



**PLIDCO® TAP+ENCLOSURE
DOMED SPLIT BOLT-ON STYLE
INSTALLATION INSTRUCTIONS**

LANGUAGES:

CLICK ON LANGUAGE DESIRED

ENGLISH

SPANISH



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PLIDCO® TAP+ENCLOSURE DOMED SPLIT BOLT-ON STYLE INSTALLATION INSTRUCTIONS

!! WARNING!!

IMPROPER SELECTION OR USE OF THIS PRODUCT CAN RESULT IN EXPLOSION, FIRE, DEATH, PERSONAL INJURY, PROPERTY DAMAGE AND/OR HARM TO THE ENVIRONMENT.

Do not use or select a PLIDCO Tap+Enclosure until all aspects of the application are thoroughly analyzed. Do not use the PLIDCO Tap+Enclosure until you read and understand these installation instructions. If you have any questions, or encounter any difficulties using this product, please contact: PLIDCO 440-871-5700

READ CAREFULLY

The person in charge of the repair must be familiar with these instructions and communicate them to all personnel involved in the repair crew.

Safety Check List

Pipeline repairs can be made with the pipeline in operation or shutdown.

- Read and follow these instructions carefully. Follow your company's safety policy and applicable codes and standards. If the PLIDCO Tap+Enclosure is to be installed underwater, be sure to read the *Underwater Installation* section.
- Whenever a PLIDCO product is modified in any form including adding a vent or changing seals by anyone other than the Engineering and Manufacturing Departments of The Pipe Line Development Company or a PLIDCO certified repacking company, the product warranty is voided. Products that are field modified do not have the benefit of the material traceability, procedural documentation, quality inspection and experienced workmanship that are employed by The Pipe Line Development Company.
- The PLIDCO Tap+Enclosure should never be used to couple pipe unless sufficient end restraint is provided such as with a Plidco Clamp+Ring. The PLIDCO Tap+Enclosure has no end restraint rating in its unwelded condition, and if so utilized could result in EXPLOSION, FIRE, DEATH, PERSONAL INJURY, PROPERTY DAMAGE, AND/OR HARM TO THE ENVIRONMENT.
- Observe the maximum allowable operating pressure (MAOP) and temperature on the label of the PLIDCO product. Do not exceed the MAOP or temperature as indicated on the unit.

- ❑ Be absolutely certain that the correct seal material has been selected for the intended use. Contact PLIDCO or an authorized PLIDCO distributor if there are any questions about the seal capability with the pipeline chemicals and temperatures.
- ❑ The PLIDCO Tap+Enclosure may be operated at the full design pressure in its bolted (non-welded) state.
- ❑ When repairing an active leak, extreme care must be taken to guard personnel. Severe injury or death could result.
- ❑ During the *Pipe Preparation* and *Installation* procedures, those installing the PLIDCO Tap+Enclosure must wear, at minimum, Z87+ safety eyewear and steel toe safety footwear.
- ❑ If the pipeline has been shut down, re-pressuring should be done with extreme caution. Re-pressuring should be accomplished slowly and steadily without surges that could vibrate the pipeline and fitting. Industry codes and standards are a good source of information on this subject. Except for testing purposes, do not exceed the design pressure of the PLIDCO Tap+Enclosure. Personnel should not be allowed near the repair until the seal has been proven.

Pipe Preparation

1. Remove all coatings, rust and scale from the pipe surface where the circumferential seals of the PLIDCO Tap+Enclosure will contact the pipe (see Figure 1). A near-white finish, as noted in SSPC-SP10 / NACE No.2, is preferred. The cleaner the pipe surface the more positive the seal.
2. Where the circumferential seals will contact any pipe welds, the welds in this vicinity must be ground flush with the outside diameter of the pipe.
3. Circumferential pipe welds within the circumferential seals do not need to be ground flush as long as the weld height does not exceed 3/16 inch (4.7 mm) (see Figure 1).

