

Non-explosive Deployed NeoThru-TubingBridgePlug (NeoT-TBP) with the use of the NeoReleaseTool (NeoRT) Run-In Procedures

Document # DRI-0163-0000NE

GENERAL RECOMMENDED PLUG-BACK OPERATIONS

Recommended Operations to Maintain Static Wellbore Conditions

The operations below were strictly followed for many decades of high success rate Thru-tubing Plug-back Operations. Many WL operators are unaware of or have chosen to not perform these critical operations. Maintaining static wellbore conditions during Thru-Tubing Plug-back Operations is critical.

These are recommended procedures that will maintain a relatively static shut-in tubing pressure (SITP) and overall wellbore pressure when making multiple wireline (WL) & Slickline (SL) runs in and out of the well.

1. Perform the lubricator pressure test using the appropriate water solution e.g., fresh water, brackish water, or weighted brine.
 - a. Use a 25% glycol/water solution if there is gas below the Master Valve (MV).
 - b. The pressure test should be at least 250 psi above the SITP.
2. Once the lubricator pressure test is finished, reduce the lubricator pressure to be 50-100 psig above the SITP.
3. Slowly crack open the MV and allow pressure equalization. Record the lubricator/wellhead SITP.
4. Descend into the well.
5. Monitor, record and adjust the wellhead pressure throughout descent and ascent operations. This must be done during every RIH until the plug is pressure tested.
 - a. Record the SITP before and after opening the MV on every RIH. Call this the recent SITP.
 - b. Maintain a constant wellhead pressure equal to the recent SITP \pm 50 psig for that RIH.
 - i. Wellhead pressure can increase due to descending line displacement while RIH, bleed off wellhead pressure at the surface to maintain recent SITP \pm 50 psig,
 - ii. Wellhead pressure can decrease due to ascending line displacement while coming out of the hole (COOH). Pump 25% glycol water solution into the wellhead to maintain the recent SITP \pm 50 psig,
6. Perform a pressure test when and as instructed.

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Due Diligence

Thru-tubing plug-back operations can have a high success rate if the following principals are practiced:

- Read these recommended procedures prior to handling and running the plug.
- Use NeoSuperSlurry Cement Kits to achieve the desired long-term hydraulic isolation in the wellbore.
- If the plug is to be run in a sour/corrosive environment, special preparations and/or a specially designed plug may be necessary. Contact NeoProducts for more details.
- Set the plug at the desired depth.
- Locate the bottom of the first bailer run approximately 5 ft above the top of the plug and dump 0.5-1 gallon of ceramic aggregate from that location if running a Size #1 plug. For all other plug sizes, dump 1-2 gallons of ceramic aggregate.
- Locate the bottom of the next bailer run approximately 1 – 2 ft above the top of the plug and dump 1 gallon of cmt slurry atop the ceramic aggregate if running a Size #1 plug. For all other plug sizes, dump 3-5 gallons of cmt slurry.
- Wait on cement (WOC) until the slurry can hold additional cement weight before dumping the second run of cement slurry (12 hrs after the cement bailer run if the BHT is at or above 250F, 18 hrs after the cement bailer run if the BHT is below 250F)
- After the minimum of 12 hours (see note in previous step) has passed since the first cement bailer run, locate the bottom of the next bailer run approximately 2-3 ft above the top of the previously dumped cement and dump 4-5 gallons of cmt slurry.
- WOC an additional 10 hrs before GIH to make the remaining dump runs for the desired overall cmt plug length. This will allow the cement slurry to support all subsequent runs of cement.
- Proceed to closing the vent with a Lead Impression Block at the top of the NeoT-TBP if running a 9-5/8" NeoT-TBP. There is no sliding vent port that needs to get closed on all other plug sizes.
- After all cement has been placed atop the plug, wait a minimum of 24 hours after the last dump bailer run before pressure testing the cement plug.

