Petersen
Products Company

PeteStop™ Inflatable Line Stop, Pipe Plugging System

129 Series

Instruction Manual

Petersen Pipe Plugs

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1. Important Safety Instructions

WARNING

Pressure forces are involved in many Inflatable Line Stop situations that may cause injury or even death. Focus and care is required to ensure the safe use of any Inflatable Line Stop, as pressure forces increase as pressure and pipe diameter increase.

- All pipe plugs shall be restrained adequately in accordance with design of the PeteStop™ Inflatable Line Stop system.
- Debris or protrusions into the pipeline may damage a seal or reduce the pressure rating.
- Do not exceed the pressures on the plug label.
- Petersen Products recommends inflatable devices shall not be used as the primary isolation or protection point for personnel downstream.
- Due to project variability, these general instructions must be adapted by a competent professional for each specific project. Instructions and training must be provided to all PeteStop™ Inflatable Line Stop users and workers on the job.

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.

Piping Review and Assessment for ILS Selection

CAUTION

Polyethylene (HDPE) or new pipelines with remains of grease or agents directly decrease the efficiency and holding strength of the PeteStop™ Inflatable Line Stop.

- Thoroughly inspect the PeteStop™ Inflatable Line Stop, before each use. Refer to Section 12.0.
- PPC recommends to never inflate an inflatable plug, outside of a pipe, above 5 PSI or 5% of rated inflated pressure, whichever is less.
- Verify air line connections and hoses are not damaged or leaking.
- Use two calibrated pressure gauges for measuring the pipeline operating pressure.
- Pressure should be equal on both sides of plug during installation and removal.
- Use two calibrated pressure gauges for monitoring the inflation pressure.
- Call Petersen with any questions or suggestions relating to the use of any Petersen product.

2. Pre-Work Inspection

SAFETY

Ensure that all project information and data is accurate. If assumptions are made, please specify and whenever there is doubt contact Petersen Products engineering for application and product technical assistance.

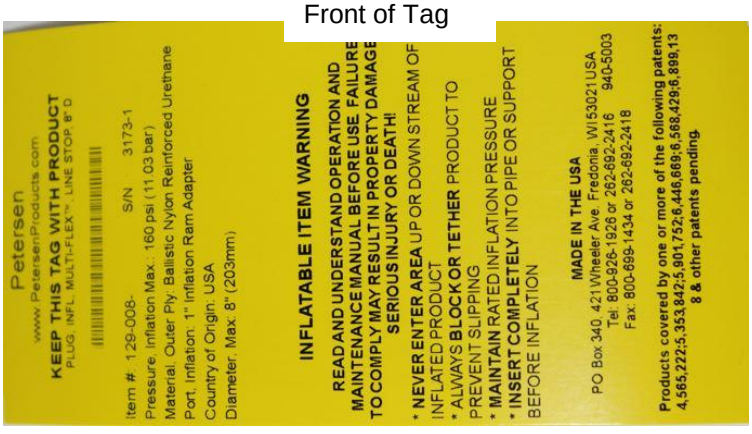
Understand your completeness of application data is paramount to project safety.

It is important to understand what your requirements are and how to deploy the ILS safely. There are many configurations to choose from based on your application. The piping configuration should also be reviewed to ensure pressure or flow differentials are not created or have means to mitigate (e.g. leak downstream of isolation point).

Operator Fill out this Section	
☐ Pipe Size / Wall Thickness / Material / Internal Coating	
☐ Design Pressure / Temperature / Flow Rate	
☐ Operating Pressure / Temperature / Flow Rate	
☐ Product / Service/ Medium	
☐ Plug Inflation Medium	
☐ Piping Design Code	
☐ Duration of Line Stop	
☐ Purpose of Line Stop	
☐ ISO or Piping Drawing Provided	
☐ Obstructions at Isolation Location	
☐ Fitting Type / Requirements / Orientation / Piggable	
☐ Flange Type / Rating	
☐ Fitting Location (Above / Below Ground)	
☐ Service Valve Bore	
☐ Service Fitting Bore	
☐ Expected Inflation Source	
☐ Expected Hot Tap Hole Size	

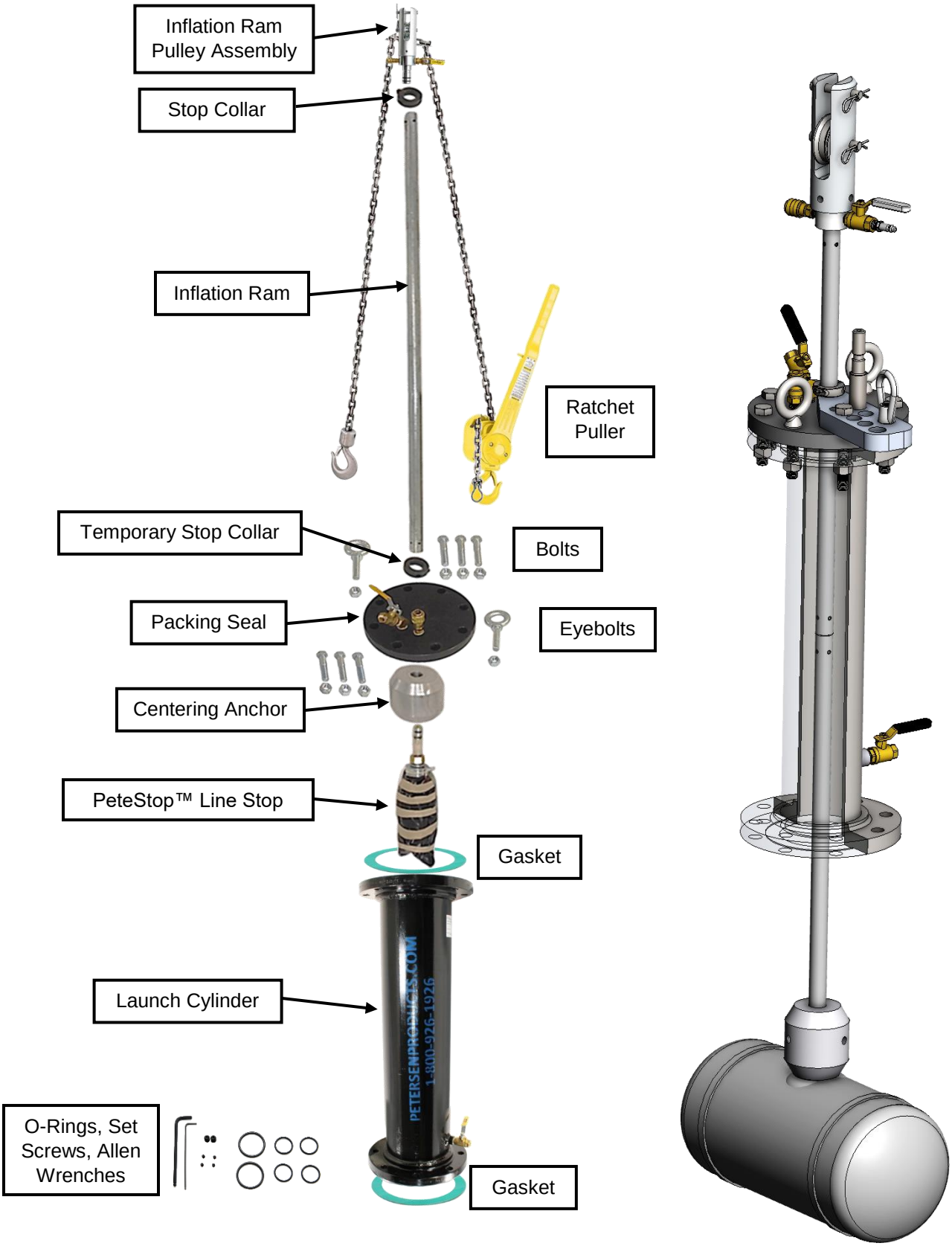
Verify the Yellow Warning Tag attached is the correct plug.

Front of Tag

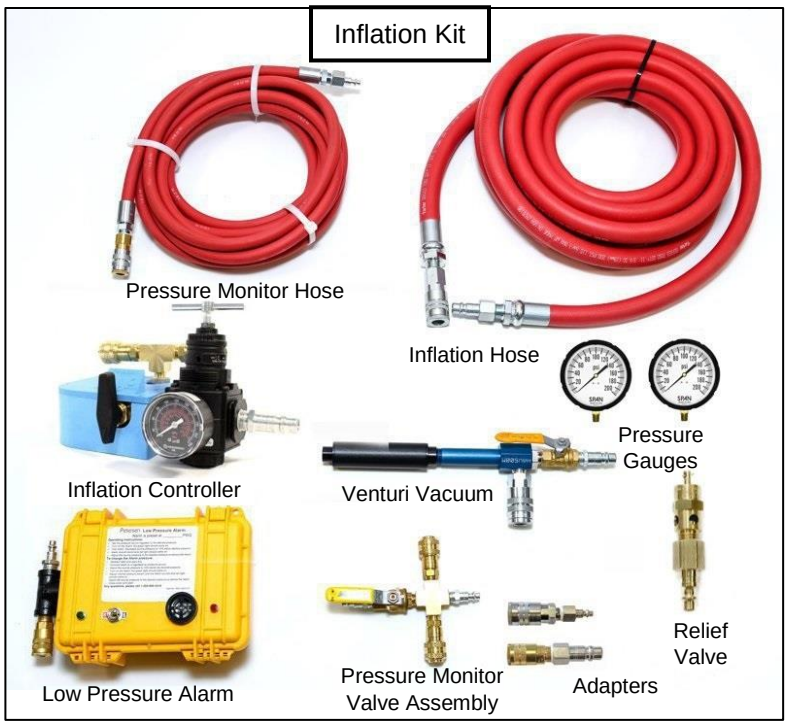


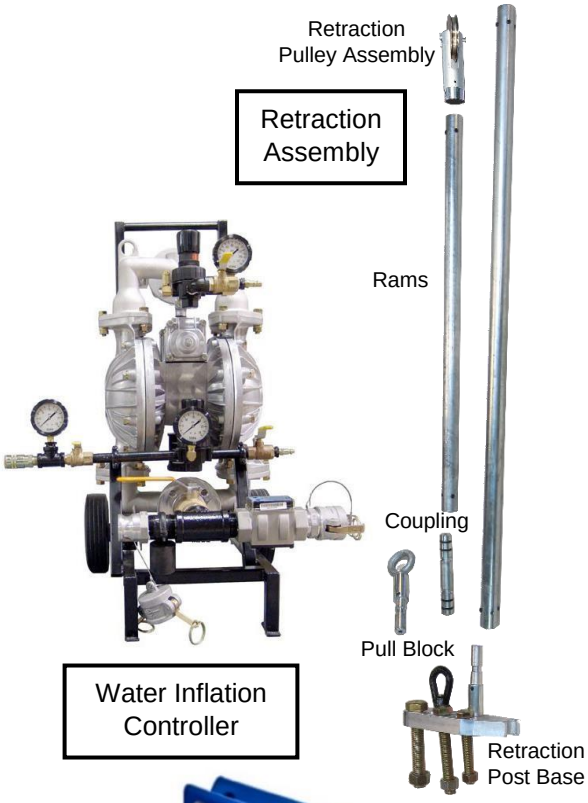
Back of yellow tag

Compare Order Confirmation to Packing List



Additional Accessories (depending on application)






Strong Back


Ram Adapter


Hot Tap Sleeve


Hot Tapper System


Completion Plug


Coupon Support

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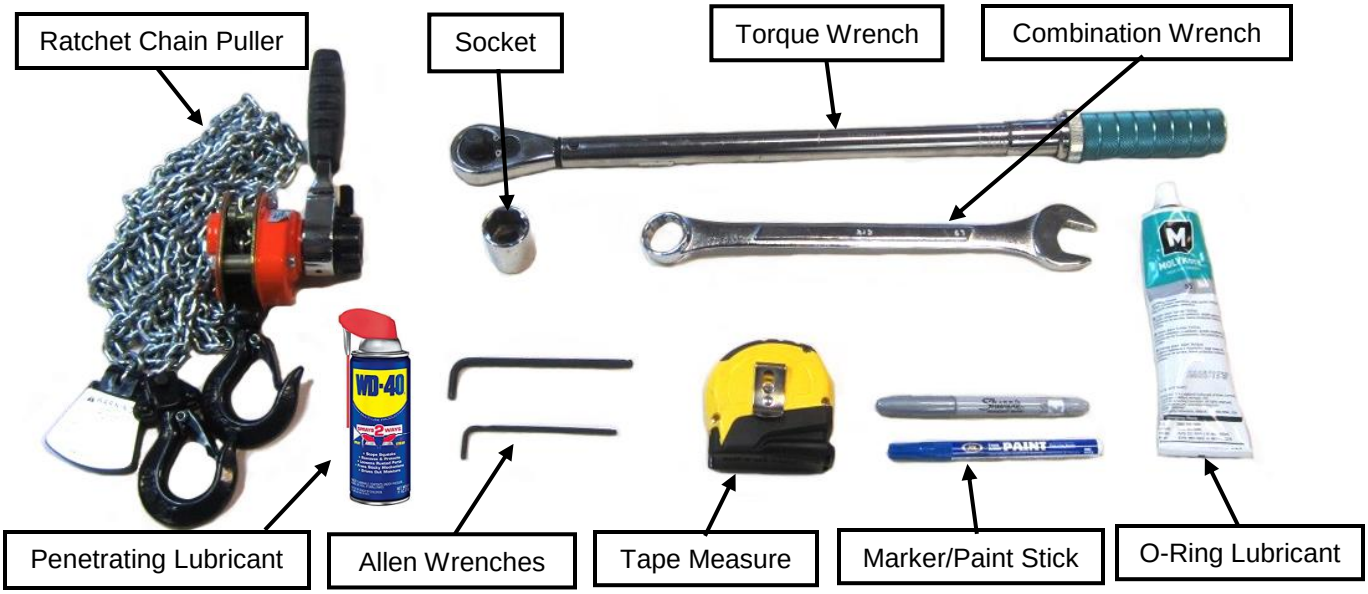
3. Line Stop Tool List

The Petersen Hot Tap Insertion System may be used on almost any size pipeline or system and therefore may require a variety of tools to match. This list is intended to assist in determining which tools to prepare for a job but is **not** a replacement for the judgement of an experienced contractor. Different jobs may require specific tools above and beyond what is listed.