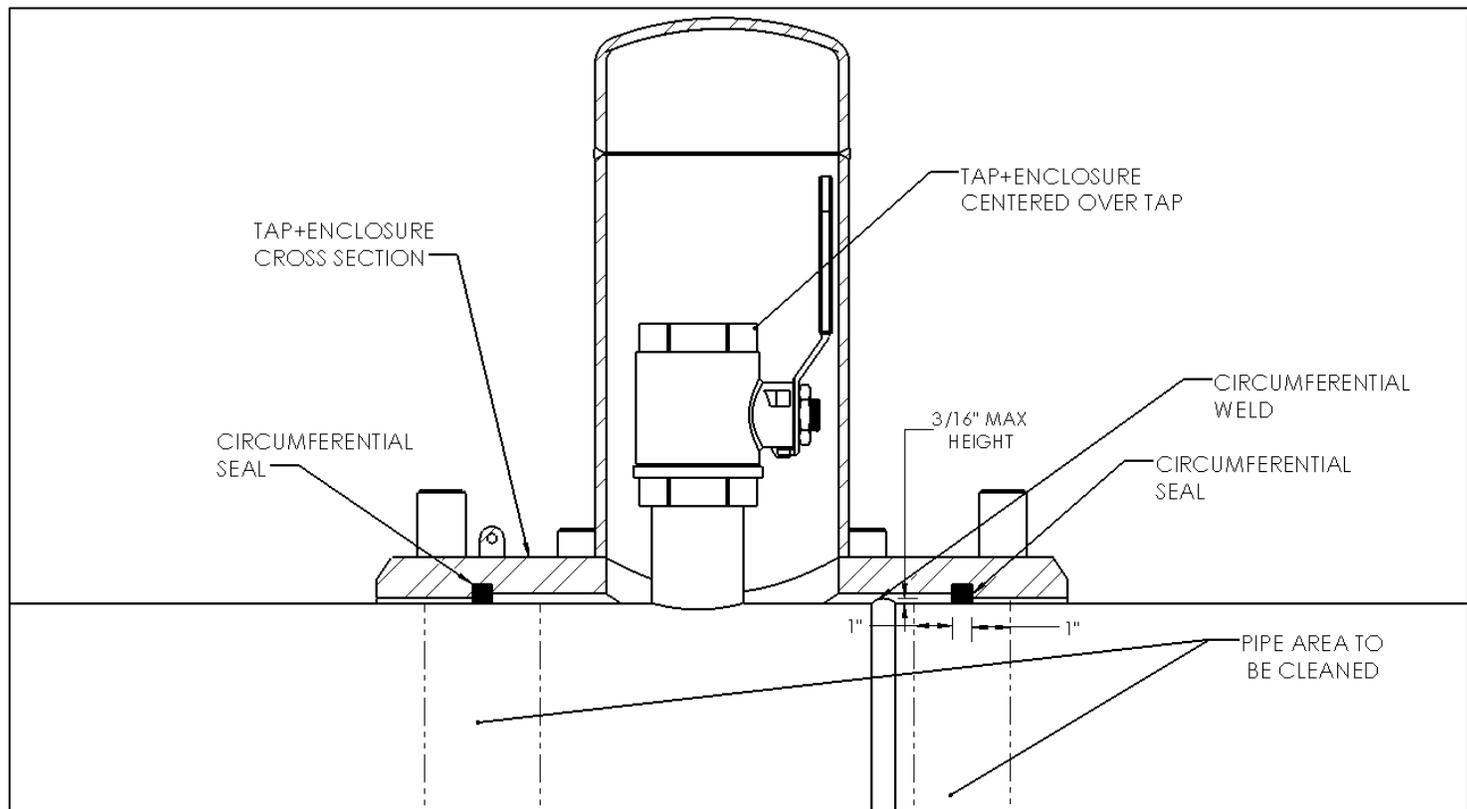


Figure 1

1. If the two sleeve halves were shipped as an assembled unit, it would have been shipped with spacers between the two halves to prevent damage to the longitudinal seals and ends of the circumferential seals. Typically, small diameter nuts are used for the spacers. The spacers must be removed and discarded before installing the PLIDCO Tap+Enclosure. Failure to remove the spacers will prevent proper compression of the seals.
2. Coat all exposed surfaces of elastomer seals with a lubricant. Table 1 lists the lubricants that are recommended for the various seals. The customer must determine if the lubricant is compatible with the product in the pipeline. Lubricant is not recommended for underwater installations or braided packing. Refer to the section on Underwater Installations.

