Petersen
Products Company

Mechanical Double Block and Bleed Test and Isolation Plugs

145-1 Series Instruction Manual

Petersen Pipe Plugs

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Petersen Products Company

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1. 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.
- Interior welds need to be ground flush with the pipe.
- 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.
- For safety, an incompressible liquid such as water should be used as the test medium. Any residual gas or air must be removed from the pipe prior to testing.
- Constantly monitor upstream pipeline pressure. Stop work immediately if any unexpected increase in upstream pressure occurs.

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.

2. Personal Safety

CAUTION

Keep all personnel out of the plug end area.

- PPC recommends adequate Personal Protective Equipment (PPE) to be used per operator policy and procedure.
- PPC recommends the operator determine if the area is considered a Confined Space and to 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.

3. Test Preparation

SAFETY

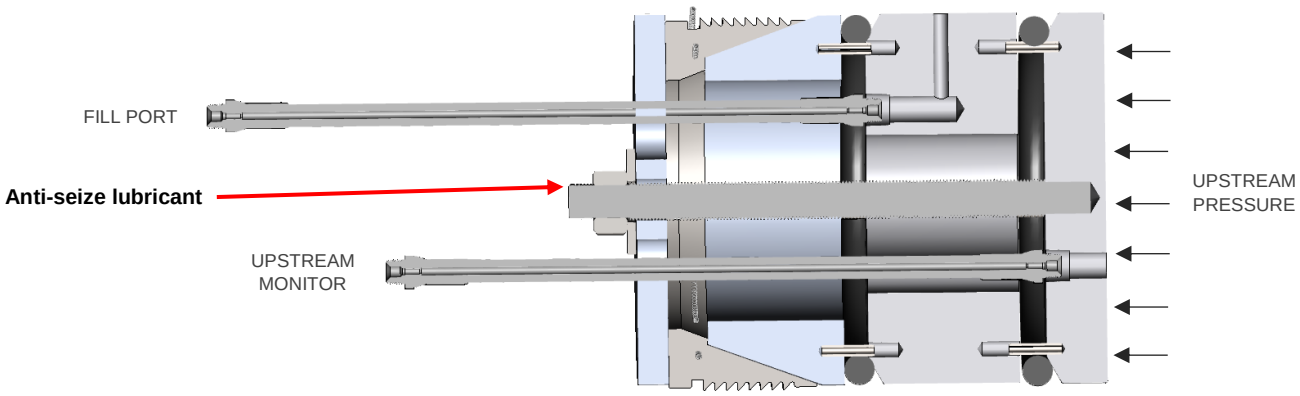
Perform the steps outlined below prior to performing your pressure test.

1. The Mechanical Double Block and Bleed Isolation Plug requires periodic inspection of the O-Rings and Seals prior to testing. The compression shaft should be inspected, and anti-seize should be applied as needed. After a test has been completed, the compression nut should be retracted so the seals can fully relax, allowing the Nitrile Buna-n Seals to return to their original size, preventing any permanent swelling and/or deformation.
2. Visually inspect the plug for worn or damaged components including any cuts, scores and deformations.
3. Verify that the pipe size and schedule of the plug is equivalent to pipe size you are testing.
4. Clean and dry the pipe ID. All moisture, debris, weld beads and excessive scale must be removed from the pipe ID to ensure proper seal is established during the pressure test.
5. Liberally spread anti-seize over both sides of the Hardened Washer and threads of the Shaft. Doing this ensures that installation torque is transmitted to the Seal.

   Note: The lubricant must not come in contact with the seals or tube ID. Failure to properly use anti-seize on the Shaft threads and Hardened Washer may cause an incomplete torque transmittal resulting in a decrease in pressure holding capability.

6. Complete site safety standard checklist.

6” Double Block and Bleed Isolation Plug



4. Installing Plug as an Isolation Barrier

Perform the steps outlined below when using the plugs as isolation barriers.