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The following well information and contingency preparations should be reviewed and recorded. Fill in the information below before running the **NeoT-TBP** in the well. Determine the following depths and write them in their space below;

- a. the depth from the bottom of the plug to the top of the nearest perforations below the set plug _____.
- b. the approximate depth from the CCL on the toolstring to the nearest casing collar below the CCL _____.
- c. the approximate depth from the bottom of the plug to the next casing collar below the plug _____.
- d. the approximate depth from the top of the plug to the bottom of the nearest existing perforations above the plug _____.
- e. the approximate depth from the top of the plug to the bottom of the future nearest perforations above the plug _____.

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CAUTION

If mishandled the NeoT-TBP could prematurely eject and cause serious personal injury. Never stand in line with the long axis of the setting sleeve when loaded with a plug.

ALWAYS HANDLE NeoT-TBPs WITH CAUTION.

Preparing the NeoReleaseTool:

1. Locate the NeoReleaseTool and place it on a clean, flat surface in order to prep the tool [see Figure 1].



Figure 1: NeoReleaseTool Ready to be Prepped for Service

2. Locate the #2 Parker Plug at the top of the NeoReleaseTool and remove the #2 Parker Plug as shown below in Figure 2.



Figure 2: Removal of #2 Parker Plug

3. Locate the pipe plug near the center of the NeoReleaseTool and remove the pipe plug as shown below in Figure 3.



Figure 3: Removal of Pipe Plug

4. Insert a pump-in fixture into the bronze tandem sub where the pipe plug was removed in step 3 [see Figure 4].



Figure 4: Pump-in Fixture threaded onto Tandem Sub

5. Connect the Enerpac Pump to the pump-in fixture with use of the quick connect. With the tool in the vertical position, slowly pump hydraulic fluid into the NeoReleaseTool. Pump until you see the hydraulic fluid flowing out of the hole at the top of the NeoReleaseTool where the #2 Parker Plug used to be. [see Figure 5].

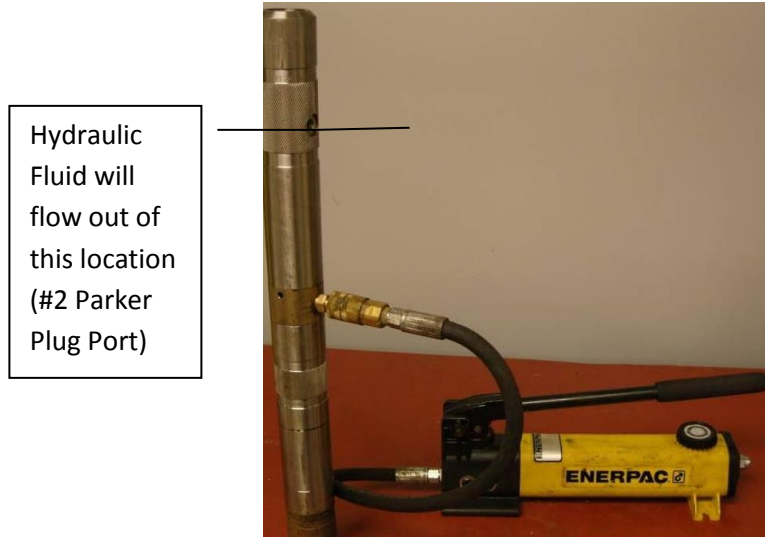


Figure 5: Enerpac Hydraulic Pump Connected to the Pump-in Fixture

6. Once the hydraulic fluid is flowing out of the #2 Parker Plug port, thread the #2 Parker Plug back into the NeoReleaseTool.
7. Flip the tool upside down and continue pumping hydraulic fluid until the fluid begins to weep out of the two small weep holes shown below in Figure 8. At this point, check the resistance of the tool. The resistance value should be 290 +/- 50 ohms. Test fire the NeoReleaseTool by applying 300-350 mA to the tool for 3 seconds.
8. Locate the bottom of the NeoReleaseTool and attach it to the top of the Non-Explosive Neo Thru-Tubing Bridge Plug shown in Figure 6.