Petroleum based lubricants	= A	
Silicone based lubricants	= B	
Glycerin based lubricants	= C	
Super Lube® Grease (1)	= D	
		Temperature (2)
Buna-N	A, B, C, D	225°F (107°C)
Viton	A, B, C, D	250°F (121°C)
Silicone	C, D	300°F (149°C)
Neoprene	B, C, D	250°F (121°C)
Aflas	A, B, C, D	225°F (107°C)
Hycar	A, B, C, D	180°F (82°C)
(1) Super Lube® Grease is a product of Synco Chemical Corporation. (www.super-lube.com)		
(2) Temperature limit is for the seal material only and does not imply the pressure rating is necessarily applicable at this limit.		

Table 1: Approved Lubricants

3. Clean and lubricate all studbolts and nuts, and prove free and easy nut running prior to the installation. Lubricant is not recommended for underwater installations.

Note: The type of lubricant will dictate the torque value per the PLIDCO torque chart on page 11.

4. Assemble the PLIDCO Tap+Enclosure around the pipe and centered over the tap or obstruction being covered making sure the yellow painted ends are matched. At no point should any weld, leak, or anomaly be closer than ½" from the circumferential seals. Try to avoid having any leak spraying directly onto the longitudinal seals.

Most Tap+Enclosures will have two different studbolt lengths. Make sure the longer studbolts are in the proper bolt holes; where PLIDCO Tap+Enclosures with 3 holes per side have the longer bolts in the two center holes, and the ones with more than 3 holes per side have the longer bolts in the four corner holes (see Figures 3 and 4)

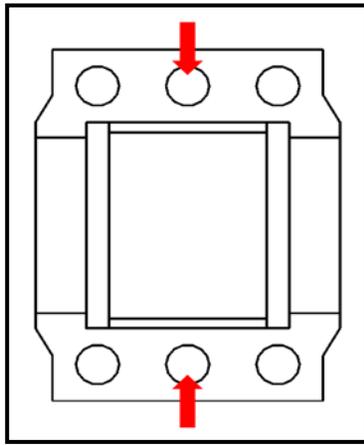


Figure 3

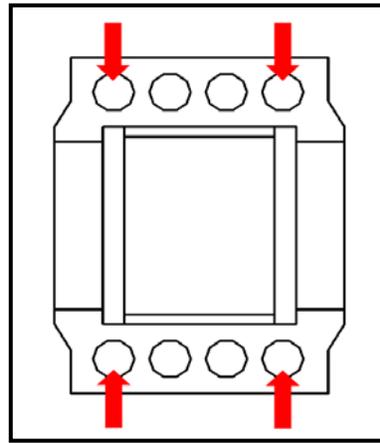


Figure 4

Sometimes it is helpful to loosely assemble the PLIDCO Tap+Enclosure to one side of the leak with the studbolts loosely secured, then reposition it centered over the leak.

5. Torque the studbolts uniformly as indicated by the corresponding value per bolt size from the **PLIDCO Torque Chart** located on page 11 of these instructions. The best results are obtained by maintaining an equal gap all around the side bars while tightening the studbolts. Ensure there is full nut engagement by having a minimum of 1/4 inch (6.4 mm) of studbolt extending beyond the nut. The sequence for torqueing the studbolts should follow the pattern shown Figure 5, and should be executed repeatedly as follows:
 - a. 1st time- Hand tight or 10% of the minimum torque value to bring the 2 halves together
 - b. 2nd time - 50% torque.
 - c. 3rd time- 100% torque.
 - d. Repeat the sequence at 100% torque until all the studbolts and nuts are unable to continue spinning.

Note: The torque values listed on the PLIDCO Torque Chart represent residual torque. The initial torque value may need to be slightly higher due to bolt relaxation. Applicable industry methods should be used to verify bolt preload. A rechecking of torque is recommended at 4 and 24 hours after installation.

