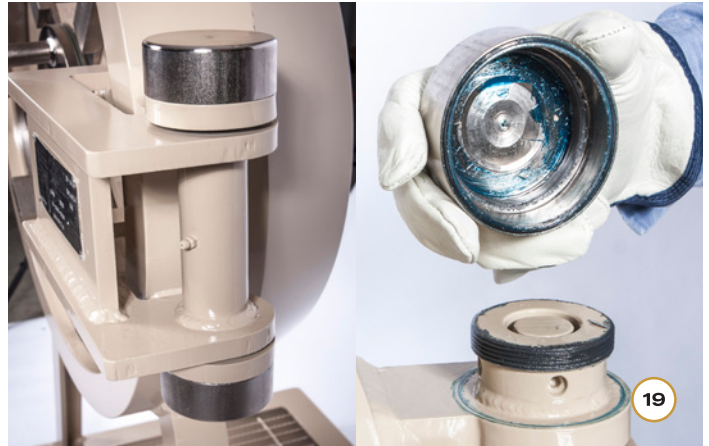
The closure door must be kept in proper alignment to ease the opening and closing operation. Should the door become misaligned, it can be realigned by performing the following steps:



Do not attempt to open the door until all internal vessel pressure is released. The pressure release valve on vessel to which the closure is attached should remain in open position while opening and closing the door. A pressure gage should be located on the vessel to confirm there is no internal pressure.



Step 1: Remove the protective adjustment caps at the top and bottom of the hinge arm [fig 19].



Step 2: With the door open, remove the primary O-Ring on the outer periphery of the door [fig 20].



Step 3: With O-Ring removed, close the door, do not engage locking lugs. The gap between the outer periphery of the door and inner periphery of the hub can now be viewed and accessed [fig 21].

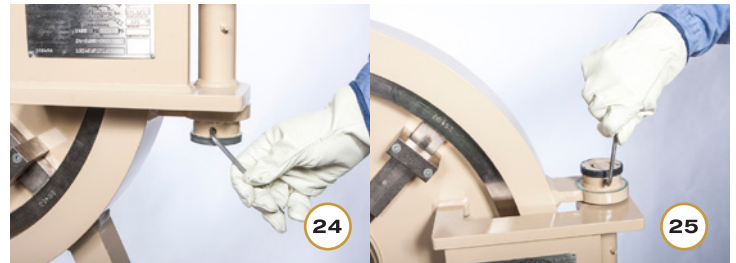


2.0 - MAINTENANCE INSTRUCTIONS (CONT.)

Step 4: Pass a feeler gauge along the entire circumference of the door. The recommended gap is .005 - .010 [fig 22 & 23].

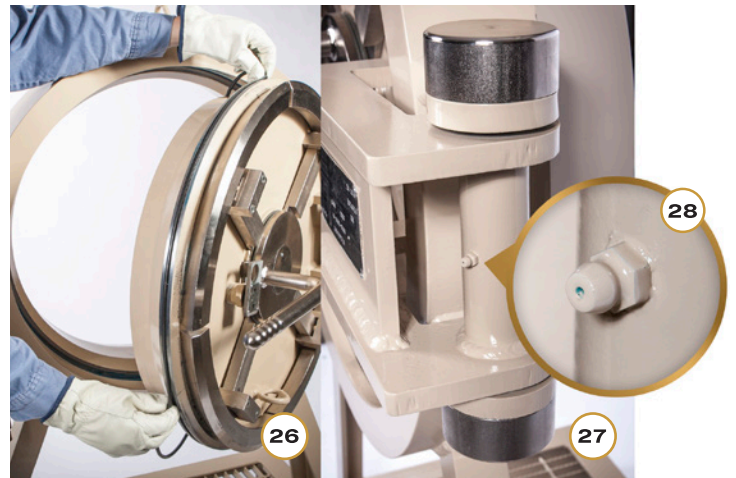


Step 5: If gap is inconsistent, using an allen wrench, slightly loosen the four(4) set screws at the top [fig 24] and bottom [fig 25] of the hinge arm. Continue adjusting inner and outer set screws until a uniform gap is achieved around the entire periphery of the closure door. If the locking lugs are not easily moved into lock position **DO NOT FORCE HANDLE**. It may be necessary to adjust front and rear set screws to ensure door is seated flat with the hub.



