

Rejuvenation Instructions

#452 – Injection Tools – iUPR & SPR



This NRI covers the following:

- How to attach the injection tools for iUPR and SPR applications.
- How to load plug pins into the injection tool.

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WARNING: It is dangerous working around energized high-voltage systems, pressurized systems, and chemicals. Always work in accordance to the Novinium Field Operations Safety Handbook (FOSH) or other local governing safety standards.

Table of Contents

Injection Tool (IT)	3
1. Load the plug pin.....	3
2. Seat the injection tool saddle on the IA.....	5
3. Insert the injector gadget into the saddle.	8
4. Install the plug pin into the IA.....	9
5. Store the injection tool.	9
Quick Disconnect Injection Tool (QDIT)	10
1. Seat the QDIT.	10
2. Inject and remove.	11
Live-Front Access Interface (LFAI).....	12
1. Seat the LFAI.	12
2. Inject and remove.	13

Injection Tool (IT)

The injection tool is the main way of injecting cables during the SPR process. It houses the plug pin needed to seal the injection adapter (IA) after injection is complete. It requires manual operation for loading plug pins and to press the plug pin into the IA.

- Overtightening parts of the injection tool can lead to damage and malfunctions in future uses.
- **Do not attempt to take apart the injection tool without the aid of instructions.**

1. Load the plug pin.

a. Choose a plug pin for the application:

- A standard red pin for normal installation (OD 0.093”).
- An oversized blue pin to replace a leaky red plug pin or the IA has been re-drilled (OD 0.094”).

b. Look at the pin. The tapered end should be painted.



Figure 1: Red and blue plug pins.

c. Examine the plug pin inserter tool for functionality.

d. Depress the plunger to make sure that there is no sticking and that it moves smoothly.



Figure 2: Check the inserter tool to make sure it is functioning properly.

- e. Insert the tapered end into the plug pin inserter tool.



Figure 3: Insert the pin's tapered end first into the plug pin inserter tool.

- f. Fully wheel back the plug pin insertion knob on the injector gadget.
 - The press pin should retract back into the gadget.