Tool List

☐	Ratchet Chain Puller	For inserting and securing 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.
☐	Combination Wrench	Attaching NPT Launch Cylinder and Packing Seal.
☐	Pipe Thread Sealant	Attaching NPT Launch Cylinder and Packing Seal.
☐	Penetrating Lubricant	Lubricate ram sections when sliding on packing seal

Flanged Launch Cylinder

☐	Torque Wrench & Socket	Match the values listed in the table below for the launch cylinder.
☐	Combination 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.

4-BOLTS

8-BOLTS

Torque Figures						
	Class 150 Flanges			Class 300 Flanges		
Size	**Bolt**	**Wrench**	**Torque**	**Bolt**	**Wrench**	**Torque**
3	5/8"	15/16"	110 lbf * ft			
4	5/8"	15/16"	110 lbf * ft			
5	3/4"	1-1/8"	195 lbf * ft			
6	3/4"	1-1/8"	195 lbf * ft	3/4"	1-1/8"	195 lbf * ft
8	3/4"	1-1/8"	195 lbf * ft	7/8"	1-5/16"	310 lbf * ft
10	7/8"	1-5/16"	310 lbf * ft	1"	1-1/2"	465 lbf * ft
12	7/8"	1-5/16"	310 lbf * ft	1-1/8"	1-11/16"	685 lbf * ft
14	1"	1-1/2"	465 lbf * ft.	1-1/8"	1-11/16"	685 lbf * ft
16	1"	1-1/2"	465 lbf * ft	1-1/4"	1-7/8"	960 lbf * ft
18	1-1/8"	1-11/16"	605 lbf * ft			
20	1-1/8"	1-11/16"	605 lbf * ft			
24	1-1/4"	1-7/8"	960 lbf * ft			
30	1-1/4"	1-7/8"	960 lbf * ft			
*Per ASTM torque standard: Torque = Force * Length*						

12-BOLTS

16-BOLTS

WARNING

Immediately before every use re-torque the attachment of the inflation ram to the plug. It is essential to wait 15 minutes between each torque sequence to allow the bolts to stretch and settle with the fabric before applying next torque application.

20-BOLTS

24-BOLTS

4. IMPORTANT – Reference Chart

C or D Measurement MUST be made PRIOR to installing plug in Launch Cylinder

A = Distance from the Top of the Valve Gasket to the Top of the Pipe PLUS the Wall Thickness of the Pipe (Pipe ID) & Hot Tap Sleeve Wall Thickness

B = Distance from the Base of Launch Cylinder to the Top of Packing Seal (Top of Retraction Base, if used)

A + B = C

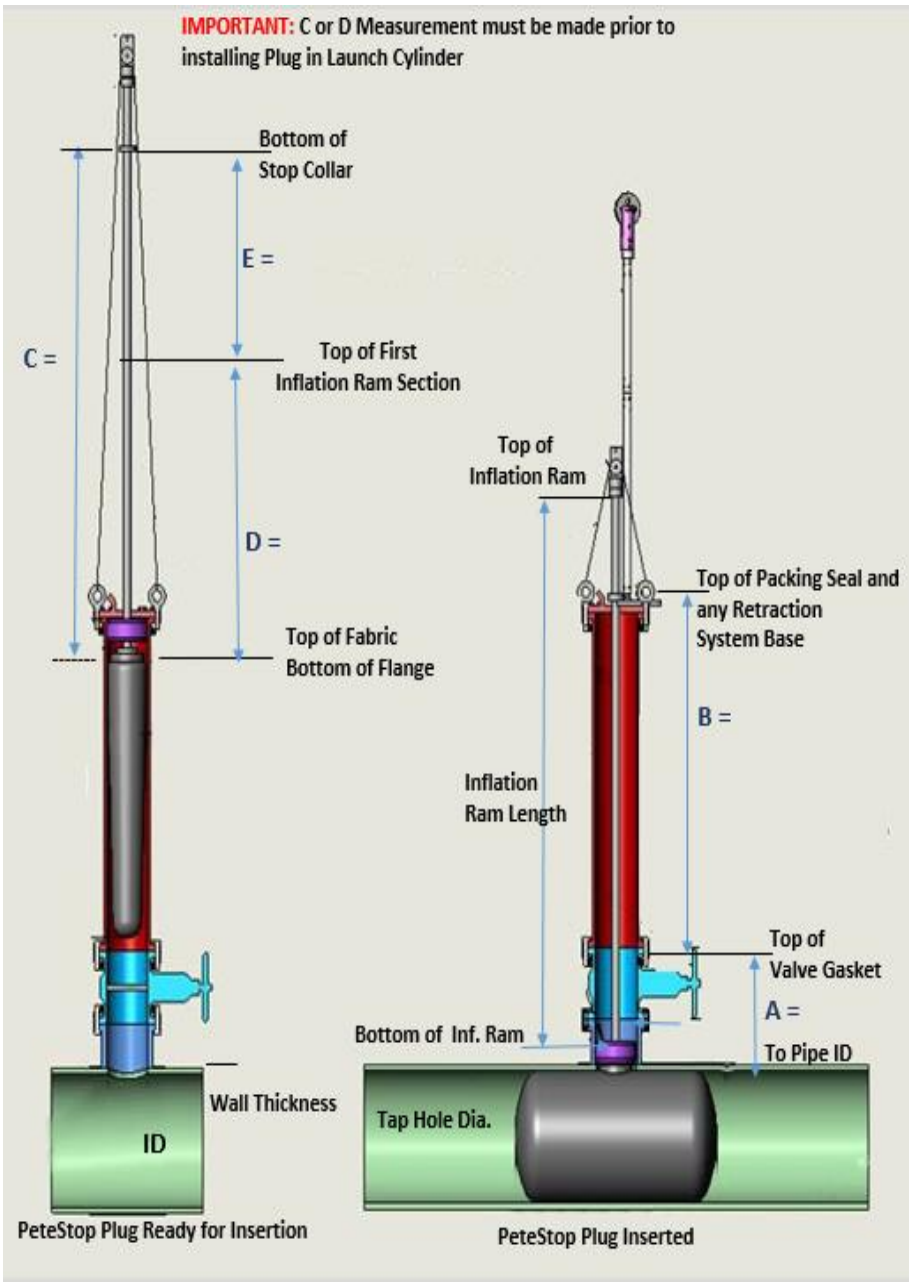
C = Measured from underneath the flange where it meets the fabric to the bottom of the Stop Collar

If single ram section ignore D & E

If multiple ram sections C = D + E

D = Measured from underneath the flange where it meets the fabric, to the far end of the FIRST Inflation Ram Section (ignore the coupling)

E = Distance from the top of the first ram section to the bottom of the Stop Collar



Last page of this manual is a Measurement Card, use this as a guide (keep the measurement units consistent)

PeteStop™ ILS system Configurator https://ilsconfigurator.petersenproducts.com/Home/129 will assist in the overall project. In the field, the IOM and the Measurement card will be closer to tolerance.

All dimensions are assumed field measured with a tape measure an accuracy of +/- 1/32" up to 12 ft. and over 12 ft. +/- 1/16".

Do not use the product if there is significant wear or damage. Return to Petersen for evaluation.

Contact PPC with any questions or suggestions relating to the use of any Petersen product.

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5. Bundling the Pipe Plug

1. Stretch out the plug and inflate - max 5% rated pressure when not supported in a pipe.

2. Roll each end inward.

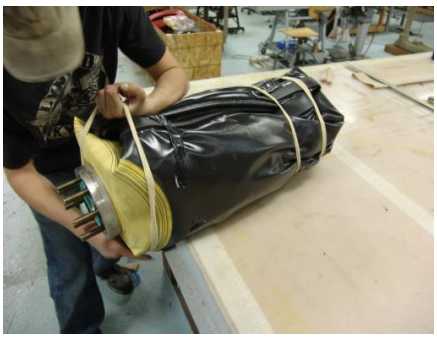
3. Continue folding inward. Maintain even folds on each end.

4. Fold until the end discs touch to the inside.

5. Fold the cylinder to create a round bundle. Verify that the sealing rings are inside.

6. Add rubber bands. Tuck in the bottom corners to reduce the length of the bundle.

7. Verify that the top corners are tucked down so that the plug fits in the hot tap hole.



8. Only use enough rubber bands so that the bundle is smaller than hot tap hole.

9. Bundling completed.

6. Calculating the Upward Force

The Inflation Ram must be restrained with a Ratchet Puller and/or Strongback sized for the upward force on the Inflation Ram when the PeteStop™ ILS Plug is inflated to its maximum pressure rating.

1. **Formula: $F = \pi \times r^2 \times PSI$**

   F = force on the Ram, π = 3.14159, r = ½ the Tap Hole Size, PSI = plug pressure

   If the Force on the Ram exceeds 11,000 lbs., a Strongback should be used.

2. Calculate this force by multiplying the rated pressure times the square inches in the tap hole. The Ratchet Puller or Strongback should be rated at least twice the Inflation RAM force.
   - Pressures exerted on a plug are the same for liquid, water, or air.
   - Pressures from gases (e.g., air, nitrogen) are compressible and more dangerous than water.

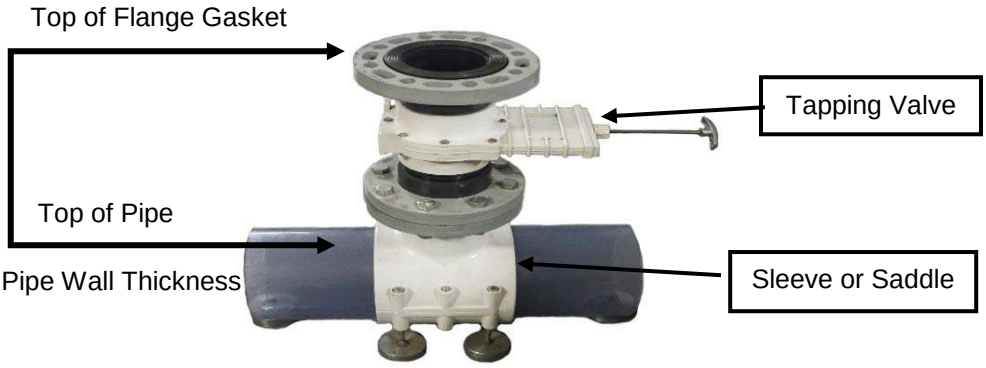
7. Setup and Tapping the Pipe

1. Install line sleeve or saddle and tapping valve (aka service valve) on pipe, according to the manufacturer's instructions.
2. Position the sleeve/saddle so that when the plug is inserted it will not be damaged by the sharp edges.
3. Use a fitting as required for each application taking into account jurisdictional service requirements.

NOTE: *129 series standard configuration is typically launched with sleeve/saddle perpendicular to the line. Caution shall be taken when launch equipment is not in standard configuration, Call engineering about non-standard configurations and their customization*

8. Key Measurements

A measurement



A - Measure the following:

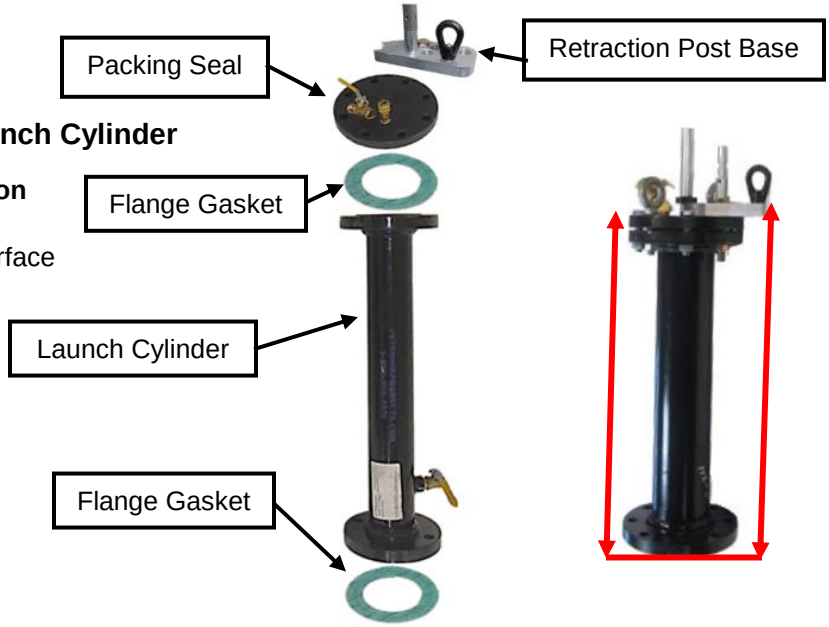
A = Distance from Top Flange Gasket to Top of Pipe + Pipe Wall Thickness

NOTE: *This is a* ***critica****l measurement and good practice is to measure from pipe to flange on both sides to make sure that the fitting and flange are square.*

B - Measure the following:

B = Retraction Post Base + Packing Seal + Launch Cylinder

1. Retraction Post Base **NOTE: Include Retraction Post Base ONLY if it will be used**
2. Packing Seal – including raised face gasket surface
3. Flange Gasket 1/16" per
4. Launch Cylinder Length

