4 ½” Slimline Tubing Perforator in 4 ½” 12.75 lb/ft GRE Tubing

450DTITP-S

DTI SO: 001908

Distribution:

Suitable for general publication.

Introduction

DTI were asked to demonstrate the suitability of a standard wireline tubing perforator for to punch holes in 4 ½" 12.75 lb/ft tubing lines with Glass Reinforced Epoxy (GRE).

In addition to determining if the tubing perforator can punch a hole we can also observe how the fiber glass reacts to being perforated and also how the fiber glass responds to the action of the slips on the tubing punch.

Test Equipment

- Section of 4 ½" 12.75 lb/ft J55 GRE Tubing with a resultant drift of 3.577". Added GRE Line weight of 1.5 lbs/ft
- 450DTITP-S
- 1 1/2" x 7ft Stem Bar
- 1 7/8" Tube Jar
- Baker Vice
- Video camera.

Test Setup

- As the test includes material damage to the GRE resulting in potential airborne particles the test should take place out-side or with the workshop doors open and suitable face masks should be worn during testing.
- Clamp Tubing In Baker Vice
- Place a blanket or similar over point where perforation will take place to capture potential projectile.

Test Procedure

1. Check and record the condition of the ID of the GRE Tubing in area where the tubing punch will act and also where the slips of the tubing punch will bite.
2. Place the tubing punch into the tubing and make up the spang jar and stem bar.
3. Video record the test.
4. Place a blanket over the area where the tubing punch is working.
5. Jar the tubing punch until a hole is punched or an issues are observed.
6. Remove check and record the condition of the ID of the GRE Tubing in area where the tubing punch will act and also where the slips of the tubing punch will bite.
7. Check and record the condition of the punch on the 4 ½" Tubing Punch.

Test Results

The test was completed successfully.

A clean hole was punched in the 4 ½” GRE lined tubing. The damage caused to the lining on the tubing by the tubing perforator slips is minor as seen on the image below.

Figure 1 - Impression of tubing perforator slips on GRE after perforating

The tubing punch punched a clean hole through the lining and the tubing as can be seen on the following two images. It was noticed that in withdrawing the tubing punch by jarring upwards the punch caught on some of the GRE causing it to unravel.

Figure 2 - Punched hole from inside of GRE lined tubing. The groove where some of the lining has unraveled can be seen.

Figure 3 - Punched hole in the tubing from the outside with the punched section.

On disassembly it was observed that the tubing punch retainer pin (item 15-SPS19-188) was slightly bent. All other components were found to be in good condition.

Figure 4 - Tubing Punch after use.

Conclusions

The DTI 4 ½" Slimline Tubing Punch is able to successfully punch through GRE lined tubing without any modifications to the tool and only minor damage to the lining of the tubing.

- It is deduced that this result will apply for all other sizes of tubing that we supply tubing punches.
- In order to fit through the typically smaller ID of lines tubing it is likely the slimline tubing punches will be required.

Tested by: Matt Barnes Date: 09/12/2020

Revision

Date	Rev	Name
10/12/2020	0	Charles Harcourt
17/09/2024	A	Charles Harcourt

About DTI

DTI products are wide ranging and include an ensemble of Flow Control Equipment and a complete portfolio of Well Intervention and Fishing Equipment for both Wireline and Coiled Tubing conveyed applications.