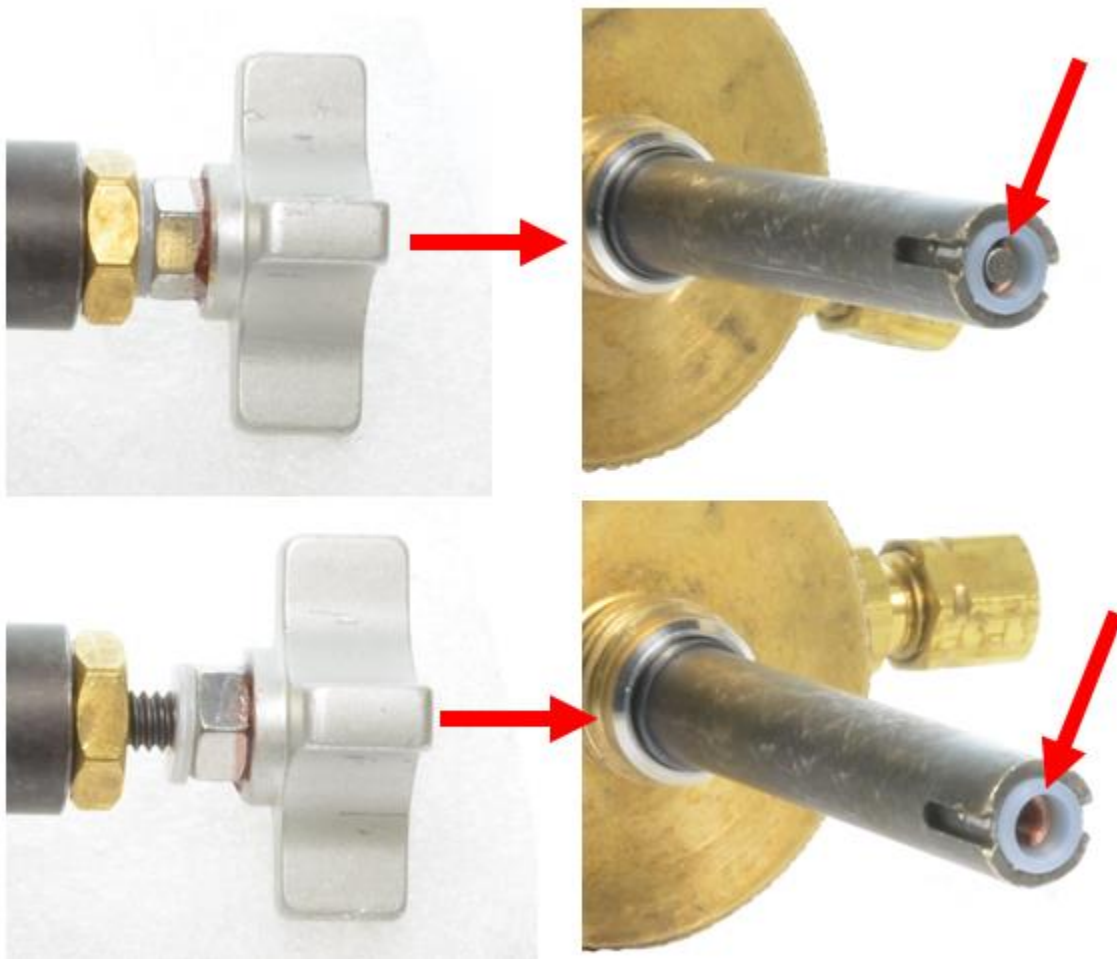


Figure 4: Wheel out the press pin in the gadget.

- g. Mate the injector gadget with the plug pin insertion tool.
 - The gadget meeting with the tool can be felt.

- h. Hold the two together and fully depress the plunger on the insertion tool.
 - The insertion tool should “rise up” a little after inserting the plug pin fully.

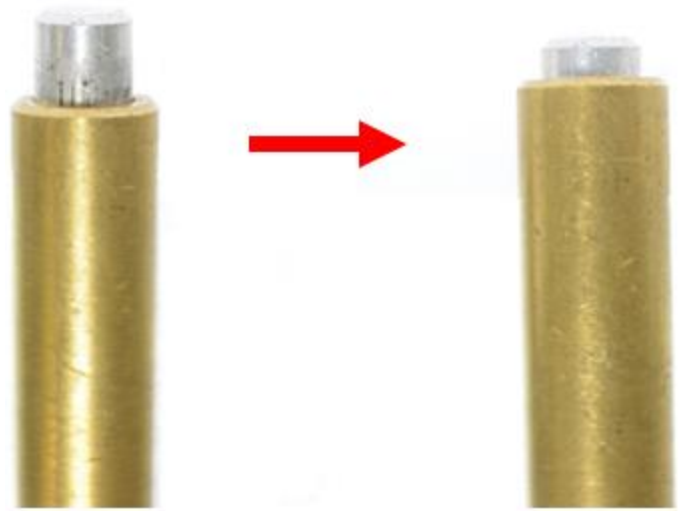


Figure 5: Depress the plunger to insert the plug pin.

- i. Confirm that the colored, tapered end of the plug pin is visible, held secure, and centered in the injector gadget.
- j. Check that the plastic sealing bushing is not damaged.



Figure 6: The colored tapered end of the plug pin is visible.

2. Seat the injection tool saddle on the IA.

- a. Look at the tip of the alignment pin to see if it is damaged or bent. If it is, replace the alignment pin.
 - A bent or damaged pin can damage the IA or lead to an improper seal.



Figure 7: Examine the alignment pin’s tip for damage.

- b. Insert the alignment pin into the injection tool saddle.
- c. If the alignment pin is the threaded metal variety, gently screw the knurled knob partially into the aluminum hand knob on the injection tool saddle.
 - Do not use tools to tighten the knurled knob. Overtightening can damage the alignment pin, saddle, and IA.



