Style HP-170 Installation-Ready™ Rigid Coupling

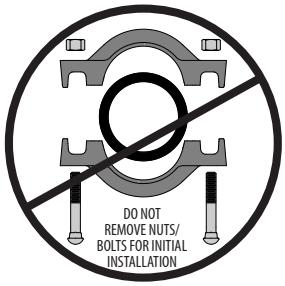
FOR THE VICTAULIC® ORIGINAL GROOVE SYSTEM (OGS) OR THE VICTAULIC® ENDSEAL™ (ES) SYSTEM

⚠ WARNING

- **Read and understand all instructions before attempting to install any Victaulic products.**
- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Wear safety glasses, hardhat, and foot protection.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

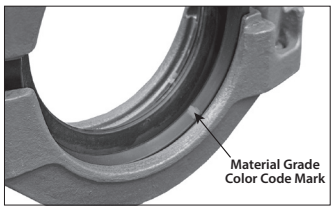
INSTRUCTIONS FOR THE INITIAL INSTALLATION OF STYLE HP-170 COUPLINGS



1. DO NOT DISASSEMBLE THE COUPLING: Style HP-170 Installation-Ready™ Rigid Couplings are designed so that the installer does not need to remove the nuts and bolts for initial installation. This facilitates installation by allowing the installer to directly insert the grooved end of mating components into the coupling after proper mating component end preparation.

2. CHECK MATING COMPONENT ENDS: The outside surface of the mating components, between the groove and the mating component ends, shall be generally free from indentations, projections, weld seam anomalies, and roll marks to ensure a leak-tight seal. All oil, grease, loose paint, dirt, and cutting particles shall be removed.

The mating components' outside diameter ("OD"), groove dimensions, and maximum allowable flare diameter shall be within the tolerances published in current Victaulic Original Groove System (OGS) specifications (publication 25.01) or Victaulic EndSeal™ specifications (publication 25.02), which can be downloaded at victaulic.com.



3. CHECK GASKET: Check the gasket to verify that it is suitable for the intended service. The color code identifies the material grade. **For the color code chart and complete compatibility information, reference Victaulic publications 05.01 and GSG-100, which can be downloaded at victaulic.com.**

Important Information for Use of Style HP-170 Couplings with End Caps and Fittings

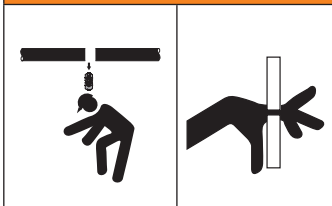
⚠ WARNING

- **Always read and follow the I-ENDCAP instructions, which can be downloaded at victaulic.com.**

Failure to follow the I-ENDCAP instructions could result in death or serious personal injury and property damage.

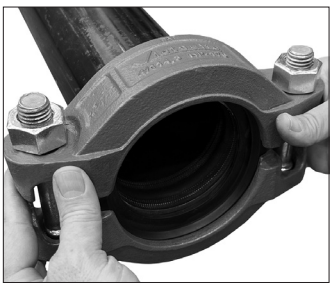
- When assembling Style HP-170 Couplings onto end caps, take additional time to inspect and verify that the end cap is seated fully against the center leg of the gasket.
- Use only Victaulic End Caps containing the "QV" or "EZ QV" marking on the inside face (for systems grooved to OGS specifications) or Victaulic No. 60-ES End Caps (for systems grooved to Victaulic EndSeal™ specifications).
- **Always confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to working with an end cap.**
- Victaulic recommends the use of Victaulic fittings with Style HP-170 Couplings.

