

Instructions for Cobalt Series Cable Termination Kits

Introduction

This document details the procedure for terminating a cable with a Cobalt connector using a Blue Trail Engineering Cable Termination Kit. The Cable Termination Kit is available in four different pin counts (3-pin, 4-pin, 6-pin, and 8-pin) and two different connector shell sizes (regular and large).

- COB-3130-SS Cobalt 3-pin Cable Termination Kit, regular
- COB-3131-SS Cobalt 3-pin Cable Termination Kit, large
- COB-3140-SS Cobalt 4-pin Cable Termination Kit, regular
- COB-3141-SS Cobalt 4-pin Cable Termination Kit, large
- COB-3160-SS Cobalt 6-pin Cable Termination Kit, regular
- COB-3161-SS Cobalt 6-pin Cable Termination Kit, large
- COB-3180-SS Cobalt 8-pin Cable Termination Kit, regular
- COB-3181-SS Cobalt 8-pin Cable Termination Kit, large



In addition to the Cable Termination Kit, you will need a Cable Termination Tool of the appropriate pin count:

- COB-3230 Cobalt 3-pin Cable Termination Tool
- COB-3240 Cobalt 4-pin Cable Termination Tool
- COB-3260 Cobalt 6-pin Cable Termination Tool
- COB-3280 Cobalt 8-pin Cable Termination Tool



The termination procedure is essentially the same for all versions. This procedure requires intermediate soldering skills as well as familiarity with potting techniques used with 2-part epoxy or urethane.

The cable to be terminated must have a bondable outer jacket (preferably polyurethane). The diameter of the cable should be no greater than 6.0 mm for the regular connector shell size or 7.8 mm for the large connector shell size.

Included materials

The Cable Termination Kit includes:

- qty. 1. Connector Shell (regular or large)
- qty. 1 Connector Insert with pre-installed electrical sockets (3-pin, 4-pin, 6-pin, or 8-pin)
- qty. 1 Locking Sleeve
- qty. 1 #012 O-Ring

Required tools and materials

The following tools and materials are required:

- soldering iron
- wire strippers
- wire cutters
- multimeter
- drill press
- vise
- 150 or 200-grit sandpaper
- optional: 6mm ($\frac{1}{4}$ ") diameter grinding bit
- syringe with needle (3 cc syringe with 16G needle recommended)
- cotton swab
- acetone
- solder
- suitable epoxy or urethane adhesive*

*Blue Trail Engineering has tested two adhesives in this application: 3M DP-420 epoxy, and 3M DP-620 urethane with Forsch Polymers ADH 1001 primer. Other adhesives or potting materials may work, but it is the customer's responsibility to test them thoroughly in this application.

Procedure

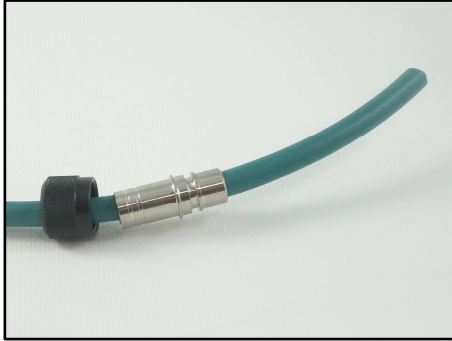
1. Use either a 6 mm (or $\frac{1}{4}$ ") grinding bit in a Dremel tool or a rolled-up piece of 150 or 200-grit sandpaper to thoroughly abrade the inside of the Connector Shell where the cable will enter. Do not abrade the 8.2-mm inner diameter portion where the Connector Insert will go.



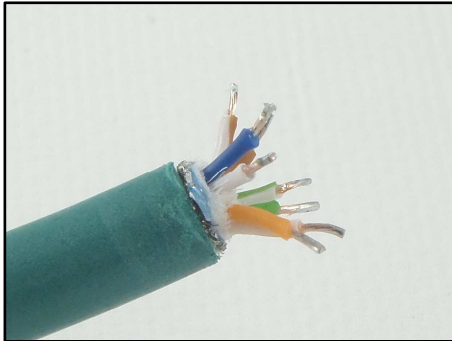
2. Clean the inside of the Connector Shell with a lint-free wipe soaked in acetone and allow to dry. If using a primer (recommended for urethane), apply the primer to the inside of the Connector Shell using a cotton swab or equivalent and allow to dry.