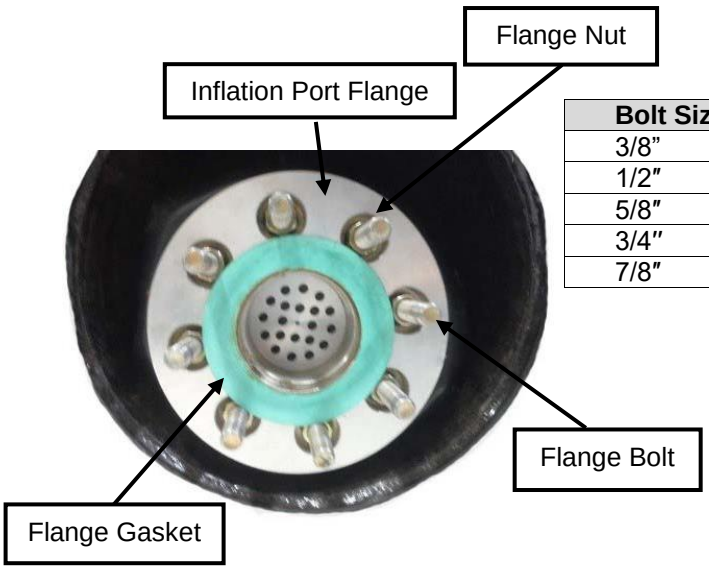


B measurement

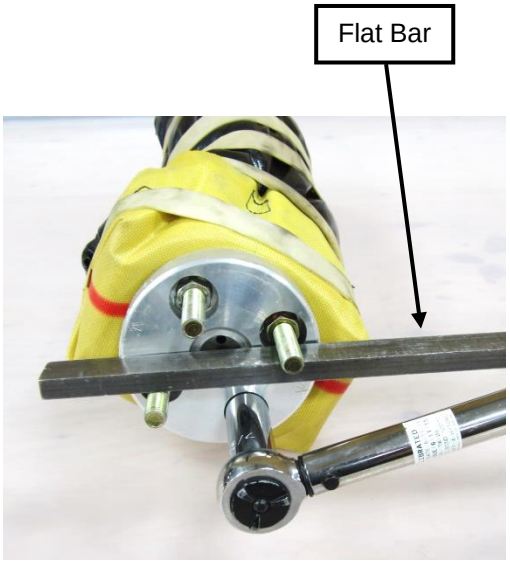
Once measurements are taken, commence Hot Tapping operation according to job specific requirements.

9. Installing the Ram

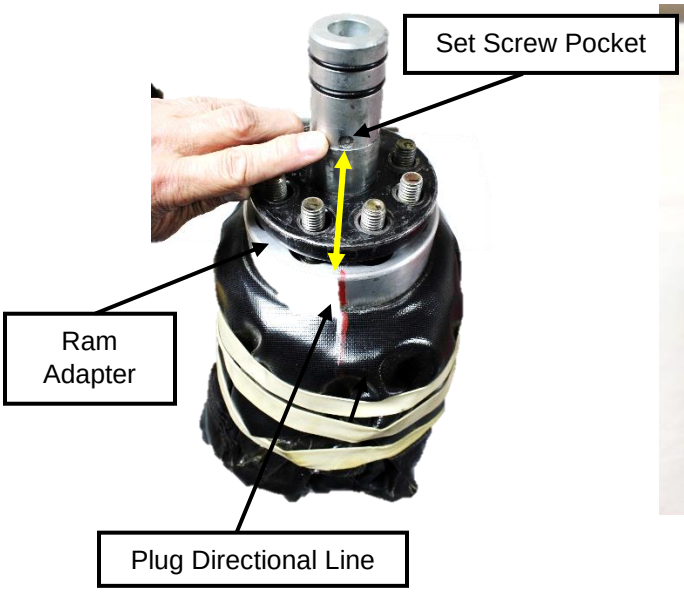
1. Clean the Inflation Port, Flange Gasket, and Ram Adapter (if needed).
2. **Tighten the Inflation Port Flange Nuts prior to use if the plug has not been in use for awhile**. The fabric may stretch during use or relax over time and loosen the Flange joint. Use a flat bar between the studs to hold the plug while applying torque.

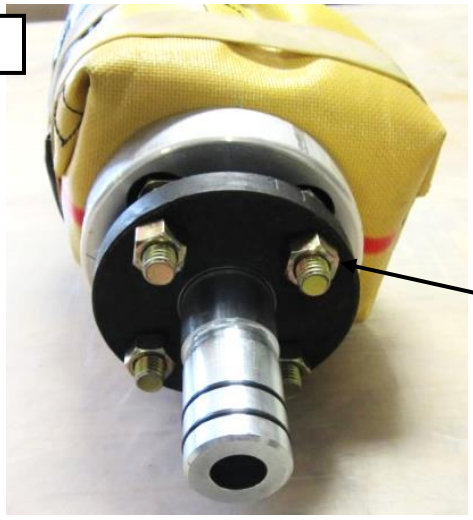


Bolt Size	Torque
3/8”	33 ft/lb
1/2″	80 ft/lb
5/8″	159 ft/lb
3/4″	254 ft/lb
7/8″	400 ft/lb



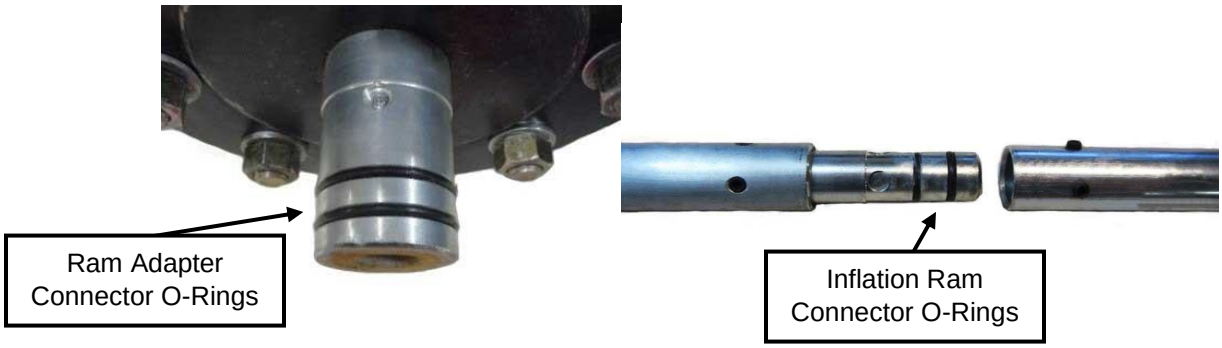
3. If no Ram Adapter is needed skip to page 13. Place the Ram Adapter end on the Inflation Port Flange. Align the Set Screw Pocket on the Ram Adapter with the Plug Directional Line on outer flange.



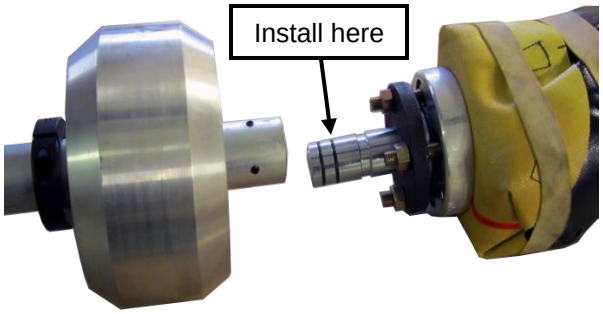


4. Tighten the Ram Adapter Nuts to secure the ram adapter. Use a star pattern to apply balanced torque. Complete the pattern three times 30%, 70%, 100% to the torqueing sequence on page 8.

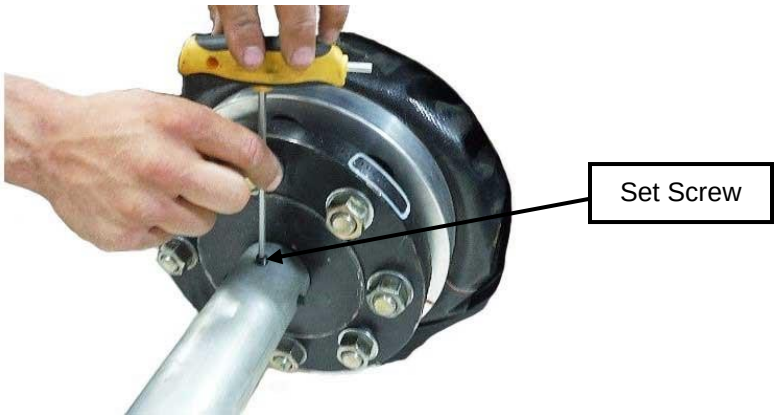
5. Apply light amount of O-Ring grease to the O-Rings on Ram Adapter and Inflation Ram Connector.



6. Install one section of the Inflation Ram to the Plug/Ram Adapter.

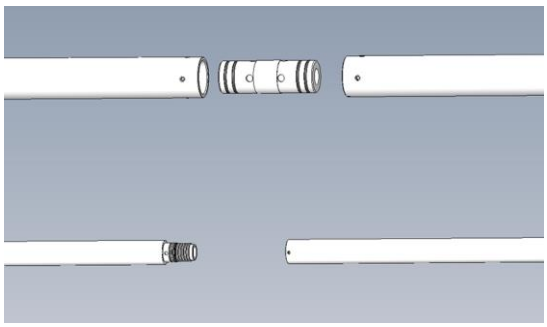


7. Align the Plug Orientation Line on the Outer Flange with a Set Screw. This will later align the plug inflation direction with the pipe direction. See table below for torque guidelines.



Screw Size	Torque
#10	30 lbf * in
1/4“	76 lbf * in
3/8”	276 lbf * in

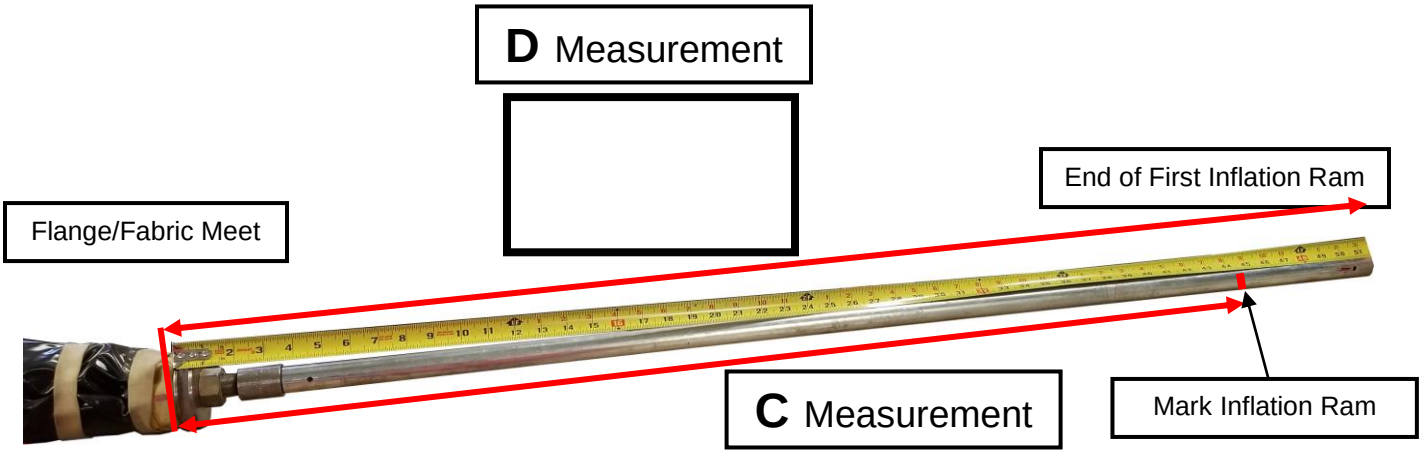
8. Set screw rams have female ends and require a ram coupling with male ends to connect. Threaded rams have male and female ends and do not require couplings.



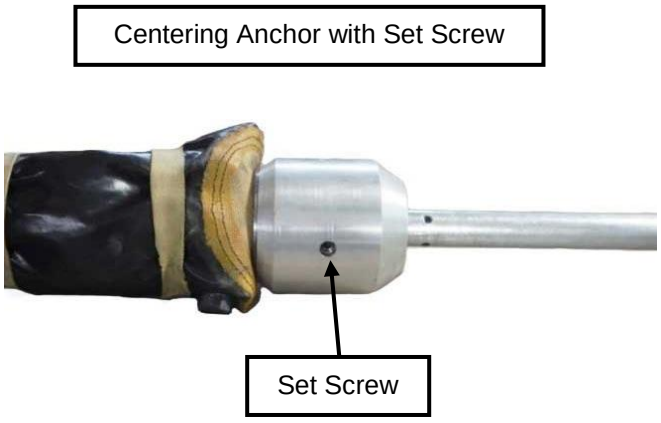
9. Use a marker to mark the inflation Ram set screw hole on the end opposite the plug. The Plug Directional Line on the outer flange should also line up with the mark and the set screws.

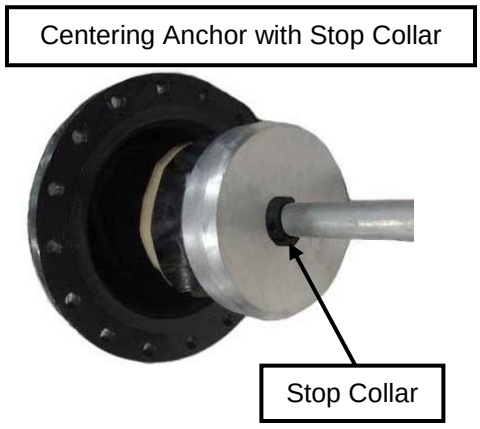
10. **If One Inflation Ram section** – Use C measurement from page 9 and measure from underneath the flange where the fabric meets to the C measurement distance. Place mark on Inflation Ram.

