128 Series Line Stop Plug

Instruction Manual

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128 Series Line Stop Plug

WARNING
Read and understand before using Petersen Line Stop Plugs!
Failure to comply may result in property damage, serious injury or death!
These instructions must be available to all users. Train all personnel for proper use.

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Important Safety Instructions

Safety is Everyone’s Responsibility

**WARNING**
Extremely 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. Extreme care is required to ensure the safe use of any Line Stop Plug.

- All line stop plugs must be anchored adequately.
- Debris or protrusions into the pipeline can damage a seal or reduce the pressure rating. NEVER use a test pressure greater than the capacity of the weakest pipe or component in the system.
- Consult qualified personnel if you cannot calculate the risks or forces involved.
- Do not exceed the pressures on the plug label.
- Never use equipment when a failure could result in injury or significant property damage. Inflatable devices may not be used as the primary protection for personnel downstream.
- Because of the many possible variables, these general instructions must be adapted by an engineer for each specific project. Instructions and training must be provided to all plug users and workers on the job.

**Personnel Safety**

**CAUTION**
Keep all personnel away from the plug end area.

- Wear required PPE including but not limited to eye protection, helmet, hearing protection.
- Follow all confined space safety controls. Confined space authorization, air monitor, and ventilation may be required.

**Safety Inspections**

- Thoroughly inspect the line stop plug for abrasions, cuts, or physical damage. Clean the plug if required.
- If outside a pipe, do not inflate a line stop plug greater than 5 psi or above 5% of rated pressure.
- Gather all required tools. Have all personnel ready when installing and removing any type of line stop plug.
- Verify that the air line connections and hoses are not damaged or leaking.
- Use two accurate calibrated pressure gauges to measure the pipeline head pressure.
- Prepare to equalize pressure on both sides of the line stop plug before installation and removal.
- Use two accurately calibrated pressure gauges that agree to monitor the inflation pressure.
- Verify that the pipeline flow is stopped.

Contact the project engineer or Petersen if needed. Safety is the highest priority.
Pre-installation Inspection

Safety
Survey the work area for unsafe conditions. Verify that each person has read the Product Labels, Scope of Work, and instructions developed specific to the project.

1. Verify the Line Stop Plug and Launch System components are complete.

1. Rotating Elbow
2. Packing Seal
3. Centering Anchor
4. Eyebolts
5. Inflation Ram Sections
6. Flange Bolts
7. Launch Cylinder
8. Inflation Ram Coupling
9. Inflation Ram Pulley Assembly
10. Stop Collars
11. Flange Gaskets
12. Line Stop Plug

NOTE
Petersen recommends inspecting the line stop plugs after every use. Covers can be damaged when inserting into a hot tap. Often line stop plugs can be refurbished and recertified by Petersen Products to like-new condition or set interval to match quality standards.

Contact Petersen to confirm the suitability of the line stop plug if needed.
2. Gather all necessary equipment and tools. Refer to Hot Tap Insertion Tool Checklist.

1. Ratchet Puller
2. Socket
3. Torque Wrench
4. Allen Wrench
5. Tape Measure
6. Wrench
7. Marker
8. O-Ring Lubricant

3. If using a Retraction System, verify that all Retraction System components are complete.

10. Ram Removal Plate
11. Ram Section, 24 inches
12. Ram Coupling
13. Ram Section, 36 inches
14. Pull Block Assembly
15. Pulley Assembly
Assembly Overview

- Pressure Monitor Hose
- Inflation Hose
- Launch Cylinder
- Tapping Valve
- Inflation Ram Pulley
- Rachet Puller
- Packing Seal
- Directional Shoe
- Rotating Elbow
- Line Stop Plug
**Hot Tap Insertion Tool Checklist**

**WARNING**
Read and understand instructions before using Petersen Inflatable devices. Failure to comply may result in property damage, serious injury, or death.