Figure 6: NeoReleaseTool Attached to Non-Explosive Neo Thru-Tubing Bridge Plug

9. Connect the Enerpac hydraulic pump to the pump-in fixture and begin slowly pumping hydraulic fluid into the NeoReleaseTool shown in Figure 7.

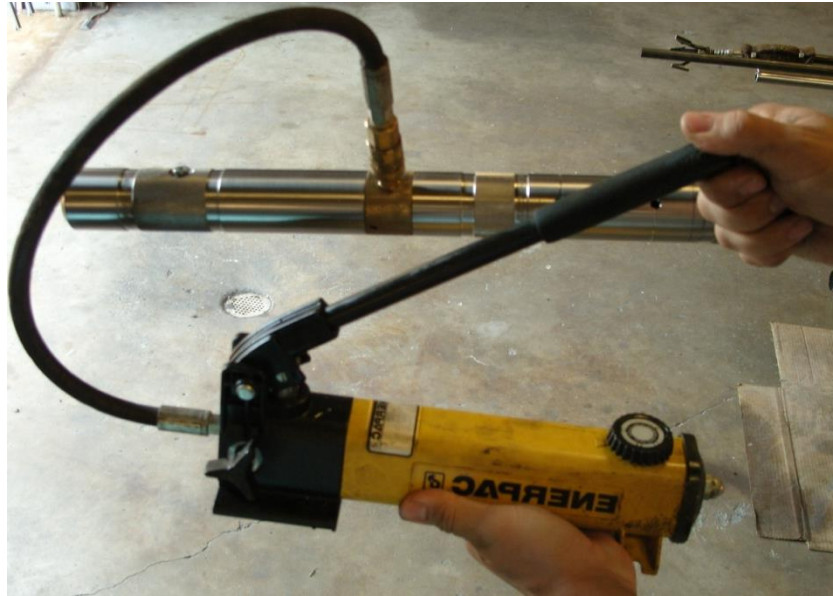


Figure 7: Enerpac Hydraulic Pump Connected to the Pump-in Fixture

10. Pump the hydraulic fluid until the fluid begins to weep out of the two small weep holes shown below in Figure 8. (Note: the large holes also shown in the figure below are not the weep holes. The small weep holes are located above these large holes)

Small weep holes located just below Part Number and above the large holes



Figure 8: Small Weep Holes

11. Once the hydraulic fluid has wept from the two weep holes, the NeoReleaseTool is now holding the plug in place and the pin can be removed from the Non-explosive Neo Thru-Tubing Bridge Plug.
12. Locate the pin on the Non-Explosive Neo Thru-Tubing Bridge Plug (found near the connection of the NeoReleaseTool to the NeoT-TBP) and tap the pin out with a hammer shown below in Figures 9 and 10.



Figure 9: Tapping out Pin on Non-Explosive Neo Thru-Tubing Bridge Plug



Figure 10: Tapping out Pin on Non-Explosive Neo Thru-Tubing Bridge Plug

13. Remove the Pump-In Fixture from Figure 4 and insert the pipe plug.

The NeoRT and non-explosive deployed NeoT-TBP are now ready to be run in the hole. Make up the NeoRT & NeoT-TBP to the CCL.

Please confirm that the NeoT-TBP you are using is the correct size for your casing size. There is a label on the PVC tube that the NeoT-TBP is shipped in that shows the size and serial number of the NeoT-TBP.

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The NeoT-TBP comes shipped as a vented plug. If you would like to make your NeoT-TBP a non-vented plug, simply thread the 1/4" NPT Pipe Plug that is supplied with your NeoT-TBP into the thread found on the bottom of the plug on the bull nose.

The following recommendations will help to achieve a successful plug-back. Although some of these recommendations might not be feasible, it is important that the Project Engineer be aware of their importance.

