

NEAR-MISS REPORT: SERVICE PULL-OUT

Description of Incident:

After a sewer contractor hit a medium pressure service, a crew renewed the service by direct burying 74 feet of 5/8" plastic. They re-used the original tap which consisted of a 4" x 1" steel saddle and a 1" x 5/8" Dresser punching tee. Three days later the customer reported an odor of gas inside the home. The responder discovered a minor leak on the inside houseline, 100% gas near the service tap, and 27% gas-in-air in a storm drain at the house which was 74 feet from the tap. When excavated, the crew discovered a 12" diameter ice ball at the outlet of the service saddle which indicated that gas had been leaking in that area at a significant rate and volume. They ran the tap down on the punching tee to stop the flow of gas, removed the ice ball and discovered the recently installed 5/8" service tubing had pulled out of the punching tee.

Post Incident Analysis:

When the crew renewed the service after the line hit, they chose to disassemble the outlet of the punching tee which included a metal insert, plastic gripper, rubber gasket, and a plastic nut. When they attempted to join the new plastic to the outlet of the punching tee, they discovered that the threads on the plastic nut were stripped. They attempted to substitute a steel nut from a new style punching tee but the thread pattern did not match the old style tee that was on the main. A nut with a matching thread pattern from a used Dresser GTO valve was found in the scrap at their shop. This nut was steel and about 3" long compared to the original nut which was plastic and about 1" long. The nut appeared to be compatible so the crew completed the joint using the steel nut. This is the joint that failed and caused the emergency condition.

Root Causes:

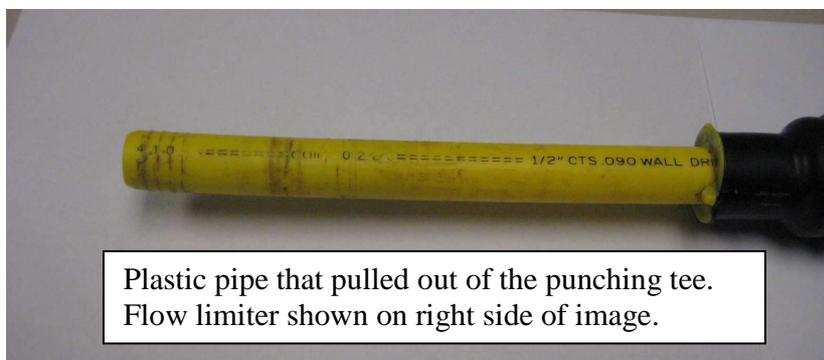
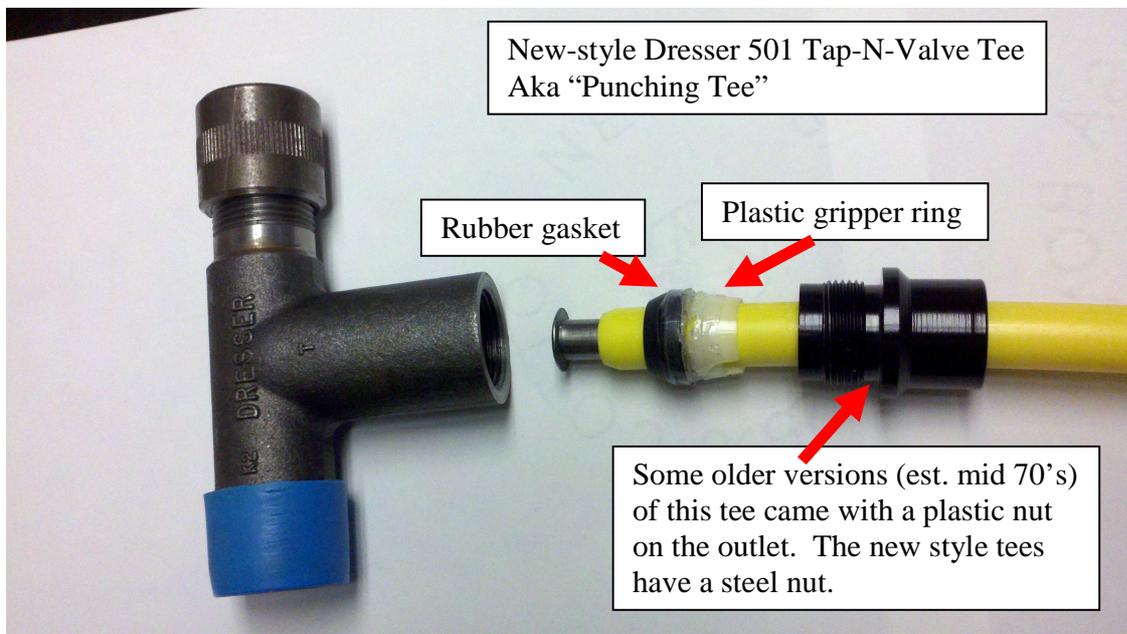
1. The components of the failed joint were not available for inspection during the root cause analysis, however the Training Department was able to re-create the joint by using other components similar to those used in the field. Based upon the post-incident investigation, it appears the nut from the GTO valve was not compatible with the punching tee. This likely contributed to the service pull out.
2. The service had been hit in a location that did not necessarily require the crew to disassemble the outlet of the punching tee. They could have kept the outlet of the original tee intact by cutting the service tubing at a point about 12" downstream and using a double connector.
3. There were no visible stab depth marks on the service tubing that pulled out of the punching tee. Either the stab depth was not marked, or the mark were worn off something other than a permanent marker was used to mark the depth.