    If Multiple Inflation Rams - Measure from underneath the flange where it meets the fabric, to the end of the inflation ram. The distance is D Measurement.

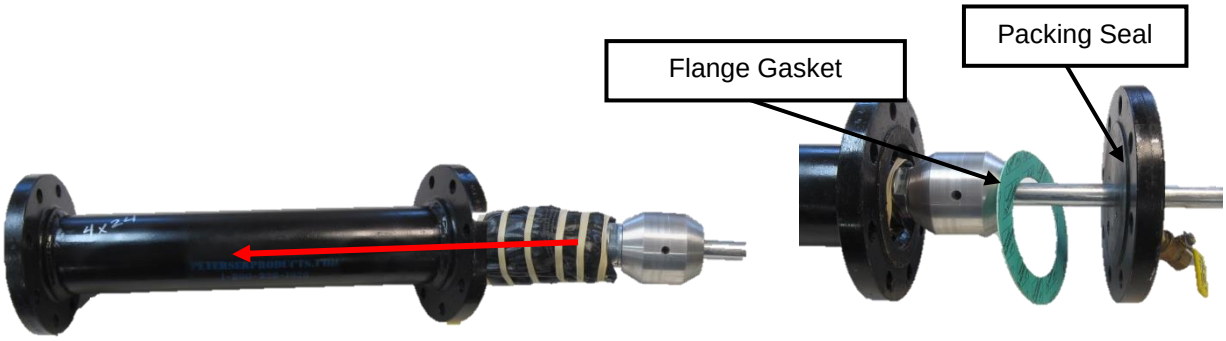


11. Slide Centering Anchor on to the Inflation Ram. Secure the Centering Anchor with a Set Screw or Stop Collar, depending on the model. The Centering Anchor should be flush with the bottom of the Plug Flange where it meets the fabric.

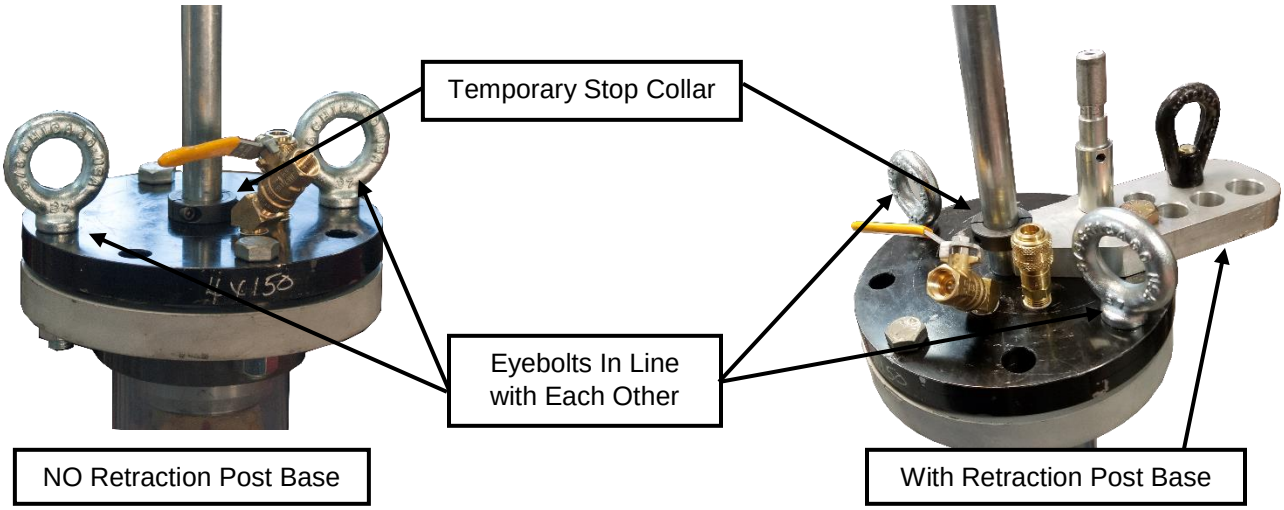




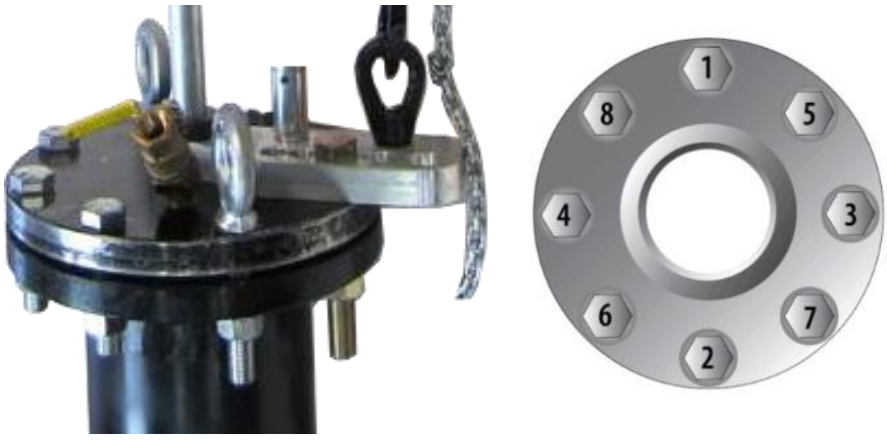
12. Insert plug into the launch cylinder. Slide the flange gasket and packing seal on the inflation ram.



13. Lightly lubricate and insert Eyebolts in line with each other. Verify the eyebolts do not interfere with the valve on the packing seal. If required, install the retraction post base which aides in the removal of the plug after work is completed. **IMPORTANT: Add a temporary stop collar on the ram to hold the packing seal in place.**



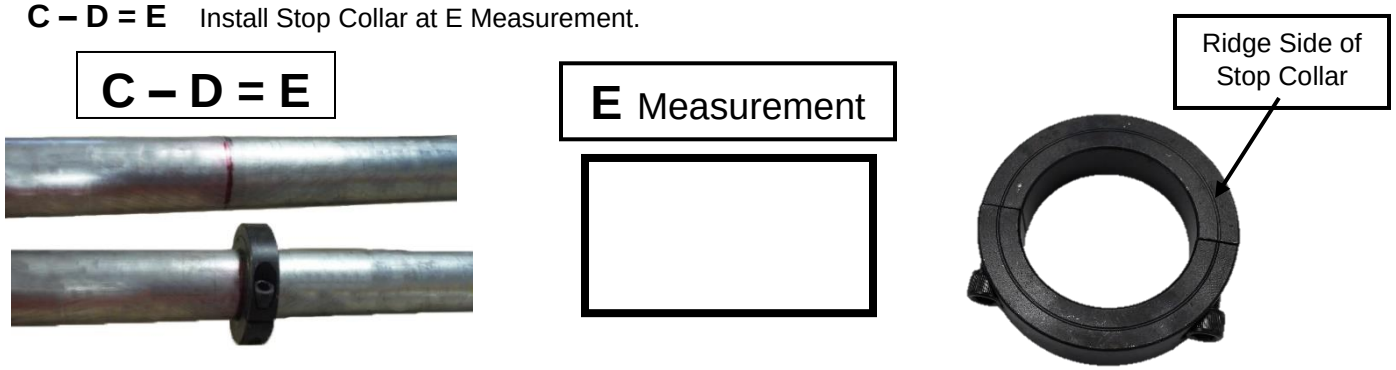
14. Lightly lubricate the bolt and nut threads. Tighten the remaining bolts to secure the packing seal to the launch cylinder flange. Use a star pattern for balanced torque. Refer to Table under Section 3.0 Torque Figures.



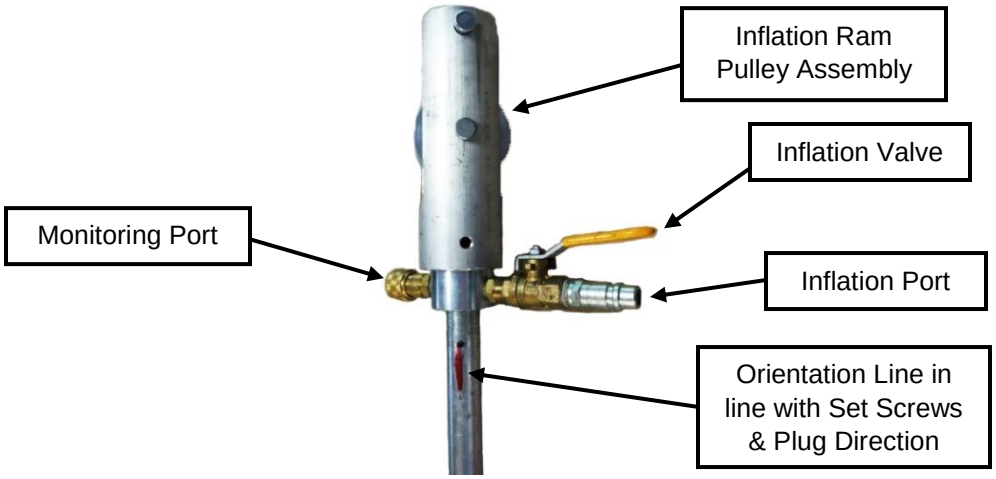
15. The ridged side of the Stop Collar should be facing the plug at the mark on the Inflation Ram.

    If One Inflation Ram Section – C Measurement.

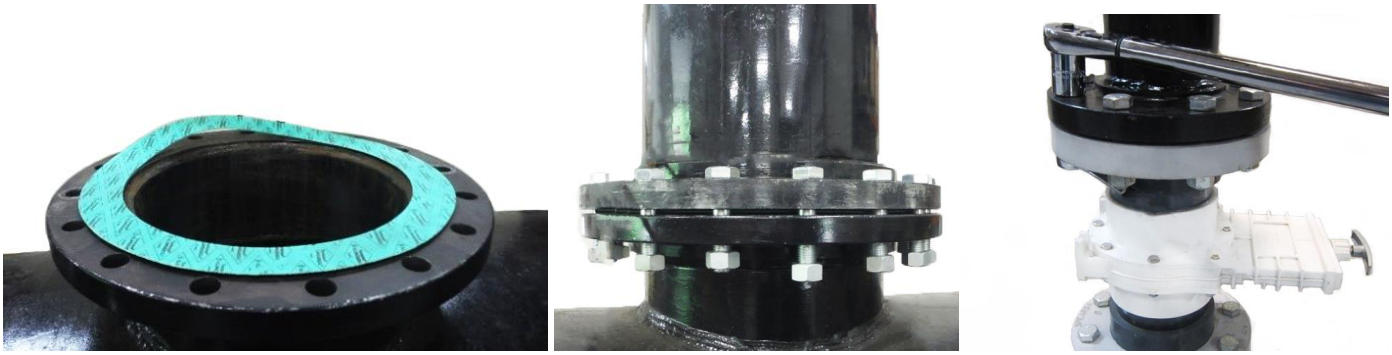
    If Multiple Inflation Ram Sections – Install remaining Inflation Ram section(s), Coupling(s) and Set Screws to the first Inflation Ram. Take C Measurement (page 9) Minus D Measurement (page 14) equals E Measurement.
    C – D = E Install Stop Collar at E Measurement.



16. Mark the Set Screw on the last Inflation Ram section with an orientation line. Verify that the mark aligns with the mark on the first Inflation Ram section. Attach the Inflation Ram Pulley Assembly to the end of the Inflation Ram. Torque all setscrews. Align the Inflation Valve and the Pressure Monitor Port with mark on the Inflation Ram for a better visual of proper plug alignment. **NOTE -** *High forces may require a strongback (See Strongback Calculation).*

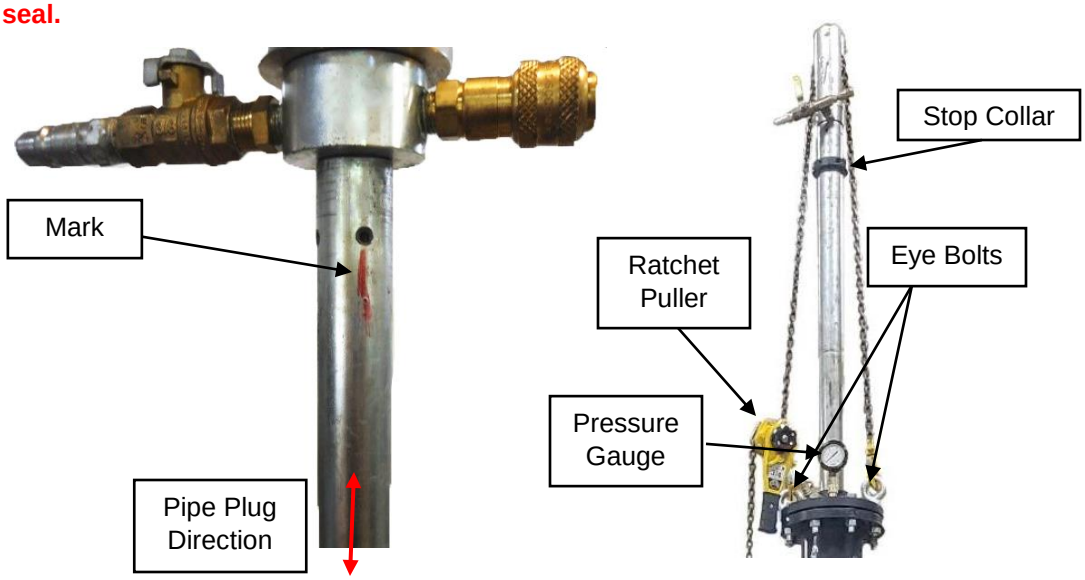


17. Verify that the gasket is between launch housing and tapping valve, lightly lubricate bolts then bolt the launch housing to the tapping valve flange. Use a star pattern for balanced torque. Complete the pattern three times: 30%, 70% 100% to the torqueing sequence. Refer to Table under Section 3.0 Torque Figures.

