



INSTA-VALVE 250 **INSERTION VALVES**

4"–12" Installation Instructions — Revised May 2021



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Section 1.0.0 — General Safety Warnings

These instructions depict the use of the most up to date Hydra-Stop insertion valves, installation equipment, and accessories. Please be certain you are following the instructions for your equipment.

General Safety Precautions — Read and Follow Instructions

Carefully read and understand all safety messages in this manual before using the equipment. The manuals provided with the equalization pump must also be read for safety. The maintenance procedures are to be followed to keep the equipment in good working condition.

Personal Protection

Hydra-Stop recommends that installers wear required personal protective equipment including but not limited to:

- Hard Hat
- Safety Shoes
- Safety Glasses
- Ear Protection
- Gloves

Avoid wearing jewelry, such as rings, wristwatches, necklaces, or bracelets. If working near traffic, select ear protection that allows you to hear the traffic for safety.

Keep Spectators Away from Installation Area

Keep all spectators and other workers away from machines and work area(s) while in operation.

Clear Work Area

Clear the work area of all objects that might interfere with the proper operation of any tools. Avoid placing tools or other objects where they can fall into the pit.

Do Not Work in an Unsupported Trench

Do not work in trench with unstable sides, which could cave in. Specific requirements for shoring or sloping trench walls are available from several sources including federal and state offices. Be sure to contact suitable authorities for these requirements before working in the trench. A minimum 5'x 5' excavation is recommended.

Locate the existing pipe joints or fittings in the area and use the appropriate restraint methods if necessary.

Check Laws and Regulations

Know and obey all Federal, State, and local laws and regulations that apply to your work situation.

Handling the Equipment

To avoid back injury, use proper lifting techniques. Follow all equipment instructions when lifting heavy loads.

Check Hardware and Equipment

Make sure that all air or hydraulic line couplings are tightened and secured to eliminate the chance of accidental uncoupling. Use hose connection retaining devices such as locking rings, clips, pins, chains, or cables. Identify all equipment and tools necessary for the size of IV 250 you intend to install. Please refer to the attached tool list (See Appendix A). Inspect equipment to verify it is in good working condition and free of wear and damage prior to use. Never start an operation if the equipment is not in proper working order. Contact Hydra-Stop if equipment is not in working order.

Do Not Exceed Load Rating on Any Lifting Equipment

This includes but is not limited to lifting magnets, eyebolts and straps. Lifting magnets provided with Hydra-Stop equipment are labeled with a load rating. 12" knife gate lifting assists and 3/4" eye bolts should ONLY be used for lifting 12" and 8" temporary gate valves respectively.

WARNING: Failure to follow any of the above safety instructions or those that follow in this manual, could result in serious injury. Any operation involving work on pipe containing liquids or gases under pressure is potentially hazardous. It is necessary, therefore, that correct procedures be followed in the use and maintenance of this equipment to maintain a safe working environment.

No person should use this equipment who is not fully trained in the procedures stated in this manual, and who is not fully aware of the potential hazards connected with work on pipe containing liquids or gases under pressure.

The purchaser of this equipment is responsible for the way this equipment is used, maintained, and the training, competence and safety of the operators.

Should any difficulty arise at any time in the use of this equipment, please contact Hydra-Stop at 708-389-5111 immediately.

WARNING!

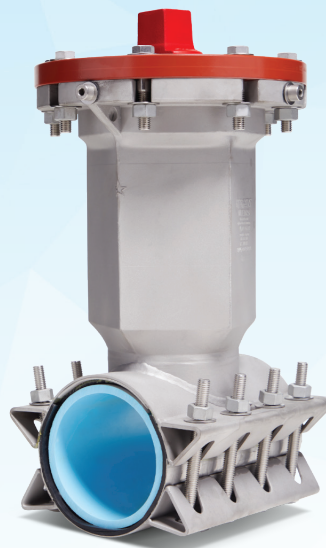
Never attempt to install Insta-Valve 250 insertion valves at pressures greater than 150 psi if equipment is not rated for 250 psi installation. This warning includes the temporary gate valve and the Hydra-Tapper.

Contact Hydra-Stop at 708-389-5111 if you have any questions regarding equipment psi ratings.



INSTA-VALVE 250 **INSERTION VALVES**

4"–8" Insta Valve 250 Installation Instructions



2.0.0 Mount Valve Body on Pipe

2.0.1 Select the proper Insta Valve 250 for installation (referred to as IV 250 from here on). Identify the type of pipe the IV 250 will be installed on. Accurately measure the outside diameter of the pipe.

2.0.2 Refer to Appendix D (page 31) to review the IV 250 Valve Body Installation Instructions.

2.1.0 Pressure Test Valve Body

NOTE: Follow steps 2.1.1 through 2.1.10 if you are using the Hydra-Stop Quick Pressure Test Plug to pressure test.

See Appendix B (Page 28) if you are using a legacy Pressure Test Flange to pressure test.



Figure 1

2.1.1 Fill valve body with water (see Figure 1). Approximately 5-10 gallons of water is needed.

2.1.2 Spray pressure test plug O-ring with spray-on food-grade lubricant.

2.1.3 Ensure set pins have been backed-out and are flush with I.D. of the flange.

2.1.4 Press-fit pressure test plug into top of valve body (see Figure 2).

2.1.5 Insert 4 flange bolts into the 4 mounting holes of the pressure test plug assembly. Finger tighten a washer and nut onto each of the four bolts (see Figure 3).

2.1.6 Connect 1/2" quick-connect coupler on Pressure Test Tree to 1/2" quick-connect nipple on Pressure Test Plug (see Figure 4).

2.1.7 Connect pressure test tree to your pressure source for pressure testing. Hydra-Stop recommends using a hydro-static method of pressurizing the valve body. DO NOT use a compressible medium such as air.

2.1.8 Follow local rules for the recommended length of the pressure test.

2.1.9 After completing pressure test, use ball valve to blow-off pressure before removing pressure test plug.

NOTE: Do not exceed recommended pressure test specifications.
Minimum Test Pressure: 1.5 times the system working pressure.
Maximum Test Pressure: 375 psi.

2.1.10 Follow the tightening pattern and re-torque carriage bolts to recommended torque before continuing.

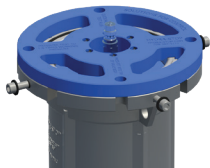


Figure 2

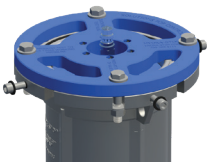


Figure 3

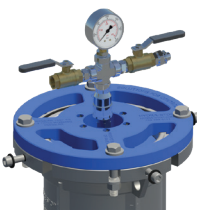


Figure 4

2.2.0 Installing the Temporary Gate Valve

2.2.1 Install O-ring into valve body flange O-ring groove.

2.2.2 Install the temporary gate valve. 4", 6" and 8" IV 250s use the 8" temporary gate valve. If possible, avoid positioning the valve at the true 3, 6, 9 or 12 o'clock position to allow access to the completion pins (see Figure 5).

NOTE: Temporary gate valves are single-direction valves and must be positioned top up. The 8" temporary gate valve must be installed with the O-ring groove facing up.

2.2.3 Bolt the temporary gate valve to the top of the IV 250 flange using the bolts, nuts, and washers provided with the installation



Figure 5

equipment. We recommend using a cross-tightening pattern.

2.2.4 Install the O-ring in the groove of the 8" temporary gate valve (see Figure 5).

2.2.5 Fully open the temporary gate valve.

NOTE: If you own an aluminum temporary gate valve: fully close the temporary gate valve and count the number of turns to open. This is important to know in order to check clearance issues later.

2.3.0 Line Tap Preparation

NOTE: Follow steps 2.3.1 through 2.10.7 steps if you are performing a Core Sample prior to valve insertion.

Proceed to steps 2.11.1 through 2.14.10 if you are performing a non-core sample line tap in preparation of valve insertion.

2.3.0 Setting up the Hydra-Tapper for Core Sampling

2.3.1 Select proper size saw mandrel. Core sampling and tapping of the 4"-8" IV 250 requires the 41" long saw mandrel.



Figure 6

2.3.2 Thread the 2.5" core cutter to 41" saw mandrel completely, then unscrew until thru holes in cutter align with threaded saw mandrel holes. Insert and thread both 1/4-20 x 3/4" set screws from the inside of the cutter. These set screws prevent the cutter from over tightening and locking on the saw mandrel (see Figure 6).

2.3.3 Loosen and remove the Allen-head pilot drill retaining set screw located on the side of the saw mandrel flange base.

2.3.4 Select proper size pilot drill for installation.

- 4" and 6" IV 250s require the 5/8" X 6" long pilot drill.
- 8" IV 250s require the 5/8" X 7-1/4" length pilot drill.

NOTE: Tapping PVC or steel pipe will require a twist style pilot drill.

2.3.5 Visually locate the tapered relief on the base of the pilot drill. Notice the stop or ledge at the base of the taper (see Figure 7).



Figure 7

2.3.6 Mark the flat of the taper with a visible marking agent (see Figure 8).



Figure 8

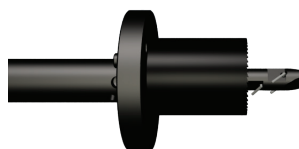


Figure 9

2.3.7 Align the pilot drill flat with the Allen-head set screw and insert the pilot drill into 41" saw mandrel (see Figure 9).



Figure 10

2.3.8) Confirm you have completely inserted the pilot drill and engaged the tapered flat. Look into set screw hole for the marking on the pilot drill. Adjust the pilot drill until you can see the marking (see Figure 10).

2.3.9) Once aligned, insert and tighten the set screw. Test pull the pilot drill to ensure the set screw is properly locked in place against the pilot drill ledge. Check the coupon retaining clips so they move freely.

NOTE: Wear gloves when pulling on the pilot drill. Edges may be sharp.

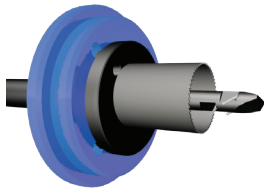


Figure 11

2.3.10) Attach 6" or 8" centering ring to the top of the saw mandrel flange using 5/16"-18 x 1.25" bolts through to top of the centering ring. Ensure wider portion of the centering ring is positioned away from mandrel plate / cutter assembly (see Figure 11).

2.3.11) Make sure the saw mandrel is clean and free of rust or grime (steel wool can be used to clean and smooth the surface).

2.3.12) Lubricate the end of the saw mandrel with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly.

2.3.13) Insert coring assembly completely into Hydra-Tapper tapping machine.

2.3.14) Hand tighten the clamp lever on the packing nut assembly to keep the assembled shell cutter and saw mandrel in place.

NOTE: Do not use tools to tighten the clamp lever.

2.4.0 Installing the Hydra-Tapper

2.4.1) Using a strap or sling install the assembled Hydra-Tapper on to the 8" temporary gate valve and align the bolt slots.

NOTE: Use extreme caution not to damage the shell cutter or pilot drill as the unit is raised and placed on the temporary valve. Note the position of the fully retracted cutting assembly.

2.4.2) Install and cross tighten the bolts, nuts, and washers to secure the assembly. Thread the 1/4" nipple and ball valve into the tap housing and wrench tighten, Teflon tape or thread sealant can be used.

2.4.3) Hold and control the exposed saw mandrel, loosen the packing nut assembly clamp lever and slowly lower the saw mandrel down until the pilot drill is resting on the center top of the pipe. Ensure the shell cutter spins freely in a clockwise direction.

NOTE: Ensure that the centering ring can rotate freely in a clockwise direction with pilot bit touching the top of pipe.

NOTE: Centering ring ensures this 2.5" core sample is centered.

NOTE: If tap is done on PVC and material melts, centering tool in next section will still function properly to center tap, but coupon may be difficult to remove.

2.4.4) Slide a stop collar over the saw mandrel.

2.4.5) Set the cutting depth by measuring from the top of the packing nut assembly to the lower side of the stop collar.

- 6" core sample: 3.5"
- 8" core sample: 3.5"

2.4.4) Install the drive unit by lifting it above the saw mandrel and slide it into the three guide bars.



Figure 12

2.4.5) Lower the drive unit onto the machined hex of the saw mandrel. Confirm the drive unit is fully seated onto the machined hex of the saw mandrel (see Figure 12).

2.4.6) Install feed screw by threading it through the top plate of the Hydra-Tapper until the opening covers the spindle on the drive unit.

NOTE: Do not apply downward force as it can damage the pilot drill.

2.4.7) When the feed screw makes contact with the top of the drive unit, back off one full turn. If you do not have the drive motor restraint kit, proceed to step 2.5.1.

2.4.8) Install the upper and lower restraint pins and cotter clips to join the saw mandrel, drive motor, and feed screw into a single assembly. Early models of Hydra-Stop Insta-Valve installation equipment did not include the drive motor restraint kit.

2.5.0 Performing the Core Sample

2.5.1) Ensure ball valve on the Hydra-Tapper P2 housing is open.

2.5.2) Connect the drive unit power source to the drive unit. The air drive unit requires 90 CFM at 90 PSI. The hydraulic drive unit requires 9 GPM at 1800 PSI.

2.5.3) Ensure the drive unit lever control is in the neutral position. Always run the power unit in the clockwise direction.

NOTE: Avoid reversing as this will damage the carbide on the pilot drill and carbide teeth on the sampling cutter.

2.5.4) Engage the drive unit and confirm the saw mandrel is rotating in the clockwise direction. Slowly turn the handle assembly in a clockwise direction keeping slight, constant pressure until the tap is complete.

NOTE: Do not overfeed the tap. Overfeeding the tap will cause the shell cutter to jam.

2.5.5) Close the ball valve on the P2 housing of the Hydra-Tapper as water fills the housing and flows from the valve.

2.5.6) The tap is complete when the stop collar contacts the packing nut assembly.

2.5.7) Return the drive unit lever control to the neutral position.

2.5.8) Tighten the packing nut assembly clamp lever to lock the saw mandrel in place. Remove feed screw. Remove drive unit.



Figure 13

2.5.9) Place a box-end wrench over the hex on the saw mandrel and use the wrench as a lever brake to hold in place (see Figure 13).