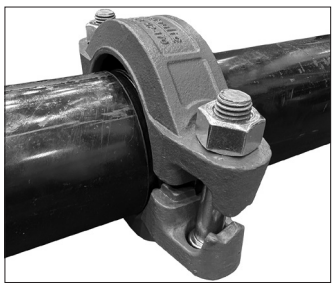
⚠ WARNING



- **Never leave a Style HP-170 Coupling partially assembled on mating component ends. ALWAYS TIGHTEN THE HARDWARE IMMEDIATELY, IN ACCORDANCE WITH THESE INSTRUCTIONS. A partially assembled coupling poses a drop or fall hazard during installation and a burst hazard during testing.**
- **Keep hands away from the mating component ends and the openings of the coupling when attempting to insert grooved mating component ends into the coupling.**
- **Keep hands away from coupling openings during tightening.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

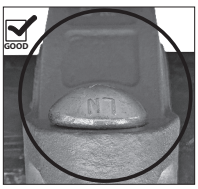




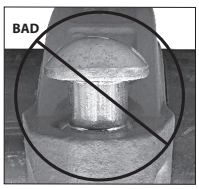
4. ASSEMBLE JOINT: Assemble the joint by inserting the grooved end of a mating component into each opening of the coupling. The grooved mating component ends shall be inserted into the coupling until contact with the center leg of the gasket occurs.

A visual check is required to verify that the coupling keys align with the groove of each mating component and that the gasket is seated properly. **NOTE:** Prior to tightening, the coupling may be rotated to verify that the gasket is seated properly on the mating component ends and within the coupling housings.

5. TIGHTEN NUTS: Using an impact tool or a standard socket wrench with a deep-well socket, tighten the nuts according to one of the methods detailed on page 4. **DO NOT** exceed the "Maximum Allowable Bolt Torque" values listed in the table on page 3 for either bolt.
NOTE: If jobsite conditions exist such that hand tightening is required (standard socket wrench or combination wrench, etc.), Method 2 (Alternating Sides) on page 4 is recommended.



OVAL NECK OF BOLT SEATED PROPERLY



OVAL NECK OF BOLT NOT SEATED PROPERLY

5a. Verify that the oval neck of each bolt seats properly in the bolt holes.

⚠ WARNING

- **When using assembly Method 1 (One-Touch) technique detailed on page 4, it is the contractor's/installer's responsibility to use this method ONLY for Style HP-170 Couplings. All other Victaulic couplings shall be installed per the requirements published in their specific installation instructions.**
- **When completing the installation, DO NOT exceed the "Maximum Allowable Bolt Torque" values shown in the table below.**

Failure to tighten nuts as instructed will cause increased loading of the hardware, resulting in the following conditions:
- **Excessive bolt torque required to assemble the joint (incomplete assembly)**
- **Damage to the assembled joint (damaged or broken bolt pads or fractures to housings)**
- **Bolt fracture or damage that makes the bolt more susceptible to fracture**
- **Joint leakage and property damage**
- **A negative impact on system integrity**
- **Voiding of the Victaulic warranty**
- **Personal injury or death**

DO NOT continue to tighten the nuts after the visual bolt pad inspection requirements are achieved (per step 6 on page 5).
- **Failure to follow this instruction could result in the conditions listed above.**

NOTICE

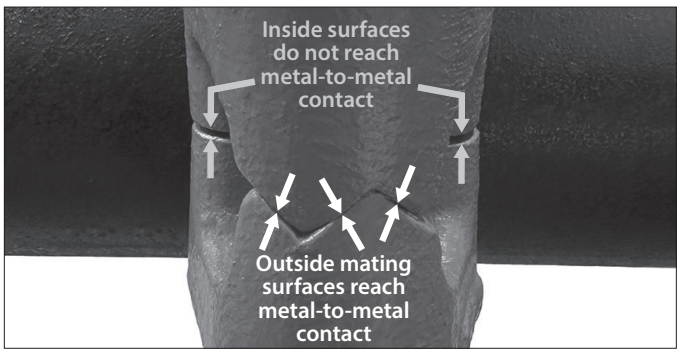
- **An impact tool or standard socket wrench can be used to tighten the hardware. Always use deep-well sockets for installation.**
- **Refer to the table below, along with the "Impact Tool Usage Guidelines" and "Impact Tool Selection" sections on pages 7 – 8.**

