IN-LINE FIGURE 700 QUICK OPENING CLOSURE
INSTALLATION, OPERATIONS AND MAINTENANCE MANUAL

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IMPORTANT

THIS DOCUMENT HAS BEEN MADE AVAILABLE TO PROVIDE ADDITIONAL INFORMATION FOR ANY IN-HOUSE TRAINING PROGRAM ON THE INSTALLATION, OPERATION AND MAINTENANCE OF THE IN-LINE QUICK OPENING CLOSURE AND IS NOT INTENDED TO SUPERSEDE THE SAFETY POLICIES OR PROCEDURES OF THE END-USER.

ALL SUPERVISORS, OPERATORS, WELDERS AND OTHER FIELD PERSONNEL THAT ARE DIRECTLY INVOLVED IN THE INSTALLATION, OPERATION AND MAINTENANCE OF THE IN-LINE QUICK OPENING CLOSURE SHOULD RECEIVE AND REVIEW THIS INFORMATION AS PART OF ANY TRAINING PRIOR TO THE INSTALLATION AND OPERATION OF THESE DEVICES.

FAILURE TO FOLLOW SAFETY GUIDELINES OR PROCEDURES MAY RESULT IN SEVERE INJURY OR DEATH.

ADDITIONAL COPIES OF THIS MANUAL MAY BE OBTAINED AT NO CHARGE BY CONTACTING:

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SECTION ONE
SAFETY INFORMATION

GENERAL

Operation of any access device is one of the most dangerous procedures faced by plant personnel and it is very important to be aware of the potential for serious injury or death that may result from unsafe practices or unseen hazards.

INTERNAL PRESSURE

Prior to operating any Closure, be certain that all internal system pressure has been fully equalized with the external pressure in a safe, controlled manner.

- Any residual internal pressure can cause severe injury or death if the Closure is operated in this state. Beware of the dangers of lower pressures as they can be equally as fatal as higher pressures, for example an NPS8 Closure with just 10 psig residual internal pressure may suddenly expend a force of 500 lbs. to free the Closure Cap.
- The Pressure Alert Fitting is designed to warn the Operator of residual internal pressure and is not intended to be used as a system bleed. If pressure is released through the Fitting as it is opened, DO NOT OPERATE THE CLOSURE. Close the Fitting and completely bleed the system pressure in a safe manner.
- The Pressure Alert Fitting is standard on all sizes NPS6 and larger. The Fitting is optional on smaller sizes.
- Since Closures are generally used in clean-out and otherwise dirty applications, pressure gages and warning devices may become plugged-off or fouled and provide false pressure situation. Even if these devices indicate a safe state continue to use extreme caution when operating the Closure.

OPERATOR POSITION

Prior to operating any Closure, be certain the Operator is situated in a safe position.

- As a rule-of-thumb, the Operator should stand on the side of the Closure opposite the hinge. If in the event residual pressure or a projectile are present, the Cap will swing away from the Operator.
- Whether the Closure Cap is in the opened or closed position, avoid looking directly into or standing in front of the opened bore or unopened Cap. Trapped objects, such as pigs or ice dams, may be suddenly released and be violently expelled out of the bore or against an unopened Cap, damaging it or forcing it clear given sufficient force and may result in severe injury or death.
- Avoid installing the Closure where the bore is directed towards buildings and equipment or where personnel or the public have access.
OPERATION

The In-Line Closure must be operated in a manner to limited physical damage to the unit and maintain its integrity.

- When opening or closing the Closure, DO NOT strike the Closure Cap with any hard-faced tools. This will severely damage the Cap by deforming the lugs and possibly crack or create a system of micro-fractures within the microstructure of the Cap material that may result in catastrophic failure.
- The In-Line Closure seals by means of a pressure energized O-Ring that is compressed only until metal-to-metal contact is achieved between the Cap and Weld Hub. Tightening beyond this point will not create a better seal and may damage the Closure. **DO NOT OVERTIGHTEN.**
- Spanner wrenches for all Closures are available and are extremely effective for safely obtaining a tight seal.
SECTION TWO
INSTALLATION INSTRUCTIONS

1. All welding procedures, welding operations and welder performance qualifications should be controlled to ensure compliance with ASME Code Section IX and the Regulatory Authority in the Jurisdiction of installation. All welding must be performed in accordance with these procedures by welders qualified with those procedures.