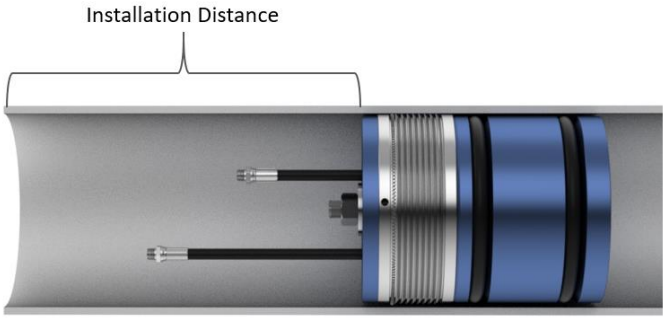
1. Attach hoses to the Fill Port and Upstream Monitor Port.

   Upstream Monitor Port: If upstream vapors are to be vented, a tee fitting should be used such that the hose and the pressure gauge are both connected to the Upstream Monitor Connection. Upstream vapors may be vented by attaching a 50 ft. (15m) of hose to the port and locating the open end of the hose well away from the hot work area.

   Pressure Connection: Connect pressure source to Fill Port to pressurize between seals for isolation and/or testing purposes.

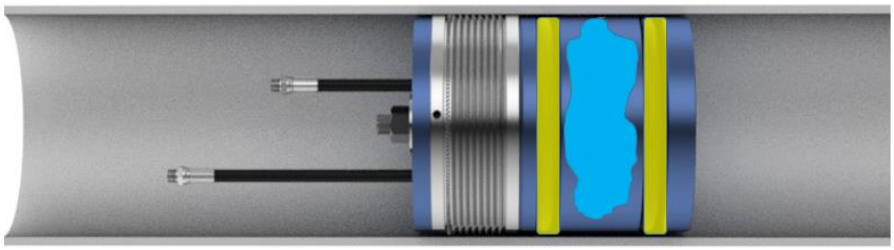
2. Place plug so seals are inside the pipe and at least 12” from any Hot Work zone.

   NOTE: The maximum temperature exposure for nitrile buna-n seals is 248°F (120°C). It may be necessary to monitor pipe temperatures during hot work to ensure seals are not damaged. Contact Petersen Products if high temperature seal materials are needed.



3. Tighten the Hex Nut to remove any slack from the parts.
4. Using a calibrated torque wrench capable of producing the required torque, tighten the Hex Nut to the normal installation torque. If the plug spins during tightening, remove the plug from the pipe, then tighten the Hex Nut to expand the gripper slightly and place the plug back into the pipe. This will create a larger contact/friction surface between the plug and the pipe, which should stop the plug from rotating. Once the Seals have fully contacted the pipe ID then the Hex Nut must be tightened.
5. Remove residual air between the seals, if necessary. Ensure Hex Nut has been properly tightened. Apply inert medium through the Fill Port until a small amount of the medium escapes.
6. Slowly introduce the isolation pressure to the Fill Port until it is greater than the potential upstream pressure. This will ensure that the hot work zone is isolated from any upstream vapors or contaminants.

   NOTE: During pressurization, some settling of the plug may occur. If the plug moves more than a total of 0.125” (3 mm) for 4” and 6” (DN100 and DN150) plug sizes during pressurization or testing, then stop your procedure immediately. Inspect the test plug and pipe ID for damage. Review installation steps taken prior to reinstalling the plug and retesting. If situation continues, contact Petersen Products for technical assistance.