FOR STYLE HP-170 PRODUCTS CONTAINING ZINC-ELECTROPLATED CARBON STEEL HARDWARE

Pipe Size inches/mm	Nut Size inches/Metric	Deep-Well Socket Size inches/mm	Typical Assembly Bolt Torque*	Maximum Allowable Bolt Torque**
2 – 3 60.3 – 88.9	⅝ M16	1 1⁄16 27	100 ft-lbs/136 N•m (First Side) 230 ft-lbs/312 N•m (Second Side)	280 ft-lbs 380 N•m
4 114.3	¾ M20	1 ¼ 32	110 ft-lbs/149 N•m (First Side) 250 ft-lbs/339 N•m (Second Side)	365 ft-lbs 495 N•m
6 168.3	⅞ M22	1 7⁄16 36	130 ft-lbs/176 N•m (First Side) 280 ft-lbs/380 N•m (Second Side)	590 ft-lbs 800 N•m

* Typical Assembly Bolt Torques for nominal groove/pipe flare conditions and first side hardware torque at initial metal-to-metal bolt pad contact:
- If the assembly bolt torques exceed these values, check the groove dimensions ("C" diameter and pipe-end flare) and the initial bolt torque on the first side hardware.
  - Keep the groove dimensions toward their minimum values ("C" diameter and pipe-end flare) and **DO NOT** over-torque the first side hardware beyond initial metal-to-metal contact of the outside mating surfaces. This will noticeably reduce installation torque for this product.
  - Excessive initial tightening of the first side hardware (beyond initial metal-to-metal contact of the outside mating surfaces) will not increase the performance/sealing of the joint and will unnecessarily increase assembly torque on the second side hardware.

** Maximum allowable bolt torque values have been derived from actual test data. **These values apply ONLY to the Style HP-170.** Contact Victaulic for maximum allowable bolt torques for hardware materials other than zinc-electroplated carbon steel.

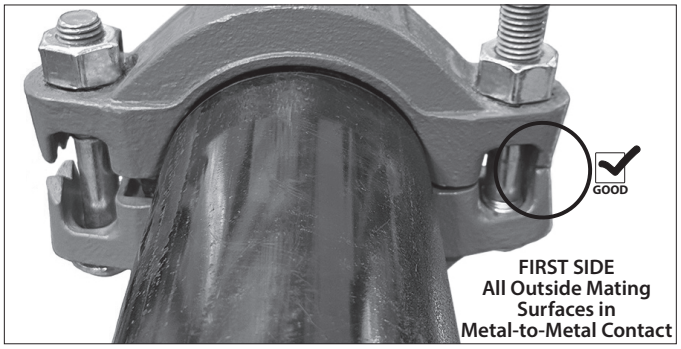


NOTICE

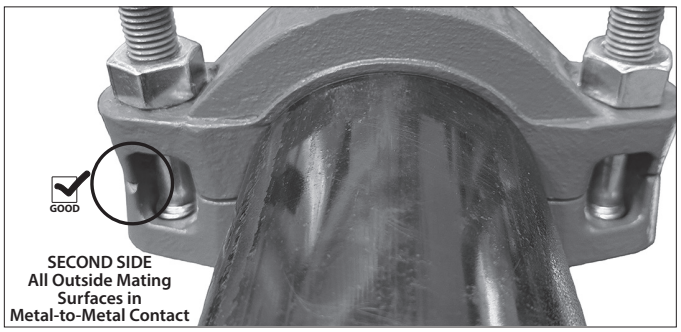
- **The photo to the left identifies the surfaces of the bolt pads that will be mentioned throughout the following installation steps.**

METHOD 1 (ONE-TOUCH):