2. Standard material for the Weld Hub: ASME SA350 Grade LF2 Class 1 (P1 Group 2).

3. Prepare the Weld Hub by removing all non-welded attachments (Cap, Seal, Hinge Assembly and Pressure Alert Fitting) and all paint and residue from the weld area.

4. Position the Weld Hub on the mating pipe or nozzle and tack weld into place. For horizontal applications, the Hinge must be vertical on the left side of the Weld Hub when facing the Seal Groove and the Pressure Alert Fitting port is at the 12 o’clock position.

5. Heat input during welding must be controlled to avoid distortion. It is recommended that sufficient pre-heat and the following pass sequence be used to minimize stress gradients caused by welding:

![Figure 1. Horizontal Hinge Orientation](image)

![Figure 2. Recommended Welding Pass Sequence](image)
6. If post-weld heat treatment is required, remove all grease from the threads and sealing surfaces and coat these exposed with an anti-oxidation compound to prevent scaling. **Do not heat treat the Cap, Hinge Assembly or Pressure Alert Fitting.**

7. Prior to assembly, clean all grease, scale, dirt and other residue from the Weld Hub, Cap and Hinge Assembly, especially from the threads and sealing surfaces. Liberally coat the Weld Hub and Cap threads with molybdenum disulfide grease (preferably) or other anti-seize lubricant. **Do not assemble or operate with the threads dry.** Grease Hinge components and assemble Hinge Arm/Cap Assembly into the Weld Hub Hinge. Do not replace the Seal at this point.

8. Cycle Cap on to the Weld Hub and adjust the Hinge Stop accordingly (see Section Four – Maintenance Instructions) until smooth operation is obtained.

9. With the Seal removed, tighten the Cap on the Weld Hub until metal-to-metal contact is achieved. Do not hammer or otherwise overtighten the Cap past this point. Place a permanent mark on both the Cap and Weld Hub to identify this as the point of maximum seal compression (see Figure 3). Do not tighten the Cap past this point during future operation. Doing so may damage the threads which may result in catastrophic failure.

![Figure 3. Metal-to-Metal Make-up](image)

10. Coat the seal groove with a **thin** film of all-purpose grease, or grease suitable for HSN elastomers and replace the seal (film of grease should be barely visible). Do not fill Seal Groove with grease.

11. Tighten Cap until metal-to-metal contact is achieved as indicated by the markings shown in Figure 3. **DO NOT TIGHTEN PAST THIS POINT.**

12. Re-install the Pressure Alert Fitting.

13. If sandblasting and/or coating is required, remove all exposed grease and mask threads and sliding parts to avoid contamination. If contamination occurs, completely clean and lubricate threads and Hinge components as described above after the sandblasting/coating operation is complete.
SECTION THREE
OPERATION INSTRUCTIONS

IMPORTANT: PRIOR TO OPERATING THE IN-LINE CLOSURE, BE CERTAIN ALL PRESSURE HAS BEEN RELIEVED. FAILURE TO PROPERLY RELIEVE PRESSURE, REGARDLESS OF ITS MAGNITUDE, MAY RESULT IN SEVERE INJURY OR DEATH. PLEASE FOLLOW ALL IN-HOUSE SAFETY PROCEDURES AND THESE INSTRUCTIONS THROUGHLY AND USE EXTREME CAUTION WHEN OPERATING THESE DEVICES.

OPENING PROCEDURE (Review Section One – Safety Information prior to operation)

1. Completely relieve all system pressure.

2. Open the Pressure Alert Fitting (if equipped) completely to verify pressure has been relieved. The Pressure Alert Fitting is not intended to relieve system pressure, only to warn the Operator of residual system pressure. It is standard on sizes 6’’ and above and available as a recommended option on smaller sizes.

3. If the Pressure Alert Fitting indicates system pressure remains, DO NOT OPERATE THE CLOSURE. Close the Fitting and repeat Steps 1 and 2 until the all pressure is relieved.