2.5.10) Loosen the packing nut assembly clamp lever and allow the pressure to slowly raise the cutter assembly fully into the tapping housing.

2.5.11) Confirm the shell cutter and saw mandrel assembly is fully retracted and lock the saw mandrel in place by tightening the packing nut assembly clamp lever.

2.5.12) Close the temporary gate valve. If using an aluminum gate valve, make sure you get the same number of turns to close as you counted in step 2.2.5 on page 6.

2.6.0 Removing the Hydra-Tapper

2.6.1) Relieve the pressure from the Hydra-Tapper by opening the tapping machine ball valve and discharging the pressure. Open the temporary gate valve ball valve to drain the tapping assembly.

2.6.2) Connect the slings or straps to the Hydra-Tapper. Unbolt and remove the Hydra-Tapper from the temporary gate valve. Place the Hydra-Tapper in a dry and safe work area.

2.6.3) Loosen the packing nut assembly clamp lever.

2.6.4) Remove cutter and saw mandrel assembly.

2.6.5) Remove the coupon by loosening the Allen-head pilot drill retaining set screw. Remove the pilot drill from the saw mandrel stud.

2.6.6) Flip the pilot drill and insert it point end through the hole in the coupon past the retaining clips and use it to pull the coupon out of the cutter.

NOTE: Wear gloves when removing the coupon. Coupon edges may be sharp.

2.6.7) Measure coupon thickness. Calculate inner diameter.

If Pipe I.D. (Inner Diameter = [Outer diameter minus (2 * wall thickness)]) is smaller than 5.75" (for 6" nominal pipe) or 7.80" (for 8" nominal pipe), then the undersized cutter and cartridge should be used. See Appendix E "Valve Cartridge and Cutter Sizing Chart" for pipe I.D. / cutter selection.

2.6.8) Remove cutter from saw mandrel.

2.6.9) Disassemble core sampling equipment. Be sure to remove centering ring from cutter assembly.

NOTE: Coupon must be removed before cutter set screws and cutter can be removed.

2.7.0 Post Core Line Tapping

2.7.0) Depending on pipe I.D., attach appropriate 6" or 8" cutter — standard or undersized — to the saw mandrel and secure with standard cutter hardware as normal. See Appendix E "Valve Cartridge and Cutter Sizing Chart" for pipe I.D. / cutter selection.

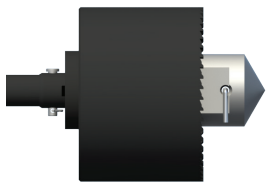


Figure 14

2.7.1) Insert 2.5" centering tool into pilot bit hole, align through-hole with saw mandrel through-hole, and lock in place with cotter pin and clip (see Figure 14).

2.7.2) Make sure the saw mandrel is clean and free of rust or grime (steel wool can be used to clean and smooth the surface).

2.7.3) Lubricate the end of the saw mandrel with a dab of the food-grade

lubricant provided with the equipment to help it slide freely through the packing nut assembly.

2.7.4) Insert tapping assembly completely into Hydra-Tapper tapping machine.

2.7.5) Hand tighten the clamp lever on the packing nut assembly to keep the assembled shell cutter and saw mandrel in place.

NOTE: Do not use tools to tighten the clamp lever.

2.8.0 Installing the Hydra-Tapper

2.8.1) Using a strap or sling install the assembled Hydra-Tapper on to the 8" temporary gate valve and align the bolt slots.

NOTE: Use extreme caution not to damage the shell cutter or the 2.5" centering tool as the unit is raised and positioned on to the temporary valve. Note the position of the fully retracted cutting assembly.

2.8.2) Install and cross tighten the bolts, nuts, and washers to secure the tapping assembly.

2.8.3) Ensure ball valve on the Hydra-Tapper P2 housing is open.

2.8.4) Partially open the temporary gate valve to allow fluid to fill the tapping assembly.

2.8.5) Close the tapping machine ball valve when fluid flows from the ball valve.

2.8.6) Fully open the temporary gate valve.

2.8.7) Hold and control the exposed saw mandrel, loosen the packing nut assembly clamp lever and slowly lower the saw mandrel until the cutter is resting on the top of the pipe. Ensure the shell cutter spins freely in a clockwise direction.

2.8.8) Tighten the packing nut assembly clamp lever.

2.8.9) Slide a stop collar over the saw mandrel.

2.8.10) Set the cutting depth by measuring from the top of the packing nut assembly to the lower side of the stop collar.

- 4" pipe = 2.5" cutting depth
- 6" pipe = 3.5" cutting depth
- 8" pipe = 4.5" cutting depth

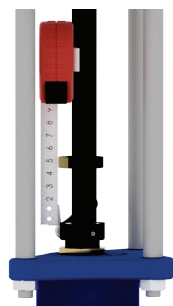


Figure 15
(Measurement shown for reference only)

2.8.11) Tighten the stop collar to the correct measurement (see Figure 15).

2.8.12) Install the drive unit by lifting it above the saw mandrel and slide it into the 3 guide bars.

2.8.13) Lower the drive unit onto the machined hex of the saw mandrel. Confirm the drive unit is fully seated onto the machined hex of the saw mandrel (see Figure 16).

2.8.14) Install feed screw by threading it through the top plate of the Hydra-Tapper until the opening covers the spindle on the drive unit.

2.8.15) When the feed screw makes contact with the top of the drive unit, back off one full turn. If you do not have the drive motor restraint kit, proceed to step 2.9.1.

2.8.16) Install the upper and lower restraint pins and cotter clips to join the saw mandrel, drive motor, and feed screw into a single assembly. Early models of Hydra-Stop Insta-Valve installation equipment did not include the drive motor restraint kit.

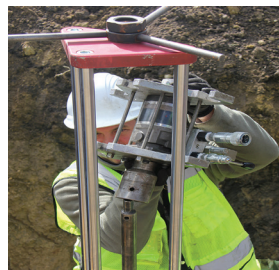


Figure 16

2.9.0 Performing the Line Tap

2.9.1) Loosen the packing nut assembly clamp lever.

2.9.2) Connect the drive unit power source to the drive unit. The air drive unit requires 90 CFM at 90 PSI. The hydraulic drive unit requires 9 GPM at 1800 PSI.

2.9.3) Ensure the drive unit lever control is in the neutral position. Always run the power unit in the clockwise direction.

NOTE: Avoid reversing as this will damage the carbide teeth on the shell cutter.

2.9.4) Engage the drive unit and confirm the saw mandrel is rotating in the clockwise direction. Slowly turn the handle assembly in a clockwise direction keeping slight, constant pressure until the tap is complete.

NOTE: Do not overfeed the tap. Overfeeding the tap will cause the shell cutter to jam.

2.9.5) The tap is complete when the bottom of the stop collar makes contact with the top of the packing nut assembly.

2.9.6) Return the drive unit lever control to the neutral position.

2.9.7) Tighten the packing nut assembly clamp lever to lock the saw mandrel in place. Remove feed screw. Remove drive unit.



Figure 17

2.9.8) Place a box-end wrench over the hex on the saw mandrel and use the wrench as a lever brake to hold in place (see Figure 17).

2.9.9) Loosen the packing nut assembly clamp lever and allow the pressure to slowly raise the cutter assembly fully into the tapping housing.

2.9.10) Confirm the shell cutter and saw mandrel assembly is fully retracted and lock the saw mandrel in place by tightening the packing nut assembly clamp lever.

2.9.11) Close the temporary gate valve. If using an aluminum gate valve, make sure you get the same number of turns to close as you counted in step 2.2.5 on page 6.

2.10.0 Removing the Hydra-Tapper

2.10.1) Relieve the pressure from the Hydra-Tapper by opening the ball valves and discharging the pressure.

2.10.2) Connect the slings or straps to the Hydra-Tapper. Unbolt and remove the Hydra-Tapper from the temporary gate valve. Place the Hydra-Tapper in a dry and safe work area.

2.10.3) Loosen the packing nut assembly clamp lever.

2.10.4) Remove cutter and saw mandrel assembly.

2.10.5) Remove the coupon by loosening the Allen-head retaining set screw. Remove the centering tool from the saw mandrel stud.

2.10.6) Flip the centering tool and insert it point end through the hole in the coupon past the retaining clips and use it to pull the coupon out of the cutter.

NOTE: Wear gloves when removing the coupon. Coupon edges may be sharp.

2.10.7) This completes performing a Core Sample prior to valve insertion. Proceed to step 3.0.0 — Preparing the Hydra-Tapper for 4"–8" Valve Insertion.

NOTE: Follow steps 2.11.1 through 2.14.10 if you are performing a non-core sample line tap in preparation of valve insertion.

2.11.1 Preparing the Hydra-Tapper for non-core sample valve insertion line tap

2.11.2) Select proper size saw mandrel. Tapping of the 4"–8" IV 250 requires the 41" long saw mandrel.

2.11.3) Select proper size shell cutter. Hydra-Stop valve insertion shell cutters are shipped painted black. If you repaint valve insertion shell cutters in the future, Hydra-Stop recommends painting them black.

- Installation of 4" IV 250 requires 3.8" cutter
- Installation of 6" IV 250 requires 5.8" cutter
- Installation of 8" IV 250 requires 7.9" cutter

NOTE: Ensure you are using the correct shell cutter for your application. See AppendixE — "Valve Cartridge and Cutter Sizing Chart" for pipe I.D. / cutter selection.

2.11.4) Select proper size pilot drill for installation.

- 4" and 6" IV 250s require the 5/8" X 6" long pilot drill.
- 8" IV 250s require the 5/8" X 7-1/4" length pilot drill.

NOTE: Tapping PVC or steel pipe will require a twist style pilot drill.

NOTE: Failure to use the proper sized or type of pilot drill will result in a failed installation.

2.11.5) Loosen and remove the Allen-head pilot drill retaining set screw located on the side of the saw mandrel flange base.

2.11.6) Visually locate the tapered relief on the base of the pilot drill. Notice the stop or ledge at the base of the taper (see Figure 18).



Figure 18

2.11.7) Mark the flat of the taper with a visible marking agent (see Figure 19).



Figure 19

2.11.8) Align the pilot drill flat with the Allen-head set screw and insert the pilot drill through the center of the saw mandrel stud (see Figure 20).

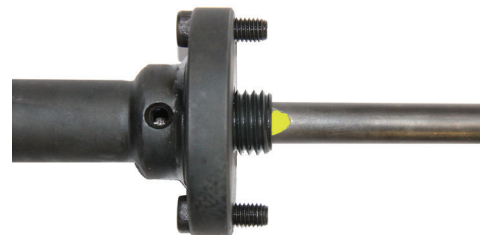


Figure 20

2.11.9) Confirm you have completely inserted the pilot drill and engaged the tapered flat. Look into set screw hole for the marking on the pilot drill. Adjust the pilot drill until you can see the marking (see Figure 21).

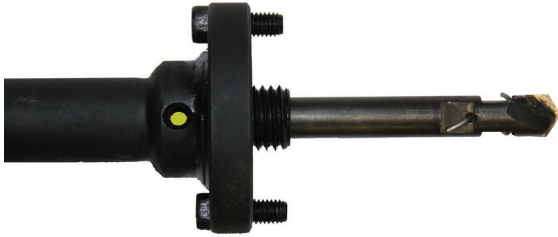


Figure 21

2.11.10) Once aligned, insert and tighten the set screw. Test pull the pilot drill to ensure the set screw is properly locked in place against the pilot drill ledge. Check the coupon retaining clips so they move freely (see Figure 22).



Figure 22

NOTE: Wear gloves when pulling on the pilot drill. Edges may be sharp.

2.11.11) Loosen and back out the two Allen-head cap screws on the flange of the saw mandrel until flush with the face of the flange.

2.11.12) Thread the appropriate shell cutter all the way onto the threaded stud of the saw mandrel flanged end.

2.11.13) Back off to align the holes in the base of the shell cutter with the Allen-head cap screws and thread them through the holes. Tighten Allen-head cap screws.

2.11.14) Make sure the saw mandrel is clean and free of rust or grime (steel wool can be used to clean and smooth the surface).

2.11.15) Lubricate the end of the saw mandrel with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly.

2.11.16) Slide the assembled shell cutter and saw mandrel into the Hydra-Tapper until the saw mandrel flange bottoms out in the Hydra-Tapper.

2.11.17) Hand tighten the clamp lever on the packing nut assembly to keep the assembled shell cutter and saw mandrel in place.

NOTE: Do not use tools to tighten the clamp lever.

2.12.0 Installing the Hydra-Tapper

2.12.1) Using a strap or sling install the assembled Hydra-Tapper on to the 8" temporary gate valve and align the bolt slots.

NOTE: Use extreme caution not to damage the shell cutter or pilot drill as the unit is raised and positioned on to the temporary valve. **Note the position of the fully retracted cutting assembly.**

2.12.2) Install and cross tighten the bolts, nuts, and washers to secure the assembly. Thread the 1/4" long nipple and ball valve into the tap housing and wrench tighten. Teflon tape or thread sealant can be used.

2.12.3) Hold and control the exposed saw mandrel, loosen the packing nut assembly clamp lever, and slowly lower the saw mandrel down until the pilot drill is resting on the center top of the pipe. Ensure the assembly spins freely in a clockwise direction.

2.12.4) Slide the stop collar over the saw mandrel.

2.12.5) Set the cutting depth by measuring from the top of the packing nut assembly to the lower side of the stop collar.

- 4" pipe = 3" cutting depth
- 6" pipe = 4" cutting depth
- 8" pipe = 5" cutting depth

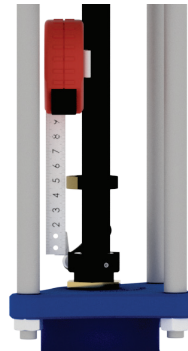


Figure 23
(Measurement for reference only)

2.12.6) Tighten the stop collar to the correct measurement (see Figure 23).

2.12.7) Install the drive unit by lifting it above the saw mandrel and slide it into the 3 guide bars.

2.12.8) Lower the drive unit onto the machined hex of the saw mandrel. Confirm the drive unit is fully seated onto the machined hex of the saw mandrel (see Figure 24).

2.12.9) Install feed screw by threading it through the top plate of the Hydra-Tapper until the opening covers the spindle on the drive unit.