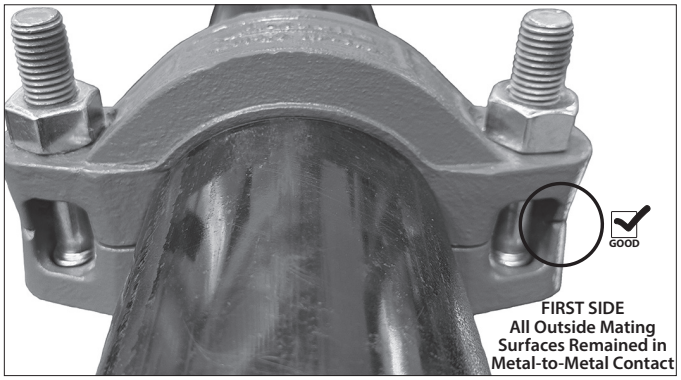
Style HP-170 Coupling hardware may be fully assembled/closed on one side before proceeding to the other side. It is the contractor's/installer's responsibility to use this installation "Method 1" ONLY for the Style HP-170 Coupling. All other Victaulic couplings shall be installed per the requirements published in their specific installation instructions.



- When assembling/closing the first side, **DO NOT** continue to tighten the nuts after visual, metal-to-metal contact of all outside mating surfaces is achieved. **NOTE:** The inside surfaces will not reach metal-to-metal contact.



- When assembling/closing the second side, hardware shall be tightened until visual, metal-to-metal contact of all outside mating surfaces is achieved. **DO NOT** continue to tighten the nuts after visual, metal-to-metal contact of all outside mating surfaces is achieved. **NOTE:** The inside surfaces will not reach metal-to-metal contact.



- Visually inspect the bolt pads at the first side after tightening the second side. If metal-to-metal contact of all outside mating surfaces is not maintained at the first side, re-tighten the nut until metal-to-metal contact occurs at all outside mating surfaces. **DO NOT** continue to tighten the nuts after metal-to-metal contact occurs at all outside mating surfaces.

NOTES:

- **DO NOT** exceed the "Maximum Allowable Bolt Torque" values listed in the table on page 3 for either bolt.
- Typical assembly bolt torques are listed in the table on page 3. If the assembly bolt torques exceed these values, check the groove dimensions ("C" diameter and pipe-end flare) and the initial bolt torque on the first side hardware.
  - Keep the groove dimensions toward their minimum values ("C" diameter and pipe-end flare) and **DO NOT** over-torque the first side hardware beyond initial metal-to-metal contact of the outside mating surfaces. This will noticeably reduce installation torque for this product.
  - Excessive initial tightening of the first side hardware (beyond initial metal-to-metal contact of the outside mating surfaces) will not increase the performance/sealing of the joint and will unnecessarily increase assembly torque on the second side hardware.
- If you suspect that any hardware has been over-tightened (as indicated by a bend in the bolt, bulging of the nut at the bolt pad interface, or damage to the bolt pads, etc.), the entire coupling assembly shall be replaced immediately.

METHOD 2 (ALTERNATING SIDES):

As an alternative to Method 1, Style HP-170 Coupling hardware may be tightened evenly by alternating sides, maintaining nearly uniform bolt pad gaps, until metal-to-metal contact occurs at all outside mating surfaces of each bolt pad location. **DO NOT** exceed the torque value listed in the "Maximum Allowable Bolt Torque" column in the table on page 3 for the applicable hardware size.

⚠ WARNING

- **Visual inspection of each joint is required.**
- **Improperly assembled joints shall be corrected before the system is filled, tested, or placed into service.**
- **Any components that exhibit physical damage due to improper assembly shall be replaced before the system is filled, tested, or placed into service.**