**Overview**
The Petersen Hot Tap Insertion System can be used on almost any size pipeline or system. Use the tool list as a guideline. Each job may require tools above and beyond what is listed.

**Tool List**
- Ratchet Puller: For inserting and securing the line stop plug and for retraction with retraction kit.
- Marker or Paint Stick: For marking on steel, fabric, or painted surfaces.
- Tape Measure: To set insertion depth on Inflation Ram or Bundling Sleeve strap lengths.
- O-Ring Lubricant: Inflation Ram and Packing Seal O-Rings.
- Allen Wrench 1/8": Set Screws for 1 inch and 1-7/8-inch diameter Inflation Ram.
- Allen Wrench 3/32": Set Screws for 1-1/2-inch Inflation Ram.
- Allen Wrench 3/16": Set Screws for 2-1/2-inch Inflation Ram, 1-inch stop collar, centering guides.
- Allen Wrench 1/4": Stop Collar for 1-7/8-inch diameter Inflation Ram.
- Allen Wrench 5/16": Stop Collar for 2-1/2-inch Inflation Ram.
- Pipe Wrench: Attaching NPT Launch Cylinder and Packing Seal.
- Pipe Thread Sealant: Attaching NPT Launch Cylinder and Packing Seal.

**Launch Cylinder**
- Torque Wrench & Socket: Match the values listed in the table below for the launch cylinder.
- Wrench: For reaction force against Torque Wrench (match socket size).

**Torque Figures**
*Note:* Sequence the torque in a star pattern. Complete the pattern three times 30%, 70%, 100% to the sequence.

<table>
<thead>
<tr>
<th>Size</th>
<th>Class 150 Flanges</th>
<th>Class 300 Flanges</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bolt</td>
<td>Wrench</td>
</tr>
<tr>
<td>3</td>
<td>5/8&quot;</td>
<td>15/16&quot;</td>
</tr>
<tr>
<td>4</td>
<td>5/8&quot;</td>
<td>15/16&quot;</td>
</tr>
<tr>
<td>5</td>
<td>3/4&quot;</td>
<td>1-1/8&quot;</td>
</tr>
<tr>
<td>6</td>
<td>3/4&quot;</td>
<td>1-1/8&quot;</td>
</tr>
<tr>
<td>8</td>
<td>3/4&quot;</td>
<td>1-1/8&quot;</td>
</tr>
<tr>
<td>10</td>
<td>7/8&quot;</td>
<td>1-5/16&quot;</td>
</tr>
<tr>
<td>12</td>
<td>7/8&quot;</td>
<td>1-5/16&quot;</td>
</tr>
<tr>
<td>14</td>
<td>1&quot;</td>
<td>1-1/2&quot;</td>
</tr>
<tr>
<td>16</td>
<td>1&quot;</td>
<td>1-1/2&quot;</td>
</tr>
<tr>
<td>18</td>
<td>1-1/8&quot;</td>
<td>1-11/16&quot;</td>
</tr>
<tr>
<td>20</td>
<td>1-1/8&quot;</td>
<td>1-11/16&quot;</td>
</tr>
<tr>
<td>24</td>
<td>1-1/4&quot;</td>
<td>1-7/8&quot;</td>
</tr>
<tr>
<td>30</td>
<td>1-1/4&quot;</td>
<td>1-7/8&quot;</td>
</tr>
</tbody>
</table>
Calculating the Head Pressure

Calculate the required head pressure to confirm effective and safe plugging. Follow these guidelines to calculate the head pressure:

1. \[ F = P \times S \] (2) \[ F = \text{force on the plug, } P = \text{pipeline pressure, } S = \text{cross-sectional area} \]
   - Force \( F \) on the plug is the plug slipping force.
   - Pressure \( P \) measured as water column height must be converted to a force over area format for the equation above.

2. The cross-sectional area \( S \) is determined by:
   - \[ S = \pi r^2 \]
   - Where \( \pi = 3.14159 \) and \( r \) (radius) = \( \frac{1}{2} \) the pipe inside diameter.