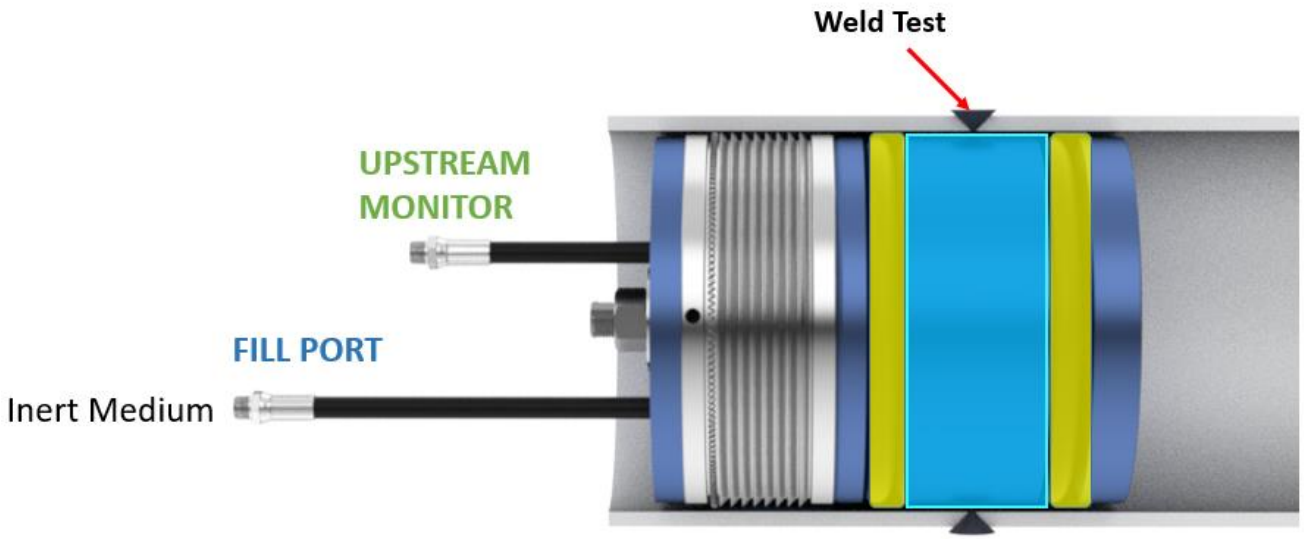


7. After testing application is complete, release all pressure from between the Seals. Verify there is no upstream pressure. **CAUTION: Never remove a plug if upstream pressure is present.**
8. Loosen the Hex Nut until the top of the nut is at the top of the shaft threads. Permanent seal deformation may occur if the Seal is left partially compressed.
9. Remove the plug from the tube end.

5. Performing the Pressure Test

Perform the steps outline below when conducting a pressure test.

1. Attach hoses to the Fill Port and Upstream Pressure Monitor connections.
2. Place plug so both Seals are inside the pipe you are testing. If you are using the plug to test a weld, position the plug so that the seals straddle the weld or area you are testing. **NOTE:** The maximum temperature exposure for nitrile buna-n seals is 248°F (120°C). It may be necessary to monitor pipe temperatures during hot work to ensure seals are not damaged. Contact Petersen Products if high temperature seal materials are needed.
3. Tighten the Hex Nut to remove any slack from the parts. Do not overtighten the Hex Nut.



4. Using a calibrated torque wrench capable of producing the required torque, tighten the Hex Nut to the normal installation torque. If the plug spins during tightening, remove the plug from the pipe, then tighten the Hex Nut to expand the grippers slightly and place the plug back into the pipe. This will create a larger contact/friction surface between the plug and the pipe, which should stop the plug from rotating. Once the grippers have fully contacted the pipe ID then the nitrile seals will begin to expand.

   NOTE: If the plug leaks, verify the correct size DBB is being used. Inspect the ID of the pipe for any scale or debris; clean as needed. Reinstall and torque the plug in increasing increments starting at the normal installation torque.

5. Slowly introduce the test pressure through the Fill Port.

   NOTE: During pressurization, some settling of the plug may occur. If the plug moves more than a total of 0.125” (3 mm) for 4” and 6” (DN100 and DN150) plug during pressurization or testing, then you must halt testing immediately. Inspect the test plug and pipe ID for damage and review installation steps taken prior to reinstalling the plug and retesting. If situation continues, contact Petersen Products for technical assistance.