Step 6: Make sure all set screws are tight, open and close the door several times to assure there is not door drag on the closure hub.

Step 7: Lubricate and replace the Door O-Ring [fig 26], and protective caps [fig 27]. Lubricate the hinge using the grease zerk [fig 28].



NOTE: During the adjustment process there four set screws at the top and four sets screws at the bottom of hinge arm. The door may be tilted left or right and/or moved left or right by using inner and outer adjustments. The door may be tilted in or out and/or moved in or out using near and far adjustments.

NOTE: Each Protective cap is equipped with an O-Ring located on the outer face of the cap. This is a non-pressure containing O-Ring and used as weather seal protecting the hinge arm bearings. Replace as necessary throughout the life of the closure [fig 29].

The vessel to which the closure is attached may be placed in service after the door is completely closed, the latch mechanism fully engaged, and the Pressure Alert Valve installed.



3.0 - WELDING INSTRUCTIONS

The **TWINLOCK** Quick Opening Closure is a highly precision machined product and must be handled and welded correctly to avoid damage during installation. The closure hub is weld beveled for weld attachment to pipe or pressure vessel [fig 30]. MTR's (material test reports) are furnished with each closure which identifies the material and material grade of the weld hub. It is the responsibility of the installer to determine the appropriate weld procedure and weld code for installing the closure.

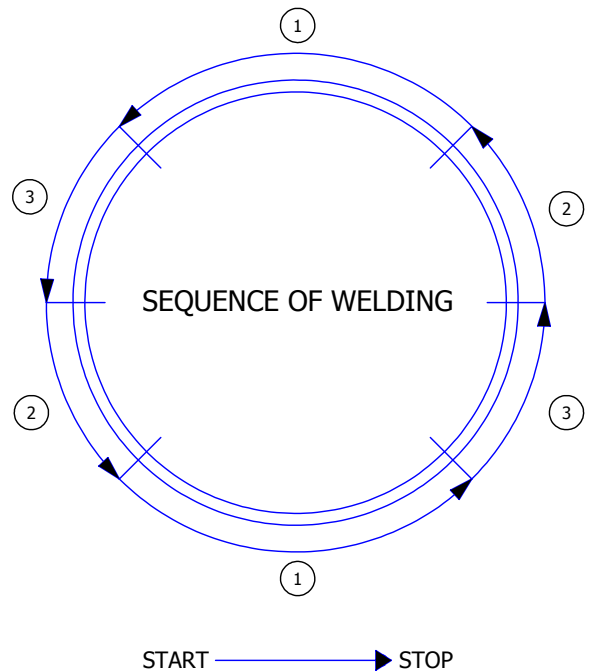


THE FOLLOWING ARE GENERAL RECOMMENDATIONS FOR WELD INSTALLING THE TWINLOCK.

Step 1: Position the closure in correct alignment with the pipe or vessel. Tack weld per applicable code assuring the door hinge arm is in true vertical position.

Step 2: With the door oriented in the correct position, open the door and remove the primary door seal O-ring located on the outer periphery of the door, then remove the smaller O-ring on the Pressure Alert Valve.

Step 3: Close the door and weld per applicable procedure and code. An example of a recommended weld pass sequence is pictured right [fig 31].



NOTICE POST WELD HEAT TREATMENT

If post weld heat treatment is required, it is recommended a localized heat treatment procedure be followed.

- Coat O-Ring groove and surfaces with a heat resistant coating.
- Interior braces should be used to prevent warp or droop.
- After post-weld heat treatment, remove braces, open and close door to assure alignment is correct, clean and lubricate O-Ring surfaces, replace O-Rings.

If localized heat treatment is not possible and entire vessel must be heat treated, the closure door and bearings may be removed by removing the adjustment screws and hinge pin.

4.0 - VERTICAL CLOSURES

PEI Vertical closures are to be installed in top vertical position only. For instructions on opening and closing the door refer to Section 1.0



Do not open vertical closure doors in the horizontal position.

On vertical closures equipped with hydraulic lift [fig 32]:

Using the hydraulic pump handle located on the davit arm, stroke pump until door is lifted and clears closure hub, then swing to left or right to gain access to inside of vessel. Swing closure door centered over hub and release valve on the side of the pump slowly to close. Follow all maintenance instructions as stated in maintenance section.