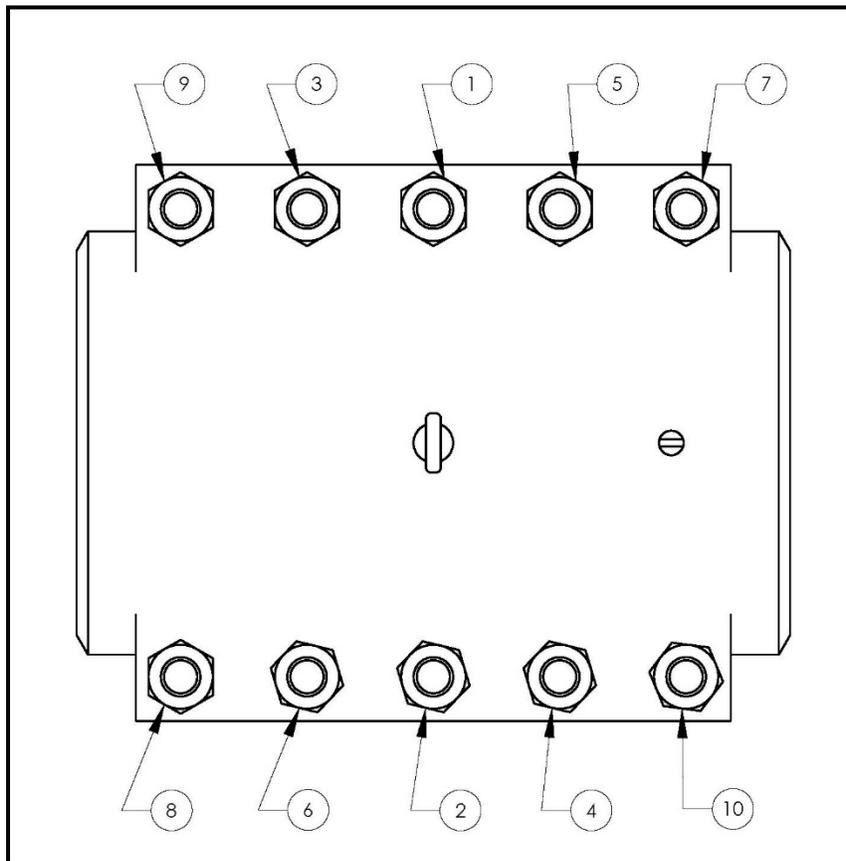


Figure 5

6. The side bars are gapped approximately 1/8 inch (3.2 mm) or less when the PLIDCO Tap+Enclosure is fully tightened.
7. Verify that the leak has been contained by visually inspecting for leaks or performing a field hydrotest.
8. If the fitting was supplied with vents, verify that the vents are snug. For all vents that were removed during installation or for hydrotesting, new Teflon tape, thread sealant, or anaerobic thread sealant shall be reapplied to the threads.

Re-pressuring and Field Testing

If the pipeline has been shut down, re-pressuring should be done with extreme caution. Re-pressuring should be accomplished slowly and steadily without surges that could vibrate the pipeline or produce a sudden impact load. Industry codes and standards are a good source of information on this subject.

Except for testing purposes, do not exceed the design pressure of the PLIDCO fitting. The PLIDCO fitting is designed to be tested up to 1½ times its design pressure. However, PLIDCO recommends following API Recommended Practice 2201, Procedures for Welding or Hot Tapping on Equipment in Service, Section 6.5. The test pressure should be at least equal to operating pressure of the line or vessel, but not to exceed internal pressure by 10%. This is meant to avoid possible internal collapse of the pipe or vessel wall. However, if prevailing conditions could cause collapse of the pipe or pressure walls, the test pressure may be reduced. (See API Standard 510 Section 5.8 for pressure testing precautions.) Personnel should not be allowed near the repair until the seal has been proven.

Field Welding Instructions

Welding is not a requirement for the pressure sealing ability of the PLIDCO Tap+Enclosure. The issue of welding is dependent on your company's requirements, applicable codes, and if longitudinal loads need to be carried by the PLIDCO Tap+Enclosure.

!! WARNING!!

Failure to follow field welding instructions could result in explosion, fire, death, personal injury, property damage and/or harm to the environment.