NOTE: Do not apply downward force as it can damage the pilot drill.



Figure 24

2.12.10) When the feed screw makes contact with the top of the drive unit, back off one full turn. If you do not have the drive motor restraint kit, proceed to step 2.13.1.

2.12.11) Install the upper and lower restraint pins and cotter clips to join the saw mandrel, drive motor, and feed screw into a single assembly.

NOTE: Early models of Hydra-Stop Insta-Valve installation equipment did not include the drive motor restraint kit.

2.13.0 Performing the Line Tap

2.13.1) Ensure ball valve on the Hydra-Tapper P2 housing is open.

2.13.2) Connect the drive unit power source to the drive unit. The air drive unit requires 90 CFM at 90 PSI. The hydraulic drive unit requires 9 GPM at 1800 PSI.

2.13.3) Ensure the drive unit lever control is in the neutral position. Always run the power unit in the clockwise direction.

NOTE: Avoid reversing as this will damage the carbide on the pilot drill and carbide teeth on the shell cutter.

2.13.4) Engage the drive unit and confirm the saw mandrel is rotating in the clockwise direction. Slowly turn the handle assembly in a clockwise direction keeping slight, constant pressure until the tap is complete.

2.13.5) Close the ball valve on the P2 housing of the Hydra-Tapper as water fills the housing and flows from the valve.

2.13.6) The tap is complete when the bottom of the stop collar makes contact with the top of the packing nut assembly.

NOTE: Do not overfeed the tap. Overfeeding the tap will cause the shell cutter to jam.

2.13.7) Return the drive unit lever control to the neutral position.

2.13.8) Loosen stop collar and continue to advance the feed screw an

additional two complete revolutions to ensure the cut is complete. The shell cutter should spin freely. If it does, disconnect the drive unit power source from the drive unit. If the shell cutter does not spin freely pull the drive unit lever control down and confirm the saw mandrel is rotating in a clockwise direction. Slowly turn the handle assembly in a clockwise direction an additional two complete revolutions. Repeat steps 2.13.6 and 2.13.7

2.13.9) Slowly turn the handle assembly in a counterclockwise direction until the stop collar has reached the starting measurement.

- **4" pipe = 3" cutting depth**
- **6" pipe = 4" cutting depth**
- **8" pipe = 5" cutting depth**

2.13.10) Tighten the packing nut assembly clamp lever to lock the saw mandrel in place. Remove feed screw. Remove drive unit.



Figure 25

2.13.11) Place a box-end wrench over the hex on the saw mandrel and use the wrench as a lever brake to hold in place (see Figure 25).

2.13.12) Loosen the packing nut assembly clamp lever and allow the pressure to slowly raise the cutter assembly fully into the tapping housing.

2.13.13) Confirm the shell cutter and saw mandrel assembly is fully retracted and lock the saw mandrel in place by tightening the packing nut assembly clamp lever.

2.13.14) Close the temporary gate valve. If using an aluminum gate valve, make sure you get the same number of turns to close as you counted in step 2.2.5 on page 6.

2.14.0 Removing the Hydra-Tapper

2.14.1) Relieve the pressure from the Hydra-Tapper by opening the tapping machine ball valve and discharging the pressure. Open the temporary gate valve ball valve to drain the tapping assembly.

2.14.2) Connect the slings or straps to the Hydra-Tapper. Unbolt and remove the Hydra-Tapper from the temporary gate valve. Place the Hydra-Tapper in a dry and safe work area.

2.14.3) Remove stop collar.

2.14.4) Loosen the packing assembly clamp lever.

2.14.5) Remove cutter and saw mandrel assembly.

2.14.6) Remove the coupon by loosening the Allen-head pilot drill retaining set screw. Remove the pilot drill from the saw mandrel stud.

2.14.7) Flip the pilot drill and insert it point end through the hole in the coupon past the retaining clips and use it to pull the coupon out of the cutter.

NOTE: Wear gloves when removing the coupon. Coupon edges may be sharp.

2.14.8) Inspect the coupon for pipe thickness and condition.

2.14.9) Remove cutter from saw mandrel.

2.14.10) This completes performing a Non-Core Sample prior to valve insertion. Proceed to step 3.0.0 – Preparing the Hydra-Tapper for 4–8" Valve Insertion.

3.0.0 Preparing the Hydra-Tapper for 4"–8" Valve Insertion

3.0.1) Locate the proper valve inserting equipment. Installation of 4"–8" IV 250s will require the 4"–8" insertion housing, the 48 1/2" long insertion tool, guide plate, and the Auto Equalization Adapter.

3.0.2) Stand the insertion housing on a flat surface with the O-ring grooved flange facing up. Place the O-ring into the insertion housing O-ring groove. Install the 3/4" nipple and ball valve.

3.0.3) Place the Hydra-Tapper on top of the insertion housing with the pointed end of the P3 facing the same direction as the step stand of the housing. Cross tighten with supplied bolts, nuts and washers.

3.0.4) Tip and lay the insertion housing and Hydra-Tapper assembly on its stand (see Figure 26).

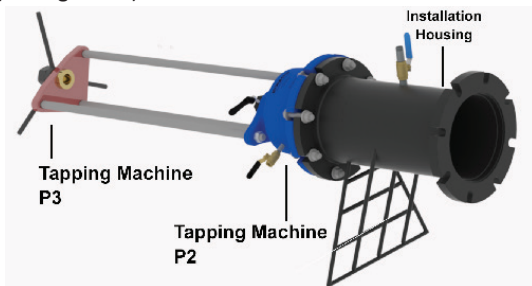


Figure 26

3.0.5) The IV 250 valve cartridge consists of top section and bottom section. The top section and bottom section must be firmly tightened together. Prior to removing operating nut hold the base of the valve cartridge and with a pipe wrench or valve key turn the valve stem firmly in the opening direction (see Figure 27).



IV 250 Valve Cartridge

Figure 27

3.0.6) Remove the operating nut and the white Teflon washer off of the valve stem. Set aside in a safe place.

3.0.7) Remove Auto Equalization Valve NPT plug. Set aside in a safe place.

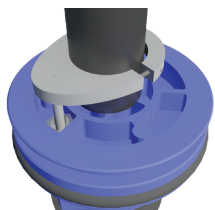


Figure 28 Auto E Generation 1 Tool

NOTE: If you elect to not use Auto Equalization, leave the NPT plug in the cartridge and refer to Appendix F.

NOTE: If you have the Generation 1 Auto Equalization tool (see Figure 28), refer to Appendix F.

3.0.8) Hand tighten the Auto-E pin into the check valve. Push down the pin to ensure it is able to actuate (see Figures 29 and 30).

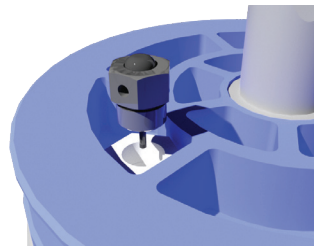


Figure 29



Figure 30

3.0.9) Place the end of the insertion tool over the valve stem. Tighten the IV 250 valve cartridge and insertion tool together by turning the knurled end of the insertion tool clockwise until snug. Tighten the 3/4" insertion tool lock nut located at the base of the knurled handle. The raised face at the end of the insertion tool must sit flush against the valve cartridge (see Figure 31a and 31b).



Figure 31a - Insertion tool making contact with the auto equalization pin.

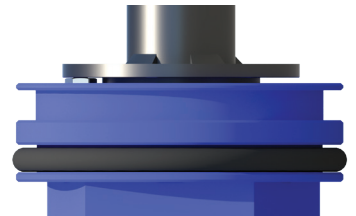


Figure 31b - Raised Face of Insertion tool installed flush to cartridge.

CAUTION: Ensure there are no gaps between the insertion tool, valve cartridge, and feed screw. The valve cartridge should remain in tight contact with the insertion tool and act as a single unit.

3.0.10) Make sure the insertion tool is clean and free of rust or grime (steel wool can be used to clean and smooth the surface). Lubricate the end of the insertion tool with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly. Ensure packing nut assembly clamp lever is loose.

3.0.11) Insert the assembled valve cartridge and insertion tool through the insertion housing / tapping assembly until the top of the valve cartridge is approximately 2.5" from the bottom flange of the insertion housing. Make sure the shorter, truncated side of the valve cartridge marked with a star is facing upwards (see Figure 32).

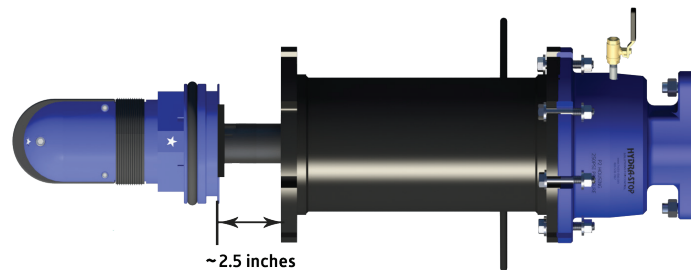


Figure 32

3.0.12) Setup the IV 250 4"–8" alignment gauge for the size being installed (4", 6", or 8"). Refer to alignment gauge instructions shipped with 4"–8" IV 250 Alignment Gauge Kit.

3.0.13) Set the curved portion of the alignment gauge within the lock pin groove of the valve cartridge. Slide the valve cartridge towards the insertion housing until the alignment gauge touches the insertion housing. The 2 gauge pins will seat in the top two holes of the insertion housing (see Figure 33 on next page).

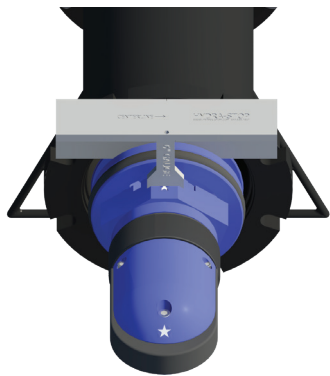


Figure 33

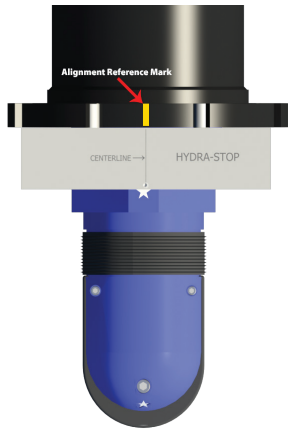


Figure 34

250 Alignment Gauge.

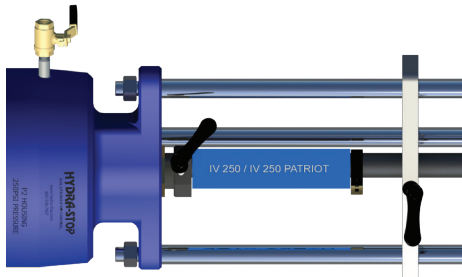


Figure 35

3.0.20) Lubricate the completion plug O-ring with food-grade lubricant provided with the equipment.

3.0.21) Slide the valve cartridge assembly fully into the insertion housing.

3.0.22) Tighten the clamp lever on the packing nut assembly to keep the assembled valve cartridge and insertion tool in place.

NOTE: Do not use tools to tighten the clamp lever.

3.1.0 Install IV 250 Insertion Equipment

3.1.1) Make sure the O-ring in the temporary gate valve is still properly seated in the O-ring groove and safely lift the insertion equipment on to the temporary valve.

3.1.2) Align the insertion housing reference mark made in step 3.0.17 with the point of the pentagon valve body that is in line with the

3.0.14) Ensure the flat of the alignment gauge arm remains aligned with the truncated side of the valve cartridge (see Figure 34).

3.0.15) Place the 7.5" IV 250 Insertion Depth Gauge on the insertion tool. Place one end of the insertion gauge against the packing nut assembly. Slide the stop collar towards the insertion gauge until the stop collar makes contact with the insertion gauge. This automatically sets the proper depth for insertion. Lock the stop collar.

3.0.16) Slide and place the guide plate to within 2" of the stop collar and lock the clamp lever (see Figure 35).

3.0.17) Make a reference mark on the insertion housing aligned with the centerline of the Alignment Gauge (see Figure 34).

3.0.18) Remove the 7.5" IV 250 Insertion Depth Gauge.

3.0.19) Slide the valve cartridge back to the original 2.5" measurement away from the insertion housing. Remove the IV

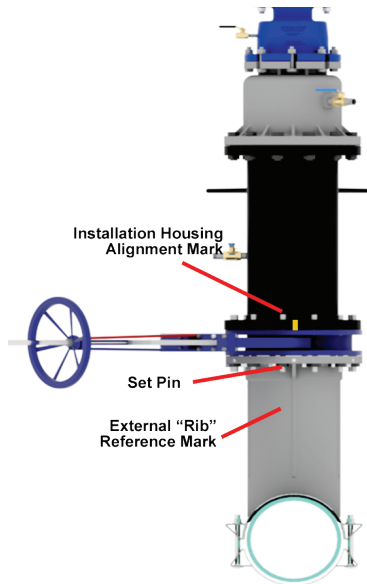


Figure 36

direction of the pipe (see Figure 36). You may also utilize the "star" on the valve as an alignment reference.

NOTE: Use the set pin hole that aligns with the valve body star as an additional alignment reference.

IMPORTANT NOTE: The 8" IV 250 does not have a star reference mark. 8" IV 250 valves have external ribs which run the height of the valve. Only one of the ribs aligns with a set pin holes. Use this rib and the set pin hole as your alignment guide for 8" IV 250 valves.

3.1.3) Using the bolts, nuts, and washers cross tighten the assembly in place.

3.2.0 Install the IV 250 Valve Cartridge

3.2.1) Loosen the packing nut clamp lever. Lower the valve cartridge / insertion tool assembly until it touches the temporary gate valve. Retighten the packing nut assembly clamp lever. It is critical to install the 30" feed screw over the knurled spindle of the insertion tool until the feed screw bottoms out on the locking nut washer.

NOTE: Failure to follow step 3.3.1 could result in damaged equipment and failed installation.

3.2.2) Install the feed screw by threading it through the top plate of the Hydra-Tapper until 2-3 inches are exposed under the top plate of the Hydra-Tapper.