Figure 8: Alignment pin goes into the saddle.

- d. Draw the saddle's brass block fully back by turning the aluminum hand knob counter-clockwise.
 - The tip of the alignment pin should stick out on the bottom of the saddle.



Figure 9: Wheel the brass block back and check for the pin tip.

- e. Insert the tip of the alignment pin into the IA's injection hole.



Figure 10: Seat the saddle onto the IA's injection hole.

- f. Hold the saddle and wrap the chain around the middle section of the IA.

- g. Hook the chain onto the saddle's hook to hold the chain in place.



Figure 11: Hook the chain onto the saddle.

- h. Square the chain on the IA's body. This is important to prevent leaks and from damaging the IA.
- i. Rotate the hand knob clockwise to extend the brass block to tighten the chain.
 - **Do not use tools to tighten the knurled knob. Overtightening can damage the alignment pin, saddle, and IA.**
 - The saddle only needs to be tight enough to not move.
 - The saddle does not seal in fluid.



Figure 12: Square the chain.

- j. Pull out and push in the alignment pin into the saddle. There should be no resistance in doing so and a clear path to the injection hole should be visible.
 - If removing and replacing the alignment pin is difficult, loosen and reset the saddle on the IA.



Figure 13: Check for ease of removal and insertion.

3. Insert the injector gadget into the saddle.

- a. Double check that the plug pin is still inside the injector gadget.
- b. Insert the injector gadget into the saddle.
 - The 1/8" tube fitting should line up perpendicular to the IA and in line with the chain.
 - The two slots in the end of the seal tube should meet with the two pins in the saddle's throat.
 - The injector gadget will resist a gentle rotation when engaged.



Figure 14: Insert the injector gadget.

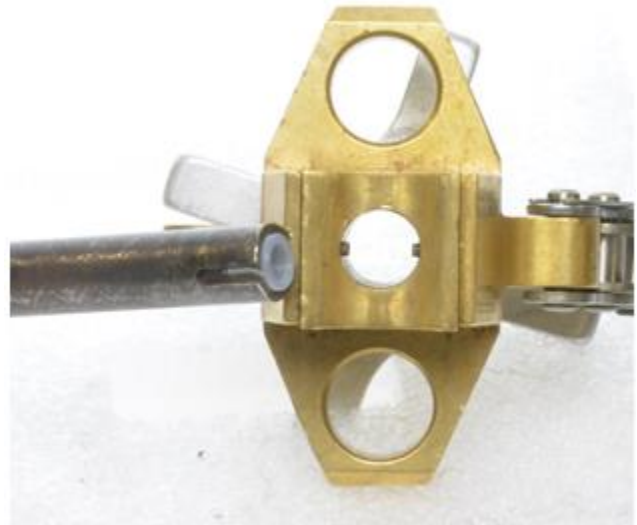


Figure 15: Align the gadget with the saddle pin.

- c. Rotate the brass knurled knob clockwise to tighten the injection gadget to the saddle.
 - The plastic sealing bushing should seal against the IA.
 - **Do not use tools to tighten the knurled knob and do not overtighten.**
- d. Inject the cable.

4. Install the plug pin into the IA.

- a. After injection is complete, rotate the plug pin insertion knob clockwise until the small aluminum hex nut contacts the plastic washer.
 - The plug pin should now be pressed into the IA's injection hole.
- b. Fully back out the insertion knob.
 - Doing so will make loosening the knurled knob easier, reducing the chance of damaging the injection tool.
- c. Loosen the brass knurled knob to remove the injector gadget. There will be a small amount of fluid present on the IA.



Figure 16: Turn the insertion knob to drive the plug pin in.

- d. Check to see if the IA is leaking around the plug pin.
 - If the plug pin leaks, load a blue oversized plug pin into the injector gadget and press it into the leaking pin.
 - The standard pin is pushed into the IA and is replaced with the larger pin.
- e. Check for leaking again. If there are no leaks, loosen the aluminum hand knob and remove the saddle.

