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SECTION 1.0
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.

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 manner in which 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.
Section 2.0 Mount Valve Body on pipe

1) Refer to Appendix A, 14” - 16” IVP 250 Valve Body Installation Instructions for complete instructions.

Section 2.1 Pressure Test Valve Body

Critical Step: A pressure test must be performed to verify that the IVP 250 valve body is properly sealed onto the pipe before tapping.

1) Apply food grade grease from the chamfer on the inside edge of the top flange to the step down approximately 6 inches down from the top edge. This grease will supply lubrication for the valve cartridge insertion process.

2) Fill the valve body with water (approximately 30 gallons will be needed).

3) Place the o-ring in the o-ring groove on the top of the flange.

4) Place the test flange on top of the o-ring.

5) Bolt the test flange in place. To prevent galling, use galvanized steel nuts and bolts and not the stainless-steel nuts and bolts that are provided with the IVP 250.

5) Connect the test flange to a hand or mechanical pump and pressurize the valve body. The maximum test pressures for a 250 psi rated valve is 375 psi. NOTE: Caution should be taken when pressure testing above the line pressure on thin walled, flexible, or brittle conditions to avoid damaging the pipe wall.

6) Isolate the pressure to the valve body and hold the pressure for the length of time required by the pressure test. Tighten any plugs on the outside diameter of the valve body flange if there is any leakage. NOTE: The valve installer and the end user are to determine the pressure and length of time for the test.

7) Upon successful completion of the pressure test, relieve the pressure in the valve body and remove the test flange.

8) After 15 minutes have passed since the valve body was pressurized, re-torque all the bolts again to the specified torque found in Appendix A.

Section 2.2 Add Pipe / Valve Body Support

Support precautions:

- Pour concrete around the clamp portion of the valve body. 4,000 lb. high-early strength concrete is recommended.

- Minimum height of concrete is to be just above the top lug bar of the valve body clamp.

- It is the responsibility of the installer to work with the end user of the valve to determine what pipe support is necessary for the given application, considering soil conditions.

Section 2.3 Install Temporary Gate Valve

1) Place a green fiber gasket from the IVP 250 installation kit on the top flange of the valve body.

2) Install and center the temporary gate valve on the top flange of the valve body (See Figure 1).

Note: A rubber gasket should not be used.

CRITICAL NOTE: To install the 14”–16” IVP 250, the 16” temporary gate valve must be bored to 16.500”. Check this measurement before beginning installation.

Immediately call Hydra-Stop Technical Support at 708-389-5111 if your temporary gate valve bore is smaller than 16.500”. DO NOT PROCEED WITH INSTALLATION.

3) Place the threaded studs of the temporary gate valve through the bolt holes on the top flange of the IVP 250. Align the temporary gate valve with the pipe.
4) Place two alignment sleeves over consecutive studs of the temporary gate valve and up into the bolt holes on the top flange of IVP on each side of the valve in line with the pipe [See Figure 2]. Add two more pairs of sleeves 90 degrees from the original two pairs. Reposition the temporary gate valve as needed until the sleeves fit over the studs and into the bolt holes.

NOTE: Bolt hole tolerances may not allow for every alignment sleeve to install in the bolt hole. Position the housing to get optimum alignment using the sleeves as a guide.

5) Loosely thread the nuts onto the studs to hold the alignment sleeves in place.

6) Thread nuts over the temporary gate valve studs without sleeves.

7) Remove the alignment sleeves and thread nuts over these studs. Tighten all nuts evenly and gradually in a crossing pattern. NOTE: For studs below the temporary gate, do not tighten nuts onto studs that are bottomed out inside the gate valve (leave a small gap). This can cause the valve body to squeeze the gate and make the gate valve hard to operate.

8) Place the second green fiber gasket onto the top raised face of the temporary gate valve, centered with the port.

Section 2.4 Cutter Assembly

NOTE: Verify correct cutter / valve cartridge is used or your installation. Contact Hydra-Stop to confirm the correct size is being used for your application. The pipeline sampling kit can be used to check pipe wall thickness prior to tapping. [See Appendix D]. If the cutter assembly is already complete, check to make sure all hardware is tight before tapping.

1) Thread the saw mandrel assembly into the appropriate cutter until it bottoms out.

2) Turn the saw mandrel counter clockwise until the bolts holes in the saw mandrel plate are aligned with the bolt holes in the cutter.

3) Thread a 2 inch long cap screw into the saw mandrel plate through the inside of the cutter until it bottoms out on the inside face of the cutter.

4) Thread a locknut onto the screw until it bottoms out and is tight. Repeat steps 3 and 4 for the other two 2 inch long cap screws.

5) Place the cutter centering ring over the saw mandrel and slide until it rests on the saw mandrel plate. Align the centering ring holes with the bolt holes in the cutter. [See Figure 3].

6) Place a screw through the bottom of the cutter and through the bolt hole in the inside pattern of holes closest to the center of the centering ring.

7) Thread a locknut onto the screw to tightly secure the centering ring to the cutter. Repeat steps 6 and 7 for the other three screws.

8) Thread the pilot drill into the end of the saw mandrel shaft inside of the cutter until it bottoms out ensuring the threads are tight.