4. Loosen the Cap approximately one-half turn and stop. It is recommended that a spanner wrench, available as an option, be used to loosen the Cap. The used of hard-faced tools and/or impact is not recommended, will void the warranty and may damage the Closure where catastrophic failure may result.

5. At this point the Seal between the Cap and Weld Hub is broken and any remaining pressure should vent through the Pressure Relief Slots in the Weld Hub threads. If pressure vents through the Slots, do not open the Closure further. Close the Cap and properly relieve remaining residual pressure. The Slots only serves as an alert feature in conjunction with the Pressure Alert Fitting and is not intended to relieve system pressure.

6. Once it is verified all pressure is relieved and with the Operator standing on the side opposite the Hinge, continue to rotate the Cap until it is removed from the Weld Hub. Swing the Cap completely out from the front of the Weld Hub to gain access to the system.

7. During the opening operation and after the Closure is opened, avoid standing or placing any part of the body directly in front of the Closure opening. Trapped or stuck objects within the system may result in projectiles if they suddenly break loose and are ejected through the Closure.
CLOSING PROCEDURE

1. Prior to closing the Closure, perform the maintenance operation as outlined in Section Four – Maintenance Instructions.

2. Position the Cap to the Weld Hub and adjust until the threads engage. Rotate the Cap until Seal contact is made.

3. Continue to rotate the Cap until metal-to-metal contact is achieved as indicated by the markings on the Cap and Weld Hub as described in Section Two Part 9. **DO NOT OVERTIGHTEN THE CAP PAST THIS POINT.**

4. As stated in the Opening operation, the used of hard-faced tools and/or impact for loosen and tightening the Cap is not recommended, will void the warranty and may damage the Closure where catastrophic failure may result. Spanner wrenches are highly recommended.

5. If the Closure is equipped with a Pressure Alert Fitting, replace the stem and hand-tighten. If necessary, gently snug the stem closed with a wrench. **DO NOT OVERTIGHTEN THE STEM AS THIS MAY DAMAGE THE PRESSURE ALERT FITTING.** If overtightening occurs, the Pressure Alert Fitting may require replacement.

6. Pressurize the system and check for leakage. If leakage occurs, perform the maintenance operation as outlined in Section Four – Maintenance Instructions.
SECTION FOUR
MAINTENANCE INSTRUCTIONS

IMPORTANT: REGULAR MAINTENANCE OF THE IN-LINE CLOSURE IS NECESSARY TO ENSURE INTEGRITY OF SAFETY FEATURES AND TROUBLE-FREE OPERATION. FAILURE TO PERFORM REGULAR MAINTENANCE MAY RESULT IN UNSAFE OPERATION CAUSING SEVERE INJURY OR DEATH.

1. Regular maintenance should be performed each time the Closure is operated. Contact the factory, if required, if the Closure or any part(s) exhibit damage or wear to the extent replacement is warranted.

2. Be certain all system pressure is relieved prior to performing maintenance procedures.

3. Inspect all welds and pressure-containing parts for defects such as cracks. Repair or replace as required.

4. Inspect the threads on both the Cap and Weld Hub for signs of wear or galling. It is vitally important the threads are clean and well lubricated. Do not operate with the threads dry.

5. Inspect the Seal and replace if damaged. In-Line Closures use standard HSN O-Rings available locally and worldwide. The O-Ring number is stamped on Weld Hub for convenience and easy identification. The Operator may use any elastomer suitable for the service.

6. If system fluids, sand and other residue contaminate the threads or Seal, remove the Seal and thoroughly clean the threads, thread slots and Seal Groove. Lightly lubricate the Seal Groove with a thin film of all-purpose grease and insert the Seal (replace if required). Liberally lubricate the Cap and Weld Hub threads with an anti-seize compound, preferably one containing molybdenum disulfide.

7. Lubricate all sliding Hinge components and grease fittings.

8. If Hinge adjustments are required, with the Closure closed halfway, loosen the Hinge Stop and lift the Hinge Arm and Cap simultaneously and re-tighten. Cycle the Closure and continue to adjust until smooth operation is achieved.

For further assistance or additional copies of this document, please contact:

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