- a. If the well has a column of fluid to the surface and a positive shut-in tubing pressure, monitor and record the SITP before opening the Tree Master Valve prior to every run in the well. Successful plug-back projects require stable pressure maintenance at the plug setting depth throughout the plug-back project.
- b. Wells with a gas cap are much less sensitive to pressure maintenance during plug-back operations. A positive shut-in tubing pressure with a gas cap is common and not a serious concern.
- c. Determine if one of the following deleterious elements is present at the plug setting depth:
 - oil
 - natural gas
 - scale
 - condensate
 - paraffin
 - salt deposits

Contact NeoProducts for consultation if any one of these damaging elements is present near the plug setting depth. Their presence can reduce or eliminate the bond between cement and casing. Oil and condensate will retard cement to the point where it takes weeks to set. When oil and/or condensate is present at the plug setting depth, dump 10 ppg NeoCasingCleaner to displace the hydrocarbon and remove the oil coating from the csg.

- d. If the well is on gas lift, bleed all pressure off the casing and tubing. If possible, pump brine into the well. Allow the well to stabilize for at least 24 hours prior to running the plug.
- e. Generally, it takes days for a wellbore to achieve pseudo-equilibrium. Fluid entering the wellbore and gas "percolating" into the wellbore can induce channels in a cement plug. Therefore, shut the well in and allow it to stabilize for at least 24 hours prior to running the plug. This will help to minimize the fluid and gas movement during plug-back operations.
- f. Run a stiff full length drift down to the plug setting depth. The drift should have the same run-in diameter and length as the dump bailer tool string.

RECOMMENDED PLUG-BACK OPERATIONS

KEEP THE SITP PRESSURE STATIC THROUGHOUT THE ENTIRE PLUG-BACK PROJECT

1. Inspect the wellhead upon arrival at the wellsite. Record the SITP. Pressure up the lubricator using brine or glycol/water to the SIP prior to opening the swab valve on every run throughout the entire plug-back project. Do this on every run.
2. Make a dummy gauge run. Include thermometers to measure the temperature at plug setting depth. Identify and record the top of fluid level. POOH.

CAUTION

The **Neo**T-TBP is spring loaded in the setting sleeve. IF MISHANDLED, THE PLUG COULD PREMATURELY EJECT AND CAUSE SERIOUS INJURY. Never stand in-line with the setting sleeve when loaded with a plug.

ALWAYS HANDLE **Neo**T-TBPs WITH CAUTION

3. Whenever the well deviation at the plug setting depth is greater than 30° run one or two bow spring centralizers at the bottom of the **Neo** T-TBP Setting Sleeve.
4. Regardless of deviation always run one or two bow spring centralizers and a minimum of 150 pounds of weight bars above 7-5/8" and 9-5/8" **Neo** T-TBPs.
5. Run the **Neo**ReleaseTool and **Neo**T-TBP in the hole. Once you are at depth, locate the **Neo**T-TBP below the setting depth and slowly pull up, then;
 - a. Locate the bottom end of the **Neo**T-TBP at the depth that is one foot below the location where you want the cmt plug to begin,
 - b. Send dc power down the line, slowly increase the current to 450-500 milliamps, hold for 3-4 seconds, remove power, wait 30 seconds,
 - c. Repeat step b two more times (wait 30 seconds between repeats),

Note: Increased wireline length will affect line resistance. Additional voltage may need to be applied at surface to reach desired voltage at the tool head.

 - d. The bottom end of the plug will extend one foot out the end of the Setting Sleeve. The top of the metal-pedal platform is now located at the point where you want the cmt plug to begin,
 - e. POOH.
 - f. Skip to Step #7 if all of these steps were completed successfully.

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6. If your NeoT-TBP has not been properly ejected, refer back to your previously recorded distances to know where the closest set of perforations below you are located.
 - a. Continue lowering the NeoT-TBP until you have reached the perforations and the plug's lower anchors are able to catch onto the perforations,
 - b. POOH

Do not slack off weight onto the plug throughout the project.