All of the aspects for in-service welding of PLIDCO Split+Sleeves are not addressed by this document. ASME PCC-2, API 1104 Appendix B, ASME Section IX, PRCI L52047, PRCI Hot Tap® Model, and other industry information pertaining to in-service welding must be considered when planning in-service welding. Refer to IP-019, Welding Considerations for addition information.

It is recommended that the pipeline should be full and under flow.

Welders and weld procedures should be qualified in accordance with API Standard 1104, *Welding of Pipelines and Related Facilities*, Appendix B, *In-Service Welding*. We strongly recommend the use of a low hydrogen welding process such as GMAW or SMAW using low hydrogen electrodes (E-XX18) because of their high resistance to moisture pick-up and hydrogen cracking. These are also the preferred welding process for seal welding the studbolts and nuts. SMAW electrodes must be absolutely dry.

Use weld material with equal or greater tensile strength than the pipe. Carefully control the size and shape of the circumferential fillet welds. The size of the fillet weld should be at least 1.4 times the wall thickness of the pipe. This assumes a 1.0 joint efficiency. You may need to select a different joint efficiency based on your level of inspection. Strive for a concave faced fillet weld, with streamlined blending into both members; avoid notches and undercuts. The smoother and more streamlined the weld, the greater the resistance to fatigue failure. The worst possible shape would be a heavy reinforced convex weld with an undercut. Improper weld shape can lead to rapid fatigue failure, which can cause leakage, rupture or an explosion with attendant serious consequences.

It is very important that the field welding procedure closely follow the essential variables of the qualified procedure so that the quality of the field weld is represented by the mechanical tests performed for the procedure qualification.

We do not recommend the use of thermal blankets for pre-heating. Thermal blankets can generate hot spots and reduce the ability of the PLIDCO Tap+Enclosure to dissipate welding heat in the vicinity of the seals. We recommend a small torch, such as a cutting torch, being careful not to aim the flame directly into the gap between the PLIDCO Tap+Enclosure and the pipe towards the seals. The flame from a preheat torch is helpful in burning off oils and other contaminants. Do not use a large torch, commonly called a rosebud, because of the difficulty controlling the size of the area being preheated.

Monitor the heat generated by welding or preheating, particularly near the area of the seals, by using temperature crayons or probe thermometers. If the heat generated approaches the temperature limit of the seal material, which is indicated on the label, welding should be discontinued or sequenced to another part of the fitting so that the affected area has a chance to cool.

Seal welding the grade B-7 studbolts of the PLIDCO Tap+Enclosure is the most difficult phase of field welding. They are made of AISI 4140 steel with a high carbon equivalence. By using a low hydrogen welding process with preheat, the problem of hydrogen cracking and pinholes can be reduced. The preheat will dry out any moisture, oil dampness or thread lubricant that may be present in the weld area. If the studbolt lengths need to be cut back, allow at least 1/4 inch (6.4 mm) of studbolt beyond the nut for the fillet weld. Preheat the studbolt and nut and then weld the nut to the studbolt. Check the preheat and weld the nut to the sidebar.

Refer to IP-019, Welding Considerations for addition information.

WELDING AFTER A CONSIDERABLE TIME LAPSE AFTER THE INITIAL INTALLATION

PLIDCO recommends that if the PLIDCO Tap+Enclosure is to be welded, the welding be completed as soon as possible after the installation; as conditions permit. Welding at a significantly later date relies heavily on whether proper installation procedures were followed and the compatibility of the elastomeric gaskets with the product in the pipeline.

After the installation of the PLIDCO Tap+Enclosure there is no meaningful test that can be performed to determine the condition of the gaskets or the remaining service life the gaskets. There are many variables that can affect the condition of the gaskets over which PLIDCO has no control.

If the PLIDCO Tap+Enclosure is to be welded at a significant time lapse from the installation, the follow precautions should be followed:

1. The PLIDCO Tap+Enclosure must be closely inspected for any leakage that may have developed.
2. The studs and nuts should be retightened per the recommended torque value.
3. If possible, the pressure in the line should be reduced.
4. Some flow in the line is still required to dissipate the welding heat to prevent damage to the elastomeric seals.
5. Following the recommended welding practices as listed under Field Welding Instructions.

