Terminating RFS LCF158 1-5/8” Corrugated Coaxial Cable with RFS Omni-Fit (F) N-Connector

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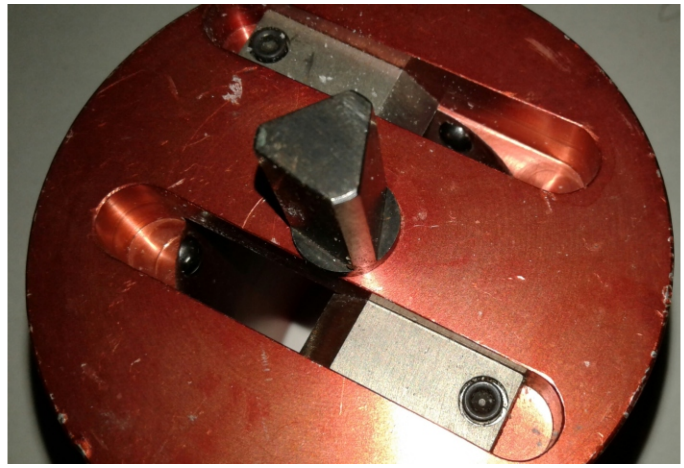
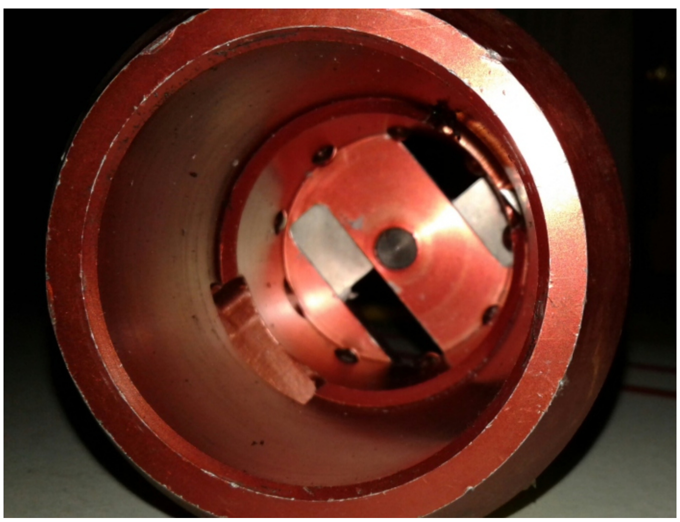
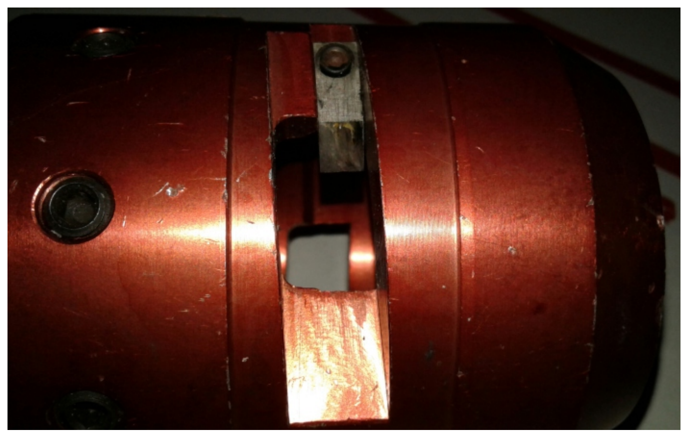
RFS TRIM-L-158-A Trimming and Stripping Tool







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Additional Tools Used for Termination

Drill press vice temporarily attached to trailer tailgate to secure cable during termination. Obviously, the spool of cable could not be just picked up and taken inside to the workbench.

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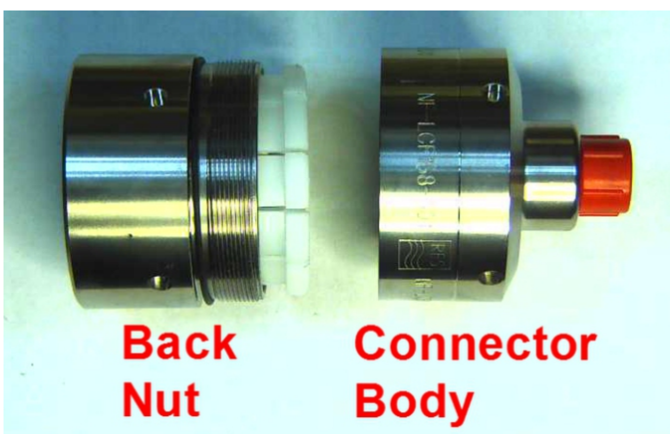