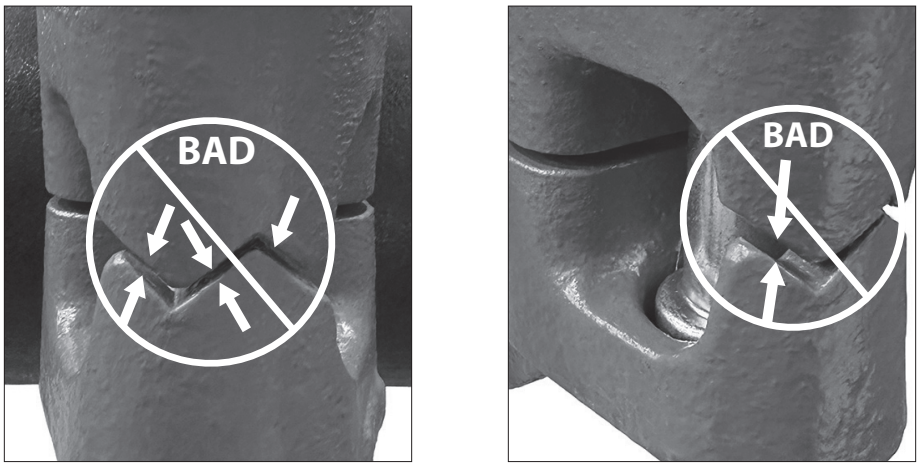
Failure to follow these instructions could cause joint failure, resulting in death or serious personal injury and property damage.

6. REQUIRED INSPECTION TECHNIQUE – VISUAL INSPECTION (ALL SIZES):

Visually inspect each bolt pad location at every joint to verify that metal-to-metal contact is achieved at all outside mating surfaces.

PROPERLY ASSEMBLED JOINT –
METAL-TO-METAL CONTACT AS INDICATED AT ALL OUTSIDE MATING SURFACES

NOTE: The inside surfaces will not reach metal-to-metal contact. Reference the previous page.



IMPROPERLY ASSEMBLED JOINT –
GAP AT OUTSIDE MATING SURFACES/UNDER-TIGHTENED

These photos represent improper assemblies, which could result in joint failure, property damage, serious personal injury, or death. Refer to the "Impact Tool Usage Guidelines" section on page 7.

INSTRUCTIONS FOR REASSEMBLY OF STYLE HP-170 COUPLINGS

⚠ WARNING

- **Always verify that the piping system has been completely depressurized and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**
- **Confirm that any equipment, branch lines, or sections of piping that may have been isolated for/during testing or due to valve closures/positioning are identified, depressurized, and drained immediately prior to installation, removal, adjustment, or maintenance of any Victaulic products.**

Failure to follow these instructions could result in death or serious personal injury and property damage.

NOTICE

Two methods can be followed for reassembly of Style HP-170 Couplings.

- **METHOD "A" FOR REASSEMBLY: The coupling can be reassembled into its "installation-ready" condition by installing the gasket into the housings and then inserting the bolts. Thread a nut onto each bolt until 2 – 3 threads are exposed, as shown to the left. If this method is chosen, steps 1 – 5 of this "Instructions for Reassembly of Style HP-170 Couplings" section, along with steps 4 – 6 on pages 2 – 4, shall be followed.**

OR

- **METHOD "B" FOR REASSEMBLY: The gasket and housings can be assembled onto the mating component ends by following all steps listed below.**

Follow these five steps for Method "A" or Method "B":

1. Verify that the system is depressurized and drained completely before attempting to disassemble any couplings.

2. Loosen the nuts of the coupling assembly to permit removal of the coupling from the mating component ends.

3. Remove the nuts, bolts, and gasket from the housings. Inspect all components for any damage or wear. If any damage or wear is present, use a new Victaulic-supplied coupling assembly.

4. Check mating component ends, as described in step 2 on page 1.

⚠ CAUTION

- **A thin coat of a compatible lubricant shall be used to help prevent the gasket from pinching, rolling, or tearing during reassembly.**
- **DO NOT use an incompatible lubricant.**
- **DO NOT use excessive lubricant on the gasket sealing lips and exterior.**

Failure to use a compatible lubricant may cause gasket damage, resulting in joint leakage and property damage.