Section 2.5 Tapping Set up

1) Measure and record the distance the pilot drill extends past the cutter teeth. This measurement will be used to determine the cutter travel for tapping.

NOTE: The distance the pilot drill extends past the cutter teeth can be easily measured using a tape measure by placing a flat piece of wood, such as a yard stick, or similar across the cutter teeth and against the pilot drill. Measure the distance from the flat surface in contact with the cutter teeth to the end of the pilot drill.
2) Install the IVP guide plate, which is compatible with the 2” OD guide bars, to the bottom of the air motor if necessary. The thicker IVP guide plate is to be installed with the longer cap screws, which are included in the IVP kit.

3) Apply grease to the packing nut o-ring (See Figure 4A) and the end of the cutter assembly's saw mandrel shaft on and around the taper (See Figure 4B).

4) With the installation housing lying on its side, insert the cutter assembly, shaft first, into the housing and through the packing nut until the cutter and its pilot drill are completely inside the housing (See Figure 5).

5) Record the distance the saw mandrel shaft extends past the P3. This measurement will be used after tapping to ensure the cutter is fully retracted into the housing (See Figure 6).

6) Tighten the split bushing in the packing nut by turning the Allen cap screw in the clockwise direction to secure the cutter assembly in the housing.

7) Using lift support and a strap around the P3, place the installation housing onto the temporary gate valve so the threaded studs of the temporary gate valve fit through the bolt holes at the bottom of the housing (See Figure 7). The port on the side of the housing is to be aligned with the pipe.

8) Place two alignment sleeves over consecutive studs of the temporary gate valve and into the bolt holes on the bottom flange of the installation housing on each side of the valve in line with the pipe (See Figure 8). Add two more pairs of sleeves 90 degrees from the original two pairs. Reposition the housing as needed until the sleeves fit over the studs into the bolt holes.

NOTE: Bolt hole tolerances may not allow for every sleeve to install in the bolt hole, position the housing to get optimum alignment using the sleeves as a guide.

9) Thread nuts over the temporary gate valve studs without sleeves.

10) Remove the alignment sleeves and thread nuts over these studs.

11) Tighten all nuts evenly and gradually in a crossing pattern (See Figure 9). NOTE: For studs above the gate, do not tighten nuts onto the studs that are bottomed out inside the gate valve (leave a small gap). This can cause the valve body to squeeze the gate and make the gate valve hard to operate.

Section 2.6 Tapping

1) Loosen the Allen cap screw in the packing nut and slowly lower the cutter through the IVP until the pilot drill contacts the pipe. Spin cutter to ensure it is moving freely.

2) Slide a stop collar onto the saw mandrel shaft down to the packing nut. Tighten the collar a small amount to allow the saw mandrel shaft to descend during tapping while providing some resistance for better control during tapping (See Figure 10).

3) Slide a second stop collar onto the saw mandrel and use this stop collar as your mechanical stop for tap-
ping. The second stop collar is to be set at a distance equal to half the outside diameter of the pipe that is to be tapped (for example, use 8.70 for a pipe that measures 17.4 in OD or 7.65 for a pipe that measures 15.3 in OD) plus the distance the pilot drill extends past the cutter teeth, which was measured in Step 1 of tapping setup. This location will prevent cutting past the centerline of the pipe (See Figure 11).

Critical Step: Setting the stop collar in the proper position prevents cutting into the inside diameter on the bottom half of the pipe, which causes leakage, and ensures a complete tap has been made.

4) Install the power unit onto the cutter assembly. The hex at the top of the saw mandrel shaft is to fit into the bottom of the air motor (See Figure 12).

5) Thread the feed screw into the P3 until it bottoms out on the air motor and backup the feed screw 1/2 turn, leaving a small gap (See Figure 13).

6) Open the ball valves on the side and top of the installation housing to allow air to be purged from the installation housing while the housing is filling. Pressurize the air motor with compressed air.

7) Move the control lever UP so that the mandrel is turning clockwise. Turn the feed screw in a clockwise direction using light and consistent force. Air and fluid will start coming out of the ball valves as the housing fills from the pilot drill penetrating the pipe wall.

8) Close the valve on the side of the installation housing after the pilot drill has pierced the pipe and water has reached that level. Close the top valve when installation housing has filled with water.

9) Continue to advance the cutter into the pipe until the top stop collar reaches the bottom stop collar (See Figure 14).

NOTE: Depending on wall thickness of the tapped pipe, the tap may be complete before the bottom stop collar is reached. In this case, continue to advance the cutter until the stop collar is reached. Additional cutter travel to the centerline of the pipe will not adversely affect the tap.

Section 2.7 Post Tapping

1) When the tap is complete, shut off the power unit.

2) Tighten the split bushing in the packing nut by turning the Allen cap screw in the clockwise direction.

3) Unthread the feed screw out of the P3.

4) Remove the power unit.

5) Place the closed end of a combination wrench over the shaft of the saw mandrel and slowly loosen the split bushing in the packing nut to allow the saw mandrel to slowly rise under pressure. (See Figure 15) Apply downward force to the wrench to control the speed of the upward movement. When the saw mandrel is within 6” of the P3, tighten the split bushing to hold the saw mandrel so you can remove the wrench before the saw mandrel passes through the P3, then loosen to finish the upward travel.