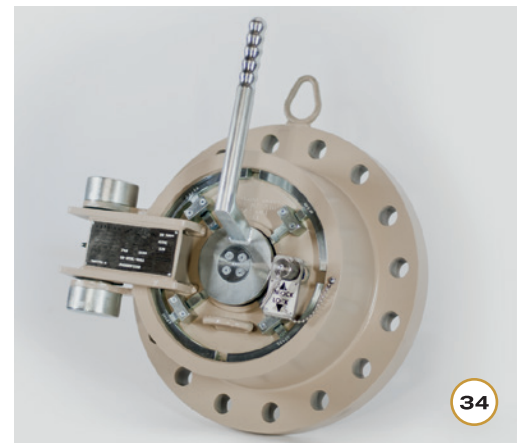
On vertical closures equipped with jackscrew lift [fig 33]:

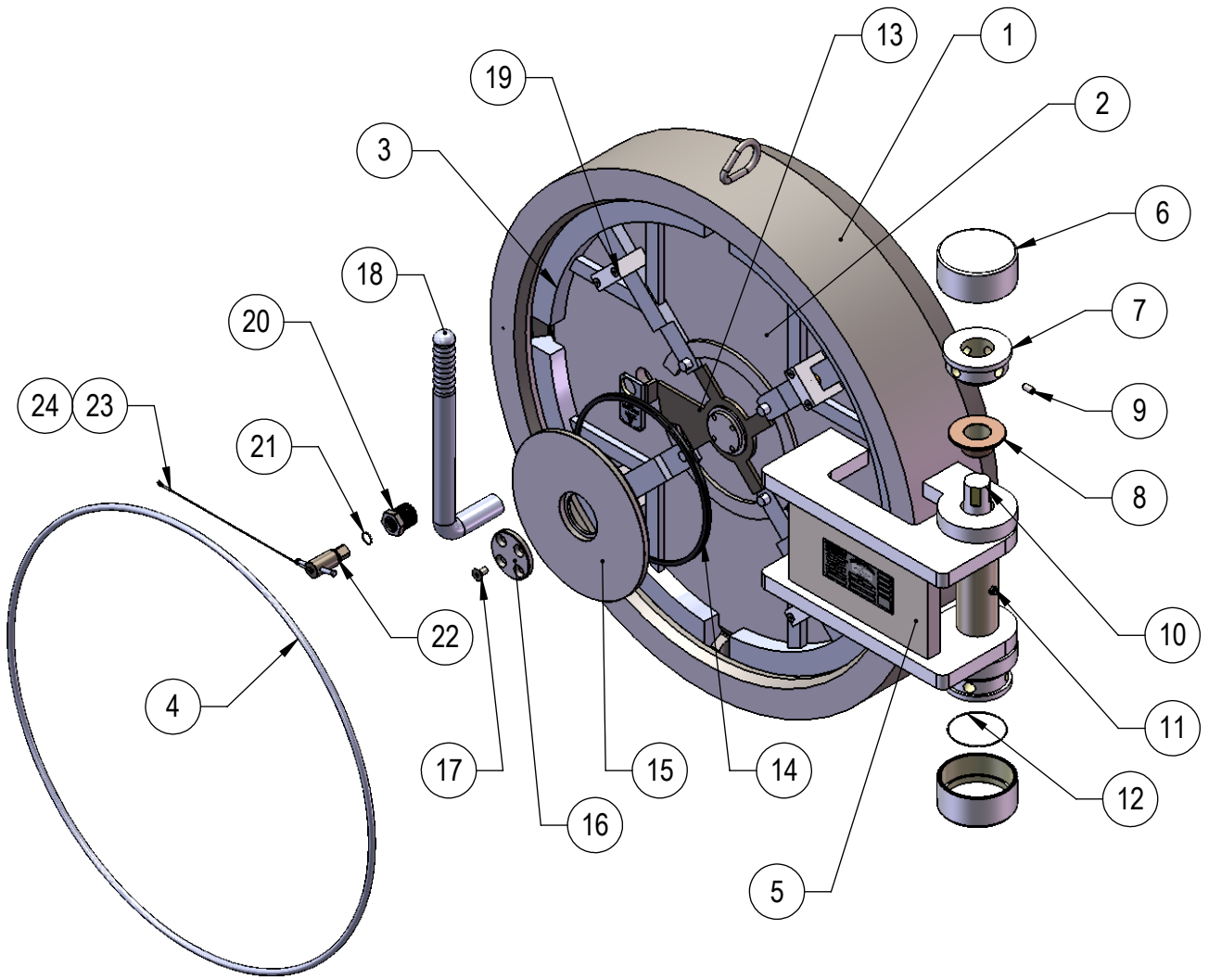
Using the hand wheel, rotate until door is lifted and clear closure hub, then swing to left or right to gain access to inside of vessel. Swing closure door centered over hub and reverse the process to close. Follow all maintenance instructions as stated in maintenance section.