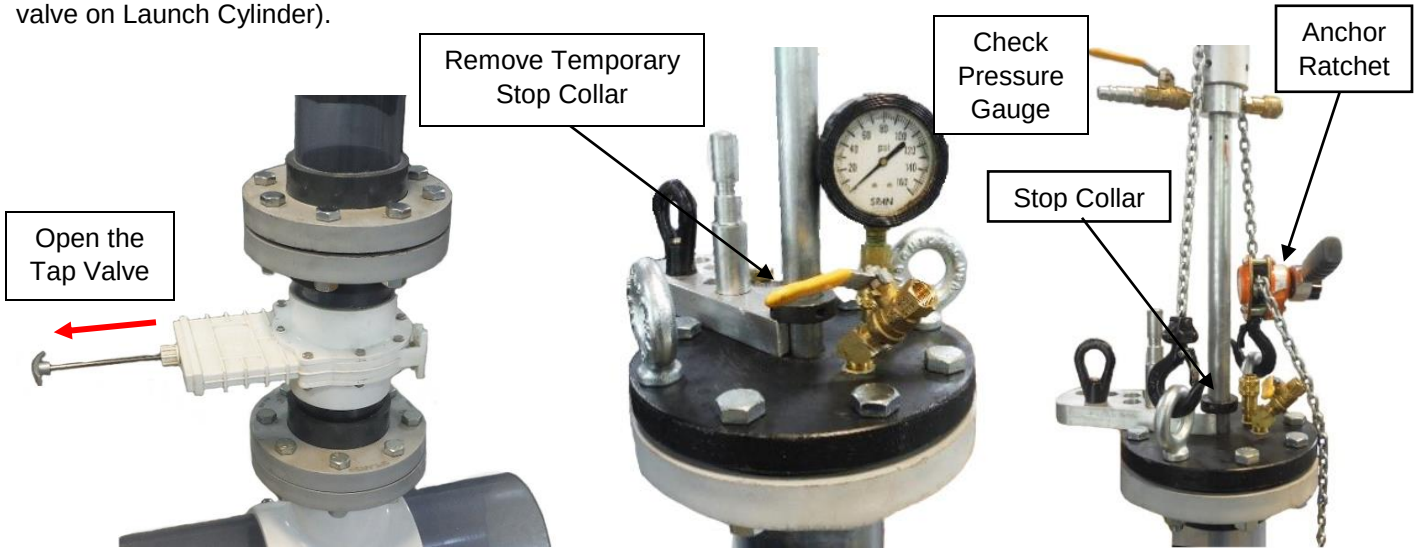


10. Plug Insertion in Horizontal Pipe (Vertical Pipe Page 32)

1. Orient the mark on the Inflation Ram with the direction of the pipe. Attach the Ratchet Puller to the Eye Bolts and over the Inflation Ram End Pulley. Install Pressure Gauge. **CAUTION: Keep all essential and non-essential personnel out of the line of fire as the inflation ram may rise until the centering guide contacts the packing seal.**



2. Open the Tapping Valve and allow pressure equalization in the Launch Cylinder (if necessary carefully open purge valve on Launch Cylinder).



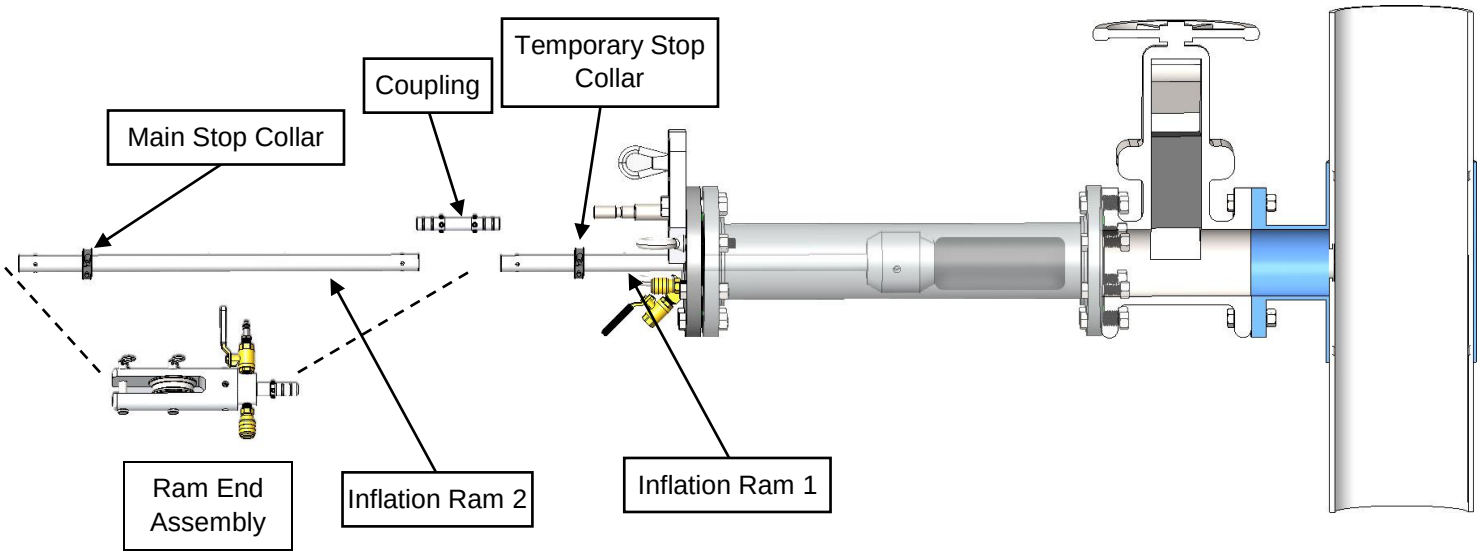
3. Use the gauge to check the pipeline pressure. Fix any possible leaks. Verify that the pipeline operating pressure is less than half the plug rated inflation pressure. Remove the temporary stop collar. **CAUTION: If there is LITTLE TO NO PRESSURE, the inflation ram MAY FALL once the temporary stop collar is removed. It is recommended to secure the ram during this operation.**
4. Verify while lowering the plug that the orientation mark on the ram stays in line with the pipeline.

5.1 Inflation Ram Sections in One Long Piece

Lower the ram until the stop collar on the inflation ram is touching the retraction post base or packing flange. Anchor the plug in place with the ratchet puller or a strong back (see Calculating Upward Force).

5.2 Inflation Ram Installation in Sections due to Height Clearance Issue

- Lower the Ram until the Initial Stop Collar reaches the Packing Seal or the Retraction Post Base. Note: maintain correct plug orientation during insertion.
- Remove the Ram End Assembly. Install the next ram section with temporary stop collar, installing the Inflation Ram with the Main Stop Collar mark last. Tighten the set screws to secure the ram sections together. Loosen the set screws and remove the temporary Stop Collar. Slowly lower the Plug. Maintain correct orientation. Use the Mark on the inflation Ram to confirm correct orientation.
- Lower the Inflation Ram until the Main Stop Collar reaches the Packing Seal. Use O-Ring lubricant if needed. Anchor the plug in place with the Ratchet Puller.
    - Connect the inflation accessories.



11. Air/Gas Inflation of the Plug

Determine Inflation Medium – Air, Nitrogen, Water, Grout or other

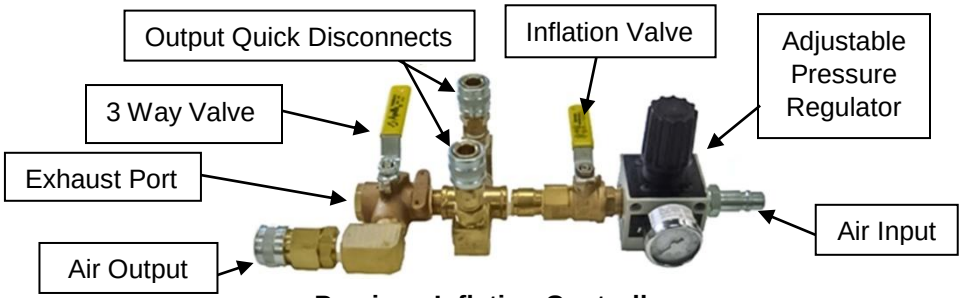
1. What is the Application?
2. What pressure is required to fill the plug and what source will this come from?
3. Will water, or other fluid be used to fill the plug, and approved by client?
4. If the plug were to burst, can the fluid come in contact with pipeline service?
5. High Pressure plugs are, by standard, water filled and pressurized with air or nitrogen.
6. Medium used is also determined by size of inflatable, pressure, temperature, service.

USE Water when (go to page 21):

- ☐ High Pressure (fill with water until full then top off with air or nitrogen to reach desired pressure)
- ☐ Pipes larger than 12” – water is recommended
- ☐ Pipe more than half full of liquid
- ☐ Pipe less than half full of liquid (fill with air to take shape then fill with water).

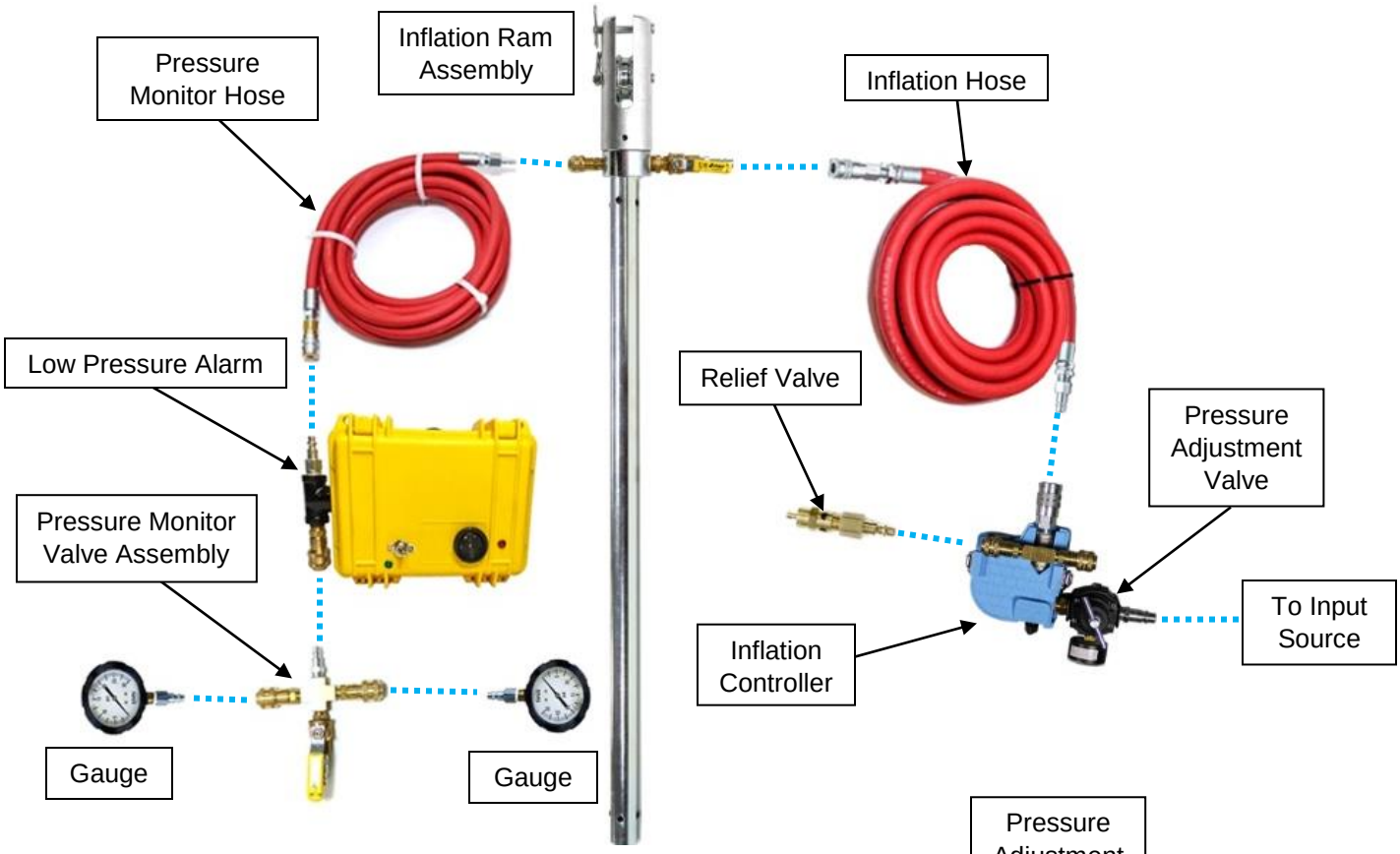
Air/Water Inflation Kit

			
Pressure Relief Valve	**Low Pressure Alarm**	**Inflation Hose**	**Pressure Monitor Hose**
			
Pressure Monitor Valve Assembly	**Inflation Controller**	**Venturi Vacuum**	**Pressure Gauges**



Previous Inflation Controller

1. Assemble the Inflation Kit. See Steps A-H for assembly.

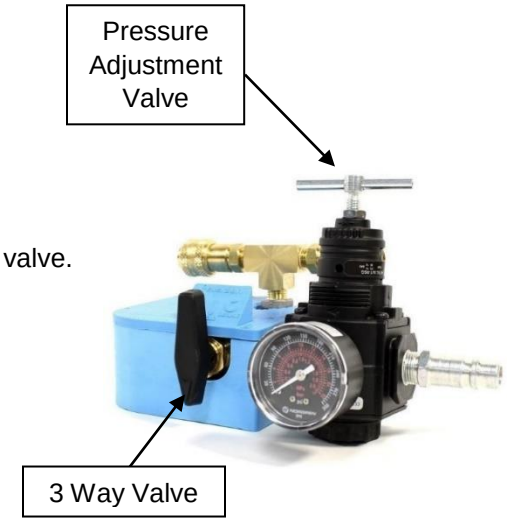


Pressure Monitor Hose Side

- **A)** Connect the Pressure Monitor Hose to Inflation Ram Assembly.
- **B)** Connect Pressure Monitor Hose to the Low Pressure Alarm.
- **C)** Connect Pressure Monitoring Valve Assembly to Low Pressure Alarm
- **D)** Attach Gauges to the Pressure Monitoring Valve Assembly and close valve.