Figure 37

3.2.3) Slide and place a second guide plate over the end of the feed screw to keep the feed screw from spinning as you turn the Hydra-Tapper OS&Y handles (see Figure 37).

3.2.4) Continue advancing feed screw until the feed screw bottoms out on the locking nut washer.

3.2.5) Open the tapping housing and insertion housing ball valves and slowly open the temporary gate valve until the insertion housing begins to fill. Stop opening the temporary gate

valve.

3.2.6) Close the insertion housing ball valve once fluid reaches the ball valve. Wait for fluid to reach the tapping housing ball valve and close ball valve. Allow the insertion / tap housings to fully pressurize.

3.2.7) Fully open the temporary gate valve. Count your turns to be sure it is fully open on aluminum gate valves (you do not need to count turns on steel gate valves).

3.2.8) Loosen the packing nut assembly clamp lever and begin advancing the valve cartridge insertion assembly.

3.2.9) Continue advancing the feed screw until the valve cartridge assembly is completely seated. The valve cartridge assembly is

completely seated when the bottom of the stop collar makes contact with the top of the packing nut assembly.

NOTE: Measuring errors may prevent the bottom of the stop collar from reaching the top of the packing nut assembly. Do not proceed to step 3.3.7 if the distance between the stop collar and the packing nut assembly is greater than 1/8 of an inch. Acceptable tolerances allow for the stop collar to be 1/8 of an inch from the packing nut.

If the distance is greater than 1/8 of an inch, fully retract the valve cartridge from the installation housing. Close temporary gate valve. Return to Section 3.0.0 *Preparing the Hydra-Tapper for 4"–8" Valve Insertion* Step 3.0.12 and repeat all installation steps.

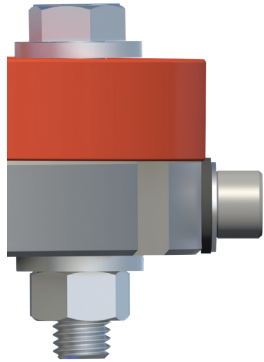


Figure 38

3.2.10) Lock the valve cartridge assembly in place by cross tightening the 4 Allen-head completion pins. Tighten each until the head of the Allen-head completion pin bottoms out against the flange as seen in Figure 38.

Figure 39 shows a cross tightening pattern which starts with Completion Pin #1 followed by Completion Pins #2, #3, and #4. You may start with any of the pins as #1, however, be sure to follow a cross tightening pattern with remaining pins.

NOTE: Do not start the next step until all completion pins have been properly set.

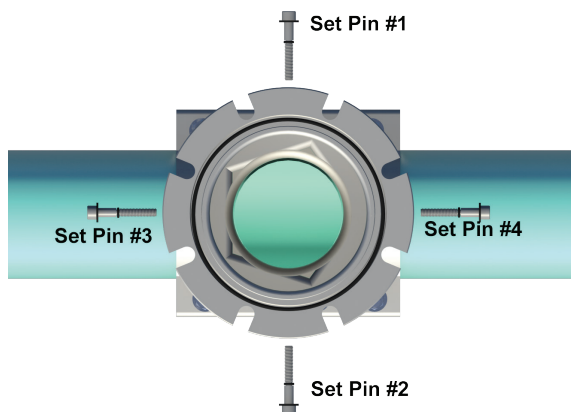


Figure 39 **Note:** Temporary Gate Valve removed for clarity. Completion Pins are shown removed for location purposes only.

3.2.11) Raise the feed screw 1 inch to expose the insertion tool lock nut.

3.2.12) Attach a 10' hose to the 3/4" ball valve on the insertion housing, then run the opposite end to a discharge location outside of the excavation.

3.2.13) Use a 3/4" open-ended wrench to loosen the lock nut until the outer shaft of the insertion tool can be raised to allow the auto equalizing check valve to close.

3.2.14) Slowly open the ball valve. A light stream of water will begin to flow from the hose.

3.2.15) Continue to turn the insertion tool lock nut, raising the feed screw 1 inch at a time as needed, to fully disengage the insertion tool from the valve cartridge.

3.2.16) The light (4 gal/min) stream of water out of the 3/4" ball valve should begin to decrease and stop as the insertion tool is disengaged from the valve cartridge.

3.2.17) Lock the clamp lever.

3.2.18) Remove the feed screw.

3.2.19) Loosen the clamp lever.

3.2.20) Raise the insertion tool up to the start position, where the knurled handle extends past the P3 of the tapping machine and secure the insertion tool in place by tightening the clamp lever.

3.2.21) Remove the IV 250 insertion equipment & temporary gate valve. Confirm O-ring is placed on top of IV 250 flange.

3.2.22) Unthread and remove the Auto Equalization Pin Assembly.

3.2.23) Place white Teflon washer onto the valve stem.

3.2.24) Teflon tape threads and replace 3/8" NPT plug into the stainless-steel check valve.

3.2.25) Lubricate the O-ring in the bore of the IV 250 bonnet and install over the valve stem. Install with recess facing down.

3.2.26) Align bolt holes.

3.2.27) Cross tighten the bolts, nuts, and washers that came with the IV 250.

3.2.28) Set the 2" operating nut on the valve stem. Thread the operating locking nut on to the valve stem.

3.2.29) Full open/close IV 250 to confirm a successful installation. The IV 250 operates at 3 turns per inch plus/minus 3 turns depending on the type and condition of the inside diameter of the pipe.

3.2.30) Fully disassemble, clean and store equipment.

3.2.31) Order replacement parts, if necessary, to replace lost, damaged, or worn components.



INSTA-VALVE 250 **INSERTION VALVES**

10" — 12" Insta Valve 250 Installation Instructions



WARNING!

Never attempt to install Insta-Valve 250 insertion valves at pressures greater than 150 psi if equipment is not rated for 250 psi installation. This warning includes the temporary gate valve and the Hydra-Tapper.

For 10" and 12" installations, your P-20 must also be bored to 13".

Contact Hydra-Stop at 708-389-5111 if you have any questions regarding equipment psi ratings.

4.0.0 Mount Valve Body on Pipe

4.0.1 Select the proper Insta Valve 250 for installation (referred to as IV 250 from here on). Identify the type of pipe the IV 250 will be installed on. Accurately measure the outside diameter of the pipe.

4.0.2 Refer to Appendix D (page 31) to review the IV 250 Valve Body Installation Instructions.

4.1.0 Pressure Test Valve Body

NOTE: Follow steps 4.1.1 through 4.1.10 if you are using the Hydra-Stop Quick Pressure Test Plug to pressure test.



Figure 41

See Appendix B (Page 28) if you are using a legacy Pressure Test Flange to pressure test.

4.1.1 Fill valve body with water (see Figure 41).

4.1.2 Spray pressure test plug O-ring with spray-on food-grade lubricant.

4.1.3 Ensure set pins have been backed-out and are flush with I.D. of the flange.

4.1.4 Press-fit pressure test plug into top of valve body (see Figure 42).

4.1.5 Insert 4 flange bolts into the 4 mounting holes of the pressure test plug assembly. Finger tighten a washer and nut onto each of the 4 bolts (see Figure 43).

4.1.6 Connect 1/2" quick-connect coupler on Pressure Test Tree to 1/2" quick-connect nipple on Pressure Test Plug (see Figure 44).

4.1.7 Connect pressure test tree to your pressure source for pressure testing. Hydra-Stop recommends using a hydro-static method of pressurizing the valve body. DO NOT use a compressible medium such as air.

4.1.8 Follow local rules for the recommended length of the pressure test.

4.1.9 After completing pressure test, use ball valve to blow-off pressure before removing pressure test plug.

4.1.10 Follow the tightening pattern and re-torque carriage bolts to recommended torque before continuing.

NOTE: Do not exceed recommended pressure test specifications.

- Minimum Test Pressure: 1.5 times the system working pressure.
- Maximum Test Pressure: 375 psi.

4.2.0 Installing the Temporary Gate Valve

4.2.1 Install the temporary gate valve. 10 and 12" IV 250s use the 12" temporary gate valve. If possible, avoid positioning the valve at the true 3, 6, 9, or 12 o'clock position to allow access to the completion pins.

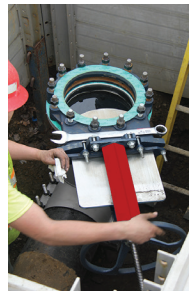


Figure 45

NOTE: Temporary gate valves are single direction valves and must be positioned top up. The 12" gate temporary valve must be installed with the red bar facing up (see Figure 45).

4.2.2 Install the flange O-ring in the O-ring channel on the IV 250. Carefully lower the 12" temporary gate valve into position. Ensure the temporary gate valve is centered on the valve flange.

NOTE: Failure to center temporary valve could cause misalignment resulting in a failed installation.

4.2.3 Bolt the temporary gate valve to the top of the IV 250 flange using the nuts and washers provided with the installation equipment.

4.2.4 Install green fiber gasket (without holes) on the top side of temporary gate valve (see Figure 45).

4.2.5 Fully open the temporary valve and re-check that temporary valve is centered.

4.3.0 Line Tap Preparation

NOTE: Follow steps 4.3.1 through 4.10.6 if you are performing a Core Sample prior to valve insertion.

4.3.1 Setting Up the Hydra-Tapper for Core Sampling

4.3.1 Bolt Hydra-Tapper to the P-20 component using the bolts / nuts included with Hydra-Tapper equipment (see Figure 46).

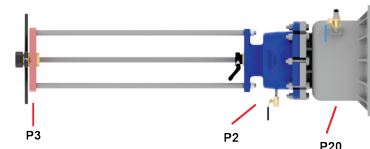


Figure 46

4.3.2 Select proper size saw mandrel. Core sampling and tapping of 10" and 12" IV 250's requires the 55" long saw mandrel.

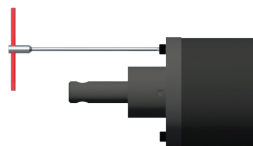


Figure 47

4.3.3 Screw 4" cutter to adaptor and lock in place with cutter hardware (see Figure 47).

4.3.4 Loosen and remove the Allen-head pilot drill retaining set screw located on the side of the coring adaptor.

NOTE: Select proper size pilot drill for installation. Installation of 10" and 12" IV 250s requires the 3/4" X 10 5/16" long pilot drill.

NOTE: Tapping PVC or steel pipe will require a twist style pilot drill.

4.3.5 Visually locate the tapered relief on the base of the pilot drill. Notice the stop or ledge at the base of the taper (see Figure 48).



Figure 48

4.3.6 Mark the flat of the taper with a visible marking agent (see Figure 49 on next page).



Figure 49

4.3.7) Align the pilot drill flat with the Allen-head set screw and insert the pilot drill through the center of coring adaptor (see Figure 50).



Figure 50

4.3.8) Confirm you have completely inserted the pilot drill and engaged the tapered flat. Look into set screw hole for the marking on the pilot bit. Adjust the pilot drill until you can see the marking (see Figure 51).



Figure 51

4.3.9) Once aligned, insert and tighten the set screw. Test pull the pilot drill to ensure the set screw is properly locked in place against the pilot drill ledge. Check the coupon retaining clips so they move freely (see Figure 52).

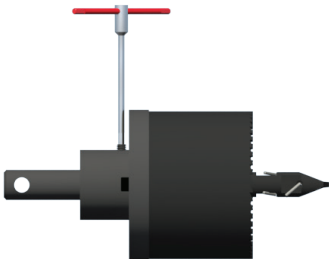


Figure 52

NOTE: Wear gloves when pulling on the pilot bit. Edges may be sharp.

4.3.10) Thread adaptor/cutter onto saw mandrel until tight, then back off until adaptor through-hole aligns with saw mandrel through-hole. (This through hole is the modification made to the saw mandrel in order to accept the 3/8" set pin included in kit (see Figure 53)).

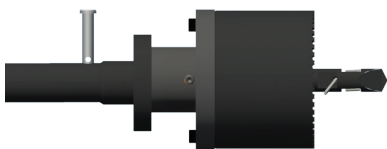


Figure 53

4.3.11) Insert set screw and cotter clip to lock adaptor in place (see Figure 54).

There should be a small amount of play between the saw mandrel and adaptor. This is desired as it tells us the adaptor will not tighten to mandrel.

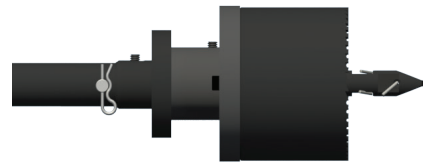


Figure 54

4.3.12) Attach Centering Ring to Coring Adaptor using 1/2"-13 x 2" Hardware (see Figure 55).

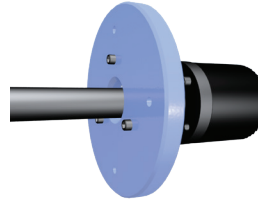


Figure 55

4.3.13) Make sure the saw mandrel is clean and free of rust or grime (steel wool can be used to clean and smooth the surface).

4.3.14) Lubricate the end of the saw mandrel with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly.

4.3.15) Slide the assembled shell cutter and saw mandrel into the Hydra-Tapper until the saw mandrel flange bottoms out in the P-20 component.

4.3.16) Hand tighten the clamp lever on the packing nut assembly to keep the assembled shell cutter and saw mandrel in place.

NOTE: Do not use tools to tighten the clamp lever.

4.4.0 Installing the Hydra-Tapper for 10" –12" Core Sampling

4.4.1) Using a strap or sling install the assembled Hydra-Tapper on to the 12" temporary gate valve and align the bolt slots.

NOTE: Use extreme caution not to damage the shell cutter or pilot drill as the unit is raised and positioned on to the temporary valve. Note the position of the fully retracted cutting assembly.

4.4.2) Cross tighten the bolts, nuts, and washers to secure the assembly. Thread the 1/4" nipple and ball valve into the tap housing and wrench tighten. Teflon tape or thread sealant can be used.

4.4.3) Hold and control the exposed saw mandrel, loosen the clamp lever and slowly lower the saw mandrel until the pilot drill is resting on the top of the pipe.

NOTE: Ensure that the centering ring can rotate freely in a clockwise direction with pilot bit touching the top of pipe.

NOTE: Centering ring ensures 4" sample tap is centered.