5. Store the injection tool.

- a. Re-insert the injector gadget into the saddle.
- b. Draw the saddle's brass block fully back.
- c. Partially thread the brass knob into the saddle.



Figure 17: Hook the chain and partially thread the gadget.

- d. Place a paper towel wad on the bottom of the saddle.



Figure 18: Use the chain and a paper towel to protect the gadget's tip.

- e. Hook the chain onto the saddle's hook to hold the paper towel in place in order to protect the tip of the injector gadget.
- f. For storage, the injection tool may be hung from an injection tank by the chain.

Quick Disconnect Injection Tool (QDIT)

Sometimes Live-front terminations will be injected by SPR, but the cable cannot be kept out of service until the injection is finished. In this case, the Quick Disconnect Injection Adapter (QDIA) and Quick Disconnect Injection Tool (QDIT) can be used to begin injection, to re-energize the cable, and to remove (using a hot stick) the injection equipment when complete.

1. Seat the QDIT.

- a. Finish installing the QDIA and the live-front termination body.
- b. Check the injection cup for the O-ring seal and pin and for any damage.
- c. Loosen the brass knurled knobs on the threaded rods to give room for the QDIA.



Figure 19: Check the cup.



Figure 20: Loosen the knobs for fitting.

- d. Pull the spring plunger to release the bolt being held, if you have not done so already.



Figure 21: Release the bolt.

- e. Position the QDIT around the QDIA. Center the injection cup over the QD fitting.
- f. Press the injection cup's pin into the QD fitting.
- g. Hold the tool in position and pull the spring plunger straight out.
- h. Place the bolt into the slot and feed the plunger into the bolt.
- i. Tighten the brass knurled knobs evenly and only to finger tight.
- j. Avoid applying torque to the QDIA. The QDIT must be positioned squarely on the IA.



Figure 22: Position the cup over the fitting.

2. Inject and remove.

- a. Inject the cable.
- b. After injection is complete, use a hot stick to grab the carabineer.



Figure 23: Remove using a hot stick.

- c. Pull the carabineer and release the QDIT from the QDIA.
- d. Control the hot stick and bring the QDIT away from the live-front termination.

Live-Front Access Interface (LFAI)

Live-front terminations injected by iUPR require using the Terminator Fluid Injection Cap (TFIC), which interfaces with the Live-Front Access Interface (LFAI). The LFAI is equipped with a quick disconnect feature that allows injection while energized and removal via hot stick when injection is completed.

1. Seat the LFAI.

- a. Finish installing the TFIC and live-front termination body.
- b. Check the injection cup for the O-ring seal and pin and for any damage.
- c. A zip tie may be attached to the release lever for hot stick removal from the TFIC after the injection is finished.



Figure 24: Check the cup.



Figure 25: LFAI with zip tie attached to release lever

- d. Back off the wing-nut until the tool easily fits around the TFIC.
- e. Center the LFAI's cup over the TFIC's injection port.



Figure 26: Position the cup over the valve.

- f. Press the LFAI's pin into the injection port and hold.
- g. Wrap the tensioning strap around the TFIC.
- h. Hook the metal ring on the tensioning strap onto the release lever.
- i. Pull the release lever toward the LFAI's body to pull the tensioning strap tight.



Figure 27: Hold tight by pulling the release lever.

- j. Lightly tighten the wing-nut on the tensioning rod to fine tune how tight the TFIC is held.
 - **Do not over-tighten the wing-nut or else the tool can be damaged.**
- k. Check the cross bar for proper tightness.
 - The LFAI's cup should not separate from the TFIC's injection port if the cross bar is tugged.

2. Inject and remove.

- l. Inject the cable.
- m. After injection is complete, use a hot stick to grab the release lever.
- n. Pull the metal ring away from the LFAI to release it from the TFIC.
- o. Control the hot stick and bring the LFAI away from the Live-Front termination.



Figure 28: Remove using a hot stick.