6) Pull up on the saw mandrel if pressure alone is not sufficient to raise the cutter until it is completely inside of the housing and clear of the temporary gate valve.

NOTE: If pipe pressure is very low and there is difficulty raising the cutter opening the top valve on installation housing allows the cutter to rise.

7) Check the distance the saw mandrel extends past the P3 to the measurement recorded in Step 5 of Tapping Set Up. The distance should be greater than the recorded measurement and sufficient for the gate of
the temporary gate valve to clear the pipe coupon if it hangs below the cutter teeth.

8) Tighten the split bushing in the packing nut when the cutter and its pilot drill are completely inside of the installation housing. Fully close the temporary gate valve to isolate the pressure in the IVP from the installation housing.

9) Open the top and side ports in the installation housing to drain the water inside of the housing.

10) Remove the nuts securing the installation housing to the temporary gate valve.

11) Secure a strap around the P3 of the installation housing and lift the installation housing off of the temporary gate valve and lay it on its side above ground, preferably on a hard, flat surface (see Figure 16).

12) Loosen the split bushing in the packing nut and the two stop collars on the saw mandrel shaft.

13) Pull the cutter assembly out of the installation housing. The packing nut can be loosened if necessary for ease of removal.

14) Remove the pipe coupon from the cutter and inspect for any abnormalities.

15) Inspect to ensure the o-ring at the inside diameter of the packing nut is in good condition. Replace the o-ring if necessary.

Section 3.0 - Valve Insertion Setup

1) Measure and record the distance from the center of one of the eight ports on the outside diameter of the IVP valve body flange to the top of the gasket lying flat on the top face of the temporary gate valve. This dimension will be used later to set the travel of the valve cartridge.

If you are using a standard Hydra-Stop Temporary Gate Valve, the measurement will be approximately 4 5/8 inches. (See Figure 17).

2) Check to make sure the valve stem of the valve cartridge is tight in the open position. Turn the operating nut in the open direction until tight if necessary.

3) Unthread the retention nut and remove the operating nut from the valve stem.

4) Place the head of the insertion tool over the valve stem protruding from the top of the valve cartridge and align the square pegs on the insertion tool head with the slots in the completion plug on the top of the valve cartridge (See Figure 18).

5) Add grease to the top of the insertion tool jam nut below the knurled handle (See Figure 19).

6) Thread the insertion tool onto the valve stem threads on the top of the valve assembly by turning the knurled handle on the top of the insertion tool in the clockwise direction until fully threaded. The head of the insertion tool bottoms out on the completion plug when it is fully threaded.

7) Use an open end wrench to tighten the 3/4” jam nut. Critical Step: This step prevents rotation of the valve cartridge during insertion.

8) Add grease to the end of the insertion tool where the round shaft transitions to a chamfer (See Figure 19).

9) Add grease to the packing nut o-ring (See Figure 20).
10) Assemble the alignment gauge plate by threading in two of the 3/8" threaded alignment pins. When installing a 14" cartridge, the holes closer to the center of the plate should be used. When installing a 16" cartridge, the holes further from center should be used. [See Figure 21].

11) Thread in all four of the fully threaded 4" posts. [See Figure 22].

NOTE: MAKE SURE ALIGNMENT PINS AND THREADED POSTS ARE NOT THREADED PAST FLUSH WITH THE BACK SURFACE OF THE ALIGNMENT PLATE.

12) Insert insertion tool knurled handle end of the cartridge assembly into equipment. Advance the 14/16 in cartridge assembly into the housing until the cartridge is supporting its own weight in the insertion housing. [See Figure 23].

13) Once the cartridge has been inserted to this point, the alignment plate may be mounted to the bottom of the cartridge with the 3/8 alignment pins fully inserted into the gate housing and the plate flush with the bottom surface of the gate housing. [See Figure 24].

At this point the stop collar and alignment plate should be placed over the insertion tool but should not yet tightened.

Step 14) The lifting handle may now be used to lift and progress the cartridge further into the insertion housing by inserting the two prongs of the handle through the 5/8" holes of the plate and into the 5/8" holes in gate housing. [See Figure 25].

15) Once progressed to within approximately 4 inches of the equipment flange, the cartridge must be lifted to align the threaded studs with the insertion housing flange holes. [See Figure 26].

CAUTION: CARTRIDGES ARE HEAVY. LIFTING SHOULD ALWAYS BE DONE WITH TWO PEOPLE TO AVOID INJURY. IT IS RECOMMENDED THAT LIFTING HANDLE BE USED ONLY BY HAND AND NOT WITH A LIFTING DEVICE.

16) Once threaded studs are aligned, insert cartridge until alignment plate is flush with insertion housing flange face. [See Figure 27].

17) Thread and hand tighten the four 1"-8 nuts until they are completely tight so the alignment plate is flush with the insertion housing flange.

NOTE: If there is not already a mark on the Insertion Housing, make a line between the top 2 flange holes on the insertion housing. This line must be in line with the pipe for a proper installation. [See Figure 28].

18) Before lifting vertical, the lifting handle must be removed.

19) Lift the insertion housing vertically onto the alignment plate. Ensure packing nut thumb screw is loose and that cartridge is sitting flush against the alignment plate.
Section 3.1 - Valve Cartridge Insertion

1) With lift support, place the installation housing onto the temporary gate valve. The alignment port of the installation housing is to be positioned for alignment in line with the pipe and faced away from webbing of the temporary gate valve.

