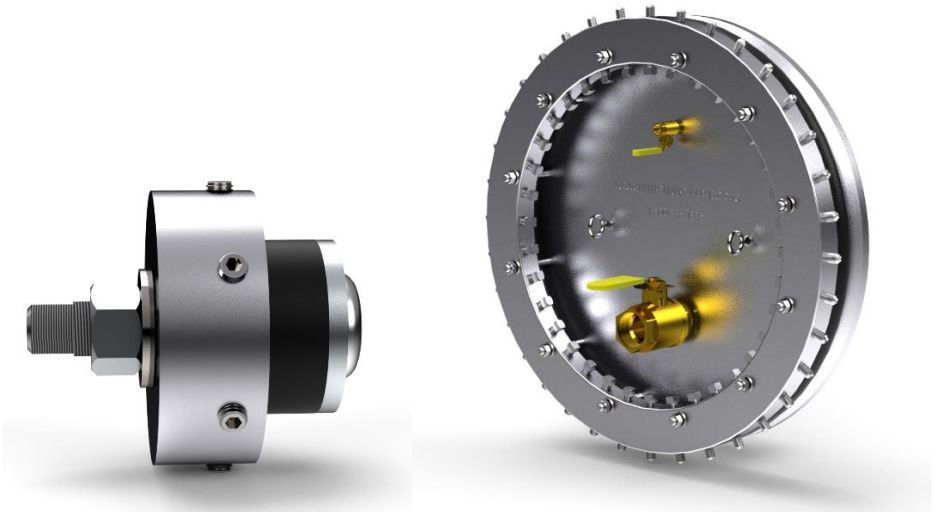
Petersen
Products Company



145-9 Series Mechanical Plug

www.PetersenProducts.com

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1. Important Safety Instructions

SAFETY IS EVERYONE'S RESPONSIBILITY

READ AND UNDERSTAND BEFORE USING PETERSEN® PIPE PLUGS!

FAILURE TO COMPLY MAY RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH!

WARNING

- Very high forces are involved in many pipeline plugging situations that may cause injury or even death.
- Forces increase dramatically as pressure and pipe diameter increase.
- Take extreme care to assure the safe use of any pipe plug.
- Keep personnel out of line with plug ends, unsupported areas of plug, open plugged pipelines, or manholes. This is any area near a line of sight to any part of the plug.
- Maximum rated backpressures assume plugs are inserted into clean dry pipes. Dirt in pipes (algae, grease, detergents, mildew, sand, etc.) can considerably decrease the backpressure values.
- Pipelines made of materials with lower coefficient of friction, e.g. polyethylene or new pipelines with remains of grease or agents directly decrease the coefficient of friction as well as the backpressure values.
- Never use when failure may result in injury or significant property damage.
- Inflatable devices may not be used as the primary protection for personnel downstream.

Due to the many possible variables these general instructions must be adapted by a competent professional Engineer for each specific project. Instructions and training must be provided to all plug users and workers on the job. Refer to website.

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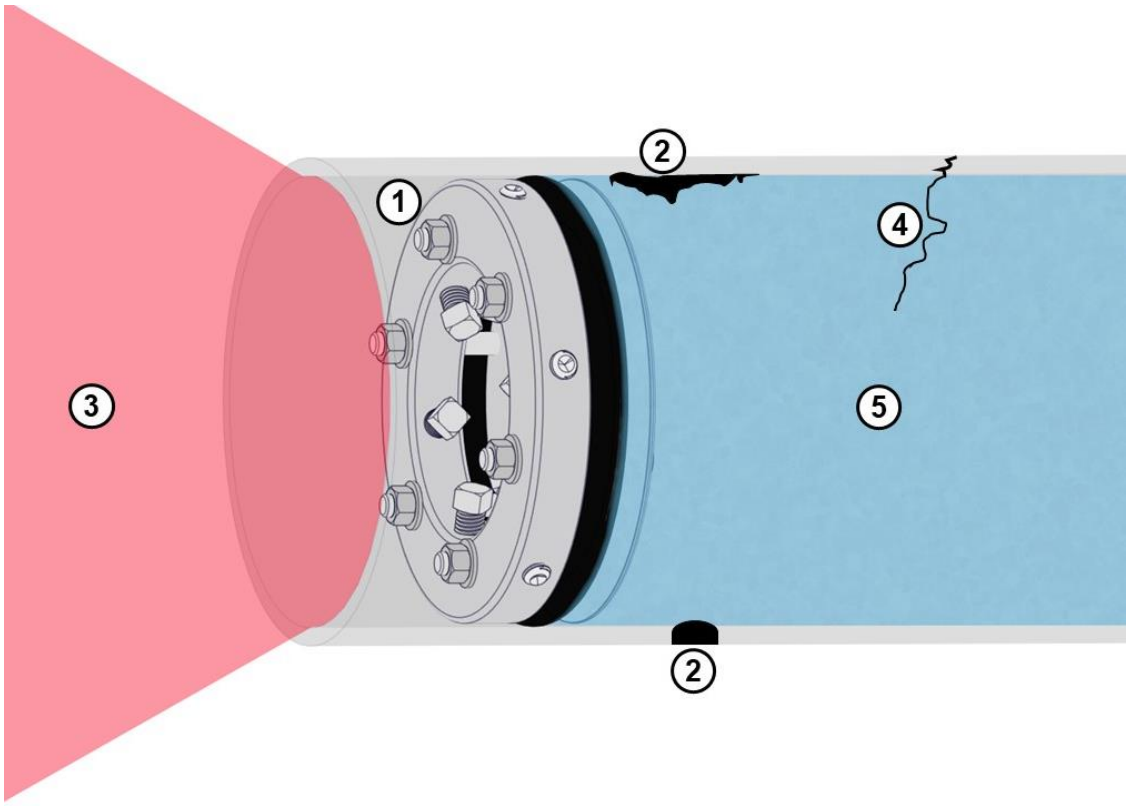