7. Make up the dump bailer system to dump bridging material. Strap the entire CCL/bailer assembly to be certain that you can accurately locate the bottom of the bailer approximately 5-10 feet above the top of the plug. GIH with enough bridging material as discussed on the Due Diligence page. Locate the bailer 5-10 feet above the top of the plug and dump the bridging material. POOH.
8. Make up the dump bailer to dump the cement slurry. Strap the entire CCL/bailer assembly.
 - a. Fill the bailer with NeoSuperSlurry and GIH,
 - b. Reduce the rate of descent to 15 fpm (9,000 fph) once the bottom of the bailer is within 50 feet of the top of the plug,
 - c. Descend until the bailer is 1'-2' above the top of the plug,
 - d. Dump the slurry,
 - e. Wait 2 minutes, pick up 3 feet. Wait 2 minutes, then
 - f. POOH.

Refer to Due Diligence page for proper weight on cement times.

9. Redress the dump bailer.
 - a. Fill the bailer with NeoSuperSlurry, and GIH.
 - b. Reduce the rate of descent to 15 fpm (9,000 fph) once the bottom of the bailer is within 30 feet of the Vent Valve.
 - c. Descend until the bailer bottom is 1-2 feet above the top of cmt,
 - d. Dump the slurry.
 - e. Wait 2 minutes, pick up 5 feet, wait 2 minutes, then
 - f. POOH.
10. For vented NeoT-TBPs, repeat bailer runs until the cmt is within 12 inches to 18 inches of the vent valve. For non-vented NeoT-TBPs, there is no need to worry about the vent port and you can continue dumping cement
11. For vented NeoT-TBPs, the initial cmt plug is now in place. Wait at least 10 hours after the last dump bailer run before dumping the remaining recommended cement slurry.

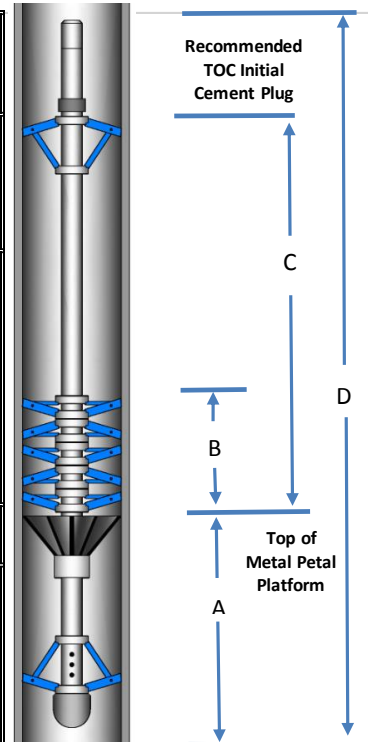
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12. Make up the dump bailer system needed to dump the remainder of the cement plug.
13. Fill the bailer with cmt. GIH, locate the bottom of the 1-2 feet above the top of cmt. Dump the slurry. Dump as much NeoSuperSlurry as needed to achieve the desired plug length.
14. **Maintain static well conditions in the well. Wait at least 24 hours after the last bailer run before producing the well or performing a pressure test.**

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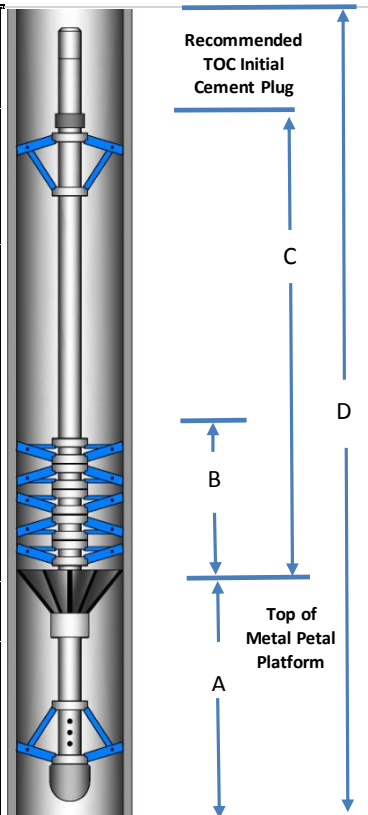
Size #1 NeoT-TBP Dimensions

