



Rejuvenation Instructions Power Cables IT (Injection Tool) Installation & Removal

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- Ultrinium[™] sustained pressure injection method (U.S. Patent 7,615,247)
- Ultrinium[™] formulation optimization injection method (U.S. Patent 7,611,748)
- Injection Adaptor (U.S. Patent 7,195,504 and 7,538,274)
- Perfectium[™] single switch injection (U.S. Patent 7,353,601)
- Predicting performance of Electrical Power cables (patent pending)
- Formulation of Ultrinium[™] & Perficio[™] components (patents pending)
- N-Rex[™] submarine cable injection process (patent pending)
- N-Ter[™] injection or Novinium thermally enhanced rejuvenation (patent pending)
- Reticular Flash Preventer (RFP) provides safer operation of conventional injection elbows (patent pending)

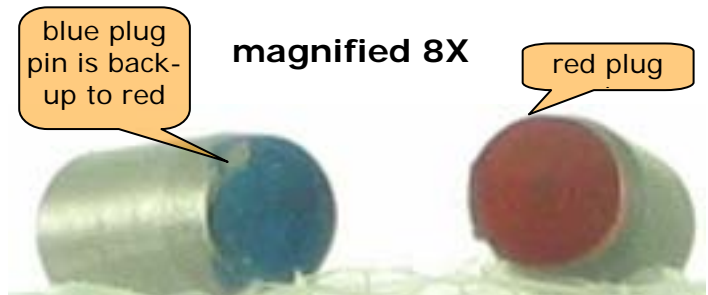
Version 20100624

IT (Injection Tools) Installation & Removal

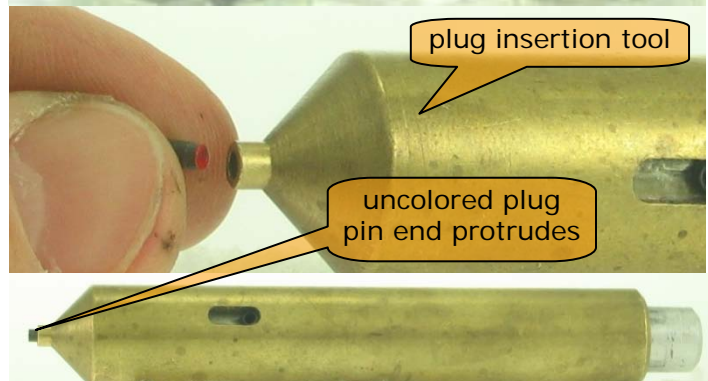


Caution: Working around energized high-voltage systems may cause serious injury or death. The procedures in these instructions should be performed by personnel familiar with good safety practice in handling high-voltage electrical equipment. De-energize, test and ground all electrical systems before proceeding.

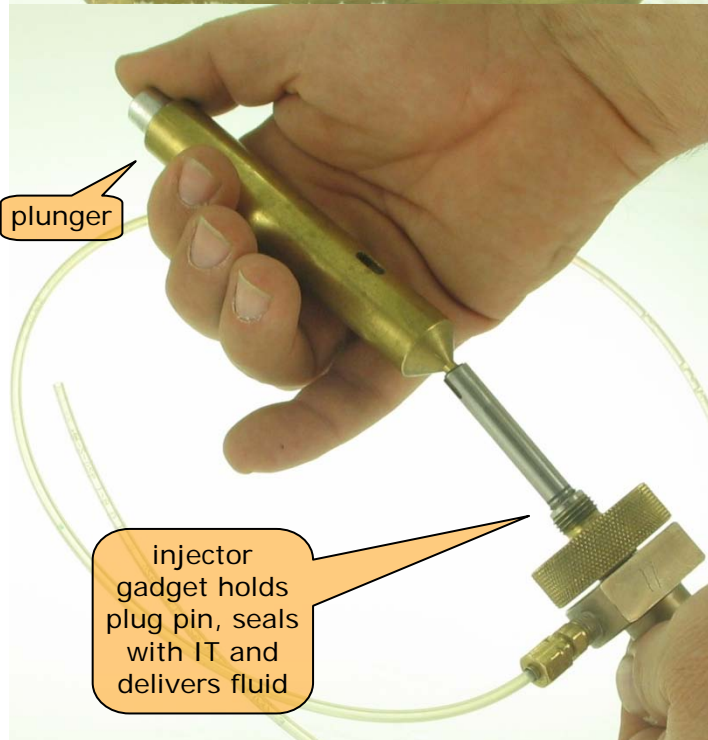
1. Choose a red plug pin (NPN 1-IA-PP) for normal installation or the slightly oversize blue plug pin (NPN 1-IA-PP-OVER) to replace a leaky red plug pin. The chamfered shoulder on the colored end guides the pin into the injection port during insertion in step 14.