1. All pipe plugs must be blocked or anchored adequately against a force equal to the head pressure times the cross-sectional area of the pipe. Common Anchoring Methods – strongback outside of pipe, anchor points drilled into pipe walls or weld anchor lugs into the pipe.
2. Debris or protrusions in the pipeline can prevent a workable seal. Thoroughly clean the pipeline before insertion of the pipe plug. Maximum rated pressures assume pipe plugs are fully inserted into clean dry pipes.
3. Mechanical plug failure could cause injury, catastrophic damage or death. Keep all personnel out of the plug end area – DANGER ZONE – when plug is in use.
4. NEVER use a test pressure greater than the capacity of the weakest pipe or component in the system.
5. Stop the pipeline flow before installing any type of Pipe plug.
6. Insert the Pipe plug seal surface completely so it is fully supported by the pipeline.
7. Do not exceed the pressures on the plug label.

PERSONNEL SAFETY

1. Due to the many possible variables these general instructions must be adapted by a competent professional engineer for each specific project. Instructions and training must be provided to all users and workers on the job.
2. If your pipe plug has a Safety and User Manual, be sure to read and understand it.
3. Properly wear and use all required Personal Protective Equipment (PPE) and Safety equipment, for your application. Common items include eye protection, hardhat, gloves, safety shoes, hearing protection, and protective clothing.
4. Determine if the area is considered a Confined Space. Refer to Occupational Safety and Health Administration (OSHA) (29CFR 1910.146), Safe Confined Space Entry. Follow all federal, local and site specific codes, standards and regulations.

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2. Basic Rules for Using Any Pipe Plug

A. Select a pipe plug manufactured for the actual size, pressure, temperature, and chemical requirements of your application. Consult PPC engineering for more information.

B. Release the back pressure or equalize pressure on both sides of the pipe plug before installing, deflating and removing.

C. **NEVER** exceed the maximum rated head pressure for the pipe plug measured at the pipe invert. See Calculation Formulas.

D. Use accurate calibrated pressure gauges that agree for measuring the pipeline head pressure.

E. Mechanical and Molded Rubber Plugs are generally used for testing because fabricated Multi-Flex® style plugs may allow some seepage unless customized for a positive seal.

F. Before and after use, thoroughly inspect the Pipe plug for surface tears, cuts or any other damage.

G. **NEVER** use a Pipe plug in a pipe size different from the recommended usage range.

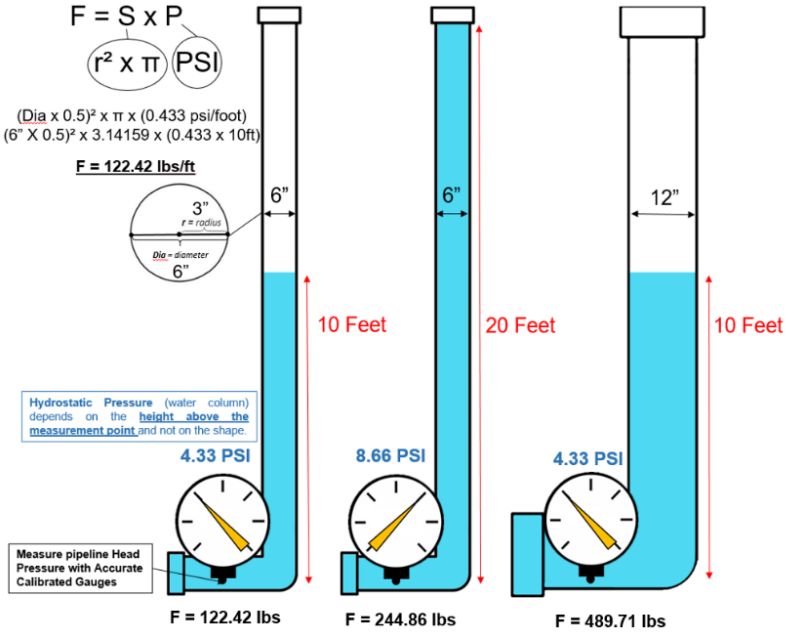
3. Calculating the Total Force that a Pipe Plug must Restrain

F = S x P

F = force on the Pipe plug (lbs.) pipe plug slipping force
S = (π x r^2) = pipe cross-sectional area (in^2), π = 3.14159, r is the Radius or ½ the diameter (inches)
P = pipeline pressure (psi), water column height must be converted to a force over area

As an example, a 10 foot water column converts to a back pressure of 4.33 psi (29.3 kPa). The configuration or liquid surface area does not affect pressure, only elevation.

