

# Fine Tuners

## For use in 3-1/8" and 4-1/16" Rigid Coaxial Transmission Line Systems

### Description

ERI Fine Tuners are used to improve the VSWR of Rigid Coaxial Transmission Line Systems. This publication does not describe the electrical tuning process. It describes the proper mechanical assembly of tuner devices. Common features of fine tuners include:

- Tuner probes with seals and locking nuts
- Extra seals and extra silicone grease
- One captivated inner connector
- Sliding flanges
- Hardware kit

### Captivated Inner Connector Installation

See Figure 1. Fully insert the bullet into one end of the inner conductor as shown. Use a small wrench to tighten the bolt, but do not overtighten. The inner connector fingers should not bulge the inner conductor tube. The bolt torque should be 3 lb-in or less. If the inner conductor tube is held in one hand and the exposed inner connector is held in the other hand, it should be extremely difficult, if not impossible, to pull them apart.

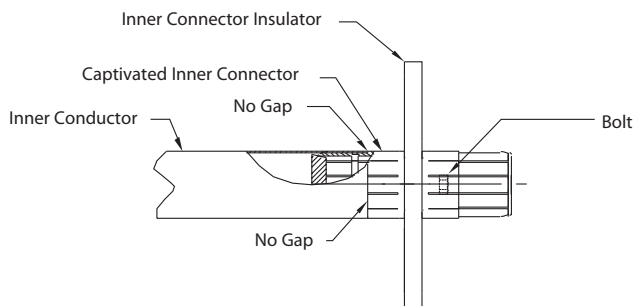


Figure 1

Look down the inside of the outer conductor to visually check how much gap is between the tuner disks and the outer conductor wall. The gap should be small approximately 1/16". See Figure 2. If there is no gap or if the gap is large, loosen the lock nut, move the probe with the screw driver slot and follow the Tuner Probe Installation procedure, below, to retighten the lock nut.

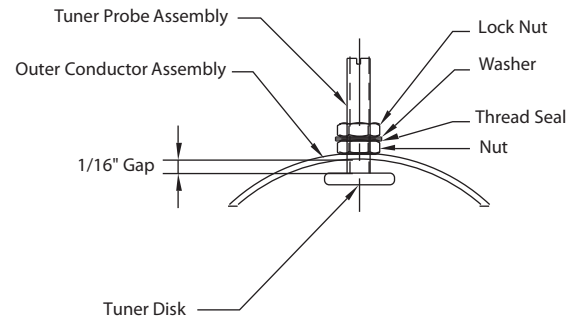


Figure 2

### O-Ring Installation

Seat the O-ring gasket in the flange gasket groove on one of the flanges. Be sure both the gasket and the groove are clean. Any foreign matter may prevent the assembly from holding pressure. A thin coat of silicone grease on the gasket will help hold the gasket in place during assembly. The electrical contact surface must be free of silicone grease.

### Tuner Installation

Depending on the direction of assembly, either join the tuner to the transmission line by inserting the inner connector on the tuner into the inner conductor in the transmission line or by sliding the tuner inner conductor onto the transmission line inner connector. Push the assembly together carefully, making certain that the gasket remains in place and that the inner connector insulator seats properly in the flange grooves. Rotate the sliding flange until the alignment pins are opposite the alignment holes then push the flanges together.

Add the connecting hardware, tightening the bolts finger tight only. Slowly rotate the tuner so that the probes are in a position where they can be adjusted easily during the electrical tuning. Alternately snug the hardware at 180 degree intervals, while keeping a uniform gap between the flanges. Continue to tighten the bolts in the same pattern recommended in the transmission line bulletin for the size line you are installing. Tighten the bolts until the torque reaches 21 lb-ft (28 N-m). The gap between the flanges must be uniform. Do not overtighten.

Repeat the procedure above for connecting the next transmission line component to the other end of the tuner using the procedures and precautions described.

## Tuner Probe Installation

Do not attempt to adjust the probes without guidance from the electrical engineer testing the assembled system. The lock nuts are set at the factory to hold pressure. When the electrical testing takes place, the lock nuts will be loosened one at a time as the individual probe is set. The seals should never be moved by sliding, they should always be rotated or the screw should be turned to prevent damage to the sealing material. After a probe has been set, even if it is not the final setting, the locking nut can be brought down to hold the setting. The locking nut should be gently screwed down with a small wrench until it and the washer just seat on the seal. When the final setting of the tuners has been completed, only a quarter to a half turn of the locking nut is sufficient to lock and seal.

## Leak Testing

Follow the pressurization instructions in the system bulletin. The maximum pressure rating for the tuner in a system is 2 to 3 psi. If a leak is detected around the adjusting screw, remove the lock nut, washer, and seal. See Figure 2. Take a new seal, lubricate all sides of the rubber, and screw it into position. Do not push it onto the screw. Reinstall the washer and the nut. Using a small wrench, gently screw the nut down until it and the washer just seat on the seal. Finish locking the nut by giving it a quarter to a half turn. Retest the system for leaks.

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## NOTICE

The installation, maintenance, or removal of antenna systems requires qualified, experienced personnel. Antenna systems should be inspected once per year by qualified personnel to verify proper installation, maintenance, and condition of equipment. ERI DISCLAIMS LIABILITY OR RESPONSIBILITY FOR THE RESULTS OF IMPROPER OR UNSAFE INSTALLATION PRACTICES.

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