2) Place two alignment sleeves over consecutive studs of the temporary gate valve and into the bolt holes on the bottom flange of the installation housing on each side of the housing in line with the pipe and another two sleeves 180 degrees apart, on the opposite side of the flange. Add two more pairs of sleeves 90 degrees from the original two pairs. Reposition the housing as needed until the sleeves fit over the studs into the bolt holes.

NOTE: Bolt hole tolerances may not allow for every sleeve to install in the bolt hole, position the housing to get optimum alignment using the sleeves as a guide.

3) Thread nuts over the temporary gate valve studs without sleeves.

4) Remove the alignment sleeves and thread nuts over these studs.

5) Tighten all nuts evenly and gradually in a crossing pattern.

6) Thread the feed screw into the P3 until the feed screw bottoms out on the thrust washer of the insertion tool.

7) Open the valve at the top of the installation housing to purge air from inside of the housing before opening the temporary gate valve (See Figure 33).

Step 9) Slowly open the temporary gate valve and close the valve on the top of the installation housing after water has discharged.

10) Continue to open the temporary gate valve until it is fully open. Tighten the packing on the temporary gate valve as needed to minimize any leakage past the packing.

NOTE: A tighter packing makes temporary gate valve operation more difficult and can be loosened as needed when operation is required.

11) If the equalization pump is to be used to pressurize the installation housing follow the next steps:

12) Connect the black hose from the equalization pump to the reservoir. Install the pressurization assembly into the top port of the installation housing. Connect...
13) Fill the reservoir. Open the ball valve and allow water to fill the reservoir. A minimum of 25 gallons of water will be needed to ensure the pump does not run dry. Close the ball valve at the connection port after collecting water.

NOTE: 25 gallons is sufficient provided temporary gate valve packing leakage is not excessive and the insertion process is not prolonged for any reason.

14) Apply pressure above the system line pressure (+5-10 PSI) to the equalization line / hose at the outlet of the pump through the top installation housing port using the air compressor or equalization pump. If using a compressor to equalize pressure a check valve should be used to prevent water from flowing into the compressor.

15) If the equalization pump is used for pressurizing the housing be sure the reservoir hose is filled before starting the pump.

NOTE: Take caution to ensure the end of the inlet hose remains submerged in water and check water level frequently to avoid pressure loss in the installation housing.

16) Plug in the pump. Open the pressurization ball valve. Ensure de-pressurization ball valve is closed. [See Figure 35].

17) Loosen the split bushing in the packing nut by turning the thumb screw in the counter clockwise direction.

18) Turn the feed screw in the clockwise direction to insert the valve cartridge into the valve body, continue until further turning is difficult, which should be less than 3” to full travel when the top gate housing o-ring first engages the bore inside of the valve it seals upon. At this point, the o-ring has isolated the installation housing from the line pressure and further valve cartridge travel would cause pressure in the housing to drop below pressure in the pipe.

Turn pump on and allow pressure to build to desired range. Watch the pump pressure gauge and maintain desired pressure by cycling pump on-off switch.

19) Continue to increase pressure in the housing above the system line pressure until full valve assembly travel can be achieved with only light downward force to the insertion tool through the feed screw (do not exceed 375 psi using 250 psi rated installation equipment).

20) Continue to lower the valve assembly by turning the feed screw until it bottoms out on its stop, indicating full travel has been achieved. Full travel is to be verified by checking for the previously noted gap from Step 12 for Valve Insertion Set Up. If the full travel was achieved solely by pressurizing the housing, continue to turn the feed screw until it meets the thrust washer of the insertion tool assembly. If it appears a small amount of travel is required, rather than immediately applying greater force to the feed screw when the valve assembly may have bottomed out, check to see if a pin installs (see steps 22-24), which would show full travel has been achieved.

21) With the installation housing pressurized slightly above line pressure, remove a plug on the side of the flange at top of the IVP that is in line with the pipe and opposite the bonnet of the temporary gate valve.

22) Thread the pin that is exposed after removing the plug in the clockwise direction until it bottoms out. Approximately 8-10 full turns are required to seat the pin. Do not continue to thread pin in with additional force after it has bottomed out. Once bottomed out, back off 1/2 turn. [See Figure 36].

23) Check the depth of the pin with the pin gauge to confirm the pin has bottomed out inside of its slot in the completion plug. The gauge bottoms out on the valve body flange when the pin is fully installed.
Critical Note: The valve assembly is not secured in the valve body until all pins not blocked by the temporary gate valve have been fully installed.

NOTE: If the initial test pin does not fully install, see directions in Appendix A for “Second Valve Insertion Attempt”. Continue to maintain installation housing pressure slightly above line pressure.

24) After full installation of the first pin and is confirmed by the gauge, fully install and check every pin starting with the pins 90° from the first pin and then the next two pins on the opposite side of the first pin. Continue to keep the installation housing pressurized slightly above the line pressure throughout this process. If the equalization pump is being used to pressurize the housing, monitor the water level (if the pressure in the housing is higher than necessary and resulting in leakage past the packing of the temporary gate valve, the pressure can be slowly lowered to a pressure still above line pressure to conserve water.)