5. FOR REASSEMBLY OF STYLE HP-170 COUPLINGS, LUBRICATE GASKET: Apply a thin coat of a compatible lubricant to the gasket sealing lips and exterior. Refer to the "Lubricant Compatibility for Gaskets" table below.

Lubricant Compatibility for Gaskets

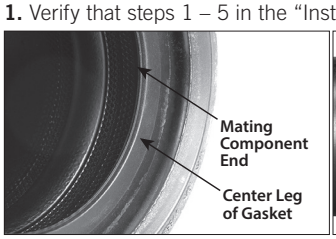
The following recommendations are for the gasket materials listed. Commercial lubricants may contain multiple ingredients. Always refer to the lubricant manufacturer's recommendations for material compatibility.

	Victaulic Lubricant*	Soap-Based Solutions	Glycerin	Silicone Grease	Silicone Spray	Corn Oil	Soybean Oil	Hydrocarbon-Based Oils	Petroleum-Based Greases
Compatible with Nitrile Gaskets?	Yes*	Yes	Yes	Yes	NO	Yes	Yes	Yes	Yes

*Victaulic Lubricant shall not be mixed with Poly Olester (POE) Oil during installation.

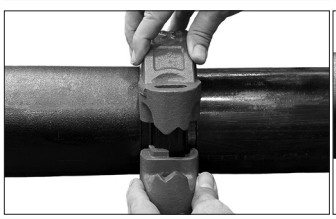
METHOD "B" FOR REASSEMBLY

1. Verify that steps 1 – 5 in the "Instructions for Reassembly of Style HP-170 Couplings" section have been followed.



2. INSTALL GASKET: Insert the grooved end of a mating component into the gasket until it contacts the center leg of the gasket.

3. JOIN MATING COMPONENTS: Align the centerlines of the two grooved mating component ends. Insert the other mating component end into the gasket until it contacts the center leg of the gasket. **NOTE:** Verify that no portion of the gasket extends into the groove of either mating component.



4. INSTALL HOUSINGS: Install the housings over the gasket. Verify that the housings' keys engage the grooves completely on both mating components.

5. INSTALL BOLTS/NUTS: Install the bolts and thread a nut finger-tight onto each bolt. **NOTE:** Verify that the oval neck of each bolt seats properly in the bolt hole.

6. TIGHTEN NUTS: Follow steps 5 – 6 on pages 2 – 4 to complete the assembly.

IMPACT TOOL USAGE GUIDELINES FOR STYLE HP-170 COUPLINGS

NOTICE

- **These guidelines are for Style HP-170 Couplings ONLY.**
- **These guidelines are for Style HP-170 Couplings containing zinc-electroplated carbon steel hardware ONLY.**

Impact tools do not provide the installer with direct "wrench feel" to judge nut torque. Since some impact tools are capable of high output speed and torque, it is important to develop a familiarity with the impact tool to avoid over-torquing, which may damage or fracture the bolts or the coupling's bolt pads during installation.

⚠ WARNING

- **DO NOT exceed the "Maximum Allowable Bolt Torque" values specified in the table on page 3 for the applicable hardware size.**

Failure to follow these instructions could cause joint failure, resulting in property damage, serious personal injury, or death.

Assemble Style HP-170 Couplings per the instructions in this document. Tighten the nuts until the visual inspection requirements are achieved. Visual inspection of each joint is required for verification of proper assembly.