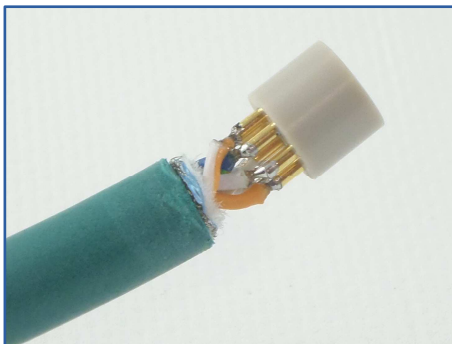
- Slide the Locking Sleeve onto the cable with the internally threaded part of the Locking Sleeve facing towards the end of the cable. Then slide the Connector Shell over the cable. The end of the Connector Shell that has the flat surface should be facing the end of the cable. Secure the Locking Sleeve and Connector Shell with tape to keep them in place during the rest of the process.



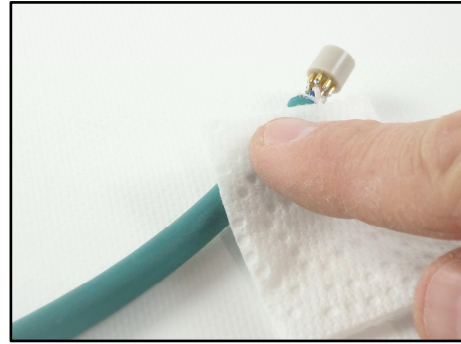
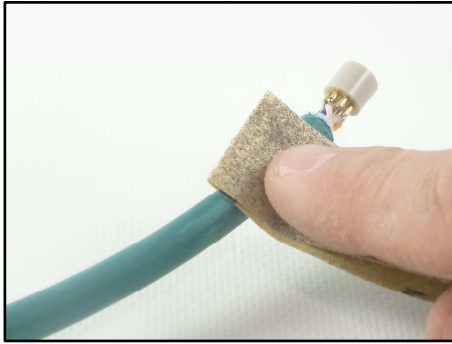
- Strip the last 1-2 cm of cable jacket off your cable. Trim the wires as close to the end of the cable jacket as possible, while still allowing enough room to solder them to the Connector Insert. Strip the last 5-6 mm of insulation off the wires. Make sure the strands of wire are tightly wound and that there are no loose or protruding strands which could cause an electrical short. Tin the ends of the wires with solder to prevent the wire strands from fraying.



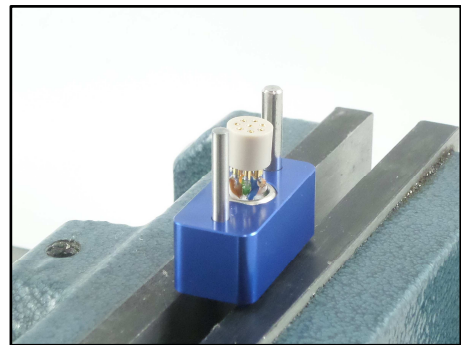
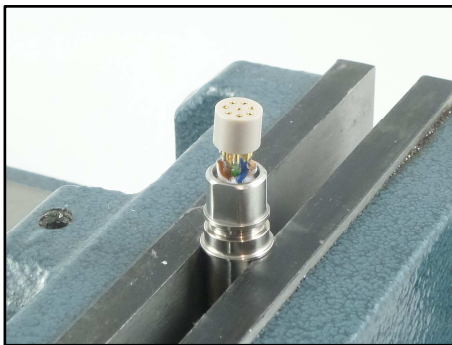
- Insert the wires into the sockets on the Connector Insert and solder them in place. It is very important to make a clean solder joint with minimal solder outside the joint – excess solder can cause shorts between the wires or between a wire and the Connector Shell. Double-check that each wire is soldered to the correct socket (the pinout will depend on the particular application).