NOTE: Sufficient clearance is provided to install the pin that is in line with the temporary gate valve with a ratchet and hex bit socket for the temporary gate valve model that requires additional valve insertion travel.

Section 3.2 - Complete Installation

1) Thread the feed screw two turns out of the P3.

2) Close the ball valve at the connection port and remove the equalization line to the housing.

3) Slowly open the ball valve at the connection port to relieve pressure and drain the housing (See Figure 37).

4) Open the ball valve at the top of the installation housing to drain water from the housing.

5) With a 3/4 inch open end wrench, loosen the jam nut on the insertion tool and un-thread the insertion tool from the top of the valve assembly by turning the knurled handle of the insertion tool in the counter-clockwise direction. (See Figure 38). Raise the guide plate with the insertion tool to allow the insertion tool to be completely unthreaded from the valve assembly. The knurled handle of the insertion tool can be raised and lowered independently from the insertion tool shaft when it is completely unthreaded.

6) Raise the insertion tool up to the start position where the knurled handle extends past the P3 and secure the insertion tool in place by tightening the split bushing in the packing nut.

7) Remove the nuts securing the installation housing to the temporary gate valve.

8) With lift support and a strap around the P3 lift the installation housing off of the temporary gate valve.

9) Remove the nuts securing the temporary gate valve to the top of the IVP 250. Leave a nut in place opposite the valve bonnet until the valve is sufficiently supported by lift support and then remove the last nut. Remove the temporary gate valve from the IVP 250 after all nuts have been removed.

10) Wrap pipe thread sealant tape around the threads of the plugs that were previously removed from the valve body flange.

11) Reinstall the plugs into the valve body flange and check to ensure all plugs are tight.

12) Place the o-ring for the valve body flange into its o-ring groove.

13) Place the top flange over the top of the valve stem and onto the o-ring on top of the IVP 250. The valve stem is to fit through the hole at the center of the top flange.

14) Bolt the top flange to the top of the IVP 250. Apply torque evenly and gradually in a crossing pattern until the top flange is in contact with the raised face of the valve body flange and the bolts/nuts are tight.

15) Visually check around the flange to be sure the o-ring did not come out of its groove. If the o-ring is out of place, remove the nuts and bolts and restart at Step 13.

16) Place the operating nut onto the valve stem ex-
tending out of the top flange.

17) Place the lock washer over the valve stem threads and tighten the retaining nut onto the threads until the lock washer is fully compressed to firmly hold the operating nut in place.

NOTE: for Left Handed valves, the operating nut will need to be secured with a wrench to avoid closing the valve while tightening the retaining nut.

18) Test valve operation. IVP 250 valves operate at a standard 3 turns per inch.

19) Fully disassemble, clean and store equipment.

20) Order replacement parts, if necessary, to replace lost, damaged or worn components.
ENSURE INSTALLATION HOUSING PRESSURE IS SLIGHTLY ABOVE LINE PRESSURE.

WARNING! NEVER FULLY OPEN INSTALLATION HOUSING BALL VALVES WHEN RELIEVING PRESSURE IN THE INSTALLATION HOUSING! RELIEVING PRESSURE IN AN UNCONTROLLED MANNER CAN CAUSE SUDDEN PRESSURE DIFFERENTIAL WHICH MAY LEAD TO EQUIPMENT DAMAGE AND BODILY INJURY.

1) If full travel of the valve assembly has been achieved and the pin does not fully thread into the completion plug, the alignment of the valve cartridge is incorrect.

2) Unthread any pins that fully installed 9 turns, to the start position to ensure there are no pins that will prevent the retraction to the valve cartridge to its start position.

Critical NOTE: Exceeding 9 turns will allow the pin to come out of the flange under pressure. All people are to stay clear of the ports while unthreading pins as a safety precaution. Also, all workers are to stay clear of the path of the rising insertion tool.

3) SLIGHTLY OPEN THE DE-PRESSURIZATION NEEDLE VALVE and bleed off pressure in the installation housing to MATCH the line pressure. [See figure1] REMEMBER - NEVER FULLY OPEN INSTALLATION HOUSING BALL VALVES WHEN RELIEVING PRESSURE IN THE INSTALLATION HOUSING!

4) Turn the feed screw in the counterclockwise direction half of a turn to create a small gap between the insertion tool washers and feed screw.

5) Open the depressurization ball valve SLIGHTLY and bleed off 5 psi from the installation housing pressure.

6) If the valve cartridge rises with the feed screw, continue to unthread the feed screw from the P3 until the cartridge stops rising or has risen to the start position.

Critical Note: During the first 2 3/4 inches of upward travel of the valve cartridge, maintaining a very small gap between the insertion tool washers and feed screw is critical to avoid rapid upward movement of the cartridge due to installation housing pressure loss, which can result in equipment damage.

7 A) If the valve assembly does not rise after lowering installation housing pressure, watch the gauge in the pressure assembly, slightly open the depressurization ball valve and bleed off an additional 5 psi from the installation housing pressure.

7 B) If the valve assembly still does not rise, bleed off an additional 5 psi from the installation housing pressure. DO NOT EXCEED A TOTAL OF 15 PSI DIFFERENTIAL BETWEEN THE INSTALLATION HOUSING PRESSURE AND THE LINE PRESSURE. CONTACT HYDRA-STOP TECHNICAL SUPPORT IF YOU REACH THE 15 PSI DIFFERENTIAL AND THE VALVE ASSEMBLY HAS NOT RISEN.

