

How to select and use the right crimp terminals for your airplane.

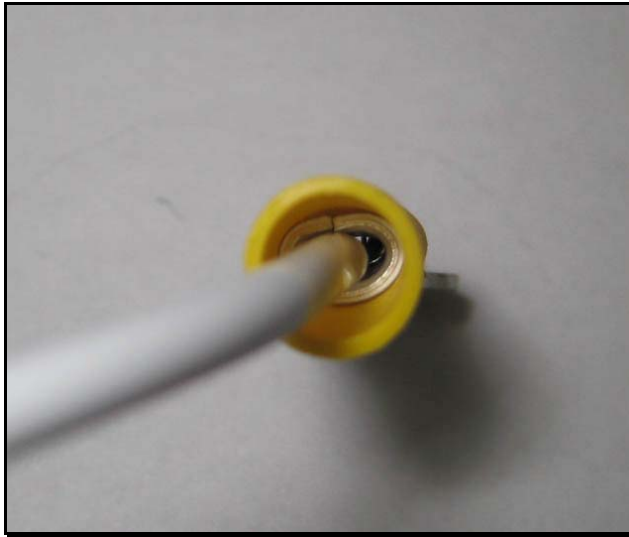
Recently I was inspecting an RV-8 that was close to first flight. The airplane had been wired entirely by the builder, and I found he had been using a type of crimp-on terminal throughout the airplane that is not suitable for aircraft. This is such a common mistake because the correct terminals and the wrong ones look so similar, and many builders are not even aware of the differences. Let's take a look:



At left is the “wrong” type of terminal to use in an aircraft, we’ll call this the automotive type. The terminal on the far left has an opaque yellow plastic jacket. The opaque plastic is the first clue that this is not for aircraft use. The terminal on the right has had its jacket removed, and it can be seen that the barrel where the wire inserts is a single piece.



Here is the terminal being crimped with a typical hand crimper. With this crimper there is no way to determine how hard to crimp the terminal. Too loose and the wire will pull out, too tight and the wire will break off with very little flexing. Also, the one-piece barrel does not hold the wire insulation to protect it from vibration.



This is looking at the back of the terminal where the wire enters. The metal barrel is crimped onto the stranded wire, but if you wiggle the wire back and forth a few times, the strands will begin to break.



Here is what the correct terminal looks like. The yellow jacket is transparent. The terminal on the right has the jacket removed and you can see the barrel is two separate parts, the forward part crimps onto the the wire strands, the back part crimps onto the wire insulation. A common brand of these terminals is the AMP PIDG series (Pre Insulated Diamond Grip), available from most electronics part suppliers.



This is the proper crimper. It has a ratcheting action so there is no guessing about how much to crimp. Just close it all the way onto the terminal then release.

This crimper is made by Ideal, and it is also available from most electronics part suppliers.



Here are jaws of the crimper. Notice on the bottom jaw there are two crimping surfaces, the forward surface for the forward part of the terminal, the rear surface for the rear of the terminal.

The colored dots (red, blue, yellow) correlate to terminal color, and the wire gauge range is shown on the upper jaws.

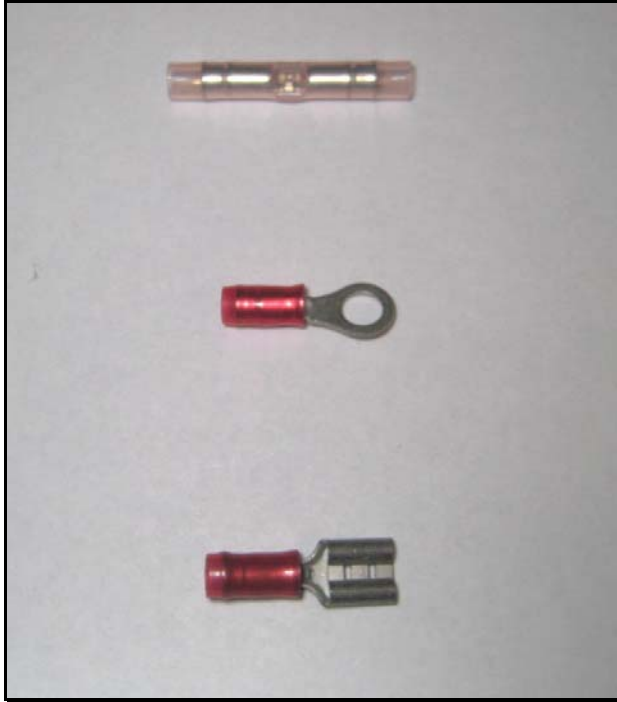


This is the crimper fully closed, the rear barrel can be seen crimped over the wire insulation. This will protect the wire from breakage due to flexing and vibration.



Here is the terminal fully crimped. The front portion is making firm contact with the wire strands, and the back part is crimped onto the wire insulation.

The wire can be bent and flexed without the wire breaking off from the terminal



Common crimp terminals in aircraft are:

TOP: Butt splice, used to connect two or more wires together.

CENTER: Ring terminal: used to connect wires to a threaded stud or screw.

Bottom: Push terminal, also called Fast-On, used to connect to tongue tabs found on some switches and other electrical components.

All of these types are available in the AMP PIDG line.

Simply using the correct terminals and crimper for all of your aircraft wiring will save you from troubleshooting broken connections in the future. It might even save you from a dangerous in-flight failure. These terminals cost incrementally more than the “automotive” type, but those have no place in your airplane.