3. Example:
   - Water column 10 m (32.8 ft) high, converts to a back pressure of 98.0 kPa (14.5 psi).

4. The configuration or liquid surface area does not affect pressure, only elevation. The pressure is multiplied by the pipe/plug diameter to arrive at the plug slipping force.
   - Pressures exerted on a plug are the same for liquid, water, or air.
   - 68.9 kPa (10 psi) of water = 98.9 kPa (10 psi) air
   - Pressures from gasses (e.g., air, nitrogen) are compressible and more dangerous than water.
   - Gas will expand to its original atmospheric volume upon release. Discharging a slipping plug will have much greater force.

Tapping the Pipe

**NOTE**
Verify that the flow in pipe is stopped before making the hot tap.

1. Install the the Saddle or Sleeve, according to manufacturer. Position the Saddle or Sleeve so that when the Line Stop Plug is inserted, it will not be damaged by sharp edges or protrusions.

2. Install the Tapping Valve according to manufacturer. Remove the blind flange if present.

**NOTE**
Inspect for leaks BEFORE using the Hot Tap Drill Equipment. Use the Test Port on the hot tap sleeve, nozzle or valve. Once the drill is used the valve will be pressurized. Fix all leaks before using the drill.

3. Open the Tapping Valve completely.

4. Use the Hot Tapper Drill Adapter to the Tapping Valve. See the Hot Tap Drill manufacturer for detailed operation and maintenance information.
5. Drill the Hot Tap Hole into the pipeline.


7. If possible, open the Chip Valve on the Hot Tapper Drill Adapter, to allow chips to be washed out and to provide differential pressure to capture the coupon/cut-out.

**Attaching the Rotating Elbow Assembly**

The Rotating Elbow Assembly is available with Thread and Set Screw type connections for the Inflation Ram Adapter.

1. Inspect the O-Rings for any possible physical damage. Petersen recommends ordering multiple O-Rings.

2. Use the Allen Wrench to loosen the Set Screws on the Cone.

3. Apply O-Ring lubricant to the Ram End on the Rotating Elbow Assembly.

4. Remove the End Cap and apply Thread Sealant to the threads on the end of the Line Stop Plug.
5. Connect the Rotating Elbow to the Line Stop Plug. Tighten 1-½ to 2-½ turns past HAND tight. Verify that the Rotating Elbow is oriented to bend in the same direction as the directional shoe.

6. Tighten the Set Screws on the Rotating Elbow to secure in position on the Line Stop Plug.

7. The bend of the Rotating Elbow should follow the natural curve of the Line Stop Plug. **Note:** The plug will tend to follow the large diameter wheel on the Directional Shoe when entering the pipeline. The elbow direction should match.

8. Slide the Cone over the Line Stop Plug. Use the Allen Wrench to tighten the Set Screws. Remove and store the tag in a safe space.

<table>
<thead>
<tr>
<th>Screw Size</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>#10</td>
<td>30 in·lb</td>
</tr>
<tr>
<td>1/4”</td>
<td>76 in·lb</td>
</tr>
<tr>
<td>3/8”</td>
<td>276 in·lb</td>
</tr>
</tbody>
</table>
Assembling the Launch Cylinder

1. Replace the Gasket each time the Launch Cylinders are assembled.
2. Verify that the Valves are oriented at the bottom for draining process fluid when the job is complete.
3. Close each Valve.
4. Insert the Gasket between the Flanges on each Launch Cylinder.
5. Bolt each Launch Cylinder section together. Use a star pattern for balanced torque. Complete the pattern three times 30%, 70%, 100% to the torqueing sequence. See Torque Figures on page 5.
Measuring the Assembly

1. Measure the length of the Rotating Elbow to the centerline of the pivot when positioned at a 90° angle.

\[ \text{Measure } M1 \]

2. Measure the distance from the top flange of the Tapping Valve to the top of the OD of the pipe. Determine the radius of the pipe. Add M2 to the radius M3 to determine M4.

