

## Continental Steel to PE Mechanical Bolt-on Saddle Punch Tee

### SUMMARY

This utility procedure establishes a uniform method for safely installing a steel to polyethylene (PE) mechanical bolt-on saddle punch tee on a natural gas distribution system operating at or below 60 pounds per square inch gauge (psig). Procedures for tapping the Continental bolt-on saddle punch tee are the same as the weld-on punch tees, and can be referenced in Utility Procedure TD-4150P-109, "Steel Tapping Tee with Coupon Retaining Punch 1/2" and 3/4" Operation," Section 2, "Tapping."

Level of Use: Reference Use

### TARGET AUDIENCE

Maintenance and construction (M&C) personnel qualified to install bolt-on saddle punch tees.

### SAFETY

Bodily injury may occur if steps in this procedure are not followed. Fitting is pressurized at full line pressure when in use. Read, understand, and adhere to steps carefully. Proper training and periodic review regarding the use of fitting in this procedure is essential to prevent serious bodily injury or equipment damage.

### BEFORE YOU START

- Ensure bolt-on saddle punch tee is not installed on a steel pipeline with a wall thickness greater than 0.280.
- Use appropriate personal protective equipment (PPE) at all times, including but not limited to:
  - Safety glasses
  - Long-sleeved shirt
  - Gloves
- Additional tools required:
  - Fire extinguisher
  - Pipe coating removal tools
  - Hand wire brush
  - Ultrasonic wall thickness tester
  - Leak detection soap solution

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- Pipe wrench
- Pipe thread sealant
- Wire crimp tool
- Thermite weld equipment
- 12" ratchet with 15/16" socket

OR

- 12" adjustable smooth faced wrench
- The following qualifications are required:
  - Operator Qualification (OQ) Task 03-05, "Pipe Inspection"
  - OQ Task 03-02, "Transmission Coatings"
  - OQ Task 06-17, "Tap a Service Tee w/Coupon Retaining Punch"
  - OQ Task 04-01, "Soap Test/Stand-up Test"

OR both of the following:

  - OQ Task 04-03, "Leak Test at Operating Pressure"

AND

  - OQ Task 04-04, "Pressure Testing For Facilities Operating Below 100 psi"
  - Gas Design Standard (GDS) D-34, "Mechanical Compression Coupling Qualification"

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## Continental Steel to PE Mechanical Bolt-on Saddle Punch Tee

### PROCEDURE STEPS

#### 1 Cleaning and Inspection of Steel Pipeline

- 1.1 IF bolt-on saddle punch tee is used for the purpose of identifying an inserted steel pipeline prior to performing any weld operations,  
  
THEN identify a location where the pipeline will be later depressurized to allow removal of the bolt-on saddle punch tee.
- 1.2 Remove pipeline coatings from the area the saddle punch tee will be installed around the entire circumference of pipe AND clean pipe to bare metal.
- 1.3 Inspect the area where the bolt-on saddle is to be installed AND ensure elastomer seal is not installed over pits or gouges in the pipe where the sealing integrity might be compromised.



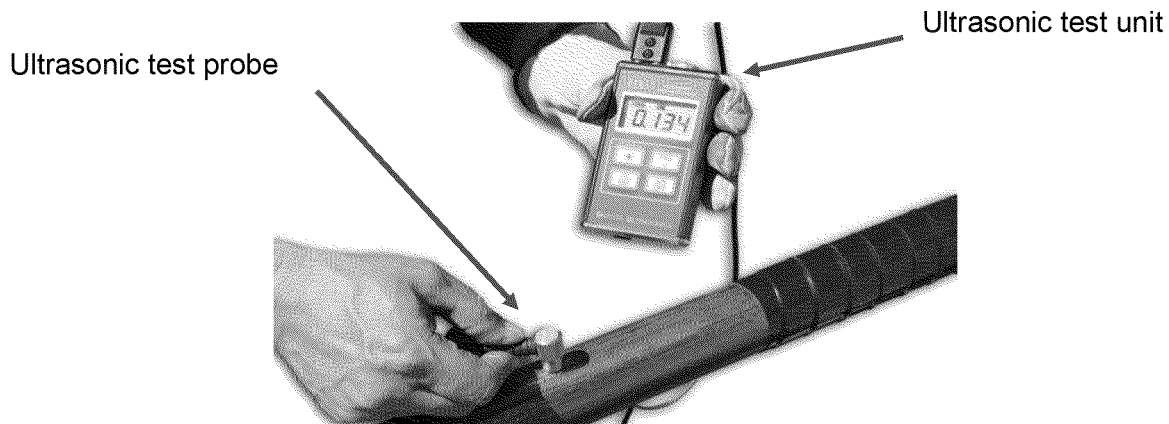
#### CAUTION

Equipment damage may result if attempting to tap steel pipeline with a wall thickness greater than 0.280.