Inflation Hose Side

- **E)** Connect Inflation Hose to the Inflation Ram Assembly.
- **F)** Connect the Inflation Hose to the Inflation Controller.
- **G)** Connect the Relief Valve to the Inflation Controller.
- **H)** Connect the Inflation Source Line to the Inflation Controller Input.



2. If using a Low Pressure Alarm, set the alarm to 10% below desired pressure.

3. Adjust the pressure using the Pressure Adjustment Valve (Clockwise to inflate, counter clockwise to deflate) on the Inflation Controller. Do not over inflate the plug. **CAUTION: Maintain pressure at 2X the pipeline pressure, but less than maximum rated plug pressure.**

4. Inflate the Plug. Monitor pressure with the Gauges on the Pressure Monitor Valve Assembly as it generally takes 10-20 minutes for the plug to stabilize (time will vary due to temperature, size, pipe conditions, medium, etc.).

5. Once inflated, turn on the Low Pressure Alarm to warn you of a drop in pressure.

12. Plug Deflation for Inflated Plugs in Horizontal Installation

Air or Gas

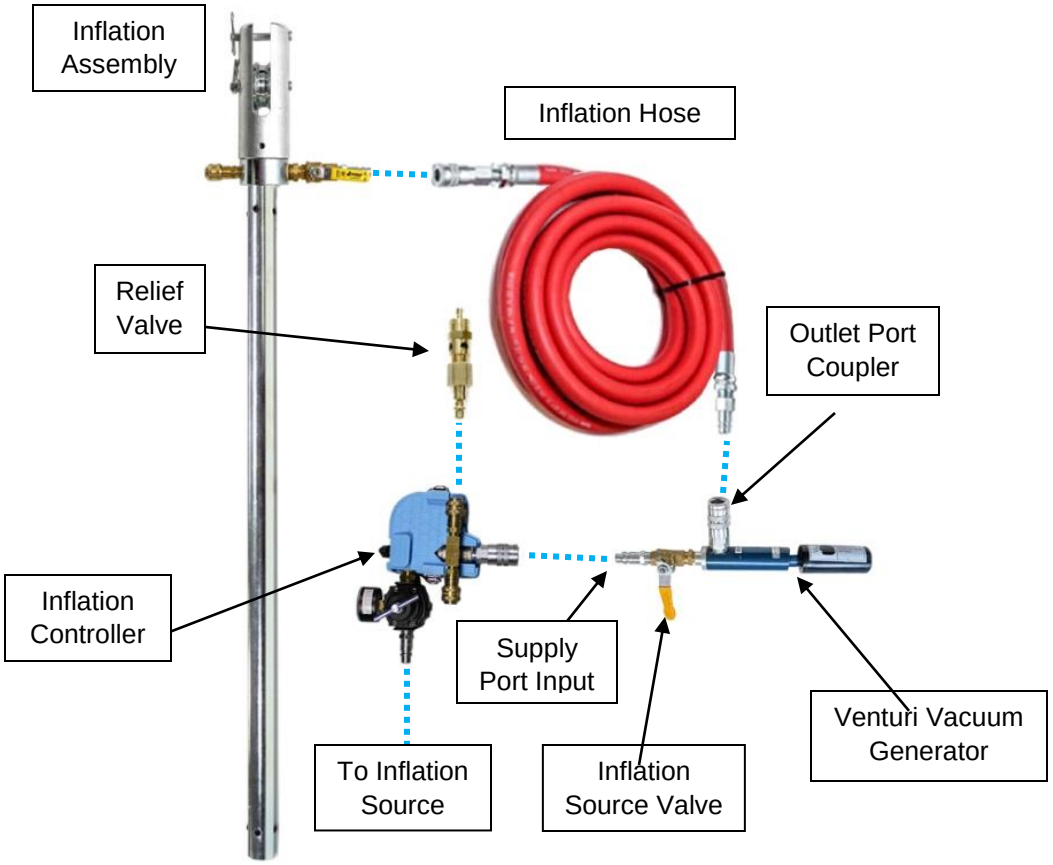
1. Equalize the pressure on both sides of the plug by opening the valve on the pressure monitor assembly.
2. Disconnect the Inflation Hose.

CAUTION

You can damage the plug if it is not fully deflated before removing from pipe.

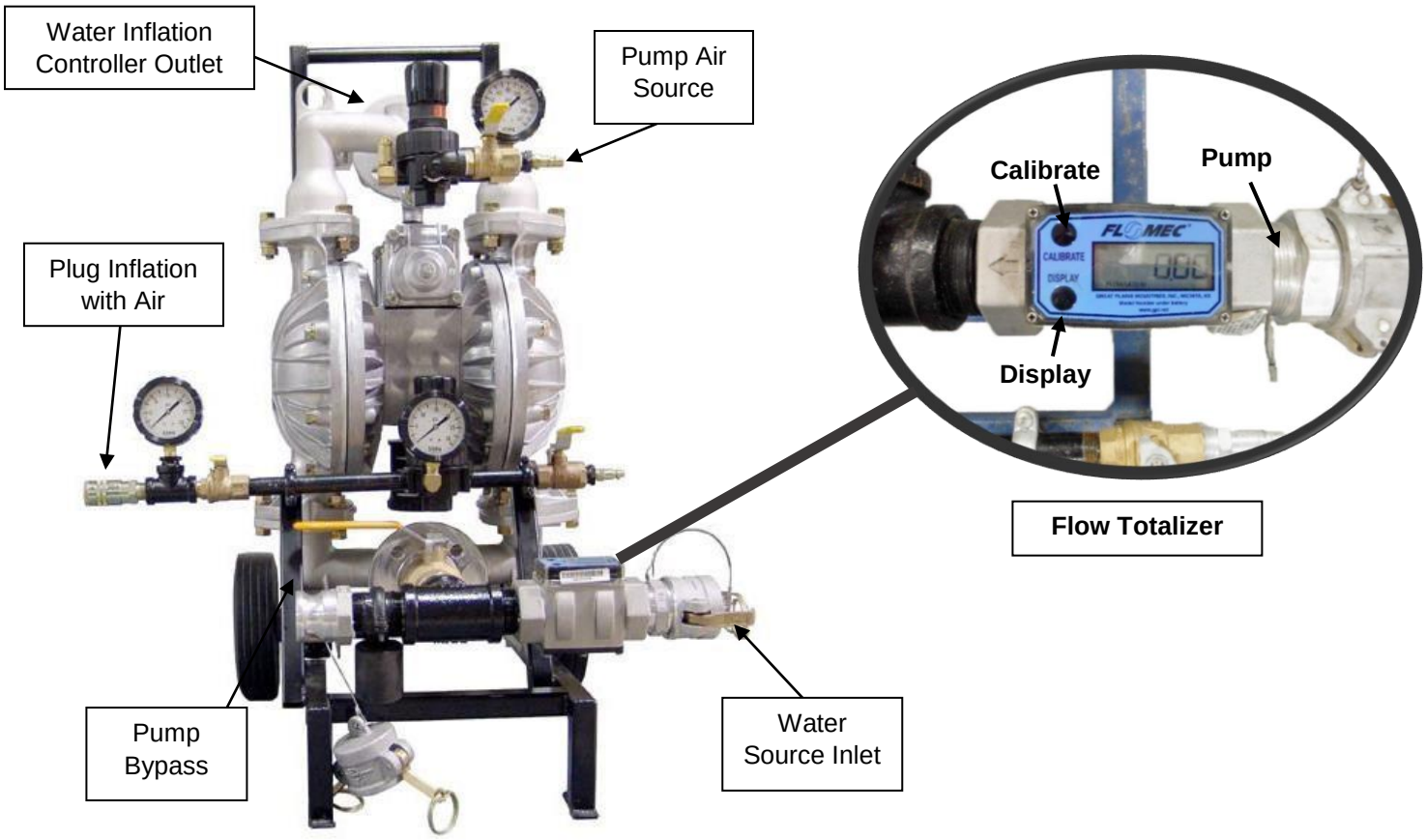
Deflating with the Venturi Vacuum Generator

1. Connect the Inflation Hose to the Venturi Outlet Port Coupler.
2. Close Inflation Source Valve.
3. Connect the Supply Port Input on the Venturi Vacuum Generator to the Outlet Valve on the Inflation Controller.
4. Increase pressure to the Venturi Vacuum Generator. Do not exceed 100 psi.
5. Open the Inflation Source Valve.
6. You will hear an audible change in sound when the vacuum pressure increases, indicating the inflatable device is fully deflated. (Go to Plug Removal)



13. Water Inflation of the PeteStop®

The 1.5” Port Pump is rated for 100 gpm max flow and 100 psi max air source. If more pressure is needed for plug, top off with Nitrogen or Air.



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.

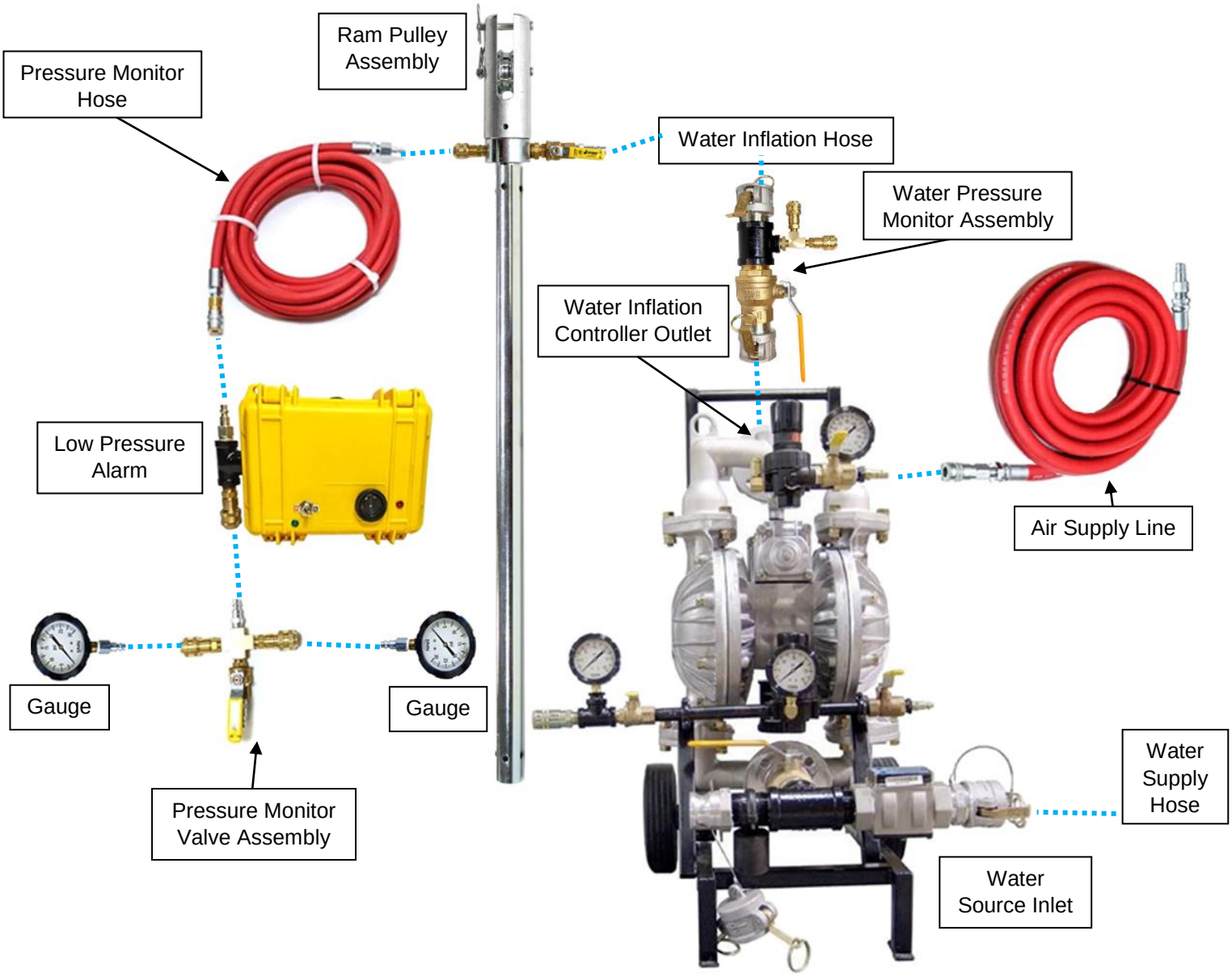
Assembling the Water Hoses and Pressure Monitoring Lines

Pressure Monitor Hose Side

1. Connect the Pressure Monitor Hose to the Inflation Ram Pulley Assembly.
2. Connect the other end of the Pressure Monitor Hose to the Low Pressure Alarm.
3. Connect Pressure Monitor Valve Assembly to the Low Pressure Alarm.
4. Connect the two Gauges to the Pressure Monitor Valve Assembly.