NOTE: If tap is done on PVC and material melts, centering tool in next section will still function properly to center tap, but coupon may be difficult to remove.

4.4.4) Slide a stop collar over the saw mandrel.

4.4.5) Set the cutting depth by measuring from the top of the packing nut assembly to the lower side of the stop collar.

- 10" core sample: 4.5"
- 12" core sample: 4.75"

4.4.6) Install the drive unit by lifting it above the saw mandrel and slide it into the 3 guide bars.



Figure 56

4.4.7) Lower the drive unit onto the machined hex of the saw mandrel. Confirm the drive unit is fully seated onto the machined hex of the saw mandrel (see Figure 56).

4.4.8) Install feed screw by threading it through the top plate of the Hydra-Tapper until the opening covers the spindle on the drive unit.

NOTE: Do not apply downward force as it can damage the pilot drill.

4.4.9) When the feed screw contacts the top of the drive unit, back off one full turn.

4.4.10) Install the upper and lower restraint pins and cotter clips to join the saw mandrel, drive motor, and feed screw into a single assembly. Early models of Hydra-Stop Insta-Valve installation equipment did not include the drive motor restraint kit. If you do not have the drive motor restraint kit, proceed to step 4.5.1.

4.5.0 Performing the Coring Sample

4.5.1) Ensure ball valves on the Hydra-Tapper P2 housing and the P20 housing are open.

4.5.2) Connect the drive unit power source to the drive unit. The air drive unit requires 90 CFM at 90 PSI. The hydraulic drive unit requires 9 GPM at 1800 PSI.

4.5.3) Ensure the drive unit lever control is in the neutral position. Always run the power unit in the clockwise direction.

NOTE: Avoid reversing as this will damage the carbide on the pilot drill and carbide teeth on the shell cutter.

4.5.4) Engage the drive unit and confirm the saw mandrel is rotating in the clockwise direction. Slowly turn the handle assembly in a clockwise direction keeping slight, constant pressure until the tap is complete.

4.5.5) Close the ball valves on the P20 housing and the P2 housing of the Hydra-Tapper as water fills the housings and flows from the valves.

NOTE: Do not overfeed the tap. Overfeeding the tap will cause the shell cutter to jam.

4.5.6) The tap is complete when the stop collar contacts the packing nut assembly.

4.5.7) Return the drive unit lever control to the neutral position.

4.5.8) Tighten the packing nut assembly clamp lever to lock the saw mandrel in place. Remove feed screw. Remove drive unit.



Figure 57

4.5.9) Place a box end wrench over the hex on the saw mandrel and use the wrench as a lever brake to hold in place (see Figure 57).

4.5.10) Loosen the packing nut assembly clamp lever and allow the pressure to slowly raise the cutter assembly fully into the P-20 housing.

4.5.11) Confirm the shell cutter and saw mandrel is fully retracted and lock the saw mandrel in place by tightening the packing nut assembly clamp lever.

4.5.12) Close the temporary gate valve.

4.5.13) Relieve the pressure from the Hydra-Tapper by opening the ball valve and discharging the pressure.

4.6.0 Removing the Hydra-Tapper

4.6.1) Connect the slings or straps to the Hydra-Tapper. Unbolt and remove the Hydra-Tapper / P-20 assembly from the temporary gate valve. Place the assembly in a dry and safe work area.

4.6.2) Remove core cutter and saw mandrel assembly.

4.6.3) Remove the coupon by loosening the Allen-head pilot drill retaining set screw. Remove the pilot drill from the saw mandrel stud.

4.6.4) Flip the pilot drill and insert its point end through the hole in the coupon past the retaining clips and use it to pull the coupon out of the cutter.

NOTE: Wear gloves when removing the coupon. Coupon edges may be sharp.

4.6.5) Measure coupon thickness. Calculate inner diameter. If pipe I.D. (Inner Diameter = [Outer diameter minus (2 * wall thickness)]) is smaller than 9.70" (for 10" nominal pipe) or 11.70" (for 12" nominal pipe), then the undersized cutter and cartridge should be used. See Appendix E — "Valve Cartridge and Cutter Sizing Chart" — for pipe I.D. / cutter selection.

4.6.6) Remove cutter from saw mandrel.

4.6.7) Disassemble core sampling equipment. Be sure to remove centering ring from cutter assembly.

NOTE: Coupon must be removed before cutter set screws and cutter can be removed.

4.7.0 Post Core Line Tapping

4.7.1) Depending on pipe I.D., attach appropriate 10" or 12" cutter — standard or undersized — to the saw mandrel and secure with standard cutter hardware as normal.

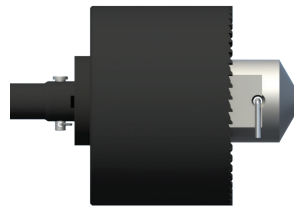


Figure 58

4.7.2) Insert 4" centering tool into pilot bit hole, align through-hole with saw mandrel through-hole and lock in place with cotter pin and clip (see Figure 58).

4.7.3) Make sure the saw mandrel is clean and free of rust or grime (steel wool can be used to clean and smooth the surface).

4.7.4) Lubricate the end of the saw mandrel with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly.

4.7.5) Insert tapping assembly completely into Hydra-Tapper P-20 Housing.

4.7.6) Hand tighten the clamp lever on the packing nut assembly to keep the assembled shell cutter, centering tool, and saw mandrel in place.

NOTE: Do not use tools to tighten the clamp lever.

4.8.0 Installing the Hydra-Tapper

4.8.1) Using a strap or sling install the assembled Hydra-Tapper on to the 8" temporary gate valve and align the bolt slots.

NOTE: Use extreme caution not to damage the shell cutter or centering tool as the unit is raised and positioned on to the temporary valve. Note the position of the fully retracted cutting assembly.

4.8.2) Install and cross tighten the bolts, nuts, and washers to secure the assembly.

4.8.3) Slowly open the temporary gate valve.

4.8.4) Hold and control the exposed saw mandrel, loosen the packing nut assembly clamp lever, and slowly lower the saw mandrel down until the cutter is resting on the center top of the pipe. Ensure the shell cutter spins freely in a clockwise direction.

NOTE: 4" centering tool will center the cut for an undersized cutter and will capture the coupon.

NOTE: If tap is done on PVC and material melts, centering tool in next section will still function properly to center tap, but coupon may be difficult to remove.

4.8.5) Slide a stop collar over the saw mandrel.

4.8.6) Set the cutting depth by measuring from the top of the packing nut assembly to the lower side of the stop collar.



Figure 59 (Measurement for reference only)

- 10" pipe = 6" cutting depth
- 12" pipe = 7" cutting depth

4.8.7) Tighten the stop collar to the correct measurement (see Figure 59).

4.8.8) Install the drive unit by lifting it above the saw mandrel and slide it into the 3 guide bars.

4.8.9) Lower the drive unit onto the machined hex of the saw mandrel. Confirm the drive unit is fully seated onto the machined hex of the saw mandrel (see Figure 60).

4.8.10) Install feed screw by threading it through the top plate of the Hydra-Tapper until the opening covers the spindle on the drive unit.

NOTE: Do not apply downward force as it can damage the cutter.

4.8.11) When the feed screw contacts the top of the drive unit, back off one full turn. If you do not have the drive motor restraint kit, proceed to step 4.9.1.

4.8.12) Install the upper and lower restraint pins and cotter clips to join the saw mandrel, drive motor, and feed screw into a single assembly.

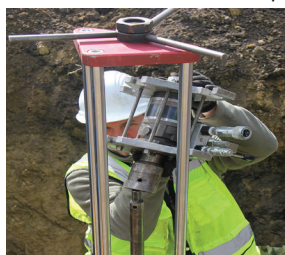


Figure 60

4.9.0 Performing the Line Tap

4.9.1) Ensure ball valves on the Hydra-Tapper P2 and P-20 housings are open.

4.9.2) Connect the drive unit power source to the drive unit. The air drive unit requires 90 CFM at 90 PSI. The hydraulic drive unit requires 9 GPM at 1800 PSI.

4.9.3) Ensure the drive unit lever control is in the neutral position. Always run the power unit in the clockwise direction.

NOTE: Avoid reversing as this will damage the carbide teeth on the cutter.

4.9.4) Engage the drive unit and confirm the saw mandrel is rotating in

the clockwise direction. Slowly turn the handle assembly in a clockwise direction keeping slight, constant pressure until the tap is complete.

NOTE: Do not overfeed the tap. Overfeeding the tap will cause the shell cutter to jam.

4.9.5) Close the ball valve on the P-20 and P2 housings as water fills the housings and flows from the valves.

4.9.6) The tap is complete when the bottom of the stop collar contacts the top of the packing nut assembly.

4.9.7) Return the drive unit lever control to the neutral position.



Figure 61

4.9.8) Tighten the packing nut assembly clamp lever to lock the saw mandrel in place. Remove feed screw. Remove drive unit.

4.9.9) Place a box-end wrench over the hex on the saw mandrel and use the wrench as a lever brake to hold in place (see Figure 61).

4.9.10) Loosen the packing nut assembly clamp lever and allow the pressure to slowly raise the cutter assembly fully into the tapping housing.

4.9.11) Confirm the shell cutter and saw mandrel assembly is fully retracted and lock the saw mandrel in place by tightening the packing nut assembly clamp lever.

4.9.12) Close the temporary gate valve.

4.10.0 Removing the Hydra-Tapper

4.10.1) Relieve the pressure from the Hydra-Tapper and the P-20 housing by opening the ball valves and discharging the pressure.

4.10.2) Connect the slings or straps to the Hydra-Tapper. Unbolt and remove the Hydra-Tapper from the temporary gate valve.

NOTE: Place the Hydra-Tapper in a dry and safe work area.

4.10.3) Remove cutter and saw mandrel assembly.

4.10.4) Remove the coupon by loosening the Allen-head pilot drill retaining set screw. Remove the centering tool from the saw mandrel stud.

4.10.5) Flip the centering tool and insert it point end through the hole in the coupon past the retaining clips and use it to pull the coupon out of the cutter.

NOTE: Wear gloves when removing the coupon. Coupon edges may be sharp.

4.10.6) This completes performing a Core Sample prior to valve insertion. Proceed to step 5.1.0 – Preparing the Hydra-Tapper for 10"–12" Valve Insertion.

NOTE: Follow steps 4.11.1 through 4.14.9 steps if you are performing a non-core sample line tap in preparation of valve insertion.

4.11.1 Preparing the Hydra-Tapper for a non-core sample Valve Insertion Line Tap

4.11.2) Select proper size saw mandrel. Tapping of the 10"-12" IV 250 requires the 55" long saw mandrel.

4.11.3) Select proper size shell cutter. Hydra-Stop valve insertion shell cutters are shipped painted black. If you repaint valve insertion shell cutters in the future, Hydra-Stop recommends painting them black.

- Installation of 10" IV 250 requires 9.8" cutter.
- Installation of 12" IV 250 requires 11.8" cutter.

NOTE: Ensure you are using the correct shell cutter for your application. See Appendix E — "Valve Cartridge and Cutter Sizing Chart" — for pipe I.D. / cutter selection.

4.11.4) Select proper size pilot drill for installation. Installation of 10" and 12" IV 250s requires the 3/4" X 10 5/16" long pilot drill.

NOTE: Tapping PVC or steel pipe will require a twist style pilot drill.

NOTE: Failure to use the proper sized or type of pilot drill will result in a failed installation.

4.11.5) Loosen and remove the Allen-head pilot drill retaining set screw located on the side of the saw mandrel flange base.

4.11.6) Visually locate the tapered relief on the base of the pilot drill. Notice the stop or ledge at the base of the taper (see Figure 62).



Figure 62

4.11.7) Mark the flat of the taper with a visible marking agent (see Figure 63).



Figure 63

4.11.8) Align the pilot drill flat with the Allen-head set screw and insert the pilot drill through the center of the saw mandrel stud (see Figure 64).



Figure 64

4.11.9) Confirm you have completely inserted the pilot drill and engaged the tapered flat. Look into set screw hole for the marking on the pilot drill. Adjust the pilot drill until you can see the marking (see Figure 65).

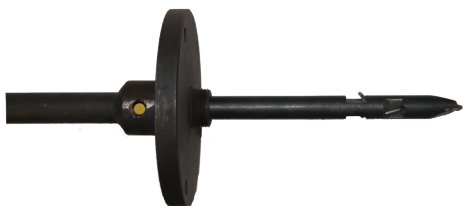


Figure 65

4.11.10) Once aligned, insert and tighten the set screw. Test pull the

pilot drill to ensure the set screw is properly locked in place against the pilot drill ledge. Check the coupon retaining clips so they move freely (see Figure 66).



Figure 66

NOTE: Wear gloves when pulling on the pilot drill. Edges may be sharp.

4.11.11) Loosen and remove the three Allen-head cap screws on the flange of the saw mandrel.

4.11.12) Thread the appropriate shell cutter all the way onto the threaded stud of the saw mandrel flanged end.



Figure 67

4.11.13) Back off cutter to align the holes in the base of the shell cutter with the Allen-head cap screw holes in the saw mandrel. Thread screws from inside the shell cutters and then into the saw mandrel holes (see Figure 67).

4.11.14) Thread nylon lock nuts onto Allen-head cap screws and tighten (see Figure 68).



Figure 68

4.11.15) Make sure the saw mandrel is clean and free of rust or grime (steel wool can be used to clean and smooth the surface).

4.11.16) Lubricate the end of the saw mandrel with a dab of the food-grade lubricant provided with the equipment to help it

slide freely through the packing nut assembly.

4.11.17) Slide the assembled shell cutter and saw mandrel into the Hydra-Tapper until the saw mandrel flange bottoms out in the P-20 component.

4.11.18) Hand tighten the clamp lever on the packing nut assembly to keep the assembled shell cutter and saw mandrel in place.

NOTE: Do not use tools to tighten the clamp lever.

4.12.0 Installing the Hydra-Tapper

4.12.1) Using a strap or sling install the assembled Hydra-Tapper on to the 12" temporary gate valve and align the bolt slots.

NOTE: Use extreme caution not to damage the shell cutter or pilot drill as the unit is raised and positioned on to the temporary valve. Note the position of the fully retracted cutting assembly.