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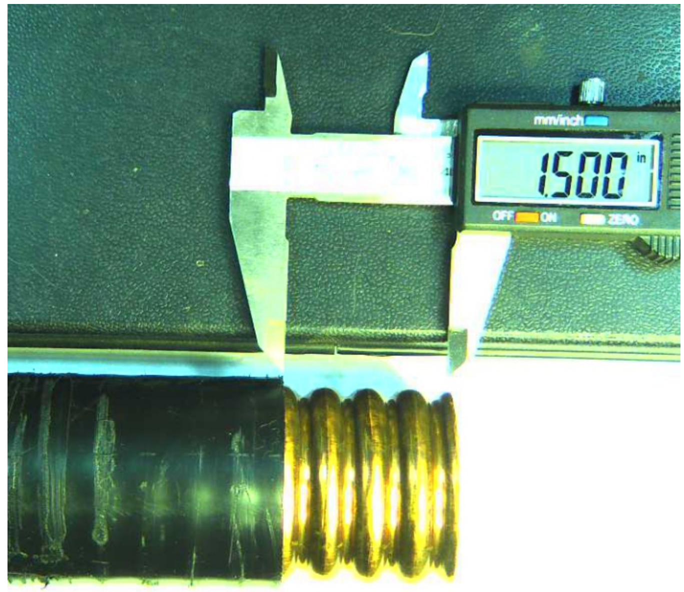
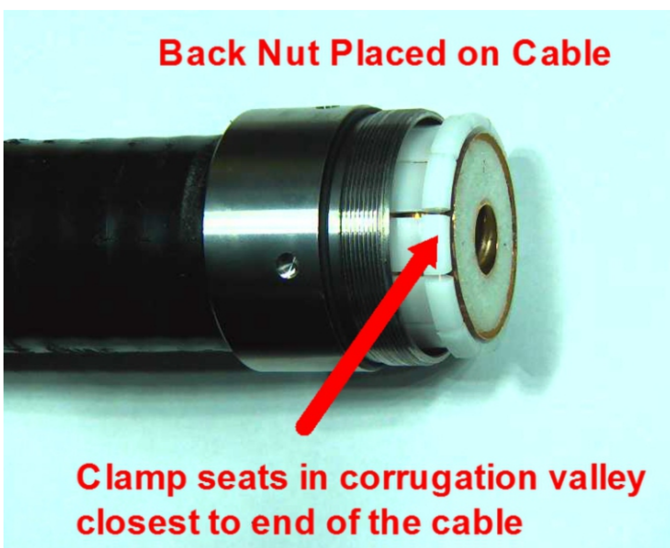
Installing the RFS NF-LCF158-D01 Female N-Type Connector

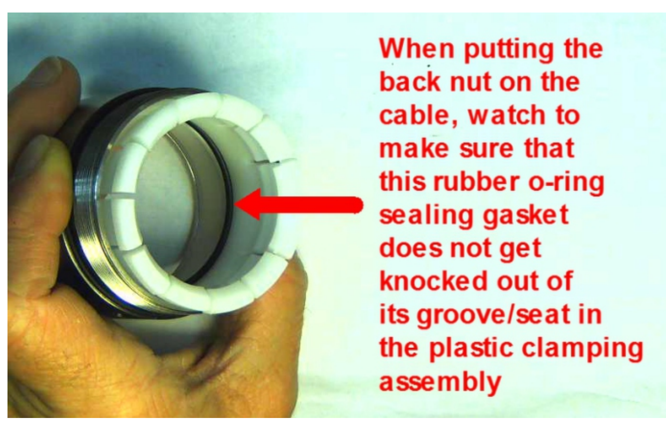
With the cable secured in the vise, the end of the cable was sawed as squarely on the end as possible. Then the RFS Trim Tool (attached to a cordless drill) was used to trim the cable. The Trim Tool is designed so that it will cut the end of the cable with the largest diameter of a ridge being the end/working face of the cable.



As can be seen in this photo, the Trim Tool removes exactly 1.5” inches of the cable outer jacket, and the remaining outer jacket ends on a ridge as it should for proper installation of the NF-LCF158-D01 connector. Using the proper Trim Tool eliminates the steps of over-cutting the outer jacket, applying the saw guide, and cutting the outer shield, foam, and inner conductor to 1.5” length.



After deburring the copper shield with a flat file, deburring the inner conductor copper with a utility knife, then carefully brushing away any copper, foam, and jacket debris with a non-metallic brush, the process of installing the connector begins by carefully pushing the back nut onto the cable.



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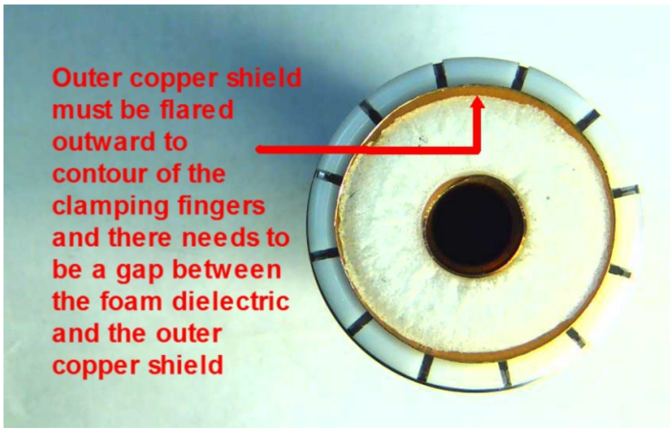
Installing NF-LCF158-D01 Female N-Type Connector (continued)



I have found that a screen roller works very well for flaring the copper shield outward to the shape of the end of the plastic clamping fingers. By carefully but fairly firmly rolling the slightly rounded edge of the screen roller tool around the inside of the copper shield while pushing outward on it, the shield gets the proper flare without being cut, gouged, or otherwise damaged. Once the outer shield is properly flared, if there is not yet a little bit of a gap between the foam dielectric and the outer shield, the rounded edge of a small screwdriver works well for pushing the outer edge of the foam toward the center conductor slightly, creating a gap for the ring in the connector to slip into without getting jammed up by the foam dielectric.