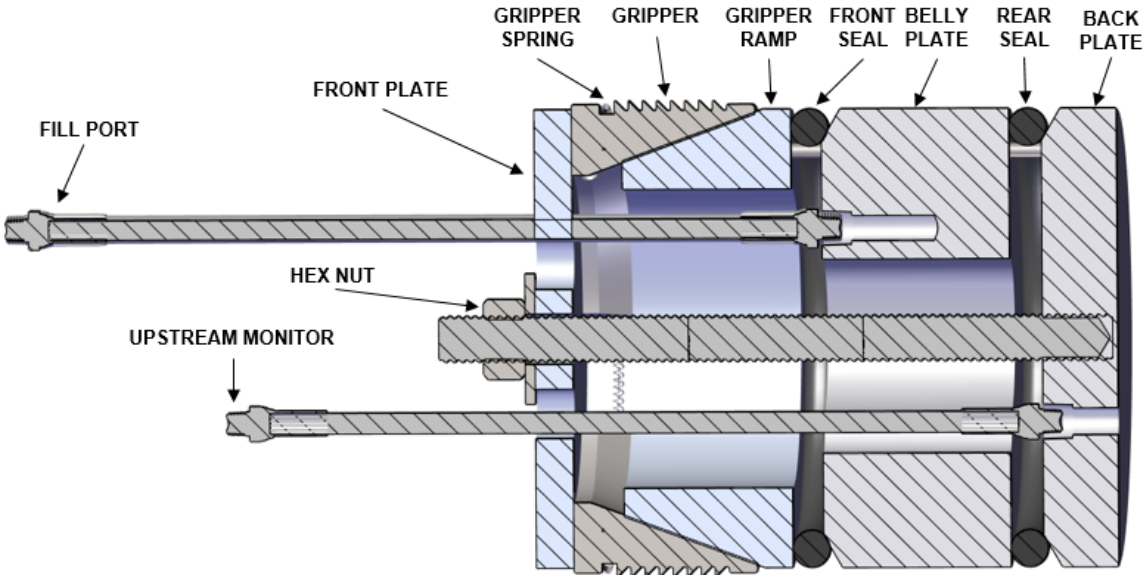
6. If performing a pressure drop test, hold the desired pressure with pump for a minimum of 5 minutes to allow parts to settle prior to closing the isolation valve.
7. After testing application is complete, release/vent all pressure from between the Seals. Verify there is no upstream pressure. **NEVER remove a plug if upstream pressure is present.**
8. Loosen the Hex Nut until the top of the nut is at the top of the shaft threads. Permanent seal deformation may occur if the Seal is left partially compressed.

9. Remove the plug from the tube end.
10. Inspect the plug for wear and replace any worn components.
    - Visually inspect seals for damage including cuts, scores and deformations.
    - If present, visually inspect O-rings* for damage including cuts, scores and deformations.
    - Liberally spread anti-seize over both sides of the hardened washer and threads of the shaft. Wipe away any excess.

6. Part Replacement - Disassembly

When taking apart the plug, be sure to keep track of the assembly order of the various parts. If you need to use a tool to pry seals away from the support, be careful not to damage any of the components.

1. Visually inspect component parts for damages. If damaged components are identified, contact Petersen Products for replacement parts.
2. To disassemble the plug and service the seal, disassemble plug assembly in this order:
    a. Hex Nut & Washer
    b. Front Plate
    c. Gripper Springs, Grippers, Gripper Ramp
    d. Front Seal
    e. Belly Plate
    f. Rear Seal
3. Reassemble plug as shown. **Note** O-rings are not integrated on all plugs. If O-rings are present, ensure o-rings are properly seated in grooves when reassembling plug. If no O-rings or O-ring grooves present, then no action is required.



6” Mechanical Double Block and Bleed Isolation Plug

7. Storage

Prior to storing, clean and dry the plug. Re-lubricate the shaft threads and between the hex nut and mating surface as previously described. Store plug in an area out of direct exposure to sun, UV light or temperature extremes. Excessive heat or UV light will damage and prematurely degrade the seal elements. Store these instructions with the plug.