4.12.2) Cross tighten the bolts, nuts, and washers to secure the assembly. Thread the 1/4" nipple and ball valve into the tap housing and wrench tighten. **Teflon tape or thread sealant can be used.**

4.12.3) Hold and control the exposed saw mandrel, loosen the clamp lever and slowly lower the saw mandrel until the pilot drill is resting on the top of the pipe. Ensure the shell cutter spins freely in a clockwise direction.

4.12.4) Slide the stop collar over the saw mandrel.

4.12.5) Set the cutting depth by measuring from the top of the packing nut assembly to the lower side of the stop collar.



Figure 69

4.12.6) Tighten the stop collar to the correct measurement (see Figure 69).

- 10" pipe = 6" cutting depth
- 12" pipe = 7" cutting depth

4.12.7) Install the drive unit by lifting it above the saw mandrel and slide it into the 3 guide bars.

4.12.8) Lower the drive unit onto the machined hex of the saw mandrel. Confirm the drive unit is fully seated onto the machined hex of the saw mandrel (see Figure 70).



Figure 70

4.12.9) Install feed screw by threading it through the top plate of the Hydra-Tapper until the opening covers the spindle on the drive unit.

NOTE: Do not apply downward force as it can damage the pilot drill.

4.12.10) When the feed screw contacts the top of the drive unit, back off one full turn. If you do not have the drive motor restraint kit, proceed to step 4.13.1.

4.12.11) Install the upper and lower restraint pins and cotter clips to join the saw mandrel, drive motor and feed screw into a single assembly.

4.13.0 Performing the Line Tap

4.13.1) Ensure ball valves on the Hydra-Tapper P2 housing and the P20 housing are open.

4.13.2) Connect the drive unit power source to the drive unit. The air drive unit requires 90 CFM at 90 PSI. The hydraulic drive unit requires 9 GPM at 1800 PSI.

4.13.3) Ensure the drive unit lever control is in the neutral position. Always run the power unit in the clockwise direction.

NOTE: Avoid reversing as this will damage the carbide on the pilot drill and carbide teeth on the shell cutter.

4.13.4) Engage the drive unit and confirm the saw mandrel is rotating in the clockwise direction. Slowly turn the handle assembly in a clockwise direction keeping slight, constant pressure until the tap is complete.

4.13.5) Close the ball valves on the P20 housing and the P2 housing of the Hydra-Tapper as water fills the housings and flows from the valves.

4.13.6) The tap is complete when the bottom of the stop collar contacts the top of the packing nut assembly.

NOTE: Do not overfeed the tap. Overfeeding the tap will cause the shell cutter to jam.

4.13.7) Return the drive unit lever control to the neutral position.

4.13.8) Loosen the stop collar and continue to advance the feed screw an additional two complete revolutions to ensure the cut is complete. The shell cutter should spin freely. If it does, disconnect the drive unit power source from the drive unit. If the shell cutter does not spin freely engage the drive unit and confirm the saw mandrel is rotating in a clockwise direction. Slowly turn the handle assembly in a clockwise direction an additional two complete revolutions.

4.13.9) Slowly turn the handle assembly in a counterclockwise direction until the stop collar has reached the starting measurement.

- 10" pipe = 6" cutting depth
- 12" pipe = 7" cutting depth

4.13.10) Tighten the packing nut assembly clamp lever to lock the saw mandrel in place. Remove feed screw. Remove drive unit.

4.13.11) Place a box-end wrench over the hex on the saw mandrel and use the wrench as a lever brake to hold in place.



Figure 71

4.13.12) Loosen the packing nut assembly clamp lever and allow the pressure to slowly raise the cutter assembly fully into the tapping housing (see Figure 71).

4.13.13) Confirm the shell cutter and saw mandrel is fully retracted and lock the saw mandrel in place by tightening the packing nut assembly clamp lever.

4.13.14) Close the temporary gate valve.

4.14.0 Removing the Hydra-Tapper

4.14.1) Relieve the pressure from the Hydra-Tapper by opening the ball valve and discharging the pressure.

4.14.2) Connect the slings or straps to the Hydra-Tapper. Unbolt and remove the Hydra-Tapper / P-20 assembly from the temporary gate valve. Place the assembly in a dry and safe work area.

4.14.3) Remove stop collar.

4.14.4) Remove cutter and saw mandrel assembly.

4.14.5) Remove the coupon by loosening the Allen-head pilot drill retaining set screw. Remove the pilot drill from the saw mandrel stud.

4.14.6) Flip the pilot drill and insert its point end through the hole in the coupon past the retaining clips and use it to pull the coupon out of the cutter.

NOTE: Wear gloves when removing the coupon. Coupon edges may be sharp.

4.14.7) Inspect the coupon for pipe thickness and condition.

4.14.8) Remove cutter from saw mandrel.

4.14.9) This completes performing a non-core sample prior to valve insertion. Proceed to step 5.1.0 — Preparing the Hydra-Tapper for 10"–12" Valve Insertion.

5.1.0 Preparing the Hydra-Tapper for 10-12" Valve Insertion.

5.1.1 Locate the proper valve inserting equipment. Installation of 10"–12" IV 250s will require the 10"–12" insertion housing, the 59" long insertion tool, the guide plate, stop collar, and the Auto Equalization Adapter.

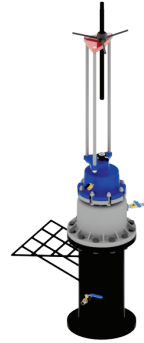


Figure 72

5.1.2 Stand the insertion housing on a flat surface. Place a green fiber gasket (included with equipment) between the insertion housing and the tapping machine / P 20 assembly. Install the 3/4" nipple and ball valve.

5.1.3 Place the Hydra-Tapper / P-20 assembly on top of the insertion housing with the pointed end of the P3 facing the same direction as the step stand of the housing, cross tighten with supplied bolts, nuts, and washers (see Figure 72).

5.1.4 Tip and lay the insertion housing and Hydra-Tapper / P20 assembly on its stand (see Figure 73).

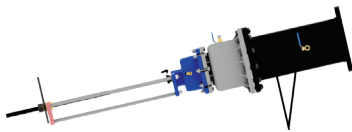


Figure 73

5.1.5 The IV 250 valve cartridge consists of top section and bottom section. The top section and bottom section must be firmly tightened together. Prior to removing operating nut hold the base of the valve cartridge and with a pipe wrench or

valve key turn the valve stem firmly in the opening direction (see Figure 74 below).



IV 250 Valve Cartridge

Figure 74

5.1.6 Remove the operating nut and the white Teflon washer off of the valve stem. Set aside in a safe place.

5.1.7 Remove Auto Equalization Valve NPT plug. Set aside in a safe place.

NOTE: If you elect to not use Auto Equalization, leave the NPT plug in the cartridge and refer to Appendix F.

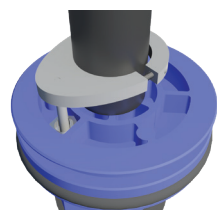


Figure 75 Auto-E Generation 1 Tool

NOTE: If you have the Generation 1 Auto Equalization tool (see Figure 75), refer to Appendix F.

5.1.8 Hand tighten the Auto-E pin into the check valve. Push down the pin to ensure it is able to actuate (see Figure 76 and 77).

5.1.9 Tighten the IV 250 valve cartridge and insertion tool together by turning the

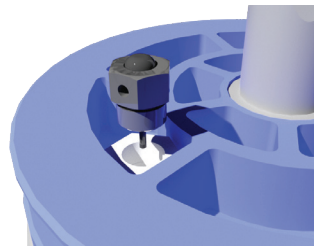


Figure 76



Figure 77

knurled end of the insertion tool clockwise until snug. Tighten the 3/4" insertion tool lock nut located at the base of the knurled handle. The raised face at the end of the insertion tool must sit flush against the valve cartridge (see Figure 78a and Figure 78b).

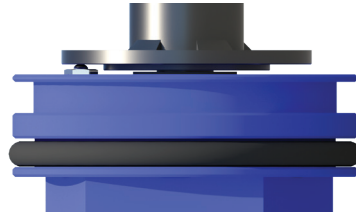


Figure 78a - Insertion tool making contact with the auto equalization pin.



Figure 78b - Raised Face of Insertion tool installed flush to cartridge.

CAUTION: Ensure there are no gaps between the insertion tool, valve cartridge and feed screw. The valve cartridge should remain in tight contact with the insertion tool and act as a single unit.

5.1.10 Make sure the insertion tool is clean and free of rust or grime (steel wool can be used to clean and smooth the surface). Lubricate the end of the insertion tool with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly. Ensure packing nut assembly clamp lever is loose.

5.1.11 Insert the assembled valve cartridge and insertion tool through the insertion housing / tapping assembly until the top of the valve cartridge is approximately 2.5" from the bottom flange of the insertion housing. Make sure the shorter, truncated side of the valve cartridge, marked with a star, is facing upwards (see Figure 79).

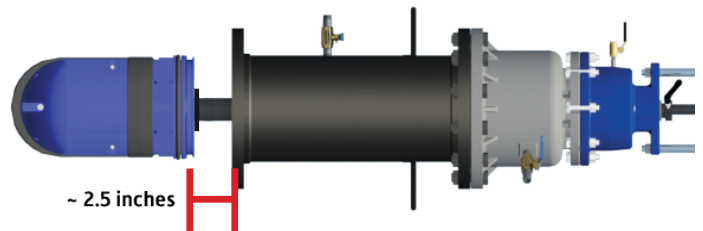


Figure 79

5.1.12 Slide the stop collar over the knurled end of the insertion tool. Align the 3 slots of the triangular shaped guide plate with the 3 guide bars and slide it over the knurled end of the insertion tool.

5.1.13 Setup the IV 250 10"–12" Alignment Gauge for the size being installed (10" or 12"). Refer to Alignment Gauge instructions shipped with 10"–12" IV 250 Alignment Gauge Kit.

5.1.14 Set the curved portion of the alignment gauge within the completion pin groove of the valve cartridge. Slide the valve cartridge and alignment gauge towards the insertion housing until the alignment gauge touches the insertion housing. The 2 gauge pins will seat in the top 2 holes of the insertion housing (see Figure 80 on next page).

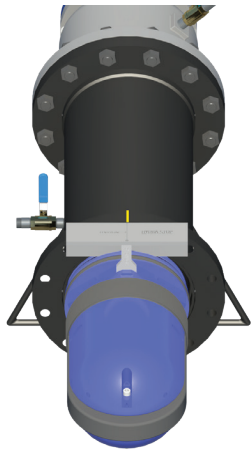


Figure 80

5.1.15 Ensure the flat of the alignment gauge arm remains aligned with the truncated side of the valve cartridge (see Figure 80).

5.1.16 Place the 4.25" IV 250 Insertion Gauge on the insertion tool. Place one end of the insertion gauge against the packing nut assembly. Slide the stop collar towards the insertion gauge until the stop collar contacts the insertion gauge. This automatically sets the proper depth for insertion. Lock the stop collar (see Figure 81).

5.1.17 Make a reference mark on the insertion housing in line with the alignment gauge centerline (see Figure 82).

5.1.18 Slide and place the guide plate to within two inches of the stop collar and lock the clamp lever (see Figure 80).

5.1.19 Remove the 4.25" IV 250 Insertion Gauge.

5.1.20 Slide the valve cartridge back to the original 2.5" measurement away from the insertion housing. Remove the IV 250 Alignment Gauge.

5.1.21 Lubricate the completion plug O-ring with food-grade lubricant provided with the equipment.

5.1.22 Slide the valve cartridge assembly fully into the insertion housing.

5.1.23 Tighten the clamp lever.

NOTE: Do not use tools to tighten the clamp lever.

5.2.0 Install IV 250 Insertion Equipment

5.2.1 Place a green fiber gasket with holes (included with equipment) between the insertion housing and the temporary gate valve. Safely lift the insertion equipment and place on to the temporary valve.

5.2.2 Align the insertion housing reference mark made in step 5.1.18 with the external "rib" cast into the valve body that is in line with the direction of the pipe (see Figure 83).

NOTE: Use the set pin hole that aligns with the external "rib" as an additional alignment reference.

5.2.3 Thread nuts and washers provided, and cross tighten the insertion assembly in place.

5.3.0 Install the IV 250 Valve Cartridge

5.3.1 Loosen the packing nut clamp lever. Lower the valve cartridge until it touches the temporary gate valve. It is critical to

install the 30" feed screw over the knurled spindle of the insertion tool until the feed screw bottoms out on the locking nut washer.

NOTE: Failure to follow step 5.3.1 could result in damaged equipment and failed installation.

5.3.2 Install the feed screw by threading it through the top plate of the Hydra-Tapper until 2-3 inches are exposed under the top plate of the Hydra-Tapper.

5.3.3 Slide and place a second guide plate over the end of the feed screw to keep the feed screw from spinning as you turn the Hydra-Tapper OS&Y handles (see Figure 82).

5.3.4 Continue advancing feed screw until the feed screw bottoms out on the locking nut washer.

5.3.5 Open the tapping housing and insertion housing ball valves and slowly open the temporary gate valve until the insertion housing begins to fill. Stop opening the temporary gate valve.

5.3.6 Close the insertion housing ball valve once fluid reaches the ball valve. Wait for fluid to reach the tapping housing ball valve and close ball valve. Allow the insertion / tap housings to fully pressurize.

5.3.7 Fully open the temporary gate valve.

5.3.8 If not utilizing OS&Y equipment, install the handle assembly over the flats at the top of the feed screw and tighten.

5.3.9 Loosen the packing nut assembly clamp lever and begin advancing the valve cartridge insertion assembly.

5.3.10 Continue advancing the feed screw until the valve cartridge assembly is completely seated. The valve cartridge assembly is completely seated when the bottom of the stop collar contacts the top of the packing nut assembly (within 1/8 of an inch).

CAUTION: The feed screw should advance easily during the valve cartridge install process. If excessive effort is required to advance feed screw the valve cartridge is mis-aligned. Immediately stop the valve cartridge installation process, retract the valve cartridge into the installation housing and close the temporary gate valve. Remove equipment and return to step 5.1.1 and repeat all installation steps.