Welding Sequence

Caution should be observed so that welding does not overheat the seals. Sequence the welding so that the heat is not concentrated in one area. It will be necessary to re-torque the studbolts and nuts periodically during field welding because weld contraction causes them to loosen.

1. Fillet weld ends to pipe. (See Figure 6)
2. Seal Weld side openings.
3. Re-torque studbolts and nuts.
4. Seal weld nuts to studbolts.
5. Seal weld nuts to side bars.
6. Seal weld vent plugs, if applicable.

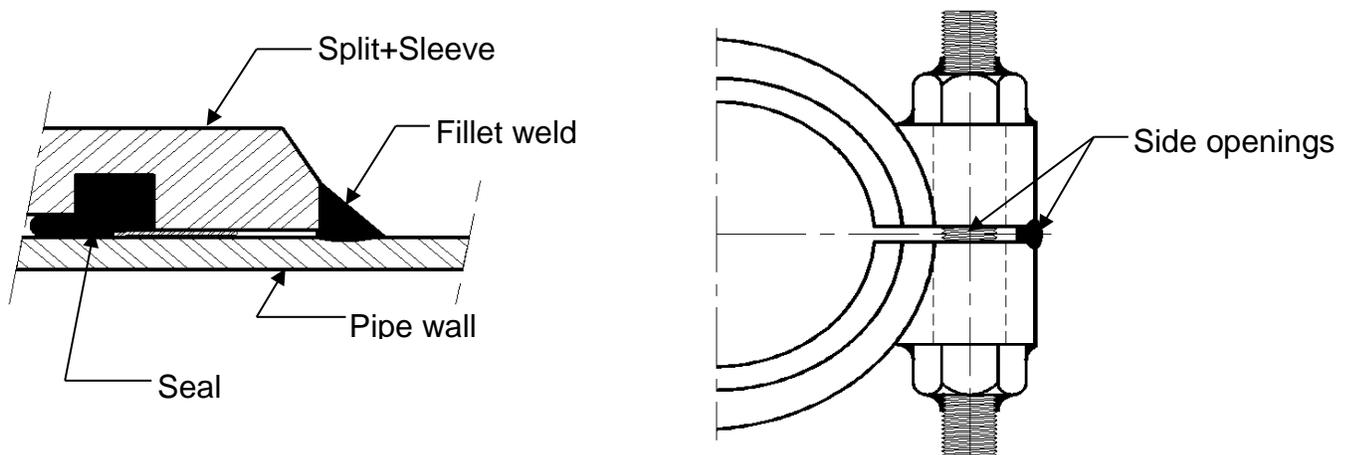


Figure 6

Storage Instructions

PLIDCO Tap+Enclosure should be stored in a dry environment to prevent the unpainted surfaces from rusting. Storage temperatures should not exceed 120°F (49°C). Cover with dark polyethylene to keep the direct sunlight from the packing. It is best to exclude contamination, light, ozones and radiation. Improperly stored PLIDCO Split+Sleeves can cause the seal material to become cracked and brittle and lose its ability to seal.

Traceability

PLIDCO Tap+Enclosure, as most PLIDCO products, have a unique serial number by which the fitting is fully traceable. Additionally, all elastomer seals have a unique batch number by which the seal material is traceable.

Recommended Inspection Schedule

1. After the pipeline is re-pressurized and field tested (see *Re-pressuring and Field Testing* for precautions) the torque values should be checked again 4 hours after installation. Then, the torque values should be checked again 24 hours after that.
2. It is recommended that if the product is not being welded, that torque striping be applied from the nuts to the sidebar of the PLIDCO Tap+Enclosure so any loosening of the bolts can be visually seen during an inspection.
3. 6 months after installation it is recommended that a visual inspection occurs that checks for visible signs of leakage, bolt/nut loosening, and general wear or corrosion.
4. After the 6-month inspection occurs, a yearly visual inspection is recommended that checks for visible signs of leakage, bolt/nut loosening, and general wear or corrosion.

Underwater Installation

WARNING!

