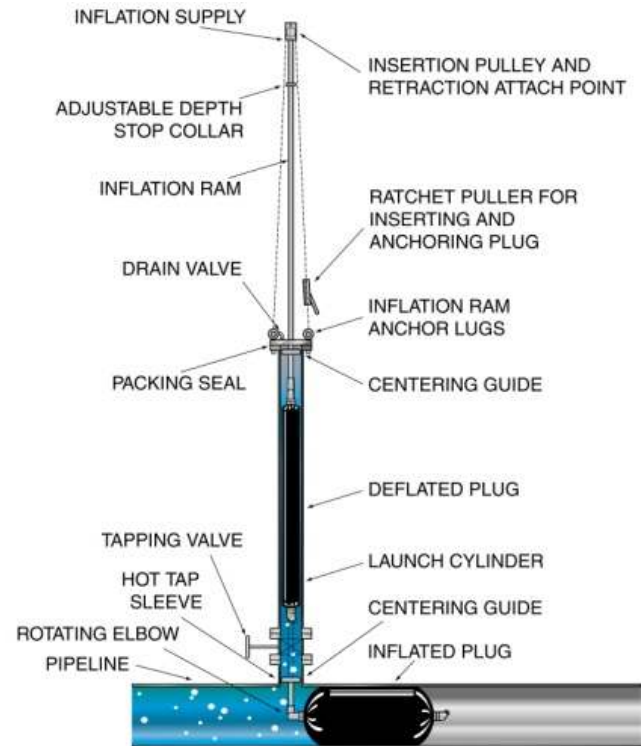


## PETERSEN® 128-SERIES Multi-Flex™ PLUG HOT TAP INSTALLATION INSTRUCTIONS

**THESE INSTRUCTIONS ARE SUPPLEMENTAL TO AND A PART OF THE “PETERSEN INFLATABLE PIPE PLUGS GENERIC OPERATING INSTRUCTION MANUAL”. THEY MUST BE ADAPTED TO THE REQUIREMENTS OF THE SPECIFIC PROJECT BY A QUALIFIED ENGINEER.**

### 1. Hot Tap Plugging Components:

- 1.1. **The Launch Cylinder** must be somewhat longer than the Multi-Flex™ Plug with all its attachments. A Packing Seal is attached to one end to provide a seal around the Inflation Ram.
- 1.2. **The Inflation Ram** is a tube that makes a mechanical connection to the Plug and is used for both inflation and positioning of the Plug.
- 1.3. **Inflation Ram Anchor Lugs** allow the Inflation Ram to be anchored to prevent it from being pushed out by pipeline or inflation pressure.
- 1.4. **A Hot Tap Sleeve** is available for any style pipe.
- 1.5. **The Tapping Valve** must have a full port to allow drilling the hot tap and inserting the Plug.
- 1.6. **Hot Tapping Equipment** is used to make the hot tap after a nozzle or sleeve and a tapping valve are installed and pressure tested.



### 2. Making the Hot Tap: (Summary only, check local requirements)

- 2.1. **Attach a Hot Tap Sleeve** to the pipeline to be tapped or weld on a nozzle.
- 2.2. **Attach a “full port” Tapping Valve** to the hot tap sleeve or nozzle.
- 2.3. **Test** for leaks through the test port on the hot tap sleeve, nozzle or the valve before drilling into the pipeline.
- 2.4. **Attach the Hot Tap Drilling Equipment** to the valve.
- 2.5. **Open the valve** completely.
- 2.6. **Open the Chip Valve** on the hot tap drilling machine to allow drilling chips to be washed out and to provide a differential pressure to help capture the coupon.
- 2.7. **Drill the Hot Tap Hole** into the pipeline and retract the drill.
- 2.8. **Close the Tapping Valve** and check for leaks.
- 2.9. **Remove the Hot Tap Drilling Equipment.**

### 3. Pipeline Insertion of Hot Tap Plug:

- 3.1. **Examine the Plug and Launch Equipment** to assure they are in good order.
- 3.2. **Assemble the Inflation Ram** and torque the set screws to maintain section orientation. (Set screw torque: 1/4" = 73 in lbs, 3/8" = 300 in lbs.)
- 3.3. **Install the Inflation Ram** through the Packing Seal if not installed. Take care not to damage the O-ring Packing Seal.
- 3.4. **Attach the Rotating Elbow to the Plug.**
- 3.5. **Attach the Plug and Rotating Elbow to the Inflation Ram.** Hold the Plug Inflation Port securely to prevent damage to the Plug at the Inflation Connection.