NOTE: Measuring errors may prevent the bottom of the stop collar from reaching the top of the packing nut assembly. Do not proceed to step 5.3.10 if the distance between the stop collar and the packing nut assembly is greater than 1/8 of an inch. Acceptable tolerances allow for the stop collar to be 1/8 of an inch from the packing nut.

If the distance is greater than 1/8 of an inch, fully retract the valve cartridge from the installation housing. Close temporary gate valve. Return to Section 5.0.0 *Preparing the Hydra-Tapper for 10"-12" Valve Insertion*, Step 5.0.1 and repeat all installation steps.

5.3.11 Lock the valve cartridge assembly in place by tightening the 6 Allen-head completion pins. Tighten each until the head of the completion pin bottoms out against the flange (see Figure 85, on the next page). Figure 84 on the next page, shows a cross tightening pattern which starts with Locking Pin #1 followed by Locking Pin #2, #3, #4, #5, and #6.

NOTE: You may start with any of the completion pins as #1, however, be sure to follow a cross tightening pattern with remaining pins.

NOTE: Do not start the next step until all completion pins have been properly set. Failure to properly set the completion pins could result in hard operation and impact valve performance (see Figure 84 on the next page).

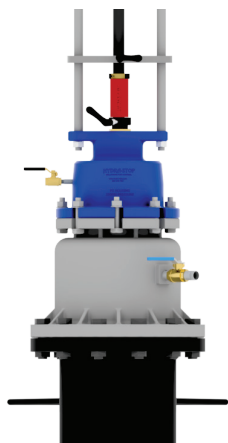


Figure 81

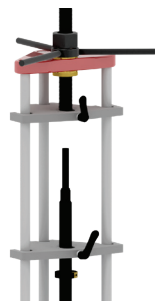


Figure 82

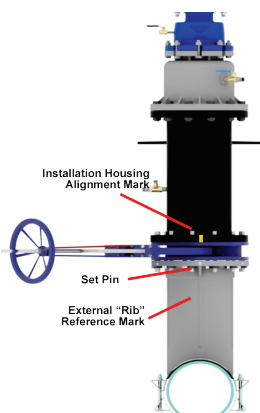


Figure 83

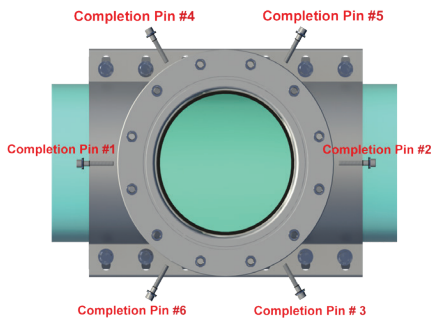


Figure 84

*** Note: Temporary Gate Valve removed for clarity.**

Completion pins are shown removed for location purposes only.

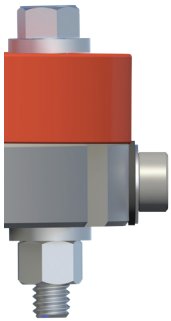


Figure 85

5.3.12) Raise the feed screw 1 inch to expose the insertion tool lock nut.

5.3.13) Attach a 10' hose to the 3/4" ball valve on the insertion housing, then run the opposite end to a discharge location outside of the excavation.

5.3.14) Use a 3/4" open-ended wrench to loosen the lock nut until the outer shaft of the insertion tool can be raised to allow the auto equalizing check valve to close.

5.3.15) Slowly open the ball valve. A light stream of water will begin to flow from the hose.

5.3.16) Continue to turn the insertion tool lock nut, raising the feed screw 1 inch at a time as needed, to fully disengage the insertion tool from the valve cartridge.

5.3.17) The light (4 gal/min) stream of water out of the 3/4" ball valve should begin to decrease and stop as the insertion tool is disengaged from the valve cartridge

5.3.18) Lock the clamp lever.

5.3.19) Remove the feed screw.

5.3.20) Loosen the clamp lever.

5.3.21) Raise the insertion tool up to the start position, where the knurled handle extends past the P3 of the tapping machine and secure the insertion tool in place by tightening the clamp lever.

5.3.22) Remove the IV 250 insertion equipment and temporary gate valve. Confirm O-ring is placed on top of IV 250 flange.

5.3.23) Unthread and remove the Auto Equalization Pin Assembly.

5.3.24) Replace the Auto Equalization Valve NPT plug.

5.3.25) Place white thrust washer onto the valve stem.

5.3.26) Lubricate the O-ring in the bore of the IV 250 bonnet and install over the valve stem. Install flange with recess facing down.

5.3.27) Align bolt holes.

5.3.28) Cross tighten the bolts, nuts, and washers that came with the IV 250.

5.3.29) Set the 2" operating nut on the valve stem. Thread the operating locking nut on to the valve stem.

5.3.30) Fully open and close IV 250 to confirm a successful installation.

IV 250 is 3 turns per inch plus / minus 3 turns depending on the type and condition of the inside diameter of the pipe.

5.3.31) Fully disassemble, clean and store equipment.

5.3.32) Order replacement parts, if necessary, to replace lost, damaged, or worn components.



INSTA-VALVE 250 **INSERTION VALVES**

Appendices

Appendix A — Technician Tool List

Miscellaneous Supplies

- Tape Measure
- Torpedo Level
- Channel Lock Pliers
- Waterproof or Paint Marker
- Teflon Tape
- WD-40
- Chlorine Sprayer
- Spray bottle with soap and water
- Food-Grade Grease (such as Primo-Lube)
- Pressure Test Kit including nipple assembly

Wrenches and Ratchets

- 1/2" or 3/4" drive Ratchet Wrench
- 15/16" Socket
- 1-1/16" Extra Deep Socket
- 1-1/4" Extra Deep Socket
- 1-5/16" Extra Deep Socket
- 1-7/16" Extra Deep Socket
- Crescent Wrench
- Torque Wrench (150 lbs.)
- 3/4" Open End Wrench
- 15/16" Open End Wrench
- 1-1/16" Open End Wrench
- 1-1/4" Open End Wrench
- 1-5/16" Open End Wrench
- 1-7/16" Open End Wrench
- 18" Pipe Wrench

Allen Wrenches

- 9/16" Allen Wrench
- 5/8" Allen Wrench
- 5/32" T-Handle Allen Wrench
- 3/16" T-Handle Allen Wrench
- 1/4" T-Handle Allen Wrench
- 5/16" T-Handle Allen Wrench
- 3/8" T-Handle Allen Wrench

Other Equipment

- Safety Equipment
- Hard Hat
- Safety Glasses
- Safety Shoes
- Fall Protection
- Hearing Protection
- Work Gloves
- Small Slings

NOTE: Have two sets of open-end wrenches on hand to allow multiple people to assist in installation.

Appendix B — Using a Standard Pressure Test Flange to Pressure Test

Figure B-1

- B.1)** Fill valve body with water (see Figure B-1).
B.2) Place O-ring into valve body O-ring groove.
B.3) Place pressure test flange onto valve body flange.
B.4) Insert 8 flange bolts into the 8 mounting holes of the pressure test flange. Tighten a washer and nut onto each of the eight bolts (see Figure B-2).
B.5) Connect a pressure test assembly to the pressure test flange (see Figure B-3).
B.6) Connect pressure test assembly to your pressure source for pressure testing. Hydra-Stop recommends using a hydrostatic method of pressurizing the valve body.



Figure B-2

- NOTE:** DO NOT use a compressible medium such as air.
- B.7)** Follow local rules for the recommended length of the pressure test.
B.8) After completing pressure test, use ball valve to blow-off pressure before removing pressure test flange.
B.9) Follow the tightening pattern and re-torque carriage bolts to recommended torque before continuing.

- NOTE:** Do not exceed recommended pressure test specifications.
- Minimum Test Pressure: 1.5 times the system working pressure.
 - Maximum Test Pressure: 375 psi.



Figure B-3

- B.10)** For 4"–8" Insta-Valves, proceed to Section 2.2.0 Installing the Temporary Gate Valve. For 10"–12" Insta-Valves, proceed to Section 4.2.0 Installing the Temporary Gate Valve.

Appendix C — Manual Measuring for Valve Cartridge Alignment

C.1) Locate the proper valve inserting equipment. Installation of 4"–8" IV 250s will require the 4"–8" insertion housing, the 47" long insertion tool, and guide plate. Installation of 10"–12" IV 250s will require the 10"–12" insertion housing, the 59" long insertion tool and guide plate.

C.2) Stand the insertion housing on a flat surface with the O-ring grooved flange facing up. Place the O-ring into the insertion housing O-ring groove. Install the 3/4" nipple and ball valve.

C.3) Place the Hydra-Tapper on top of the insertion housing with the pointed end of the P3 facing the same direction as the step stand of the housing, cross tighten with supplied bolts, nuts, and washers.

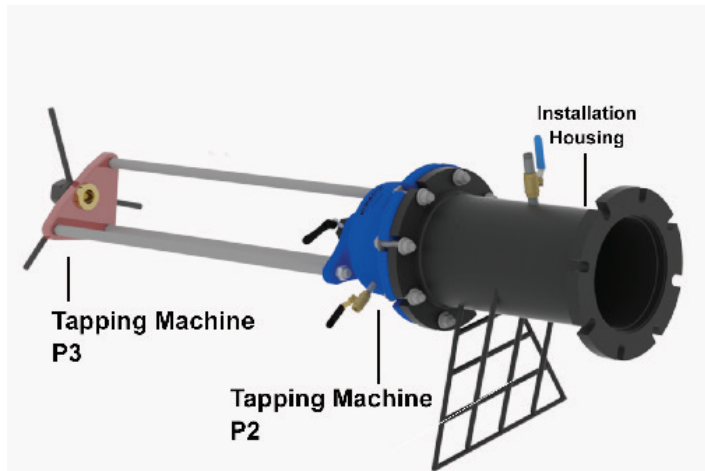


Figure C-1 4-8" Hydra-Tapper and Insertion Housing

C.4) Tip and lay the insertion housing and Hydra-Tapper assembly on its stand (see Figure C-1).

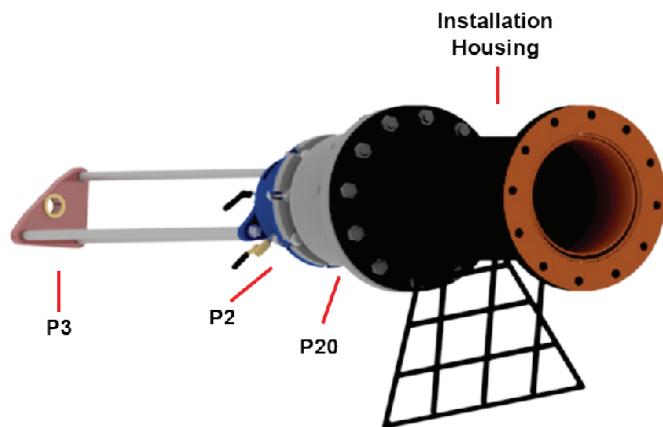


Figure C-1 10-12" Hydra-Tapper, P-20, and Insertion Housing

C.5) The IV 250 valve cartridge consists of top section and bottom section. The top section and bottom section must be firmly tightened together. Prior to removing operating nut hold the base of the valve cartridge and with a pipe wrench or valve key turn the valve stem firmly in the opening direction (see Figure C-2).

C.6) Remove the operating nut and the white Teflon washer off of the valve stem. Set aside in a safe place.



Figure C-2

C.7) Remove Auto Equalization Valve NPT plug. Set aside in a safe place.

If you elect to not use Auto Equalization, leave the NPT plug in the cartridge.

C.8) Hand tighten the Auto-E pin into the check valve. Push down the pin to ensure it is able to actuate (see Figures C-3 AND C-4).

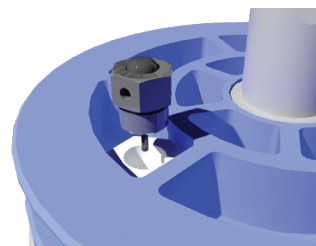


Figure C-3



Figure C-4

C.9) Place the end of the insertion tool over the valve stem. Tighten the IV 250 valve cartridge and insertion tool together by turning the knurled end of the insertion tool clockwise until snug. Tighten the 3/4" insertion tool lock nut located at the base of the knurled handle. The raised face at the end of the insertion tool must sit flush against the valve cartridge (see Figure C-5a and C-5b).



Figure C-5a — Insertion tool making contact with the auto equalization pin.

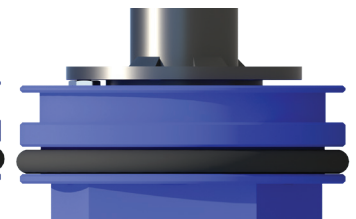


Figure C-5b — Raised Face of Insertion tool installed flush to cartridge.

C.10) Tighten the IV 250 valve cartridge and insertion tool together by turning the knurled end of the insertion tool clockwise until snug. Tighten the 3/4" insertion tool lock nut located at the base of the knurled handle.

Caution: Ensure there are no gaps between the insertion tool, valve cartridge and feed screw. The valve cartridge should remain in tight contact with the insertion tool and act as a single unit.

C.11) Make sure the insertion tool is clean and free of rust or grime (steel wool can be used to clean and smooth the surface). Lubricate the end of the insertion tool with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly. Ensure packing nut assembly clamp lever is loose.

C.12) Insert the assembled valve cartridge and insertion tool through the insertion housing / tapping assembly until the top of the valve cartridge is approximately 2.5" from the bottom flange of the insertion housing. Make sure the shorter, truncated side of the valve cartridge, marked with a star, is facing upwards (see Figure C-6).

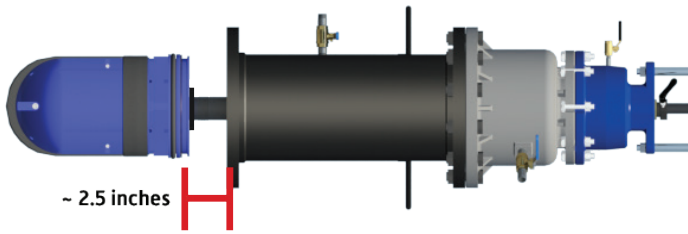


Figure C-6

C.13) Slide the stop collar over the knurled end of the insertion tool. Align the 3 slots of the triangular shaped guide plate with the 3 guide bars and slide it over the knurled end of the insertion tool.