This warning is only applicable to a non-leaking, underwater installation. When assembling a PLIDCO Tap+Enclosure product under water (or under any liquid) it is possible to build up thousands of pounds of pressure in the annulus between the fitting and the pipe. The pressure is caused by compressing the fluid trapped in the annulus as the two fitting halves are closed and tightened. For installations over a leak, pressure in the annulus equalizes with the pressure in the pipe. The pressure trapped in the annulus may have the following effects:

The pressure rating of the split product is exceeded causing leakage or damage to the fitting.

The pipe on which the fitting is installed is damaged.

Personal injury or death due to subsequent removal of a vent plug.

RECOMMENDATIONS

The Pipe Line Development Company strongly recommends the following for non-leaking, underwater installations:

1. All fittings are supplied with vents.
2. Vents are open during installation.

Additionally, the Pipe Line Development Company recommends not using a lubricant on the seals or on the studbolt and nut threads. This is to prevent sand, gravel, or debris from sticking to the lubricant and possibly interfering with sealing and/or obtaining accurate torque reading on the stud bolts. It is recommended that the torque value listed under the 0.15 C_f (coefficient of friction) be used for non-lubricated studs installed underwater.

PLIDCO Torque Chart for Tap+Enclosure

Nominal Diameter of Studbolt (inches) (see Note 2)	Wrench Opening Across Flats (inches)	Torque Values (see Note 1)	
		0.15 C _f	
		ft-lbs	Nm
		25,000 psi pre-stress	
5/8--11	1-1/16	56	76
3/4--10	1-1/4	98	133
7/8--9	1-7/16	156	212
1--8	1-5/8	233	316
1-1/8--8	1-13/16	342	464
1-1/4--8	2	480	651
1-3/8--8	2-3/16	651	883
1-1/2--8	2-3/8	857	1160
1-5/8--8	2-9/16	1110	1490
1-3/4--8	2-3/4	1390	1890
1-7/8--8	2-15/16	1730	2350
2--8	3-1/8	2120	2870
2-1/4--8	3-1/2	3050	4140
2-1/2--8	3-7/8	4230	5740
		23,000 psi pre-stress	
2-3/4--8	4-1/4	5220	7080
3--8	4-5/8	6890	9340
3-1/4--8	5	8800	11900
3-1/2--8	5-3/8	11000	15000
3-3/4--8	5-3/4	13600	18500
4--8	6-1/8	16600	22500
		18,800 psi pre-stress	
4-1/4--8	6-1/2	16300	22100
4-1/2--8	6-7/8	19400	26300
4-3/4--8	7-1/4	22900	31000
5--8	7-5/8	26700	36300
5-1/4--8	8	31000	42100
5-1/2--8	8-3/8	35700	48400
5-3/4--8	8-3/4	40900	55400
6--8	9-1/8	46500	63000

Studs: ASTM A193 Grade B7 - Nuts: ASTM A194 Grade 2H

Note 1: The torque values listed are residual torque value. This is the torque value and residual stress after bolt relaxation. The studs and nuts must be clean, free running, free of obvious flaws. The values listed assume that the nuts are properly lubricated with a lubricant having an approximate coefficient of friction (μ) 0.15 or k factor of 0.19 such as light weight machine oil. If a lower coefficient of friction lubricant is used, such as graphite, please contact PLIDCO's Engineering department for appropriate torque values.

Note 2: The second number is the pitch, which is shown in number of threads per inch.

Note 3: Use the pre-stress value shown for the applicable studbolt size if bolt tensioners are to be used and follow the bolt tensioner manufacturer's instructions.

Note 4: This chart is also to be used for all PTFE (Teflon) coated studs.

4. Pipe outside diameter tolerance is $\pm 1\%$ for 6-inch nominal pipe size and smaller. For pipe sizes larger than 6-inch nominal the tolerance is ± 0.06 inch (± 1.5 mm).
5. The seal can tolerate minor surface irregularities up to $\pm 1/32$ inch (0.8 mm) deep. The defective surfaces may be rendered suitable for sealing by applying a suitable epoxy such as Belzona 1161 and sanding or filing the surface to match the required outer diameter.
6. A PLIDCO Tap+Enclosure is capable of sealing on out-of-round pipe up to approximately 5% ovality. This is based on the ability of the bolting to reshape the pipe. For very thick wall pipe the bolting may not be able to reshape the pipe. Badly out-of-round pipe may require repositioning the PLIDCO Split+Sleeve or using of a different length PLIDCO Tap+Enclosure to ensure the circumferential seals are positioned on round pipe.
7. A PLIDCO Tap+Enclosure is not capable of reshaping flattened or dented pipe.