**Note:** M3 is the distance from the OD of the pipe to the centerline. Find M3 by dividing the OD by 2.

**Note:** M2+M3=M4

\[ \text{Measure } M2 \]
\[ \text{Measure } M3 \]
\[ \text{Measure } M4 \]
3. Measure or calculate the total length of the fully assembled Inflation Ram section. Fit the sections together if needed.

4. Combine the length of the Launch Cylinders, the width of the Packing Seal, and the thickness of the Ram Removal Plate (if the Retraction System is used) to determine M6.
Attaching the Main Stop Collar

**NOTE**
Position the Main Stop Collar so that the Plug and Rotating Elbow will insert to in the center of the pipe.

1. Find the total length the assembly. $M4 + M6 - M1 + 1/8$ inches (1 gasket) = $M7$

2. Subtract the length of the assembly from the Ram length. $M5 - M7 = M8$

3. Attach the Main Stop Collar at $M8$. Tighten the Socket Head Cap Screws to secure the Main Stop Collar in place.

<table>
<thead>
<tr>
<th>Collar</th>
<th>Screw Size</th>
<th>Allen Wrench</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>1” &amp; 1-1/2”</td>
<td>1/4”</td>
<td>3/16”</td>
<td>14 ft-lb</td>
</tr>
<tr>
<td>1-7/8”</td>
<td>5/16”</td>
<td>1/4”</td>
<td>27 ft-lb</td>
</tr>
<tr>
<td>2-1/2”</td>
<td>3/8”</td>
<td>5/16”</td>
<td>47 ft-lb</td>
</tr>
</tbody>
</table>
Assembling the Insertion System

NOTE
The Insertion System can be assembled in two methods:
- If height clearance is sufficient, insert the Ram in one increment.
- If height restriction is an issue, use an Initial Stop Collar and insert the Ram in multiple increments.

1. Apply O-Ring lubricant to the O-Rings on the Inflation Ram Couplings. Connect each ram section together.

2. Tighten the Set Screws to secure each Ram section in place. See figure below for torque.

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<td>276 in·lb</td>
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</table>

3.1 If height clearance is sufficient, fully assemble the Inflation Ram. Attach the Packing Seal and Ram Assembly End to the Inflation Ram.
   Note: Apply O-Ring lubricant to the Packing Seal if needed.
3.2 If height restriction is an issue:
- Separate the Inflation Ram section with the Main Stop Collar from the rest of the Inflation Ram.
- Remove as many sections as required to fit in with the available space.
- Attach the Packing Seal and Ram End Assembly to the remaining sections of the Inflation Ram, which will be the bottom section(s).
- Attach an Initial Stop Collar approximately 6” below the Ram End Assembly, but above the Packing Seal. 
  **Note**: Apply O-Ring lubricant to the Packing Seal if needed.

4. Slide a Gasket and the Centering Anchor on the Ram below the Packing Seal. Position the Centering Anchor \( M_3 - M_1 \) distance from the end of the Ram. Tighten the set screws. See figure below if needed.
  **Note**: \( M_3 \) is the distance from the OD of the pipe to the centerline. Find \( M_3 \) by dividing the OD by 2.

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<tr>
<td>3/8”</td>
<td>276 in·lb</td>
</tr>
</tbody>
</table>
5. Apply O-Ring lubricant to the O-Rings on the Rotating Elbow Assembly. Attach the Rotating Elbow to the end of the Inflation Ram. Tighten the Set Screws to secure the Inflation Ram to the Rotating Elbow.

<table>
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### Attaching the Insertion System

**NOTE**

The Insertion System can be attached in two methods:
- If height clearance is sufficient, insert the Ram in one increment.
- If height restriction is an issue, use an Initial Stop Collar and insert the Ram in multiple increments.