Inflation Hose Side

5. Connect the Water Inflation Hose to the Inflation Ram Pulley Assembly.
6. Connect the Water Inflation Hose to the Water Pressure Monitor Assembly.
7. Connect Water Pressure Monitor Assembly to the Water Inflation Controller outlet.
8. Connect the Water Supply Hose to the Water Source Inlet.
9. Connect the Air Supply Line to the Pump Air Source Connection.



Inflating the Line Stop Plug with Water

CAUTION

Do Not inflate more than 20% over the pipeline pressure until the Inflation Ram is anchored into the correct position.

For maximum safety, remove as much air as possible, by venting through the Inflation Ram with the Pressure Monitor Valve Assembly.

The maximum rated pressure assumes the plug is fully inserted into a proper sized pipe.

Do Not exceed the maximum rated pressure.

NOTE: *Add 0.433psi for every foot the pressure gauge is above the bottom of the pipe (pipe invert). Remove 0.433psi for every foot the pressure gauge is below the invert of the pipe* ***(ONLY if filled with water).***

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.

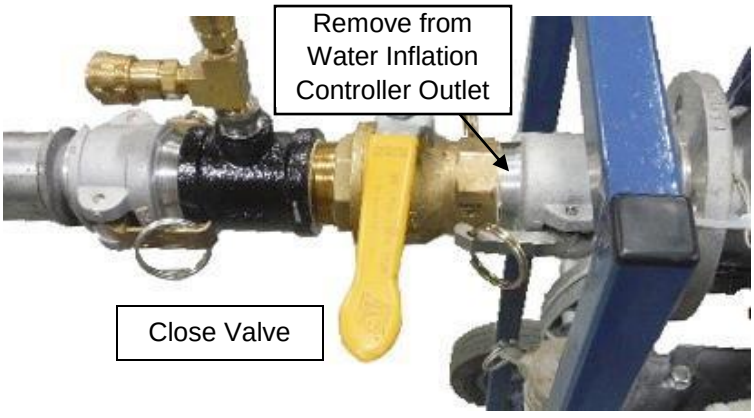
NOTE

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

4. When the pressure in the plug climbs close to the maximum rated pressure or the pump flow rate drops too far, stop the pump and then close the Inflation Valve. Open the valve at the Pressure Monitor Assembly to release any air. Close the Pressure Monitor Valve. Repeat multiple times until the Pressure Monitor Valve is releasing only water.
5. High pressure plugs can be topped off with air or nitrogen after they are filled with water.
6. Turn on the Low Pressure Alarm. If the pressure drops below the alarm set point then the alarm will sound.

14. Water Deflation

1. Close the valve on the Plug Water Inflation Hose. Remove from the Water Inflation Controller Outlet.

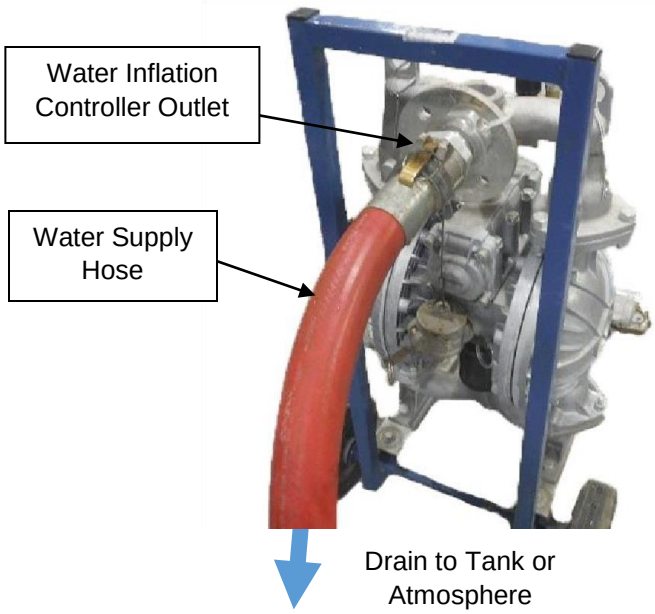


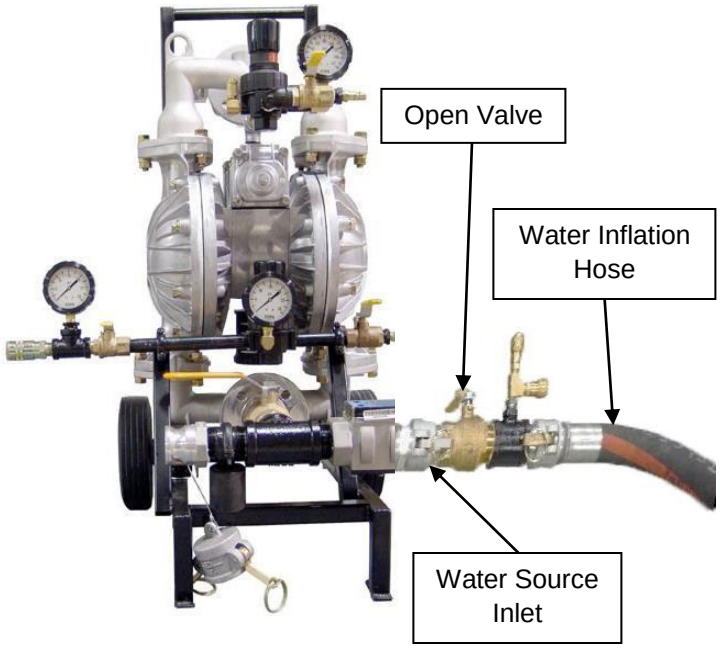
2. Switch the Water Hoses to the other connection ports. Connect the Water Inflation Hose to the Water Source Inlet. Connect the Water Supply Hose to the Water Inflation Controller Outlet.
3. Verify that the Water Pump Outlet hose drains into a tank or area that can collect the water pumped out of the line stop plug.
4. Zero the batch counter to track the output.

NOTE

The pipeline pressure can trap water and deflate the line stop plug. Re-inflate the plug to purge the water as needed.

5. Open the valves on the Water Inflation Hose and begin deflating the Line Stop Plug.
6. Continue pumping until water completely stops trickling.





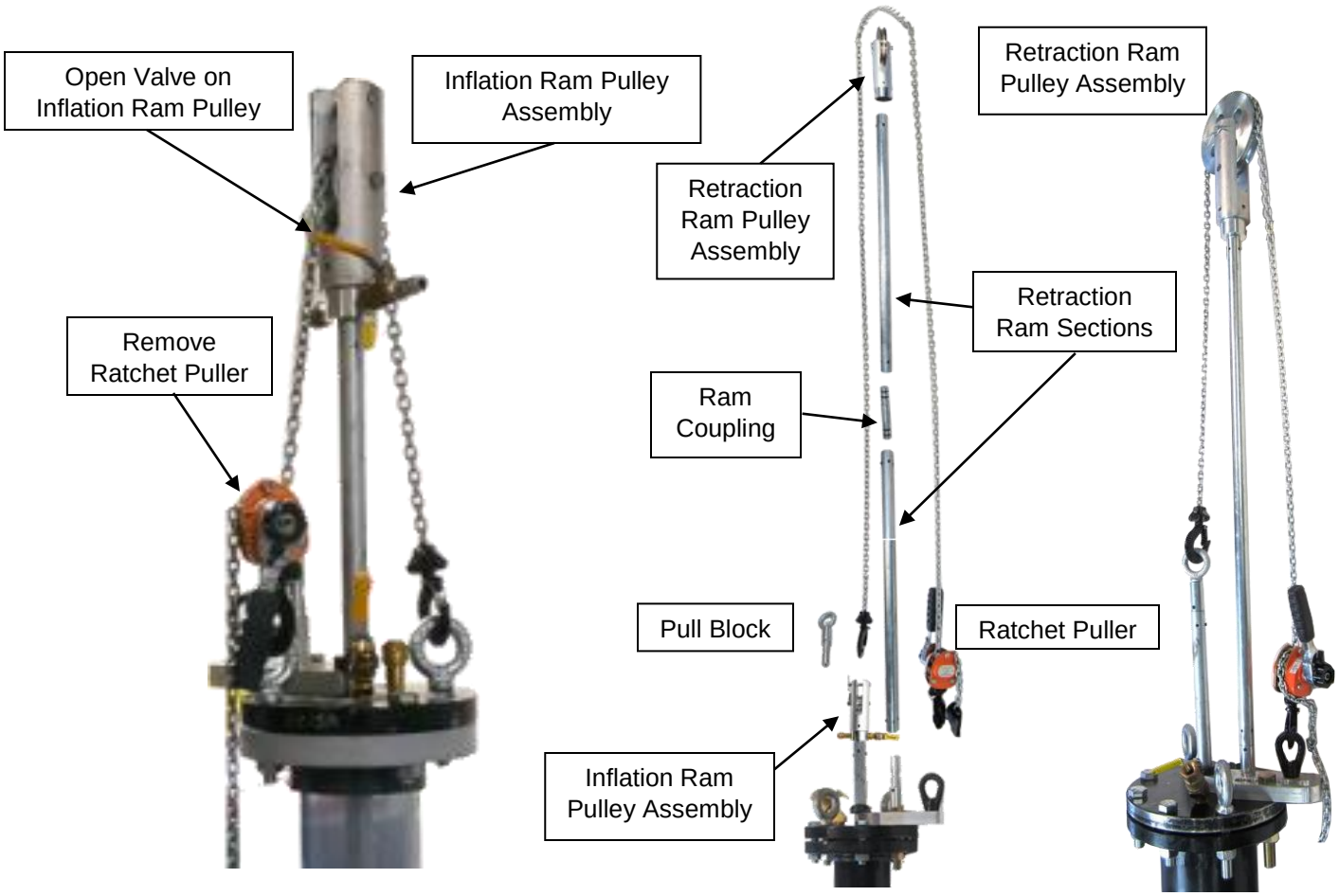
NOTE

Maximum vertical lift from the pipe invert is 18 ft. The Pump will only lift water 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.

15. Plug Removal



Removal of the Plug

1. Open valve on Inflation Ram Pulley Assembly to allow air to vent when removing the plug from the pipe.
2. Remove the Ratchet Puller.
3. Remove the Strong back, if using a Strong back.
4. If using a retraction system, attach Retraction Ram Section(s) and Ram Couplings (if any) to Ram Removal Base Plate. Use extreme caution and pull slowly when retracting with a crane, hoist or other method.
5. Install Retraction Ram Pulley Assembly to top of Retraction Ram Section(s).
6. Put the chain over the Retraction Ram Pulley Assembly and secure the hooks to the Inflation Ram Pulley Assembly and Eye Bolt on the Ram Removal Base Plate.
7. Using the Ratchet Puller, retract the Inflation Ram, removing one Inflation Ram Section at a time. Use the pull block for the remaining Inflation Ram Sections. NOTE: listen for escaping air from Inflation Ram Pulley Valve as you remove the plug. If you hear air escaping rapidly, slow down retraction of plug to prevent damage.
8. Repeat until the plug is fully in the launch housing.
9. Once the plug is fully retracted, close the tapping valve. Drain the Launch Cylinder by opening the Drain Valve.
10. Disassemble the system in the reverse order it was assembled.

16. Maintenance and Care

It is important before and after every use you carefully inspect for abrasions, tears, movement of clamps, air leaks or any other signs of deterioration or defect.

Clean with mild soap and water, disinfect if necessary*.

NEVER clean with solvents or petroleum products. Contact PPC with any questions or concerns about disinfectant and cleaner use.

Large plugs may be leak tested in smaller pipes.

The plug may be inflated for cleaning and inspection. **CAUTION: Do not exceed 5% of the plugs rated pressure when outside of a pipe.**

Do not allow the plug to remain in sunlight for long periods to prevent damage.

Verify that the plug is empty of water and dry prior to storage in a dry location.

Keep the instructions and the yellow Warning Tag with the plug.

NOTE: You can send your plug to Petersen Products to be Refurbished and for Recertified.

17. Troubleshooting

Pro Tips:

- Rubber bands may slide or snap off. This is normal and the rubber bands do not affect the operation of the plug.
- Rubber bands are standard. If stringent foreign material exclusion (FME) procedures are in place, the rubber bands may be replaced with insertion sleeves.
- The deflated length of the plug is always longer than the pipe ID dimension. In most cases, there is some force required to press the plug into the pipe to the correct set-dimensions noted by the inflation ram stop collar.
- The location of the stop collar is of critical importance. The top of the plug must seat at the pipe ID.
- Caution shall be used when deflating the plug. Watch for water/air locks if excessive force is required to lift the plug.
- Fluids may become trapped between plys and cause the plug to require more force to lift out of service.
- Always check plug for damage after use and clean prior to storage/recertification.
- The plug will provide a “workable” seal. The exact site conditions vary and pipe wasting, pipe tolerances, scaling, solids, etc. may be present in the line. Always consider mitigation techniques for a small amount of leak by such as using double block and bleed. When the highest quality seal is required sealing rings and other methods may be required to minimize leak by the plug.
- Plugs work great in less than 0.5ft/s flow.
- Plugs work best with friction in the pipeline, solids, metal shavings, imperfections in pipe, out of roundness, scaling, are typically not a problem.
- The ratchet puller should be left engaged when the plug is in operation.

Safety Tips:

- Always check alignment between fittings and launch equipment and use.

- Always follow safe rigging practices.
- Always follow site-specific safety requirements.
- Always wear appropriate PPE.
- Adhere to all local jurisdictional requirements.