NeoProducts Vented Thru-Tubing Bridge Plug (NeoT-TBP)					
NeoT-TBP API Csg Size	Sets in this API Csg Wgt Range	Plug Dimensions			
		A	B	C Recommended Initial Cmt Plug	D
2 3/8" - 4"	all weights (this is a NeoWideRange T-TBP)	34 3/4"	N/A	see running procedures (1 gallon of cement slurry for initial cement)	73 1/2" (6 ft 1.5in.)
Where to Position the NeoT-TBP to Accurately Place the Bottom of the Initial Cmt Plug					
The NeoT-TBP is placed in a spring loaded Setting Sleeve. When the plug is deployed it slides 12" - 18" out the bottom of the Setting Sleeve. In order to accurately place the Metal-Petal-Platform you must position the bottom of the plug 1 ft below the depth where you want the bottom of your cmt plug. Fire the release tool and the top of the Metal-Petal-Platform will be at the desired depth. The top of the Metal-Petal-Platform establishes the bottom of the cmt plug.					



Size #2 NeoT-TBP Dimensions

NeoProducts Vented Thru-Tubing Bridge Plug (NeoT-TBP)					
NeoT-TBP API Csg Size	Sets in this API Csg Wgt Range	Plug Dimensions			
		A	B	C Recommended Initial Cmt Plug	D
Standard length 4 1/2" - 7"	all weights (this is a NeoWideRange T-TBP)	30"	19"	see running procedures (maximum of 5 gallons of cement slurry for initial cement; a minimum of 1 ft of fill is needed for the initial cement)	176" (14 ft-8in)
Shorty 4 1/2" - 7"	all weights (this is a NeoWideRange T-TBP)	31"	18"	Contact NeoProducts with any questions.	100 1/2" (8 ft 4.5in.)
Where to Position the NeoT-TBP to Accurately Place the Bottom of the Initial Cmt Plug					
The NeoT-TBP is placed in a spring loaded Setting Sleeve. When the plug is deployed it slides 12" - 18" out the bottom of the Setting Sleeve. In order to accurately place the Metal-Petal-Platform you must position the bottom of the plug 1 ft below the depth where you want the bottom of your cmt plug. Fire the release tool and the top of the Metal-Petal-Platform will be at the desired depth. The top of the Metal-Petal-Platform establishes the bottom of the cmt plug.					



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7-5/8" & 9-5/8" NeoT-TBP Dimensions

NeoProducts Vented Thru-Tubing Bridge Plug (NeoT-TBP)					
NeoT-TBP API Csg Size	Sets in this API Csg Wgt Range	Plug Dimensions			
		A	B	C Recommended Initial Cmt Plug	D
Standard length 7 5/8"	all weights	30"	19"	see running procedures (maximum of 5 gallons of cement slurry for initial cement; a minimum of 1 ft of fill is needed for the initial cement)	176" (14 ft-8in)
Shorty length 7 5/8"		31"	89"		100 1/2" (8 ft 4.5in.)
Standard length 9 5/8"	all weights	35.75"	55"	Contact NeoProducts with any questions.	180" (15 ft)
Shorty length 9 5/8"		30"	55"		130" (10 ft 10in.)
Where to Position the NeoT-TBP to Accurately Place the Bottom of the Initial Cmt Plug					
<p>The NeoT-TBP is placed in a spring loaded Setting Sleeve. When the plug is deployed it slides 12" - 18" out the bottom of the Setting Sleeve. In order to accurately place the Metal-Petal-Platform you must position the bottom of the plug 1 ft below the depth where you want the bottom of your cmt plug. Fire the release tool and the top of the Metal-Petal-Platform will be at the desired depth. The top of the Metal-Petal-Platform establishes the bottom of the cmt plug.</p>					