Installation

Careless handling can damage the seals and GirderRings (seal retainers). Lifting devices such as chains, cables or lift truck forks should not be allowed to contact the seals or GirderRings. Contact can result in the seals being pulled from their grooves. (See Figure 2)

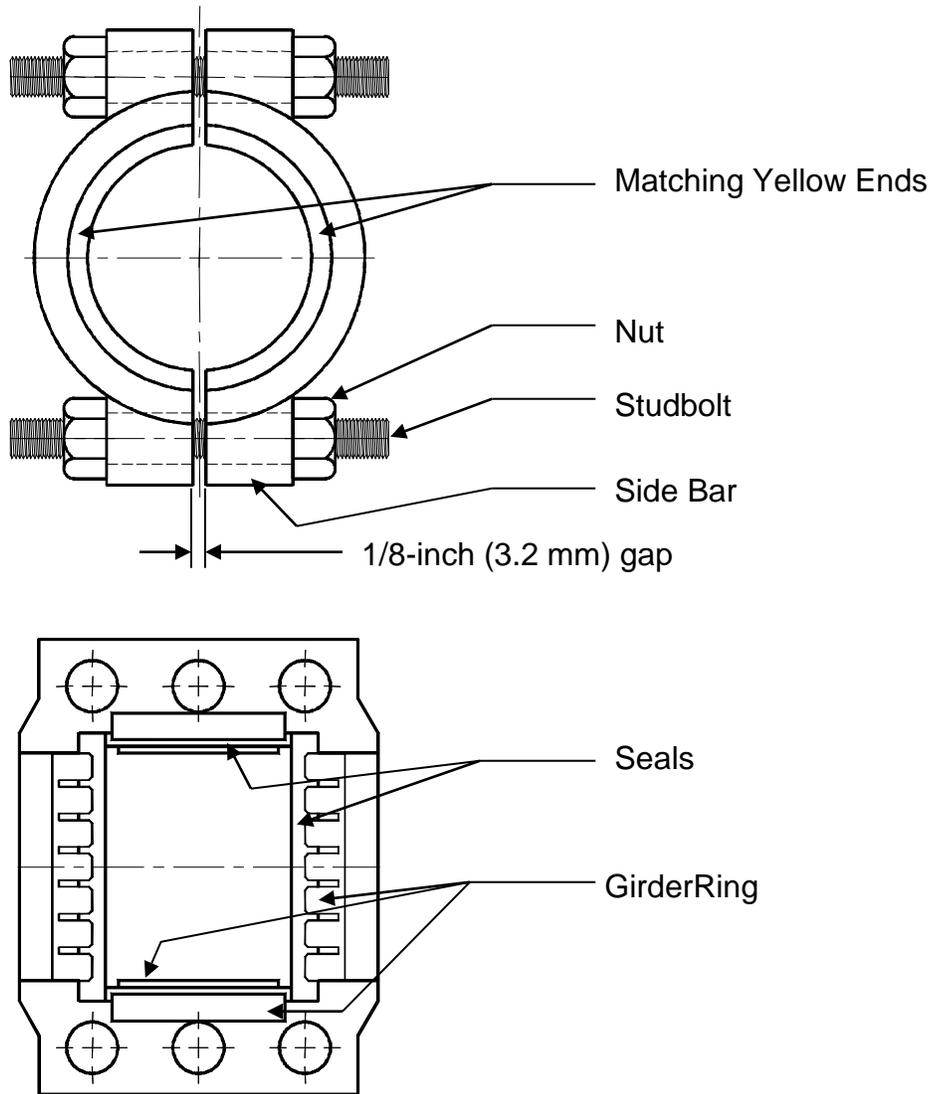


Figure 2

PLIDCO[®]

SPANISH INSTRUCTIONS
COMING SOON