PROBLEM	POSSIBLE CAUSES	ACTION
Plug tears off ram	Damage from hot tapped edge High Flow Application Pressure not equalized	**Contact PPC IMMEDIATELY**
Not a workable seal	Application requirements or project specifications Piping inside condition – build up, debris, troughing Piping geometry or service inside piping Folds creases of inflatable	**Contact PPC IMMEDIATELY**
Received visibly damaged inflatable	Shipping	Inspect per PPC guidance Contact PPC
Threaded or flanged connection issue	Shipping	Contact PPC
Lift point issue	Lift device location Obstruction of lift device Lift point rating	Seek Rigging Competency Contact PPC
Equipment stack up too long for work area	Cylinder spool length Cylinder ram length Bundled length of inflation	Request multi-piece assembly Request bundled length reduction Contact PPC
Inflatable not going into bore (valve, nozzle, hot tapped) Anchor size issues	Diameter of bundled inflatable or anchor larger than the valve or hot tapped diameter	Contact PPC
Pressure test issues with equipment	Gasket bolted connections not adequately aligned or torqued Threaded connections not adequately engaged	Inspect bolted connections Inspect threaded connections Contact PPC

PROBLEM	POSSIBLE CAUSES	ACTION
Equipment packing seal leaking	Scoring on inflation ram	Check ram for obvious scoring or damage. Repair or replace ram section.
	Packing fell out/missing	Replace missing or damaged packing
	Debris on inflation ram/packing	Wipe clean and re-lubricate
	Packing used too many times	Replace packing and re-lubricate
Equipment vent valve issue	Debris in the valve seat	Flush out valve
	Bolted or threaded connection issue	Inspect
	Not rated for application	Replace with rated valve
		Contact PPC
Loose flange connection	Time between installation Handling	Re-Torque, refer to page 8
Inflatable not inflating or Inflatable not holding pressure	Inflation medium supply issue	Inspect all fittings and connections for leaks
	Loose ram connections	Inspect for missing O-rings and tighten any loose connections
	Inflatable integrity lost	Inspect for damage or excessive wear and tear Contact PPC
Plug not going to set position	Dimensional error	Double check using ref. Using manual or procedure Discuss with piping owner
	Debris in the pipeline or hot tap	Discuss with piping owner for root causes and PPC
	Flow in pipeline greater	Discuss with Contractor.
	Hot tapped diameter too big or too small	Always specify proposed hot tap hole to PPC in the RFQ
		Contact PPC
Sealing strips rip off	Damage from hot tapped edge	Contact PPC
	High flow	Plug sometimes may be used without rings or refurbished
	Piping inside surface condition	
Flow Stop Issue	Application issue	Contact PPC
DBB Issue	Application issue	Contact PPC

PROBLEM	POSSIBLE CAUSES	ACTION
Not able to equalize pressure	Open ended pipe downstream of inflatables No equalization point upstream or downstream of inflatable Non looped system	Contact PPC
Retraction issue - (Inflatable depressurization), binding, Valve issue	Fluid in plug Fluid trapped between plies Inflation ram bent Water lock.	Remove as much fluid as possible prior to lifting Verify other causes are not at work and use more force Evaluate safe ways to remove by force Bleed-off launch tube
Depressurization of inflatable equipment	Service valve leaking/ malfunctioning Vent valve malfunction	Contact owner of service valve Contact owner of vent valve or PPC

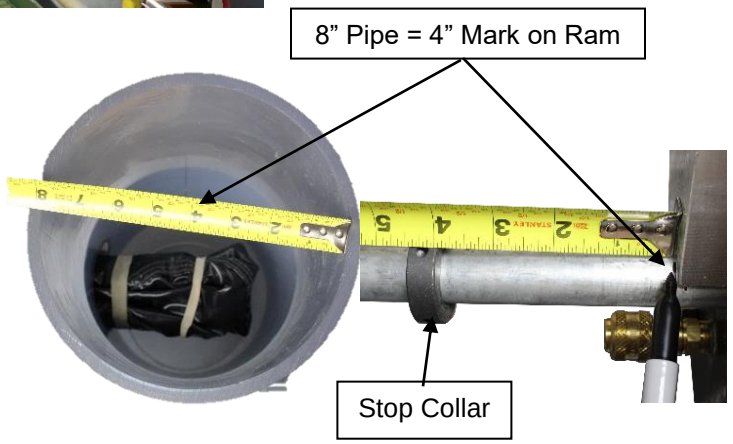
18. Acronyms/Definitions

Acronym	Definition
%	Percent/percentage
Aka	Also known as
DBB	Double block and bleed
FME	Foreign material exclusion
ft.	Feet
gpm	Gallons per minute
HDPE	Polyethylene
ID	Inner diameter
ILS	Inflatable Line Stop
in (“)	inch
IOM	Instruction Operation Manual
Launch housing	(aka) Line Stop Cylinder
Lbf * ft.	Foot pound
Lbf * in.	Inch pound

Acronym	Definition
LD	Lost Distance
Line Stop Fitting	(aka) Sleeve or Saddle
max	Maximum
MD	Measured Distance
OD	Outer Diameter
PPC	Petersen Product Company
psi	pounds per square inch
RFQ	Request for quote
Tapping Valve	(aka) Service Valve
TTD	Total Travel Distance
UV	Ultraviolet
Workable seal	Any seal Safely managed by contractor
x	Times

19. Plug Insertion for Installation in Vertical Pipe

When inserting a plug into a vertical pipeline, the plug may sag down in an empty pipe or float up in a full pipe causing a poor seal. Follow the Instructions below for best results.



8.1 Orient the mark on the Inflation Ram with the direction of the pipe. Attach the Ratchet Puller to the Eye Bolts and over the Inflation Ram End Pulley. Install Pressure Gauge on the Packing Seal.

Make a Mark on the insertion ram below the stop collar that is half the pipe diameter (i.e. 8” diameter pipe 4” distance from the stop collar)

8.2 Open the tapping Valve and allow pressure equalization in the Launch Cylinder (if necessary carefully open purge valve on Launch Cylinder).

8.3 Use the gauge to check the pipeline pressure. Fix any possible leaks. Verify that the pipeline operating pressure is less than half the plug rated inflation pressure.

8.4 Verify the orientation mark on the ram stays in line with the pipeline.

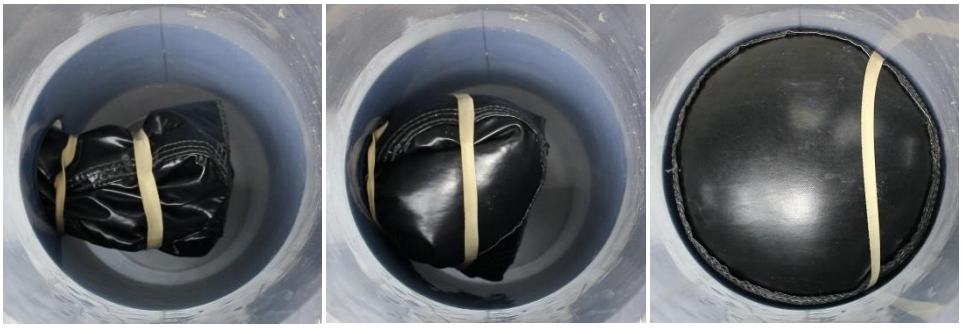
8.5 Insert the plug into the pipeline until it reaches the half pipe diameter mark on the inflation ram. A small plug or low pressure pipe you may need to push the plug into the pipeline. A large, heavy plug may need to be ratcheted in. If there is flow in the pipe you may need to restrain the plug using the ratchet puller on the retraction assembly.

8.7-9.1 Connect inflation hoses, accessories and gauges.

9.2 If using a Low Pressure Alarm, set the alarm to 10% below desired pressure.

9.3 Add air/water allowing the plug to pull itself into the pipeline. Do not allow the pressure to exceed 5 psi over the pipeline pressure. Continue inserting the plug until the insertion stop collar makes contact with the retraction base plate.

9.4 If required, anchor the inflation ram with a strongback(click here)



9.5 Fully inflate the plug with air or water to 2x the line pressure. **CAUTION: Pressure should be 2X the pipeline pressure but less than maximum rated plug pressure.** Let the plug stabilize. It generally takes 10-20 minutes. Monitor pressure with the Pressure Monitor Assembly. Do not over inflate the plug.

9.6 Once inflated, turn on the Low Pressure Alarm to warn you of a drop in pressure.

10.1 Deflation of the plug when using Water for inflation.

Open the Water Inflation Valve to deflate the plug.

The line pressure in the pipe should push out all the water in the plug.

Now re-inflate the plug with air to 1 psi over line pressure.

Open the Pressure Monitor Valve and start retracting the plug using the ratchet puller to bleed off the air until the plug is fully retracted.

If the plug gets stuck, repeat above two procedures.

10.2 Deflation of plug when only using AIR for inflation.

Open Pressure Monitor Valve and deflate the plug until the Pressure Gauge is less than your line pressure.

Using the Ratchet Puller, retract the plug out of the pipeline and back into the Launch Cylinder as the air bleeds out.

If the plug gets stuck, re-inflate the plug with air to 1 psi over pressure to center it in the Launch Cylinder. Then open Pressure Monitor Valve and start ratcheting the plug back.

Once the plug is fully retracted, close the tapping valve.

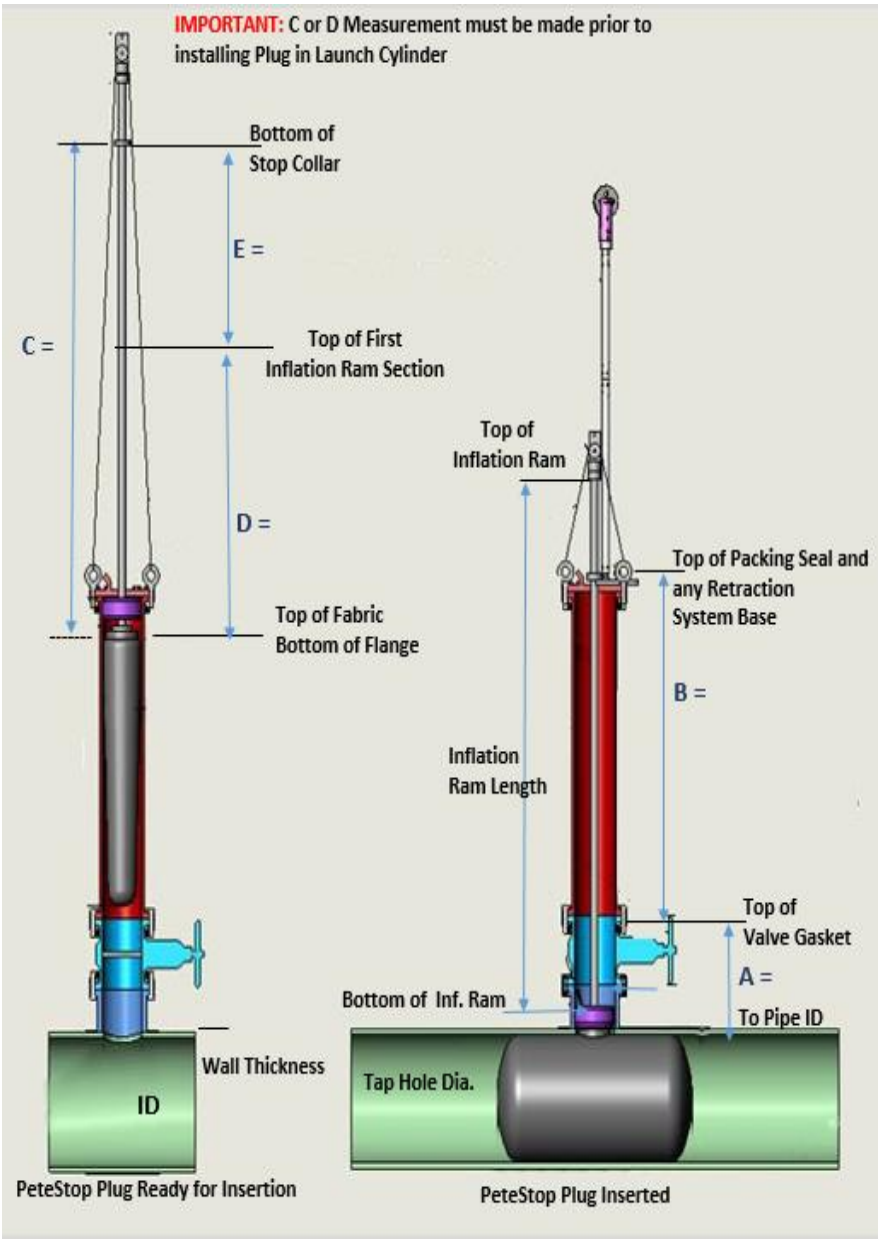
Drain the Launch Cylinder by opening the Drain Valve.

Disassemble the system in the reverse order it was assembled

Measurement Card (https://ilsconfigurator.petersenproducts.com/Home/129)

C or D Measurement MUST be made PRIOR to installing plug in Launch Housing

	Measurement (maintain units)
A The distance from the pipe ID to the top of the valve flange gasket Including Wall Thickness	
B The distance from the base of the Launch Cylinder to the top of the packing seal. (Top of Retraction Post Base, if used) **A + B = C**	
C **Set Stop Collar** Measured from where the fabric meets the Inflation Flange to the bottom of the Stop Collar. ***If single ram section ignore D & E*** ***If multiple ram sections C = D + E***	
D Measured from underneath the flange where it meets the fabric, to the far end of the FIRST Inflation Ram Section (ignore the coupling)	
E Distance from the top of the Rirst Inflation Ram section to the bottom of the Stop Collar. **C – D = E**	



All dimensions are assumed field measured with a tape measure (or laser) and an accuracy of +/- 1/4" up to 12 ft. and over 12 ft. +/- 1/2".