1. Use a Marker or Paint Stick on the Inflation Ram to mark the orientation of the Rotating Elbow and Plug. The Orientation Line should align with the curvature of the Plug and direction of insertion. Use the mark as a guide when lowering the Plug into the Pipe.
   **Note**: Use the Orientation Line and and measurements to verify the Plug insertes in the center of the Pipe.

2. Insert the Plug and the Inflation Ram into the Launch Cylinder. Hand-tighten the bolts to secure the Packing Seal to the Launch Cylinder.
   **Note**: The rubber bands must remain on the Line Stop Plug for effective insertion.

3. Add the Eyebolts to the Packing Seal, positioned 180° apart. Orient the Eybolts so that they are parallel, not perpendicular. See image on Page 16 if needed.

4. If using the Retraction System, attach the Ram Removal Plate to the Packing Seal. Hand-tighten the bolt to secure the Ram Removal Plate to the Packing Seal.
5. Tighten each bolt. Use a star pattern for balanced torque. Complete the pattern three times 30%, 70%, 100% to the torquing sequence.  
   **Note:** See Torque Figures on page 5.

6. Pull the Line Stop Plug into the Launch Cylinder so that no part extend past the end of the Launch Cylinder. Attach a Stop Collar to the Inflation Ram flush with the top of the Packing Seal to secure the Line Stop Plug in position.

7. If installing vertically, connect the hoist end to the Eyebolts on the Packing Seal. If installing horizontally, wrap slings around the Launch Cylinder.

8. Use a hoist to lift the Launch Cylinder assembly on the flange of the Tapping Valve. Install a gasket in between the Tapping Valve and the Launch Cylinder.

**NOTE**  
Do not lift the assembly by the Ram End. The load could slide and physical damage could occur.
9. Verify that the Inflation Ram Assembly, Launch Cylinders, and Line Stop Plug are aligned with the direction of the plug insertion. Verify each valve on each Launch Cylinder is closed.

10. Tighten the bolts to secure the Assembly in place. Use a star pattern for balanced torque. Complete the pattern three times 30%, 70%, 100% to the torquing sequence. See Torque Figures on page 5.

11. Attach the ratchet puller. Loop the chain over the Inflation Ram. Connect each end to the Eyebolts.

12. Insert the Gauge on the quick connect port on the Packing Seal to monitor the head pressure.
Inserting the Plug

1. Open the Tapping Valve.

2. Inspect the Gauge Pressure. Inspect the Head Pressure on the Gauge on the Packing Seal. If the Pipeline is filled with water, add 0.433 psi per foot the Gauge is above the Pipeline invert.
   
   **Note**: The actual head pressure should not be greater than half the rating of the Plug.

3. Use the Rachet Assembly to lower the Inflation Ram and Plug into the pipe. Loosen the Stop Collar that is against the Packing Seal to allow the Line Stop Plug to lower down into the pipe.

   **NOTE**
   The Insertion System can be attached in two methods:
   - If height clearance is sufficient, insert the Ram in one increment.
   - If height restriction is an issue, use an Initial Stop Collar and insert the Ram in multiple increments.

4. If the Inflation Ram is already fully assembled lower the untill the Main Stop Collar reaches the Packing Seal. Use O-Ring lubricant if needed. Skip to Step 5.
   
   **Note**: Maintain correct plug orientation during insertion.
CAUTION
The Inflation Ram may fall when the stop collar is removed.

4.2 If the Inflation Ram is not already fully assembled, lower until the Initial stop collar reaches the Packing Seal.
   Note: Maintain correct plug orientation during insertion.

4.3 Remove the Ram End Assembly. Install the remaining ram section with the stop collar. Tighten the Set Screws to secure the Ram sections together.

   Ram End Assembly

   Initial Stop Collar

   Rachet Puller

   Packing Seal

4.4 Loosen the Set Screws and remove the Initial Stop Collar. Slowly lower the Plug. Maintain correct orientation. Use the Mark on the Inflation Ram to confirm correct orientation.