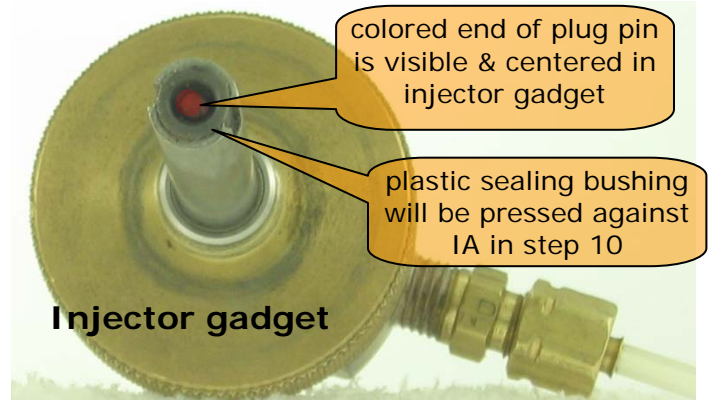
2. Insert the colored end of the plug pin into the hole at the tip of the plug insertion tool (NPN: O-IT-PP-INSERT).



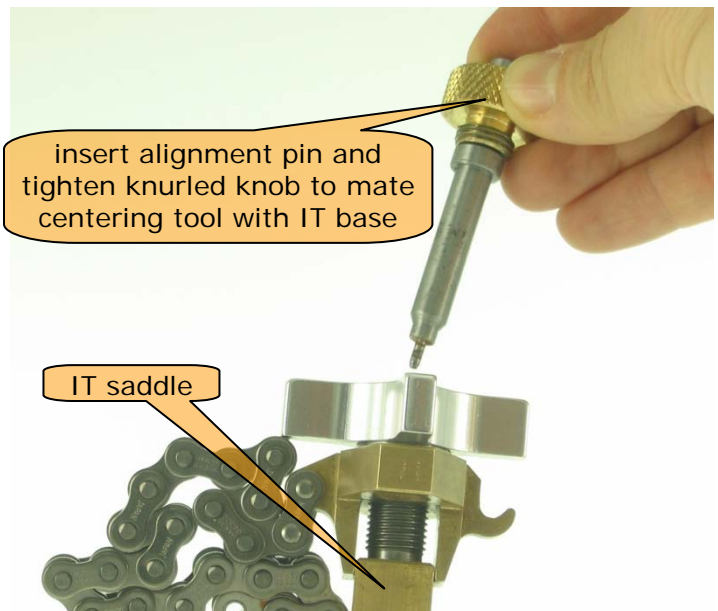
3. Insert the plug pin and a portion of the plug insertion tool tip into the recessed collet on the end of the injector gadget and push the aluminum plunger. The injector gadget is a sub-assembly of the injection tool or IT (NPN: O-IT-ITOOL).