Pressures exerted on a Pipe plug are the same for liquid, water or air. Ten (10) psi of water is the same as ten (10) psi of air as one example. **Use extreme caution!** Pressures from gases such as air and nitrogen are compressible and store energy, making them far more dangerous than water. As a result, the Pipe plug has a much greater force when discharging a slipping Pipe plug since gas will expand to its original atmospheric volume upon release.



4. Pre-Insertion Inspection

A. Verify all required tools and equipment are available for pipe plug installation.

B. Confirm ALL information on the pipe plug Data Tag.

C. Inspect pipe plug before and after every use. Possible damage can occur when inserting a plug into a pipe.

D. Inspect the Set Screws for any physical damage. Replace as needed. **Note:** Dull, damaged, or clogged points will not hold rate pressure.

E. Remove any dirt and debris from the pipe ID. The plug requires a clean landing area for an effective seal.

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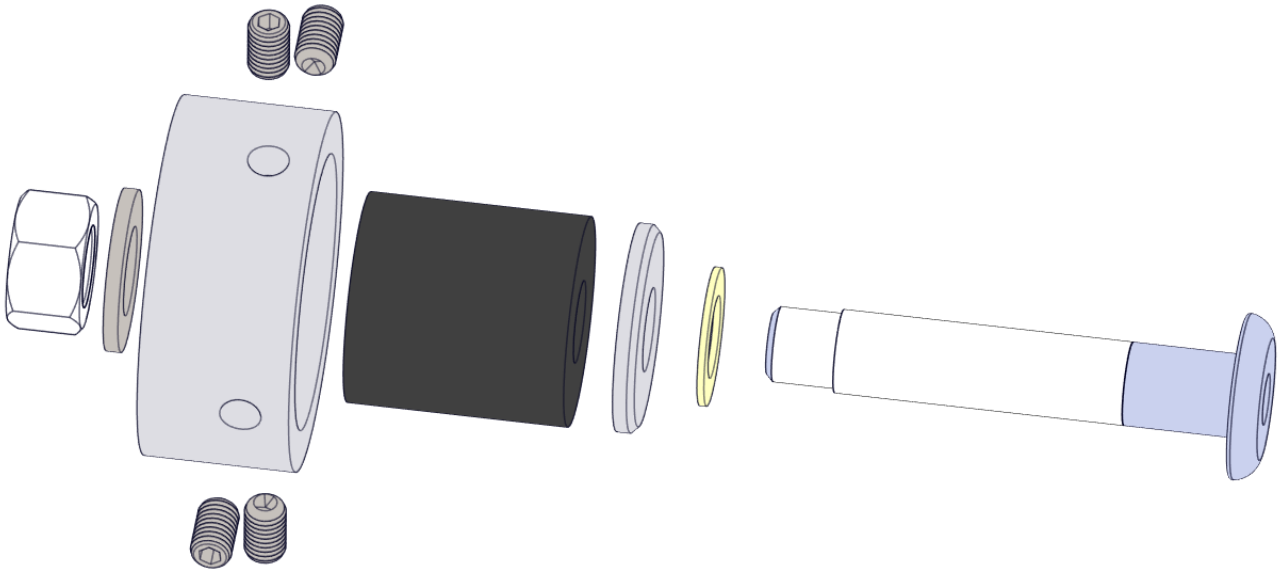
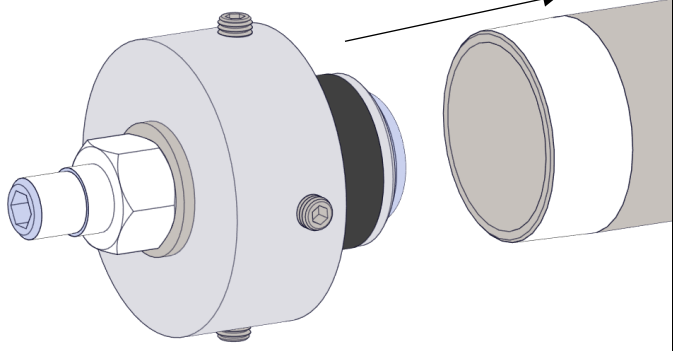
145-9 Series Pipe Plugs up to 3.75”