#### NOTE

It is recommended to clean steel pipeline in the area to be ultrasonic tested to bare metal AND perform multiple ultrasonic tests in various locations to insure accurate wall thickness measurements.

- 1.4 Check steel pipeline wall thickness with an ultrasonic tester. Ensure the wall thickness **does not** exceed 0.280. Refer to Figure 1; "Check Pipeline Wall Thickness" below.



**Figure 1. Check Pipeline Wall Thickness**

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### 2 Fitting Installation

- 2.1 Inspect bolt-on saddle punch tee for damage to the fitting AND its components.
- 2.2 Remove saddle bolt AND inspect elastomer seal for damage OR dis-bonding from upper saddle.



#### CAUTION

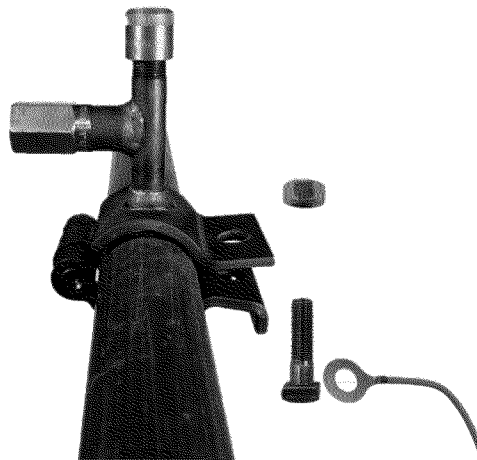
Ensure coupon retaining punch is fully retracted within tee to avoid damage during installation.

- 2.3 Place saddle in the desired position on the pipe.

#### NOTE

It is recommended to use a torque wrench if available to achieve the 25 to 40 foot pound torque requirement. If a torque wrench is not available, then the required torque can be achieved using either a 12" ratchet or 12" smooth faced wrench.

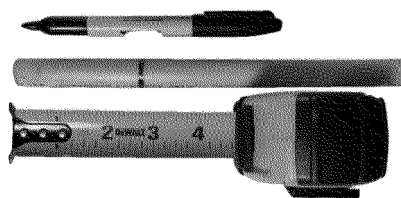
- 2.4 Replace saddle bolt AND install Cathodic protection wire ring connector as follows (Figure 2):
  1. Crimp #10 wire to ring connector supplied with the fitting.
  2. Remove saddle bolt nut AND install ring connector over saddle bolt.
  3. Install saddle bolt with ring connector positioned between lower saddle AND saddle bolt.
  4. Install saddle bolt nut to saddle bolt AND tighten between 25 to 40 foot pounds of torque taking care not to rotate saddle on the steel pipeline.



**Figure 2. Installation of Cathodic Protection Wire Ring**

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- 2.5 For additional guidance, refer to Utility Procedure TD-4170P-52, Mechanical Fitting Connections for Polyethylene Pipe (Threaded Compression Transitions)."
- 2.6 Cut PE tubing ends square.
- 2.7 Wipe the PE pipe end with a clean, dry cloth.
- 2.8 Establish the stab depth by measuring as follows:  
IF fitting is ½" CTS using a line shield nut,  
THEN measure 2-13/16" from end of PE pipe.  
IF fitting is 1" CTS using a line shield nut,  
THEN measure 3-1/8" from end of PE pipe.
- 2.9 Using a soft black felt tip pen, mark the PE pipe at the stab depth measurement (Figure 3).



**Figure 3. PE Stab Depth Measurement**

- 2.10 Loosen the line shield nut until the seal ring is no longer compressed.
- 2.11 Confirm that all internal components are present and loose.
- 2.12 Insert the PE tubing over the stiffener until it butts against the shoulder inside the compression fitting.
- 2.13 Tighten the line shield nut until it bottoms out against the fitting shoulder; do not over-tighten.
- 2.14 Visually examine and measure the completed connection as follows:
1. Ensure that the line shield nut is bottomed out against the fitting shoulder.
  2. Measure to ensure that the stab depth mark is **no more** than 3/8" from the face of the line shield nut.
  3. IF any requirement in Step 1 or Step 2 above is not satisfied,  
THEN perform the following tasks:

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2.14 (continued)

- a. Disassemble the connection.
- b. Correct the problem.
- c. Cut the PE pipe to remove any PE pipe defect left by the stiffener and seal ring.
- d. Reassemble the connection beginning at Step 2.5.

2.15 Install PVC schedule 80 nipple with moisture seal into the outlet of the line shield nut AND hand tighten (Figure 4).