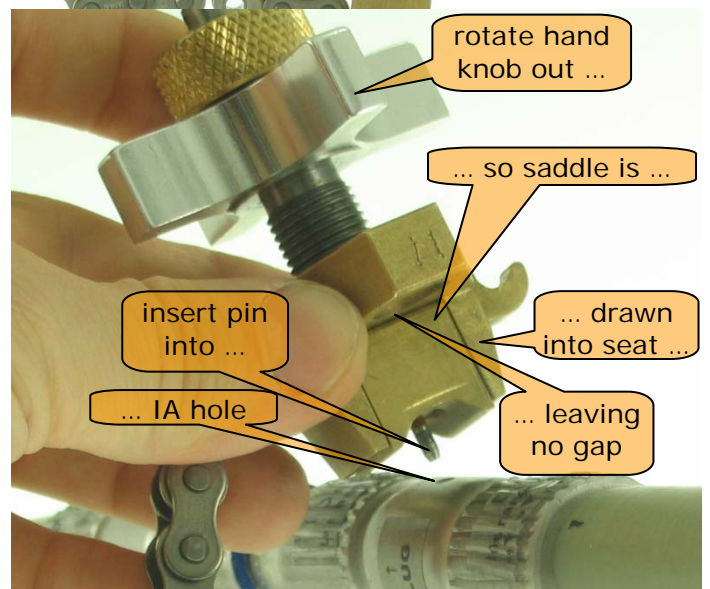
4. Confirm that the colored end of the plug pin is visible, held securely, and centered in the injector gadget. Confirm that the plastic sealing bushing is not damaged.



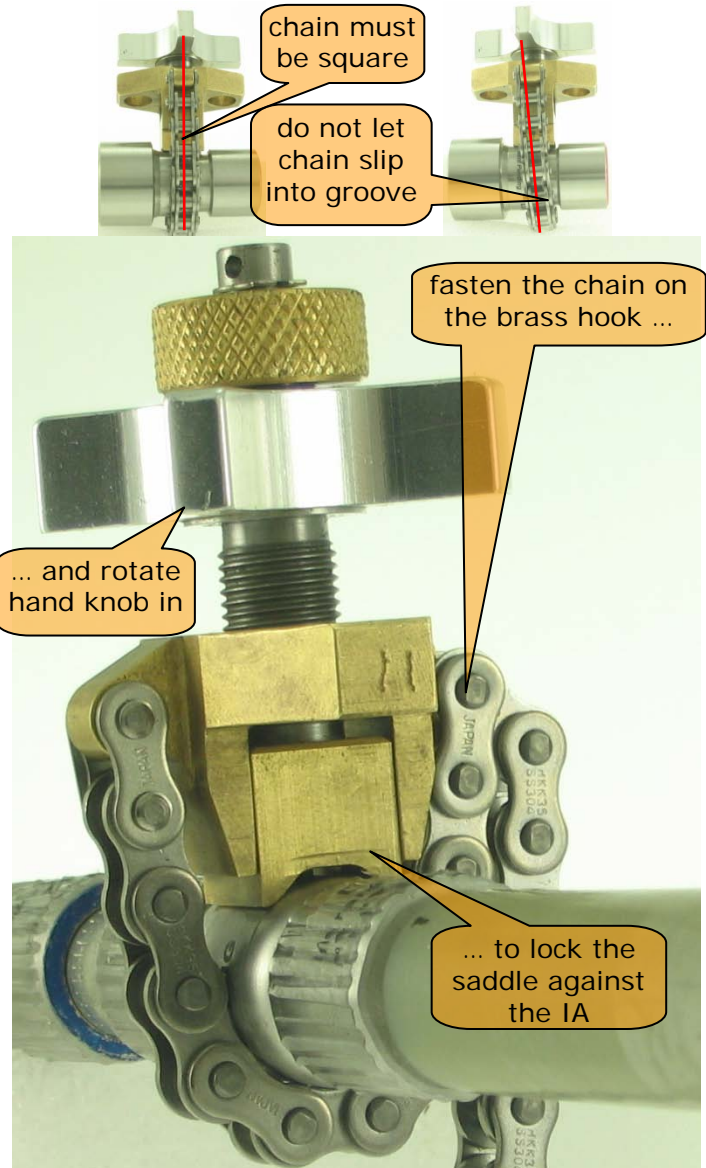
5. Insert the alignment pin (npr: 2-it-itool/pin) into the IT saddle and gently thread them together with the knurled knob. Do not use any hand tools. Do not over tighten.