8) When valve assembly reaches approximately 2 3/4 inches of upward travel of the valve cartridge has been completed. At this point the o-ring at the top of the cartridge is no longer engaged, which allows host pipe to pressurize above and below the cartridge.

9) Close the ball valves on the top of the installation housing as external pressure is no longer needed. Turn off equalization pump.

10) Apply upward force to the guide plate to raise the valve cartridge to its start position.

11) Tighten the cap screw in the packing nut to hold the valve cartridge in place.

12) Close the temporary gate valve. Open the ball valves at the top of the installation housing and open lower installation housing ball valve to drain the water.

13) Remove the installation housing from the valve body.

14) Return to Section 3.0 Valve Cartridge Setup, Step 12 and re-align valve cartridge.

15) Thread the ball valve, in the closed position, back into the alignment port on the side of the installation housing. Repeat the Valve Cartridge Insertion process starting at Step 9 on Page 11 - (“Slowly open the temporary gate valve”).
IMPORTANT: Read installation instructions before installing valve body. Failure to follow installation instructions will void product warranty.

INSTALLATION INSTRUCTION STEPS

1) Inspect the IVP 250 valve body and valve cartridge to ensure no damage has occurred in transit (see figure 1 showing valve body mounted on pipe).

2) Unbolt and remove the top flange of the valve body and store the o-ring, nuts and bolts in a place they will be free from debris (see figure 2).

3) Check the outside diameter of the pipe and valve body clamp to confirm the correct size IVP is on hand for the installation.

4) Thoroughly clean the surface of the pipe over the area the IVP is to be installed.

5) Check the surface of the pipe where the gasket of the valve body is to seal to be sure there are no gouges, flaws or extreme irregularities that would compromise a drip tight seal.

6) Lubricate the pipe and valve body gasket with soapy water. Do not use grease or pipe lubricant.

7) Using lift support, position the valve body onto the pipe in the position it is to be installed in so that adjusting of the valve’s position is not necessary (see figure 3). A level should be used to check the orientation of the valve body flange during positioning. If repositioning is necessary lift the valve body off the pipe and retry. Do not rotate the valve body once it is on the pipe as this can cause damage to the gasket. NOTE: Placing two bolts into the valve body flange, 180° apart and placing a strap over each bolt and above the flange is the recommended method of lifting.

8) Place the bottom sleeve of the valve body into position, underneath the pipe.

9) Install the bolts, nuts, and washers into the lug bar slots on the top and bottom sections of the valve body. A double set of washers is to be installed between each nut and the lug bars.

NOTE: The stainless steel hardware is to be kept clean and free from nicks. Debris and thread damage can cause the nut to seize on the stud. The use of a pneumatic wrench or similar can also cause the nuts to seize and is not to be used.

Questions? Call 800.538.7867
Appendix B - IVP 250 Valve Body Installation Instructions

10) Once the nuts are hand tight, tighten the outside nuts first and work toward the center using a torque wrench (see Figure 4). Tighten nuts evenly and alternate from one side of the valve to the other. The gaps between the top and bottom sleeves are to be equal on both sides (within 1/8”). Nuts are to be torqued to the values provided below. Be sure to follow this tightening procedure to properly load the gasket.

Torque for CI / DI / Steel Pipe: 75 ft-lbs
Torque for PVC Pipe: 55 ft-lbs
Torque for AC Pipe: 75 ft-lbs

Critical Step: Mounting the valve with equal gaps (1/8”) on each side allows proper cutter travel during tapping and gate travel during valve operation. See Figure 5.

11) Visually inspect inside of the valve to ensure the gasket on the inside of the top sleeve has remained in place. Check to ensure the depth of the pins threaded into the valve body flange are flush with the inside diameter of the flange.

12) After mounting valve body on pipe, perform a hydrostatic pressure test as detailed in the IVP 250 Installation and Operating Instructions - section 2 - Pressure Test Valve Body.

13. Recheck torque after pressure test.

IVP 250 VALVE BODY - INSTALLATION BEST PRACTICES

- Retighten mounting bolts to specified torque after pressure test.
- Keep nuts and bolts clean and free of debris.
- Adequately lubricate pipe and valve body gasket with soap/water solution paying special attention to AC pipe. Ensure branch gasket is adequately lubricated. Do not use grease or pipe lubricants.
- Avoid rotating top half of valve body once placed on pipe.
- Tighten nuts equally in no more than 25 ft-lb increments.
- Wait at least 10 minutes before re-tightening bolts.
- Ensure gaps between top half and bottom half of valve body are the same front to back and side to side (Within 1/8”).
- Check final torque with a torque wrench to ensure adequate torque has been applied to valve body bolts.
- Do not use a pneumatic wrench to tighten bolts.
- Hydrostatically pressure test a minimum of 1.25 times the system pressure or a maximum of 1.5 times the rated working pressure of valve.
- Block/Support the pipe before installing the tapping machine.