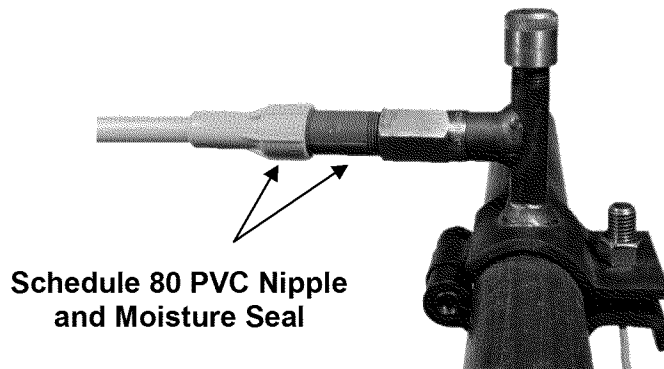


Figure 4. Installation of Schedule 80 PVC Nipple

### 3 Pressure Test

**NOTE**

Pressure can be gauged using either outlet of the tee. If using the top, remove the punch per steps 3.1 and 3.2.

- 3.1 Remove completion cap AND coupon retaining punch.
- 3.2 Inspect coupon retaining punch to ensure no coupon exists from prior use (Figure 5).

IF coupon is found,

THEN replace with new coupon retaining punch.

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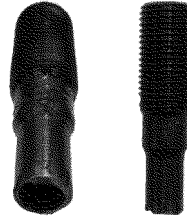


Figure 5. Coupon Retaining Punch

- 3.3 Install pressure test assembly to either tee body or tee outlet (Figure 6).



Figure 6. Typical Pressure Test Assembly Installed

- 3.4 Pressure test bolt-on saddle punch tee assembly. Refer to GDS A-34, "Piping Design and Test Requirements."

#### 4 Tapping

- 4.1 Follow tapping procedure in TD-4150P-109, Section 2 "Tapping."

- 4.2 Verify line pressure at the service outlet.

1. IF line pressure is present,

THEN perform the following steps:

- a. IF steel pipeline is under Cathodic protection,

THEN bond end of #10 wire installed in Step 2.4 to steel pipeline.

IF steel pipeline is **not** under Cathodic protection,

THEN crimp end of #10 wire installed in Step 2.4 to a 5 lb. zinc anode AND place anode 2 feet from bolt-on saddle punch tee.

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4.2 (continued)

- b. Wrap steel pipeline AND fitting with approved wax tape. Refer to GDS E-35 "Selecting and Applying Coatings for Buried Transmission Pipe."
- c. Install EMS marker next to saddle punch tee prior to backfill AND follow the mapping requirements described in Utility Procedure TD-4461P-20, "As-Built Process for Distribution Mains and Services."

IF no line pressure is present,

THEN proceed to Section 5 "Removal" below to remove saddle punch tee.

### 5 Removal

- 5.1 Confirm steel piping AND bolt-on saddle punch tee assembly is depressurized.
- 5.2 Confirm coupon retaining punch is flush with the top of tee.
- 5.3 Loosen AND remove saddle bolt.
- 5.4 Remove bolt-on saddle punch tee from steel pipeline.
- 5.5 Remove coupon retaining punch from tee AND replace with new coupon retaining punch for future reuse of bolt-on saddle punch tee.

### END of Instructions

### DEFINITIONS

NA

### IMPLEMENTATION RESPONSIBILITIES

Superintendents and supervisors ensure communication of this utility procedure to gas field personnel.

### GOVERNING DOCUMENT

Utility Standard TD-4150S, "Pressure Control for Gas Transmission and Distribution Steel and Cast Iron Pipeline"

### COMPLIANCE REQUIREMENT / REGULATORY COMMITMENT

DOT 49 CFR, PART 192, Subpart L—Operations

PG&E Gas Operator Qualification Plan



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### REFERENCE DOCUMENTS

#### Developmental References:

GDS A-34, "Piping Design and Test Requirements"

GDS E-35 "Selecting and Applying Coatings for Buried Transmission Pipe"

Utility Procedure TD-4150P-109, "Steel Tapping Tee with Coupon Retaining Punch 1/2" and 3/4" Operations"

Utility Procedure TD-4170P-52, "Mechanical Fitting Connections for Polyethylene Pipe (Threaded Compression Transitions)"

Utility Procedure TD-4461P-20, "As-Built Process for Distribution Mains and Services"

#### Supplemental References:

NA

### APPENDICES

NA

### ATTACHMENTS

NA

### DOCUMENT REVISION

NA

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**Continental Steel to PE Mechanical Bolt-on Saddle Punch Tee****REVISION NOTES**

Where?	What Changed?
NA	This is a new procedure.