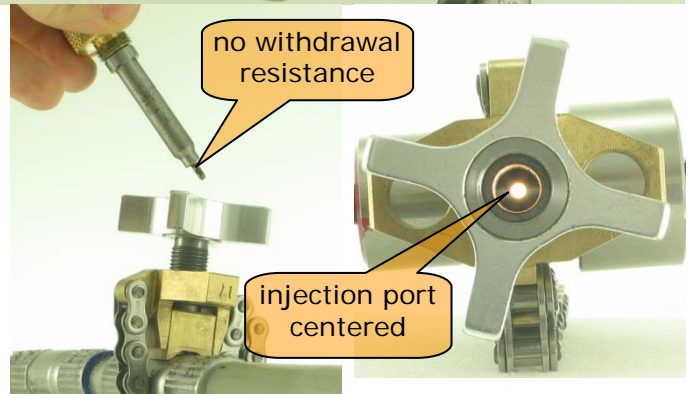
6. Rotate the aluminum hand knob of the IT saddle counterclockwise to draw the brass saddle into its brass seat. Insert the centering pin into the injection hole on the IA.



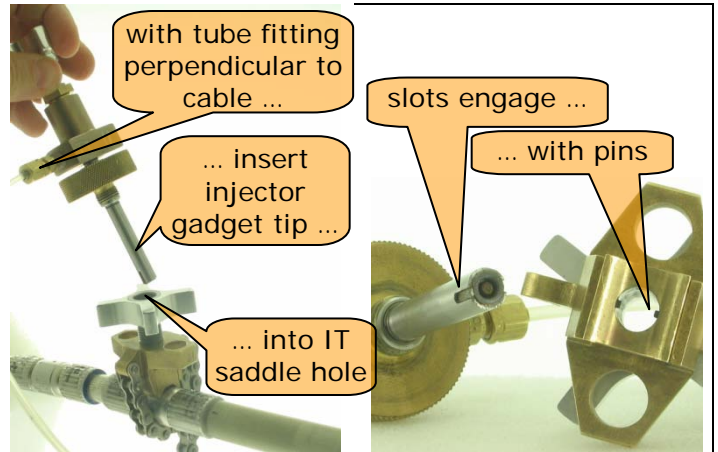
7. Wrap the chain around the IA waist and hook the chain on the brass hook. Make sure the chain is square around the IA waist and does not slide into adjacent groves. Rotate the aluminum hand knob clockwise to press the saddle against the IA waist. Do not over tighten the hand knob. Do not use a hand tool to turn the hand knob. The saddle needs only to be tight enough so that it does not move. The saddle does not seal the fluid.



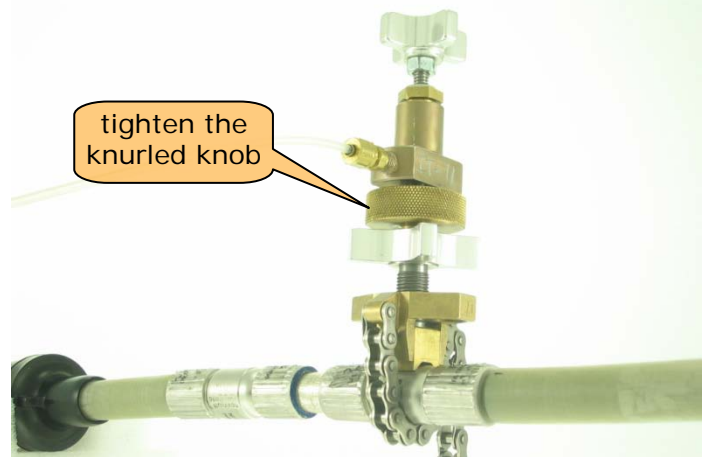
8. Withdraw the centering tool from the IT saddle by turning the brass knurled knob counterclockwise. There should be no resistance to the removal of the centering pin and there should be a clear view down the shaft to the centered injection port.