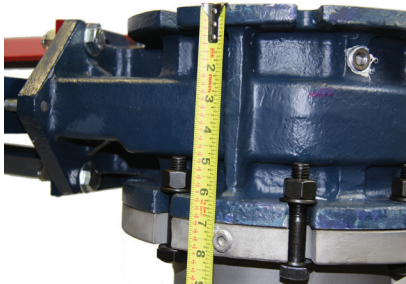


Figure C-7

C.14) Measure the distance from the **CENTER** of one of the completion pin caps to the face of the top flange of the temporary gate valve. **RECORD THIS MEASUREMENT** (see Figure C-7).

C.15) Adjust the valve cartridge so the completion pin groove is centered half in and half out of the insertion housing flange (see Figure C-9).

Set the distance from the top of the packing nut assembly to the bottom of the stop collar equal to the measurement recorded in step C.12 (see Figure C-8).

In most cases, this measurement will be 7.5" for 4-8" installations and 4.25" for 10-12" installations.

C.16) Confirm the valve cartridge completion pin groove is still centered.

C.17) Adjust and align the shorter side of the valve cartridge, which is marked with a star, between (2) bolt holes accordingly. Make a reference mark on the insertion housing, between the 2 bolt holes.



Figure C-8

Slide the guide plate to the stop collar and lock the guide plate clamp lever (see Figure C-10).

C.18) Lubricate the completion plug O-ring with food-grade lubricant provided with the equipment. **DO NOT LUBRICATE WIPE SEALS OR PADDLE.**

C.19) Slide valve cartridge and insertion tool assembly into the insertion housing until it seats against the top of the insertion housing.

C.20) Tighten the clamp lever on the packing nut assembly to keep the assembled valve gate and insertion tool in place. Do not use tools to tighten the clamp lever.

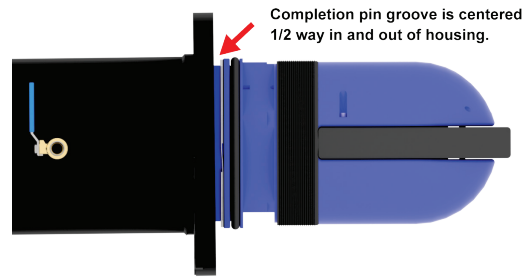


Figure C-9

C.21) After completion of the *Manual Measuring for Valve Cartridge Alignment* section, refer to Section 5.2.0, *Install IV 20 Insertion Equipment* to continue the valve insertion procedure.

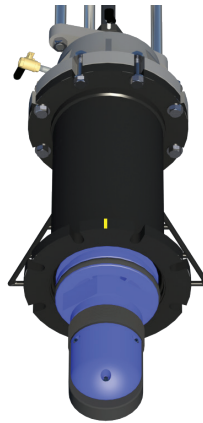


Figure C-10

Appendix D — 4"–12" Valve Body installation instructions

IMPORTANT: Read installation instructions COMPLETELY before installing the Insta-Valve 250 valve body. Failure to follow installation instructions will void product warranty. Follow local safety regulations and use personal protection equipment (PPE) as required by national, state and local regulations.

INSTALLATION INSTRUCTION STEPS



Figure 1

D.1) Inspect the valve body to ensure no damage has occurred during shipment or storage (see Figure 1).

D.2) Locate valve cartridge and box containing stainless steel mounting hardware. Store in a clean, safe location.

D.3) Measure pipe outside diameter where the Insta-Valve 250 is being installed to ensure the correct insertion valve is being used.

D.4) Thoroughly clean the pipe surface with a wire brush where the valve body will be installed to ensure all loose debris and material is removed. Inspect for flaws (ex. gouges, protrusions, excessive corrosion, etc.). Irregular surfaces should be avoided to assure maximum gasket sealing.

D.5) Liberally lubricate top and bottom of pipe and mat and throat gaskets with a soap/water solution. Ensure branch gasket is adequately lubricated.

D.6) Mount the top half of the valve body on the pipe in the position required for permanent installation (see Figure 2). Do not rotate the top half of the valve body after it is positioned on the pipe.

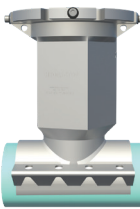


Figure 2

D.7) Install the bottom half of the valve body over the tapered ends of the mat gasket ensuring they are flat and smooth against the pipe surface. Visually inspect gasket to ensure tapered ends are not folded or rolled under themselves.

D.8) Install stainless steel carriage bolts, washers, and nuts (see Figure 3). Finger tighten nuts, ensuring gaps between top half and bottom half of the valve body are the same front to back and side to side within 1/8" (see Figure 4).

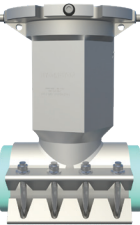


Figure 3

D.9) Using a torque wrench, tighten nuts in proper pattern. Tightening patterns (see Figures 5-7 on next page) for each size valve are on the reverse side of this document. Repeat tightening pattern in no more than 25 ft.-lb. increments until recommended torque is reached.

D.10) Wait 10 minutes to allow the gasket to fully seat then retighten bolts to recommended torque three additional times following the tightening pattern.

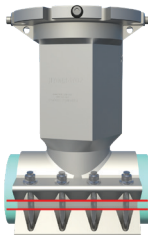


Figure 4

RECOMMENDED TORQUE:

4" –8" Insta-Valve 250

Cl / DI Pipe: 115 ft.-lbs.

PVC Pipe: 55 ft.-lbs.

AC Pipe: 75 ft.-lbs.

10" –12" Insta-Valve 250

Cl / DI Pipe: 65 ft.-lbs.

PVC Pipe: 55 ft.-lbs.

AC Pipe: 60 ft.-lbs.

Installation instructions and best practices continued on next page.

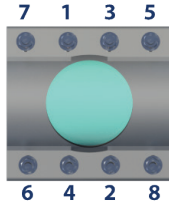


Figure 5
4" –6" Bolt Tightening Pattern

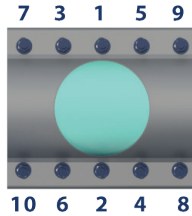


Figure 6
8" Bolt Tightening Pattern

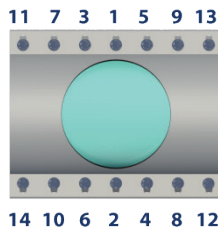


Figure 7
10" and 12" Bolt Tightening Pattern

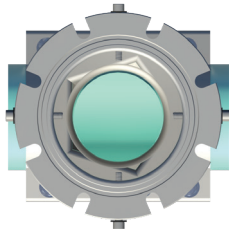


Figure 8
Completion pins **NOT** flush with inner valve flange. **DO NOT ATTEMPT VALVE INSTALLATION WITH PINS IN THIS POSITION.**

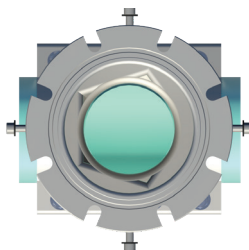


Figure 9
Completion pins flush with I.D. of flange. This is correct position to begin pressure test and continue with installation procedure.

D.11) Check inside of valve body outlet to ensure gasket is properly seated. Completion pins are shipped in the fully installed position. Backout and ensure completion pins are flush with I.D. of the flange (see Figures 8 and 9).

D.12) Fill valve body with water. Install Quick Pressure Test Plug (from Hydra-Q.I.K. kit) or test flange. Perform pressure test to ensure a complete seal between the valve body and pipe.

NOTE: DO NOT use a compressible medium such as air.

- Minimum Test Pressure: 1.5 times the system working pressure
- Maximum Test Pressure: 375 psi

D.13) Remove the Quick Pressure Test Plug or test flange.

D.14) Following the tightening pattern, re-torque carriage bolts to recommended torque before continuing.

D.15) Properly block (support) Insta-Valve 250 valve body and ensure pipe joints are properly restrained. Proceed with valve insertion operation.

INSTALLATION BEST PRACTICES:

- Keep nuts and bolts clean and free of debris.
- Adequately lubricate pipe and Insta-Valve 250 gaskets with soap/water solution paying special attention to AC pipe. Ensure branch gasket is adequately lubricated. Do not use grease or pipe lubricant.
- Avoid rotating top half of Insta-Valve 250 once placed on pipe.
- Do not use a powered wrench to tighten nuts. You will gall the bolts and damage the valve.
- Block / support the pipe before installing the tapping machine.
- Ensure all pipe joints are restrained prior to proceeding to valve insertion operation.
- Label valve body with a paint pen or permanent marker with the tightening pattern as a visual reminder of the tightening pattern.

Call Hydra-Stop for technical support at 800.538.7867 and visit us on the web at www.hydra-stop.com.

Appendix E — Original Valve Cartridge and Cutter Sizing Information

Nominal Size	Cutter Size	Cutter Color	ID Range	Valve Cartridge Part Number
4"	3.8	Black	3.75+	8IVBULTLH04-250
6"	5.5	Red	5.45-5.75	8IVBULTLH06-250-U5.5
	5.8	Black	5.75+	8IVBULTLH06-250
8"	7.5	Red	7.40-7.80	8IVBULTLH08-250-U7.5
	7.5	Red	7.40-7.80	8IVBULTLH08-250-U7.5-AC
	7.9	Black	7.80+	8IVBULTLH08-250
10"	9.5	Red	9.40-9.70	8IVBULTLH10-250-U9.5
	9.5	Red	9.40-9.70	8IVBULTLH10-250-U9.5-AC
	9.8	Black	9.70+	8IVBULTLH10-250
12"	11.1	Blue	11.00-11.40	8IVBULTLH12-250-U11.1
	11.5	Red	11.40-11.70	8IVBULTLH12-250-U11.5
	11.5	Red	11.40-11.70	8IVBULTLH12-250-U11.5-AC
	11.8	Black	11.70+	8IVBULTLH12-250

Appendix F — Insta-Valve 250 Valve Body Installation Instructions

Installation without Auto Equalization

F.1) Installer may choose to install valve cartridge without the use of Hydra-Stop's Auto Equalization procedure.

F.2) If this is the case, it is the responsibility of the installer to utilize a method of hydro-static equalization to assist with the "setting" of the cartridge in the valve body. Install an equalization fitting onto the insertion housing 3/4" ball valve. The equalization source will determine the proper fitting.

Auto Equalization with Generation 1 Auto Equalization Tools

F.3) The IV 250 valve cartridge consists of top section and bottom section. The top section and bottom section must be firmly tightened together. Prior to removing operating nut hold the base of the valve cartridge and with a pipe wrench or valve key turn the valve stem firmly in the opening direction (see Figure 30).



IV 250 Valve Cartridge

Figure 30

F.4) Remove the operating nut and the white Teflon washer off of the valve stem.

F.5) Remove Auto Equalization Valve NPT plug. Set aside in a safe place. If you elect to not use Auto Equalization, leave the NPT plug in the cartridge.

F.6) Place the end of the insertion tool over the valve stem. Tighten the IV 250 valve cartridge and insertion tool together by turning the knurled end of the insertion tool clockwise until snug. Tighten the 3/4" insertion tool lock nut located at the base of the knurled handle.

NOTE: Caution: Ensure there are no gaps between the insertion tool, valve cartridge and feed screw. The cartridge should remain in tight contact with the insertion tool and act as a single unit.

F.7) Make sure the insertion tool is clean and free of rust or grime (steel wool can be used to clean and smooth the surface). Lubricate the end of the insertion tool with a dab of the food-grade lubricant provided with the equipment to help it slide freely through the packing nut assembly. Ensure packing nut assembly clamp lever is loose.

F.8) Slide the Auto Equalization adapter over the top of the knurled handle of the insertion tool and over the larger-OD bell-like portion of the insertion tool (see Figures 31A and 31B).

NOTE: Install Auto Equalization adapter after insertion tool has been tightened

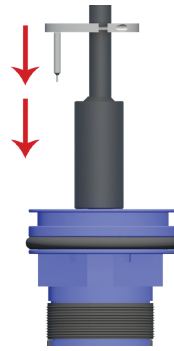


Figure 31A

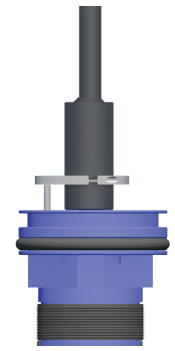


Figure 31B

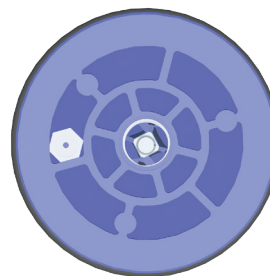


Figure 32

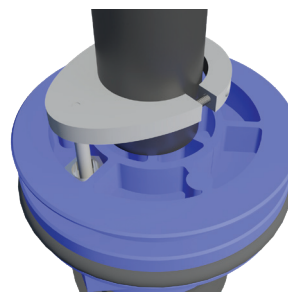


Figure 33

F.9) Make sure the actuator pin of the Auto Equalization adapter is aligned with the stainless-steel check valve located on the top of the valve cartridge (see Figure 32). Press the actuator pin of the Auto Equalization adapter down as far into the check valve as possible to ensure check valve is open. Tighten the two Auto Equalization cap head screws securing the adapter in place (see Figure 33).

F.10) Return to step 3.0.12 for 4"–8" valve installation or step 5.1.12 for 10"–12" Valve Installation.

INFORMATION AND NOTICES

NOTICE:

This valve is equipped for using the Hydra-Stop Auto Equalization System.

Please see Section 3.0 (4"–8" Valves) or Section 5.1 (10"–12" Valves) for information on using Auto Equalization.

NOTICE:

INSTA-VALVE 250 TORQUING PROCEDURE HAS CHANGED.

SEE ENCLOSED INSTA-VALVE 250 INSTALLATION INSTRUCTIONS, APPENDIX C, FOR NEW TORQUING PROCEDURE

NOTE: These instructions depict the use of the most up-to-date Hydra-Stop insertion valves, installation equipment, and accessories. Please be certain you are following the instructions for your equipment.