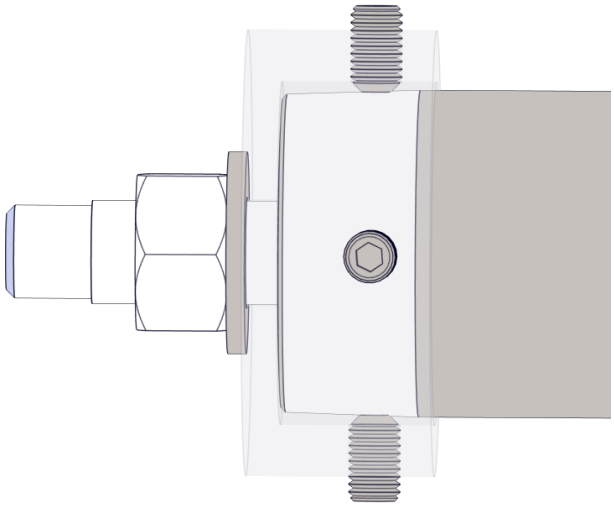


5.1 Mechanical Pipe Plug Installation - Up To 3.75”



1. Slide the plug onto the pipe. You may need to loosen the set screws.

NOTE: Thin wall pipes must be supported by a pipe clamp on the OD of the pipe. Contact Petersen if a pipe clamp is needed.



2. Verify that the edge of the pipe is flush against the inside back of the set screw housing.

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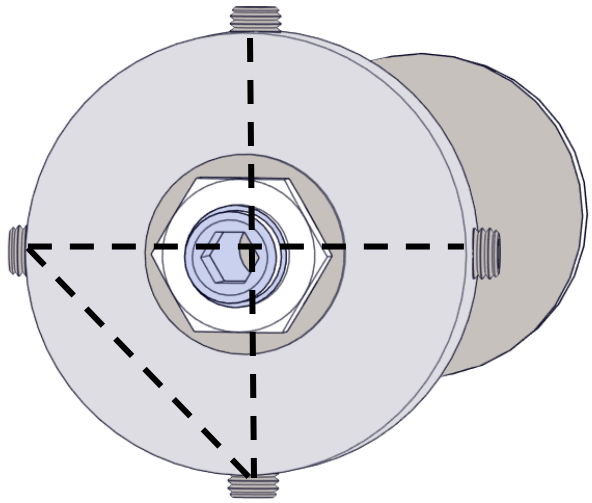
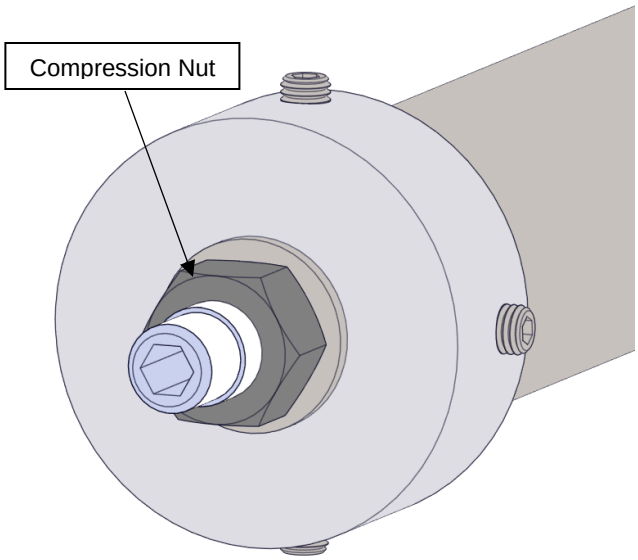
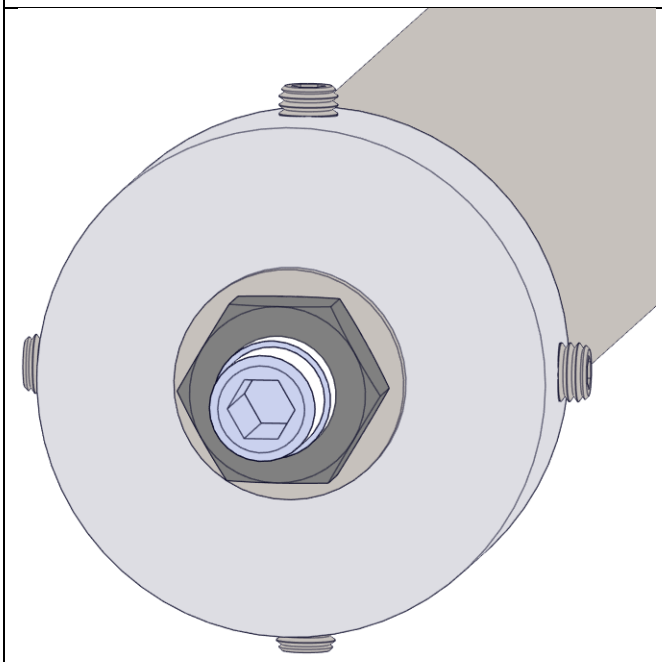