9. Confirm plug pin is still in place from step 4. Insert the injection gadget into the IT saddle. The injection tube fitting must be perpendicular to the IA and cable so that the two slots on the gadget tip engage with the two pins in the saddle throat. When the pins are engaged in the slots the injector gadget will resist gentle rotation.

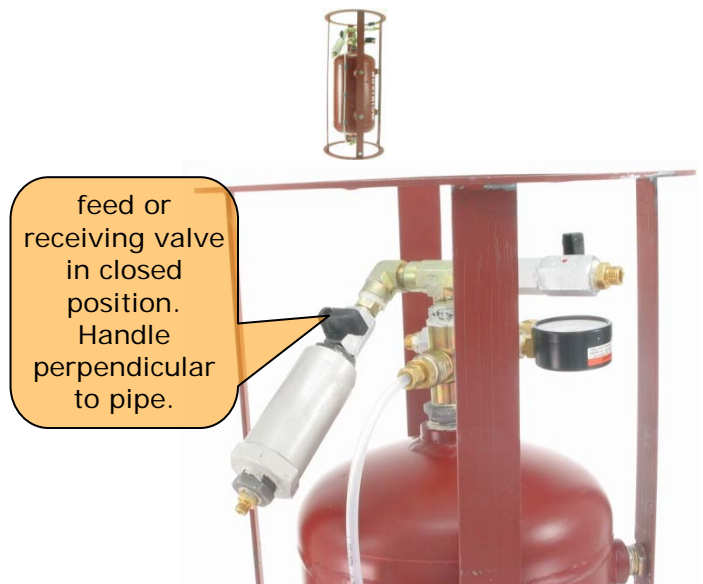


10. Rotate the brass knurled knob clockwise to connect the injection gadget to the IT saddle and to press the plastic sealing bushing (see illustration in Step 4) against the IA to complete the seal. Do not over tighten. Do not use a hand tool on the knurled knob.



11. Repeat steps 1-10 for the other end of the cable segment or subsegment.
12. Inject the cable segment or subsegment as per: Novinium Rejuvenation Instructions: Tailored Injection.

13. Confirm valves from pressurized feed or receiving tanks or rotometers are closed.



14. Rotate plug pin insertion knob (the smaller of the two aluminum knobs) clockwise until the hex nut touches the plastic washer to press the plug pin into the IA port hole.

Rotate the plug pin insertion knob counter-clockwise until it stops. This reduces the pressure of the fluid in the tool and makes loosening the knurled knob easier, which in turn reduces the chance of damage to the retaining ring.

Loosen the brass knurled knob and withdraw the injector gadget. There will be a drop or two of fluid that drips from the injector gadget end. Confirm that there are no leaks before proceeding. If fluid is leaking from a plug pin the larger (blue) plug pin can be inserted behind the leaking pin. This will push the smaller pin into the IA and replace with it with a larger diameter pin.

If there are no leaks, loosen the aluminum hand wheel and unhook the chain to remove the IT saddle.

15. After injection is complete and the plug pin is inserted flush with the IA exterior, install the component as per the manufacturer's installation instructions. Silicone grease may be applied to the IA exterior.

16. The Novinium Certified craftsman who is responsible for the quality of this installation shall place his/her "Novinium Certified" sticker (**NPN: 1-MI-CRFT-TAG**) over the plug pin. The sticker may optionally be covered with vinyl tape to assure it does not move during component installation.