During the installation process, the installation torque shall not exceed the "Maximum Allowable Bolt Torque" values specified in the table on page 3 for the applicable hardware size. Conditions that may result in bolt torques exceeding either the "Maximum Allowable Bolt Torques":

- **Initial over-tightening of first side hardware –** When assembling/closing the first side, **DO NOT** continue to tighten the nut after metal-to-metal contact of all outside mating surfaces is achieved. Additional tightening will result in excessive torque to complete installation of the second side.
- **Improperly-Sized Impact Tool –** Refer to the "Impact Tool Selection" section on the following page.
- **Out-of-specification grooved pipe end dimensions –** If proper visual assembly is not achieved, or if the coupling assembly requires torques higher than the "Maximum Allowable Bolt Torques" shown in the table on page 3, remove the coupling and confirm that all grooved pipe end dimensions are within Victaulic specifications. If grooved pipe end dimensions are not within Victaulic specifications, rework the pipe ends by following all instructions in the applicable pipe preparation tool's operating and maintenance manual.
- **Continued tightening of nuts after the visual inspection requirements are achieved – DO NOT** continue to tighten the nuts after the visual inspection requirements are achieved. Continuing to tighten the hardware after proper visual inspection requirements are achieved may cause joint failure, resulting in property damage, serious personal injury, or death. In addition, continued tightening may cause excessive stresses that compromise the long-term integrity of the bolts and may cause joint failure, resulting in property damage, serious personal injury, or death. Additional bolt torque will not provide a better installation; bolt torque that exceeds the "Maximum Allowable Bolt Torque" values specified in the table on page 3 could damage or fracture the bolts and/or the coupling's bolt pads during installation.
- **Pinched gasket –** A pinched gasket could result in the inability to achieve proper visual inspection requirements. The coupling shall be disassembled and inspected to verify that the gasket is not pinched. If the gasket is pinched, a new gasket or coupling assembly shall be used.
- **Coupling was not assembled per the installation instructions –** Adherence to installation instructions will help to avoid the conditions covered in this section.

If you suspect that any hardware has been over-torqued, the entire coupling assembly shall be replaced immediately. (As indicated by a bend in the bolt, bulging of the nut at the bolt pad interface, or damage to the bolt pad, etc.)

Impact tools and the batteries that power them will decline in performance due to time and usage. It is the installer's responsibility to periodically assess the tool's performance and ensure that it continues to be capable of performing the installation requirements defined in this document.

Continued on the following page

IMPACT TOOL SELECTION FOR STYLE HP-170 COUPLINGS

Appropriate selection of an impact tool is required to ensure proper installation in accordance with these installation instructions. Improper impact tool selection could cause coupling mis-assembly and damage, resulting in property damage, serious personal injury, or death.

To determine the suitability of an impact tool, perform trial installation assemblies with a standard socket wrench or a torque wrench. These trial coupling assemblies shall meet the visual installation requirements listed in these installation instructions. After visual installation requirements are achieved, measure the torque applied to each nut with a torque wrench. Using the torque value measured, select an impact tool with a torque output or torque output setting that conforms to the measured value but generally does not exceed the "Maximum Allowable Bolt Torque" values specified in the table on page 3.

Selection of an Impact Tool:

Impact Tools with Single Output Torque – Selection of an impact tool with an output torque considerably higher than the required installation torque could result in hardware and/or coupling damage due to the possibility of hardware over-torque. Under no circumstances shall an impact tool be selected for use that has a torque output setting that generally exceeds the "Maximum Allowable Bolt Torque" values specified in the table on page 3.

Impact Tools with Multiple Output Torque Settings – If an impact tool with multiple output torque settings is selected, the impact tool shall have at least one torque setting that satisfies the above requirements for an "Impact Tool with Single Output Torque."

Use of impact tools with excessive output torques creates installation difficulties for the installer due to the tool's unmanageable rotational speed and power.

Periodically check nut torque on coupling assemblies throughout the system installation process.

For safe and proper use of impact tools, always refer to the impact tool manufacturer's operating instructions. In addition, verify that proper impact grade sockets are being used for coupling installation.

⚠ WARNING

Failure to follow instructions for tightening hardware could result in:

- **Bolt damage or fracture**
- **Damaged or broken bolt pads or fractures to housings**
- **Joint leakage and property damage**
- **A negative impact on system integrity**
- **Voiding of the Victaulic warranty**
- **Personal injury or death**

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