4.5 Lower the inflation Ram until the Main Stop Collar reaches the Packing Seal. Use O-Ring lubricant if needed.

5. Anchor the plug in place with the Rachet Puller.
Air Inflation Kit

If using water inflation skip to the water inflation section, Page 22.

Pressure Gauge
Low Pressure Alarm
Inflation Hose
Pressure Monitor Hose

Pressure Monitor
Valve Assembly
Inflation Controller
Relief Valve
Assembling the Air Inflation Kit

Pressure Monitor Side

1. Connect the Pressure Monitor Hose and Inflation Hose to the Inflation Ram Assembly.
2. Attach one or two Gauges to the Pressure Monitoring Valve Assembly.
3. Connect the Low Pressure Alarm to the Pressure Monitor Hose.
4. Connect the Pressure Monitoring Valve Assembly to the Low Pressure Alarm.

Inflation Side

5. Connect one Gauge to the Inflation Controller.
6. Connect the Relief Valve to the Inflation Controller.
7. Connect the Inflation Hose to the Inflation Controller.

**CAUTION**
Close the valve on the Inflation Controller before connecting air supply.

8. Connect the Inflation Source Air line to the Inflation Controller.
9. If using a Low Pressure Alarm, set the alarm according to alarm set procedure.

**NOTE**

Petersen recommends to use two calibrated gauges to verify the Plug Inflation Pressure.

**NOTE**

Trip hazard. Keep the hoses coiled when not in use to prevent equipment damage.

**CAUTION**

Do not over inflate. Maintain the pressure at 2X the pipeline pressure, but less than maximum rated plug pressure.

10. Adjust the Regulator on the Inflation Controller. Do not over inflate the plug.

11. Inflate the Plug. Monitor pressure with the Pressure Monitor Assembly.

12. Turn on the Low Pressure Alarm. If the pressure drops below the alarm setpoint the alarm will sound.
Deflating Air from the Line Stop Plugs

NOTE
The line stop plug will deflate if the existing pressure is higher than the head pressure.

1. Deflate the line stop plug. Disconnect the air source and open the valve on the Pressure Monitor Assembly.

2. The Vacuum Generator may be used to deflate the larger plugs with air.

Water Inflation Controller

Overview
The 1.5” Port Pump is rated for 100 gpm max flow and 100 psi max air source.
Operating the Water Flow Totalizer:

- Press the Display button once to display the total volume of water ever used by this pump.
- Press the Display button again to display the Batch (amount of water used).
- Press the Display button again to show Flow Rate.
- To reset the Batch to Zero to track the quantity of water: display the Batch then press and hold the Display button.
- To change units from gallons to liters: hold the Calibrate button and press the Display button.

Assembling the Water Hoses and Pressure Monitoring Lines

1. Attach the Water Hose and Pressure Monitor Hose to the Inflation Ram Pulley Assembly.

2. Attach the other end of the Pressure Monitor Hose to the Low Pressure Alarm.

3. Attach Pressure Monitor Valve Assembly to the Low Pressure Alarm.
4. Attach the two Gauges to the Pressure Monitor Valve Assembly.

5. Attach the Water Hose to the Water Pressure Monitor Assembly and to the Water Inflation Controller outlet.

6. Attach the water supply line to the Water Source Connection of the Water Inflation Controller.

7. Connect the air source line to the Pump Air Source Connection of the Water Inflation Controller.
Inflating the Line Stop Plug with Water

CAUTION
Do not over inflate. The maximum rated pressure requires a fully inserted plug into a clean steel pipe.

CAUTION
For maximum safety remove as much air as possible.

1. Zero the Batch Counter on the Flow Totalizer.
2. Inflate the plug with water.
3. Open the valve at the Pressure Monitor Assembly to release any air.

NOTE
Do not allow the pressure to drop below 5 psi from 5% of the line pressure.

4. To monitor the inflation pressure with a water hose that is filled with water:
   - Add 0.433 psi to the gauge readings for every foot that the gauge is above the invert of the pipe.