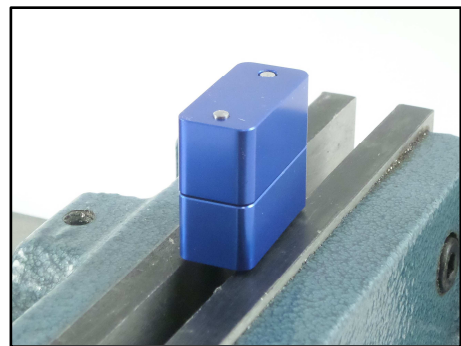
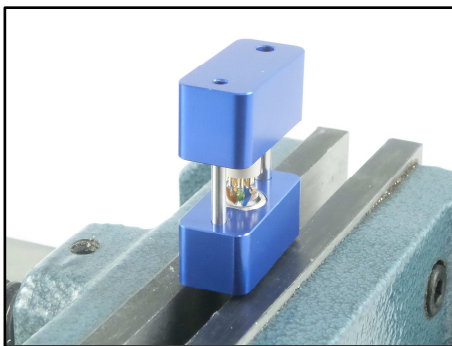
6. Abrade the last 3 cm of the cable jacket with sandpaper and clean with acetone to prepare it for potting. From this point on, be careful to keep this part of the cable jacket clean.



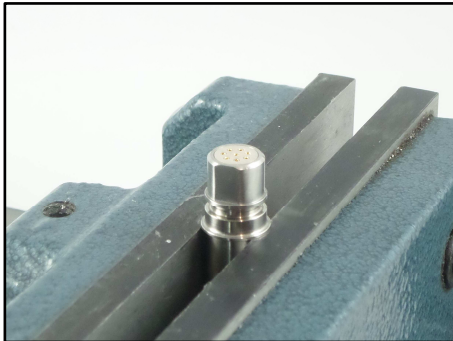
7. Visually inspect one more time for any stray strands of wire or solder. Once the Connector Insert is pressed into the Connector Shell, there will be no way to fix any electrical shorts.
8. Slide the Connector Shell down the cable towards the Connector Insert and gently clamp the Connector Shell vertically in a vise. Place the lower half of the Termination Tool over the Connector Shell, aligning the flats.



9. Slide the upper half of the Termination Tool onto the lower half of the Termination Tool. Insert the pins on the upper half of the Termination Tool into the sockets on the Connector Insert, rotating the Connector Insert as necessary to ensure the proper pinout for your application (make sure that the wires are in the desired alignment relative to the flat on the Connector Shell). Using a drill press or other press, push down on the upper half of the Termination Tool until the Connector Insert is pressed completely into the Connector Shell.



10. Remove the Cable Termination Tool. Ensure that the face of the Connector Insert is flush with the end of the Connector Shell. If not, put the Termination Tool in place again and press the Connector Insert completely into the Connector Shell.



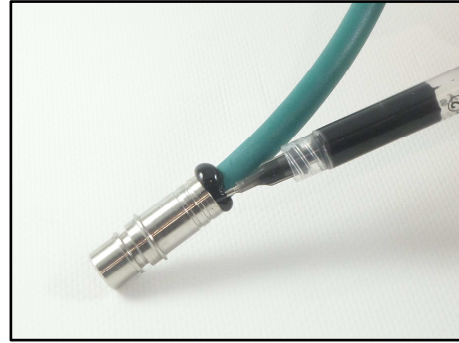
11. Use a multimeter to check for electrical shorts between the individual sockets and between each of the sockets and the Connector Shell.
12. Prepare the epoxy or urethane for the potting operation. It may be helpful to warm up the epoxy or urethane slightly to ensure that it flows easily. It should be at least at room temperature, preferably slightly warmer.



13. Install a mixing tip on the epoxy or urethane cartridge (mixing tips greatly reduce the amount of bubbles). Discard the first 1-2 ml of epoxy or urethane that comes out of the mixing tip. Insert the mixing tip deep into the syringe and inject the epoxy or urethane into the syringe. Try to fill the syringe without getting any air bubbles into the epoxy or urethane.



14. Insert the syringe with needle deep into the Connector Shell. Inject the epoxy or urethane into the Connector Shell until the epoxy or urethane starts to come out the rear of the Connector Shell. Move the cable around inside the Connector Shell to ensure that both the outer surface of the cable jacket and the inner surface of the Connector Shell are fully wetted with epoxy or urethane. Continue injecting epoxy or urethane while withdrawing the needle from the Connector Shell. Avoid injecting any air bubbles into the Connector Shell.



15. Clean off the excess epoxy or urethane with a paper towel and acetone or alcohol.



16. Allow the epoxy or urethane to cure fully without disturbing the assembly. When fully cured, check for electrical shorts one more time with a multimeter.
17. Lubricate the O-ring and install it in the groove on the Connector Shell, making sure that the groove and the O-ring are free from lint, hair, or other contamination.