1. Tighten the set screws in a cross pattern. Sequence the torque three times 30%, 70%, 100% of the rated torque.

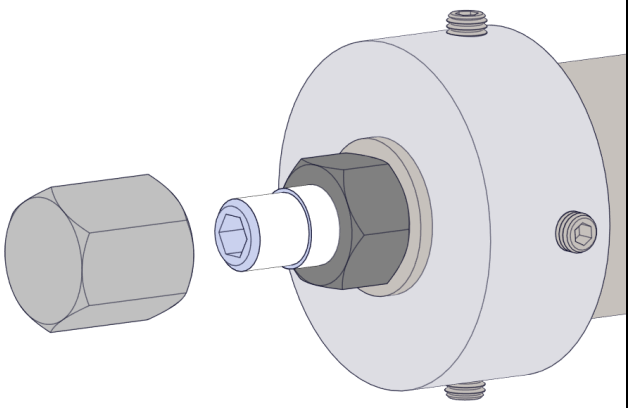
   NOTE: See the Data Tag or visit petersenproducts.com for torque figures.



2. Tighten and torque the compression nut to the rated torque. You may need to use an allen wrench on the shaft end to prevent the shaft from turning.



5. Stress relaxation can occur. Retorque the set screws and compression nut until the torque holds at the required values.



6. A high-pressure pipe cap may be installed to close the bypass.

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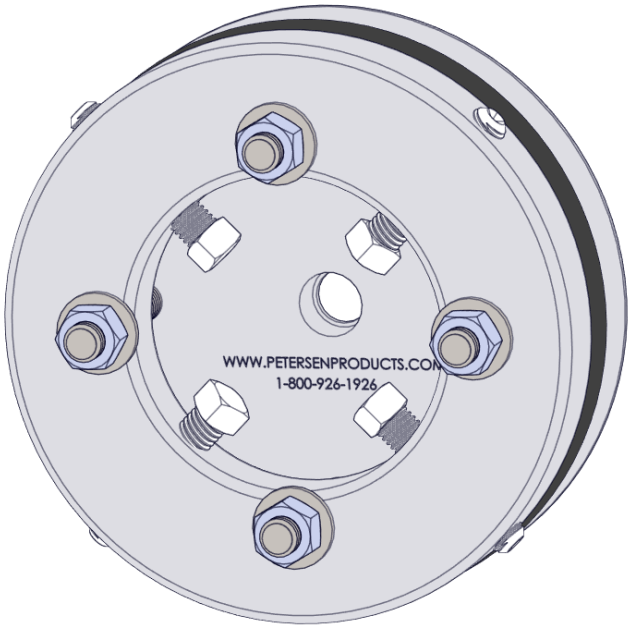
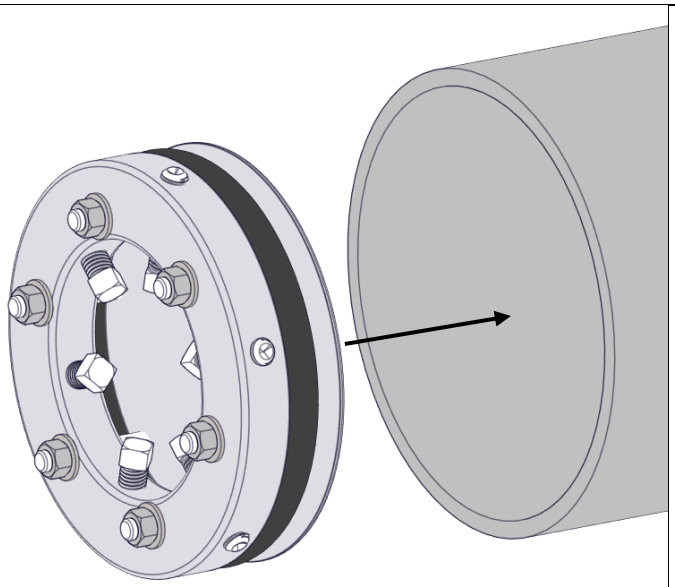
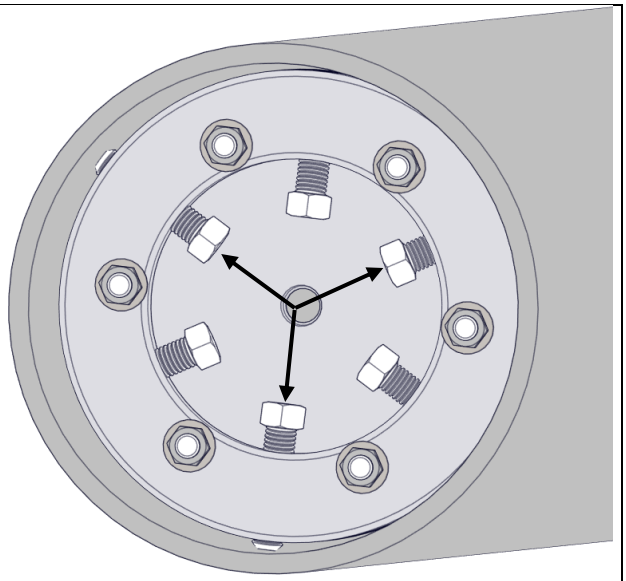
145-9 Series Pipe Plugs 3.75” and Larger



5.2 Mechanical Pipe Plug Installation - 3.75” and Larger



1. Insert Pipe plug into pipeline. You may need to loosen set screws. **NOTE:** Thin wall pipes must be supported by a pipe clamp on the OD of the pipe. Contact Petersen if a pipe clamp is needed.