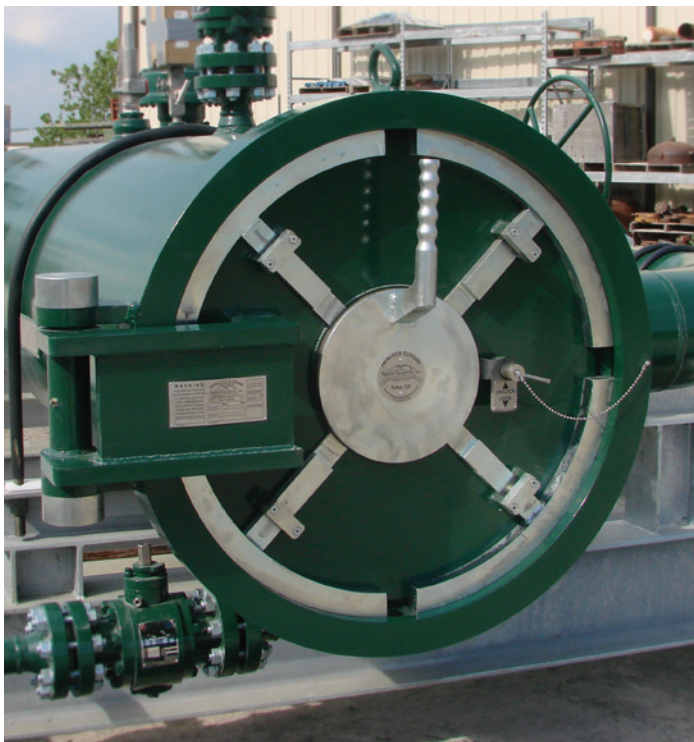
5.0 - FLANGED TWINLOCK QUICK OPENING CLOSURE

The PEI Flanged **TWINLOCK** [fig 34] is designed and rated to be installed by bolting to a mating and matching flange. Proper studs, nuts, gaskets meeting code requirement should be used and tightened in sequence to the desired torque specifications during installation. For instructions on opening and closing the door, refer to Section 1.0. If adjustments are required refer to **section 2.0**.





ITEM NO.	QTY	DESCRIPTION	ITEM NO.	QTY	DESCRIPTION
1	1	HUB	13	1	SAFETY LOCK
2	1	DOOR	14	1	SLIDE PLATE V-SEAL
3	4	LUG ARM ASSEMBLY	15	1	SLIDE PLATE
4	1	DOOR O-RING	16	1	CENTER CAP
5	1	HINGE ARM ASSEMBLY	17	4	CAP SCREW
6	2	HINGE CAP	18	1	SLIDE PLATE HANDLE
7	2	HINGE ADJUSTER	19	4	LUG HOUSING ASSEMBLY
8	2	HINGE BUSHING	20	1	PRESSURE ALERT BUSHING
9	8	ADJUSTMENT SCREW	21	1	PRESSURE ALERT O-RING
10	1	HINGE PIN	22	1	PRESSURE ALERT VALVE
11	1	GREASE ZERK	23	1	WIRE ROPE LANYARD
12	2	HINGE CAP O-RING	24	2	DRIVE SCREW



SERVICE NOTES

TWINLOCK

QUICK
OPENING
CLOSURE

OPERATION, MAINTENANCE, AND INSTALLATION MANUAL

(NO. 0816)



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EXTRUSION
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