Call Hydra-Stop for Technical Support at 800.538.6867 and visit us on the web at www.Hydra-Stop.com
Appendix C - Valve Insertion Without Alignment Gauge Plate

Step 1) Measure and record the distance from the center of one of the eight ports on the outside diameter of the IVP valve body flange to the top of the gasket lying flat on the top face of the temporary knife gate valve. This dimension will be used later to set the travel of the valve cartridge. The measurement will be approximately 4 5/8 inches. (See Figure C1).

Step 2) Check to make sure the valve stem of the valve cartridge is tight in the open position. Turn the operating nut in the open direction until tight if necessary.

Step 3) Unthread the retention nut and remove the operating nut from the valve stem.

Step 4) Place the head of the insertion tool over the valve stem protruding from the top of the valve cartridge and align the square pegs on the insertion tool head with the slot in the completion plug on the top of the valve cartridge (See Figure C2).

Step 5) Add grease to the top of the insertion tool jam nut below the knurled handle (See Figure C3).

Step 6) Thread the insertion tool onto the valve stem threads on the top of the valve assembly by turning the knurled handle on the top of the insertion tool in the clockwise direction until fully threaded. The head of the insertion tool bottoms out on the completion plug when it is fully threaded.

Step 7) Use an open end wrench to tighten the jam nut.

Critical Step: This step prevents rotation of the valve cartridge during insertion.

Step 8) Add grease to the packing nut o-ring (See Figure C4).

Step 9) With the valve assembly supported with a strap and lift support and oriented with the insertion tool shaft parallel to the ground, guide the insertion tool through the packing nut at the top of the installation housing (installation housing to be lying on its side).
Appendix C - Valve Insertion Without Alignment Gauge Plate

**NOTE:** the packing nut threaded into the top of the installation housing will need to be sufficiently loose to take pressure of the packing chord to allow the insertion tool to pass through easily; unthread as needed. (See Figure C5).

**Step 10** Insert the valve cartridge into the installation housing until the distance from the center of one of the eight milled slots on the outside diameter of the aluminum completion plug of the valve cartridge to the bottom flange face of the installation housing is equal to the measurement taken in Step 1. The measurement will be approximately 4 5/8 inches. (See Figure C6).

**Step 11** Place a stop collar over the shaft of the insertion tool and tighten onto the shaft with a small gap of at least 1/4 inches above the top of the packing nut. The gap is necessary to ensure enough travel will be provided to completely install the valve cartridge. Make note of the small gap that was used (See Figure C7).

**Step 12** Before the valve cartridge is fully installed into the installation housing, lubricate the valve assembly by applying generous amounts of food grade grease to the gate housing o-rings (top and bottom) and sides of the gate seal.

**Step 13** Place the guide plate over the knurled handle of the insertion tool and continue installing the valve cartridge into the housing.

**Step 14** Before the knurled handle of the insertion tool goes through the P3, move the guide plate down onto the shaft of the insertion tool.

**Step 15** Insert gate housing extension rods into two holes on opposite sides of the gate in the bottom of the gate housing (See Figure C8).

**Step 16** Continue inserting the valve assembly into the installation housing until it bottoms out. Lifting up on the extension rods and pushing the valve cartridge into the housing may be needed to achieve the last three inches of travel before bottoming out.

**Step 17** Check and make note of the allowable travel provided by the distance of the stop collar above the top of the packing nut. This dimension should be approximately 30 5/8 inches plus the gap that was used to be sure sufficient travel will be allowed.

**Step 18** Rotate the valve cartridge inside the installation housing until the slot on the side of the gate housing is aligned with the alignment port on the side of the installation housing (See Figure C8).
Appendix C - Valve Insertion Without Alignment Gauge Plate

Insert the alignment pin through the housing port and into the slot to verify and hold the position of the valve assembly. If the alignment pin does not bottom out on the port, proper alignment has not been achieved and the valve assembly must be rotated further (See Figure C10).

**Step 19**) Visually check to ensure proper valve cartridge orientation (the gate is to be perpendicular to the alignment port before continuing) (See Figure C10). Remove the gate housing extensions.

**Step 20**) Position the guide plate about 6 inches above the stop collar.

**Step 21**) Thread the Allen cap screw into the guide plate until the split bushing is closed tightly onto the insertion tool shaft. Tighten the jam nut on the cap screw by turning in the clockwise direction to hold the position of the cap screw.

**Critical Step:** This step prevents rotation of the valve assembly during insertion.

**Step 22**) Tighten the packing nut at the top of the installation housing if it was previously loosened by turning in a clockwise direction. The packing nut must be sufficient tight to compress the packing which seals on the shaft of the insertion tool.

**Step 23**) Tighten the split bushing in the packing nut by turning the Allen cap screw in the clockwise direction. The split bushing must be sufficiently tight to hold the valve assembly inside of the installation housing.

**NOTE:** Before continuing to Valve Insertion, the technician(s) is to be familiar with the equalization pump operating manuals. The maintenance procedures are to be followed to keep equipment in good working order.

**Step 24**) Adjust the pressure relief valve on the outlet line of the equalization pump to ensure pressure does not exceed 375 psi for 250 psi rated equipment and 225 psi for 150 psi rated equipment. This is accomplished by increasing the spring compression for higher pressure or decreasing for lower pressure by turning the spring stop, which can be accessed through the end of the valve with a 3/8” allen wrench.