2. Tighten Set Screws snug to center the plug in the pipe.

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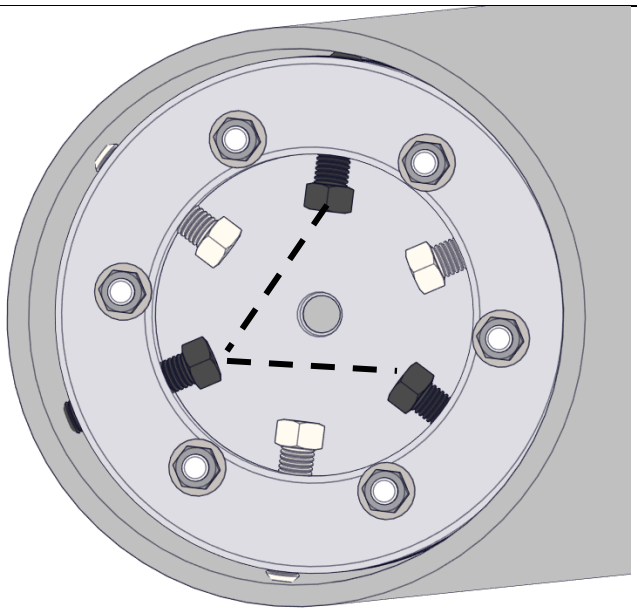
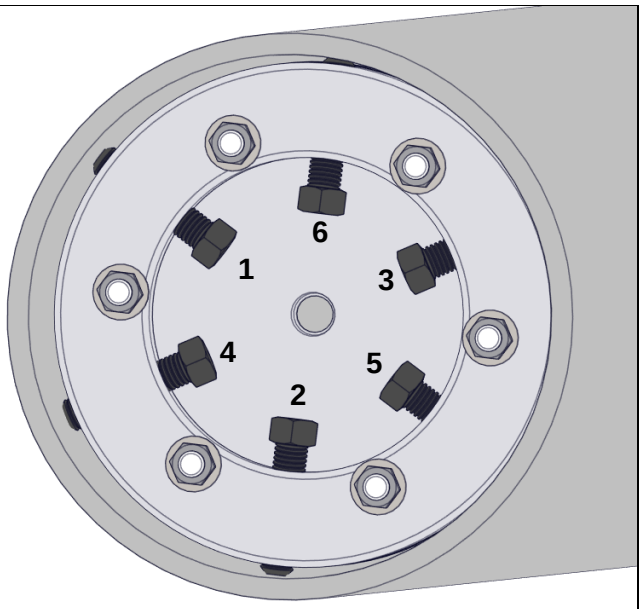
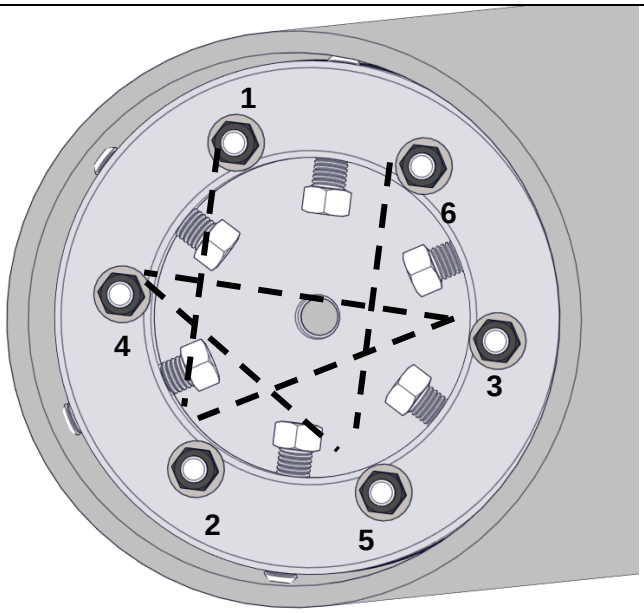