On the next page, you will get to see how I improvised (cheated?) because RFS Corp. designed these connectors to be installed using special 5mm pin-type spanner tools and a torque wrench. Unfortunately there are none of those special spanner tools to be found in the marketplace. RFS discontinued these particular "D01" series connectors, and I highly suspect RFS has totally discontinued the manufacturing of the spanner tools designed for installing them, meaning there may never be any more of those spanners available for purchase.

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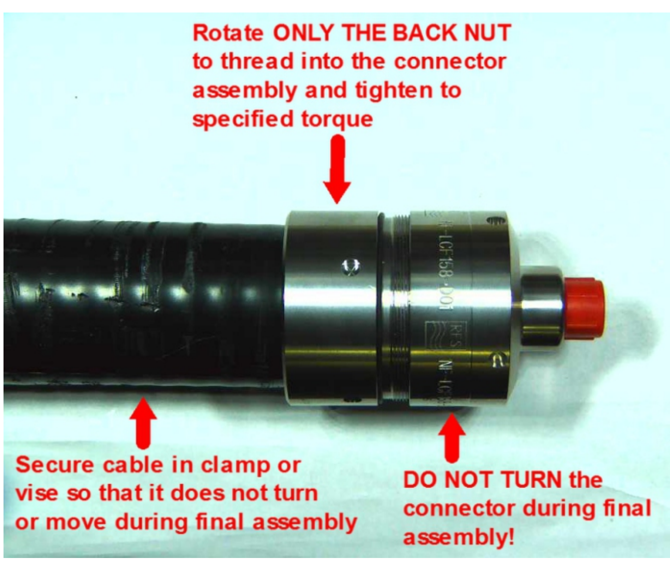
Installing NF-LCF158-D01 Female N-Type Connector (continued)

This is where I had to improvise/cheat on the connector installation. With none of the special spanner wrenches or Uni-Spanner adapters available, I had to come up with a "Plan B." There are no flat surfaces on these connectors to facilitate using a large "open end" wrench of any kind, and I did not want to use pipe wrenches, which could gouge the connector and back nut, possibly promoting corrosion of the connector. Enter the rubber strap wrenches I picked up at a well-known tool and hardware store. Those managed to give me a firm enough grip on the back nut and connector to firmly thread the back nut into the connector body. With these connectors, only the back nut should be turned – you do not want the connector body turning, because doing so can damage the metal fingerstock type flanges in the connector which press their way into the center conductor to make contact between it and the center conductor of the N-type connector (or DIN connector, if you happen to be using a DIN instead of N-type connector.)



Lacking the availability of the spanner wrench and adapters, there was no feasible means of using a torque wrench to tighten the back nut to the connector body to the factory specified torque. In deciding how tight to tighten it using the rubber strap wrenches, my logic was pretty simple:

Tighten it enough that the rubber O-Ring which sits between the back nut and the connector body is compressed enough for an obvious weatherproof seal, but not to the point that the O-Ring gets damaged or protrudes from the gap so much it means it's getting over-compressed. When this end of the cable gets pulled up the tower and the pigtail connector from the antenna gets attached to it via the N-connector, a specially sized piece of Cold Shrink will be applied which will weatherproof the entire union of the two cables including all of the connectors and some cable beyond those on both sides of the junction, so seal/weatherproofing will not be an issue.

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Sweeping the Installed Connector and Entire Spool of Feedline

Using the highly trusted and versatile IFR-1600S as a tracking generator in order to “sweep” the LCF158 1-5/8” cable, starting from the freshly installed N-connector.

The sunlight outside prevented the camera from being able to clearly capture the tracking generator/spectrum analyzer display on the IFR-1600S, but you can see portions of the first “dip” which was detected. Adjusting one of the markers to the center of that first “dip” it read to be roughly 0.3860 MHz,which you can see in the white highlighted area in the right-hand area of the display. That represents the first 1/4-wave frequency of the cable length. Seeing those dips meant the connector was properly installed.

The formula for determining the length of a cable in feet by sweeping it is 234 divided by the first 1/4-wavelength dip (in MHz), multiplied by the velocity factor (VF) of the cable. RFS specifications indicate a VF of 0.90 for LCF158 Cellflex cable.

Doing the math: 234 / 0.386 x 0.9 = 545.6 feet

This spool of cable was purchased to be 550 feet in length. The sweep method and calculations resulted in a very close match (within 0.8%) Plus keep in mind that some cable was sawed and cut off in the process of installing the connector. Bottom line: this feedline and connector tests good, is ready to be hoisted up the tower, the other end cut to the proper length, a connector installed at that end, and she’s good to go.

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