Contributing Factors:

Since the 3" long nut from the used Dresser valve has not yet been available for inspection, it is unclear if and how it factored in to the failure. It clearly made it more difficult to determine an accurate stab depth and was therefore at least a contributing factor to the incident.

Action Plan to Prevent Recurrence:

1. Operations supervisors review details of this incident with all Operations employees. Emphasize the importance of following established procedures to ensure safe installation of components in the gas system.
2. Training Department to review procedures with Operations employees to follow when encountering old or obsolete fittings in the gas system. This review can be added to the annual mechanical fitting re-fresher training. In general, parts from used gas components should be used as a last resort on a kind-for-kind replacement basis only. For example, parts from a used curb valve should not be used to replace broken parts on a punching tee.
3. Although not a direct root cause of the service pull-out, the fact that the service line had been mis-marked was a contributing factor. The service had been marked by measurements since there was no tracer wire. If the service had been accurately located by vacuum excavation or some other method, the contractor may not have hit the line and the entire incident may have been avoided.



INSTALLATION INSTRUCTIONS

DRESSER® STYLE 501 TAP-N-VALVE® TEE

With SEAL-PLUS™ Restraining End

GENERAL: FOR WELDED INLET AND THREADED INLET X 501 POLYETHYLENE TUBING COMPRESSION OUTLET TAP-N-VALVE TEES

1. On weld inlet tees, remove tapping tool and all compression end components. Do not remove weld splatter cap from tee inlet.
 2. For threaded inlet tees, apply pipe thread compound to threads and attach to the main. For weld inlet tees, weld to main and allow to cool to hand touch prior to reassembly of tapping tool & compression and components. (Reassemble parts in the sequence and orientation shown.)
 3. Cut tubing square and deburr. Tubing must be clean and free of longitudinal scratches. At lower temperature a slight chamfer approximately 1/16" x 45° on the end of tubing will facilitate insertion into the fitting.
 4. Make sure nut flange is 1/4" to 5/16" from body contact.
 5. Mark tubing for stab depth: 2-3/4" for 5/8" O.D. thru 1-1/8" O.D., 3" for larger sizes.
 6. Check stiffener to assure it is for wall thickness of tubing used (see color code).
 7. Stab tubing into fitting until it bottoms. If properly stabbed, the tube markings will be inside or not over 1/8" from the UNTIGHTENED nut.
- STABBING NOTE:** This fitting does not grip when the tubing is stabbed. If difficulty is encountered in stabbing, withdraw the tubing and try reinserting again. (Be sure nut flange is at least 1/4" from body.) After proper stabbing is determined, THE NUT MUST BE HAND TIGHTENED TO ACTIVATE THE GRIP RING FOR HOLDING THE TUBING IN PLACE DURING FINAL TIGHTENING.

COLOR CODE	
Tubing Wall (Any Dia.)	Color
.062	Red
.077	Blue
.090	Steel (Green)
.099, 1.017, 1.03	Gold
.121	Black

9. (9. Cont'd) gripper teeth marks, reassemble parts in proper order, remark tubing, and then repeat the connection procedure.

10. See other side for tapping instructions.

11. Rotate tool counterclockwise until flush with top of tee.

12. Apply thread compound on pipe threads and tighten cap.

WARNING

Use proper stab and grip ring on P.E. pipe end. Improper stabber could result in escaping gas and cause property damage, serious injury or death.

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Piping Specialists
Dresser, Inc.
 41 Fisher Ave., Bradford, PA 16701

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