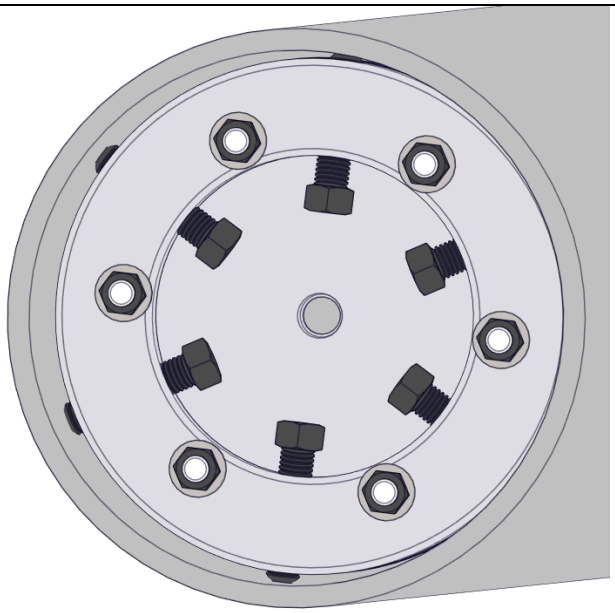
3. Tighten the remaining Set Screws in a cross pattern.



4. Sequence the torque for all set screws three times 30%, 70%, 100% of the rated torque.



5. Tighten and torque the Compression Nuts to the rated torque in a cross pattern. **NOTE:** See the Data Tag or visit petersenproducts.com for the torque figures.



6. Stress relaxation can occur. Retorque the Set Screws and Compressions Nuts until the torque holds at the required values.

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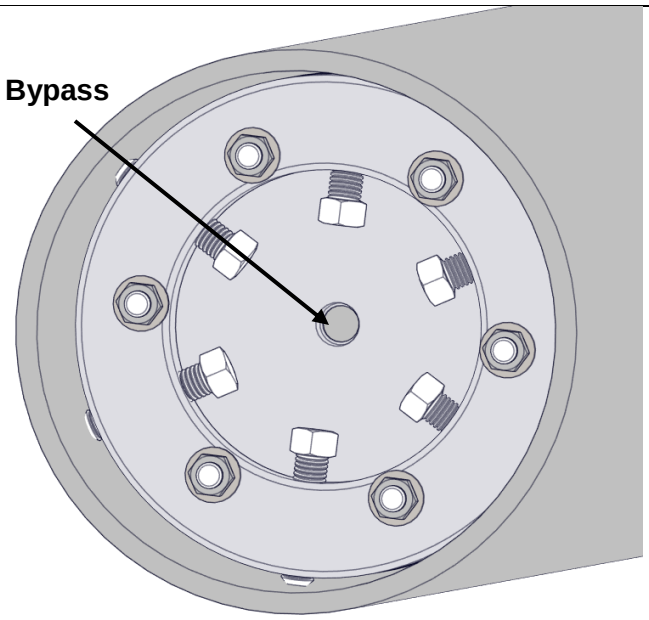

7. Install bypass or plug the pipe plug if needed.

5.3 Mechanical Pipe Plug Installation (Shoe Design) – 17” and Larger

1. Loosen the set screws on shoes so they slide freely.

NOTE: Thin wall pipes must be supported by a pipe clamp on the OD of the pipe. Contact Petersen if a pipe clamp is needed.