Proceed with Valve Cartridge Insertion section, Page 11 of IVP 250 Installation Instructions.
14 - 16 INCH SAMPLING MATERIAL LIST

Materials Needed - Core Sampling

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Standard 16” Saw Mandrel (75” Long)</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>3/8 x 2” Adaptor Set Pin/Cotter</td>
<td>1</td>
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<tr>
<td>3</td>
<td>Cutter Attachment Hardware - 3/8-16 bolts</td>
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<tr>
<td>4</td>
<td>14/16 Mandrel Adaptor</td>
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<tr>
<td>5</td>
<td>4in Cutter</td>
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<tr>
<td>6</td>
<td>4in Pilot Bit</td>
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<td>7</td>
<td>14” Centering Ring</td>
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<td>8</td>
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<td>9</td>
<td>Centering Ring Adaptor Plate</td>
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Materials Needed Post-Core Sampling Tapping

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<td>10</td>
<td>13.3” Undersized Cutter (Blue)</td>
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<td>11</td>
<td>15.3” Undersized Cutter (Blue)(not shown)</td>
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<td>12</td>
<td>13.8” Standard Cutter (Black)(not shown)</td>
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<td>13</td>
<td>15.8” Standard Cutter (Black)</td>
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<tr>
<td>14</td>
<td>Cutter Attachment Hardware ½-13 x 2 (3), ½-13x 2.5” (4), (7) Lock Nuts (not shown)</td>
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<td>15</td>
<td>3/8” X 2” Centering Tool Set Pin / Cotter</td>
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<td>4” Centering Tool</td>
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<td>17</td>
<td>14/16” Centering Tool Adaptor</td>
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14-16” Standard Tool List

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<th>Item</th>
<th>Description</th>
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<tbody>
<tr>
<td>18</td>
<td>T-Handle Allen Wrenches (5/32, 1/4, 5/16, 3/8)</td>
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<tr>
<td>19</td>
<td>3/4 inch open end wrench</td>
<td>1</td>
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</table>
Procedure – Core Sampling

1) Screw 4in cutter to adaptor and lock in place with cutter hardware. See Figure 1.

2) Insert Pilot Bit into adapter and lock in place with set pin. See Figure 2.

3) Thread adaptor/cutter onto saw mandrel until tight, [nylon locking feature will prevent adaptor from unthreading], hex pattern may be used for tightening/loosening. See Figure 3.

4) Attach centering ring to centering ring adaptor plate using (4) 1/2”-13 x 2.5” Hardware. It is recommended that the locking nuts be placed on the adaptor plate side. [See Figure 4]
5) Attach centering ring adaptor plate to top of 14/16in saw mandrel plate using (3) 1/2”-13 x 2.0” rounded socket head cap screws and locking nuts. It is recommended that screws be threaded from the bottom of the mandrel plate as shown. [See Figure 5]

6) After pressure testing - insert coring assembly into tap housing. Set a tapping depth of 5 inches and perform a core sampling tap. [See Figure 6]

Notes:
Centering ring ensures this 4in sample tap is centered.
Check that centering ring can rotate freely with pilot bit touching the pipe.
The 4 in tap can generate extra heat. It is recommended that this 4in sample tap is done at a slower that average speed if done on PVC.

7) Remove core sample and measure wall thickness. Check the Hydra-Stop ID chart at the end of this setup guide to determine proper cutter and cartridge size for the ID application.

8) Disassemble core sampling equipment

9) Thread centering tool extension completely onto 75” saw mandrel. Flats maybe be used with crescent or 1-1/16” wrench. [See Figure 7]
10) Thread cutter onto saw mandrel completely, then back off until the 3 equally spaced holes in the cutter align with the threaded holes of the saw mandrel. Secure cutter with 1/2”-13 screws and lock nuts. [See Figure 8]

![Figure 8](image)

11) Insert 4in centering tool into extension adapter, align through-hole with extension through-hole and lock in place with cotter pin & clip. [See Figure 9]

![Figure 9](image)

12) Using the 14”/16” tap housing, lower cutter until the teeth of the cutter touch the pipe. At this point your cutter is centered and tapping depth should be set to 1/2 pipe O.D.

13) Perform a standard tap on the pipe. Go to “Section 2.5 Tapping Set up”, page 6, in the IVP 250 Installation Instructions.

Note: Centering Tool will center the cut for an undersized cutter and will capture the coupon.

### 14” / 16” Cutter and Valve Cartridge Selection

<table>
<thead>
<tr>
<th>Nominal Size</th>
<th>Cutter Size</th>
<th>Cutter Color</th>
<th>ID Range</th>
<th>Valve Cartridge Part Number</th>
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<td>13.3</td>
<td>Blue</td>
<td>13.3”-13.8”</td>
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<td>13.8</td>
<td>Black</td>
<td>13.8” - 14.6”</td>
<td>8IVP250CARTLH14</td>
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<tr>
<td>16”</td>
<td>15.3</td>
<td>Blue</td>
<td>15.3” - 15.8”</td>
<td>8IVP250CARTLH16-AC</td>
</tr>
<tr>
<td></td>
<td>15.8</td>
<td>Black</td>
<td>15.8” - 16.6”</td>
<td>8IVP250CARTLH16</td>
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