CAUTION
Do not exceed the maximum rated pressure.

5. Monitor the pressure when filling the Plug.
6. High pressure plugs can be topped off with air or nitrogen after they are filled with water.
7. Turn on the Low Pressure Alarm. If the pressure drops below the alarm setpoint then the alarm will sound.
Deflating Water from the Line Stop Plugs

1. Close the valve on the Plug Water Inflation Hose.

2. Switch the Water Hoses to the other connection ports. The hose that was connected on the Water Source Connection is now connected to the water pump outlet. The hose that was connected to the water pump outlet is now connected to the Water Source Connection.

3. Verify that the Water Pump Outlet hose drains into a tank or area that can collect the water pumped out of the line stop plug.

4. Zero the batch counter to track the output.
5. Open the valves on the Water Inflation Hose and begin deflating the Line Stop Plug.

6. Continue pumping until water completely stops trickling.

NOTE
The pipeline pressure can trap water and deflate the line stop plug. Reinflate the plug to purge the water as needed.

NOTE
Maximum vertical lift from the pipe invert is 18 ft. The Pump will only lift 18 ft on the inlet side. Pipeline pressure can assist with water deflation. If needed, Petersen can make line stop plugs that displace water with air for lifts over 18 ft. Never exceed the pressure rating of the Line Stop Plug when displacing water. Stop adding air when water no longer discharges from Pump outlet. Continue deflating until all air is out of the Line Stop Plug.

NOTE
As the water is displaced with air the Line Stop Plug may float if submerged and the water and air will be evacuated by the Pump. Remove the Line Stop Plug only after it is deflated completely.
Removing the Line Stop Plug

4. Remove the Inflation and Pressure Monitor Hoses from the Inflation Ram.

5. Open valve on Inflation Ram Pulley Assembly to allow air to vent when removing the Line Stop Plug from the pipe.

6. Relax the Rachet Assembly. Disconnect the Rachet Assembly from the Eyebolts on the Packing Seal.

7. Loosen the set screws to remove the top of the Inflation Ram.

**NOTE**
The stop collar must be on the Inflation Ram at all times.

8. Attach the Pull block to the Inflation Ram. Tighten the Set Screws to secure the Pull Block to the Inflation Ram.

9. Attach the Ram sections to the Ram Removal Plate. Tighten the Set Screws to secure the Ram Sections in place.

10. Attach the Pully Assembly to the Ram Sections. Tighten the Set Screws to secure the Pully Assembly in place.

**NOTE**
The Ram Removal Plate is rated for 5 feet of Ram in a vertical position.

11. Loop the chain around the Pully Assembly and connect the Ratchet Puller to the Pull Block and Ram Removal Plate.

12. After one section of the Inflation Ram is retracted, attach a Stop Collar at the lower Ram section to prevent the Ram from falling back down into the pipe.

13. Remove the Inflation Ram one section at a time. Move the Pull Block down each time.
14. Repeat until the Line Stop Plug is fully in the Launch Cylinder. Use Measurement M6 from the stop collar to verify that the Inflation Ram is fully retracted. See M6 on Page 11.

15. Once the Line Stop Plug is fully retracted, close the Tapping Valve.

**NOTE**
Use a Catch Pan or Drain Hoses when opening the Valves on the Launch Cylinders.

16. Open the bottom Valve on the Launch Cylinder to release the pressure.
Cleaning and Storing

1. Before and after each use, clean the line stop plug and inspect for surface tears, cuts, or any other damage.
2. Clean with mild soap and water.
3. The line stop plug can be inflated for cleaning and inspection. Do not exceed 5% of the plugs rated pressure.
4. Do not allow the line stop plug to remain in sunlight for extended periods of time to prevent damage.
5. Verify that the line stop plug is empty of water and dry prior to storage in a dry location.
6. Keep the instructions with the line stop plug.

Do not use the product if there is significant wear or damage or return to Petersen for repair and recertification.

Call Petersen with any questions. We’re here to help.

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