## 3.6. Plug connection instructions:

### 3.6.1. FLANGE-Style Connection:

- 3.6.1.1. Examine and clean flanges, bolts, nuts, and washers.
- 3.6.1.2. Lightly lubricate bolt and nut threads.
- 3.6.1.3. Install flange gasket.
- 3.6.1.4. Install raised face flange.
- 3.6.1.5. Install flat washers.
- 3.6.1.6. Pre-tighten all hex nuts.
- 3.6.1.7. Tighten the Plug Inflation Port Flange Nuts. (Set screw torque:  $3/8"$  = 33 ft lbs,  $1/2"$  = 80 ft lbs,  $5/8"$  = 159 ft lbs, and  $3/4"$  = 282 ft lbs.)
- 3.6.1.8. Sequence torque in a circular cross – pattern: 1, 3, 2, 4 etc...
- 3.6.1.9. Orient the Plug length in line with the pipeline and mark orientation on the Inflation Ram.

### 3.6.2. PIPE-THREAD-Style Connection:

- 3.6.2.1. Apply pipe thread sealant to threaded end of Inflation Ram.
  - 3.6.2.2. Attach Plug securely to the end of Inflation Ram.
  - 3.6.2.3. Mark orientation of Rotating Elbow onto inflation end of Inflation Ram.
- 3.7. **Pull the Multi-Flex™ Plug** into the Launch Cylinder with the Inflation Ram. Maintain the Plug orientation until the Plug is pushed into the pipeline so the Plug inflates in line with the pipeline.
- 3.8. **Position the Stop Collar** on the Inflation Ram to position the centerline of the Rotating Elbow at the center of the pipeline.
- 3.9. **Attach the Launch Cylinder** to the Tapping Valve.
- 3.10. **Open the Tapping Valve** and allow the pipeline pressure to equalize in the Launch Cylinder and the tapped pipeline.
- 3.11. **Stop the flow** in the pipeline.
- 3.12. **Push the Multi-Flex™ Plug into the pipeline** with the Inflation Ram to the preset collar stop position. **Maintain the proper Plug orientation** with the pipeline as the Plug is inserted. An optional ratchet puller is available for sliding the Inflation Ram in and out and anchoring the Inflation Ram.
- 3.13. **Anchor the Inflation Ram** to Anchor Lugs to prevent the pipeline or inflation pressure from pushing the Inflation Ram back out of the Launch Cylinder.
- 3.13.1. **Calculate the forces** on the Inflation Ram in advance to determine the anchoring requirements.

## 4. Plug Inflation

- 4.1. **Attach the Inflation Pressure Hose** to the Inflation Ram.
- 4.2. Inflate the Plug following the Generic Operating Instruction Manual inflation and pressure calculations procedures.

## 5. Removal of Multi-Flex™ Plug:

- 5.1. **Equalize the head pressure** on both sides of the Plug.
- 5.2. **Deflate the Plug.**
- 5.3. **Pull the Plug back** into the Launch Cylinder after it is deflated completely. The Purge Valve on the Launch Cylinder may be opened to relieve pressure and help move the Plug back into the Launch Cylinder. It may be helpful to use a vacuum pump or a shop vacuum to deflate the Plug and a ratchet puller or winch to pull the Plug into the Launch Cylinder with the Inflation Ram.
- 5.4. **Close the Tapping Valve.**
- 5.5. **Remove the Launch Cylinder** and Multi-Flex™ Plug.

Refer to the General Operating Instructions Manual for inspection and maintenance procedures.

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

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