2. Turn Shoe Bolts clockwise to retract shoe to center of plug.

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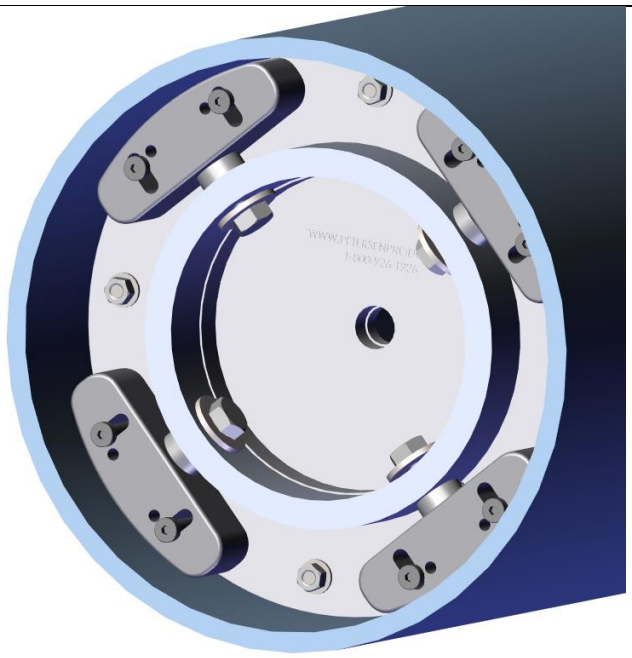
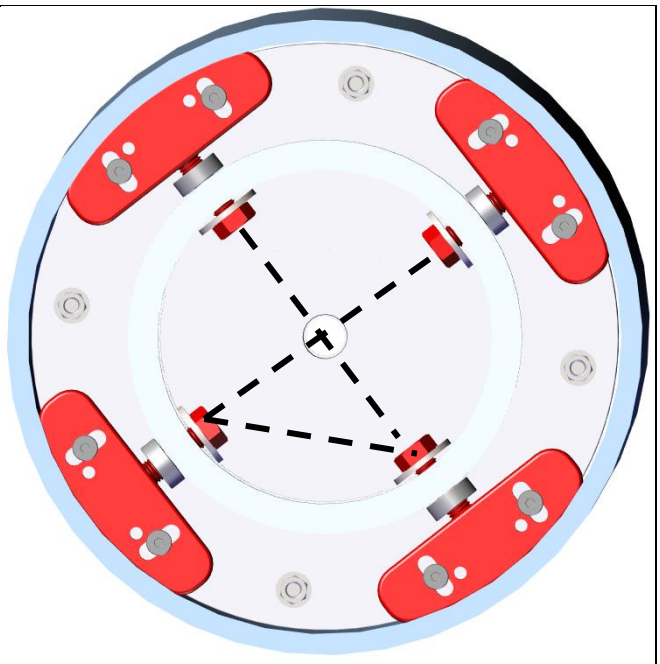
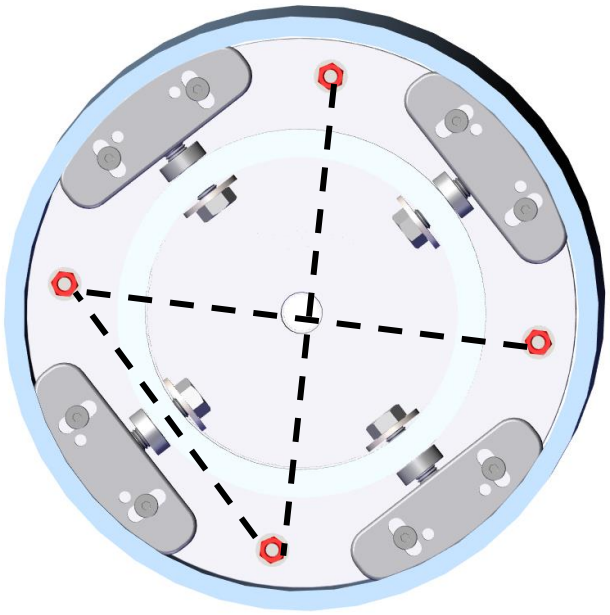


3. Insert Plug into pipe, keeping the plug face perpendicular to the pipe wall.

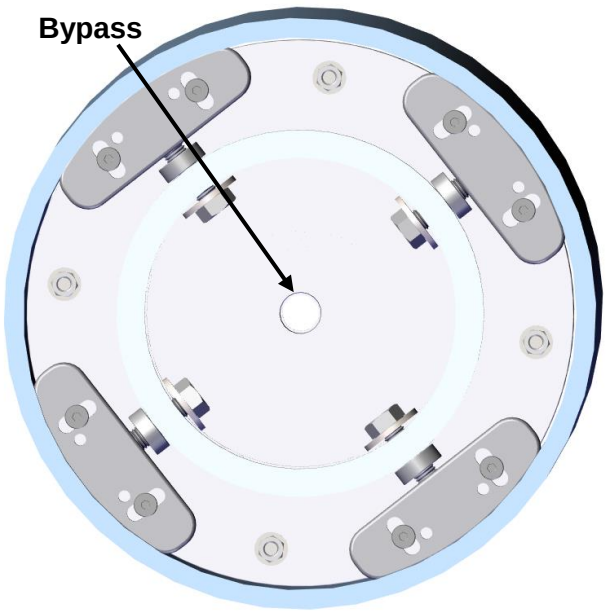


4. Turn the Shoe Bolts counter clockwise to secure the shoe to the pipe wall. Tighten in a cross pattern. Once tight, tighten the set screws on the shoes.

NOTE: See the Data Tag or visit petersenproducts.com for torque figures.



5. Torque the Compression Nuts going in a cross pattern.



6. Stress relaxation can occur. Retorque the Shoe Bolts and Compression Nuts until the torque holds at the required values. Install a Bypass or plug the pipe if needed.

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5. Removing the Plug

1. Verify that all pressure is released from both sides of the pipe plug
2. Remove any bypass if present
3. Loosen the Compression Nuts to relax the seal.
4. Loosen the Set Screws in a cross pattern until the pipe plug is free. Remove the pipe plug from the pipe.

6. Cleaning and Storing

1. Completely relax all compression nuts.
2. Inspect for any possible cuts, tears, or any other physical damage.
3. Clean with mild soap and water if needed.
4. After the Plug is dry, remove all fasteners and lightly lubricate, and re-install.
5. Store Plug away from direct sunlight and out of the weather. Ultraviolet exposure will deteriorate the compression seal.
6. Keep the instructions with the Plug

Do Not Use the Product if there is significant wear or damage. Return to Petersen for evaluation.

Contact Petersen with any questions or suggestions about the use of any Petersen Product.

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