

HOW TO CRIMP AN ELECTRICAL CONNECTOR

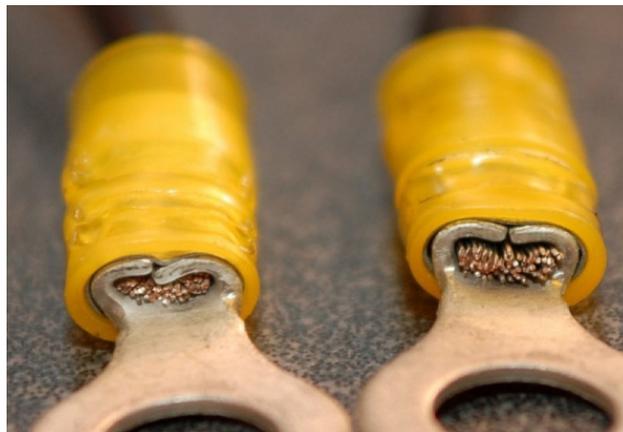
An electrical connector is a device for joining electrical circuits together using a mechanical assembly. The connection may be temporary or serve as a permanent electrical joint between two wires.

There are hundreds of types of electrical connectors. Connectors may join two lengths of wire together or connect a wire to an electrical terminal.



The Tool

The word crimping in this context means to join two pieces of metal together by deforming one or both of them to hold the other. The deformity is called the crimp.



The metal has been deformed to pinch the wire and hold it in place

In order to crimp connectors onto a wire, a special tool is required. Note: Pliers are not crimpers! Neither are hammers, vises, needle nose pliers or flat rocks. A good crimper when used correctly will make a cold weld between the wire and the barrel of the connector. If you were to cut a well executed crimp in half you would see a solid form of wire and connector. Using the wrong tool will not achieve a good crimp!

Why is this level of perfection required? A poor crimp leaves air pockets between the wire and connector. Air pockets allow moisture to collect, moisture causes corrosion, corrosion causes resistance, resistance causes heat, and may ultimately lead to breakage.



The top crimper will give better results, however the bottom one works just fine too

There are several different styles of crimpers available. The best crimper, shown on the top, has a built in ratchet. As the handles are squeezed together, it will ratchet and prevent the jaws from opening back up. When enough pressure has been applied, the ratchet will disengage and release the crimped part. This ensures enough pressure has been applied. This style of crimper also has a wide jaw to cover more surface area on the connector.

The crimping tool on the bottom can achieve nearly the same results, although it requires the user be much more vigilant. This style of crimper is generally less sturdy. Attention must be given while crimping to ensure the jaws are lined up properly on the connector.

Misalignment will cause a less than desirable crimp connection. Over time, wear and tear

from normal usage can also cause the jaws to become separated and not close fully. Generally, squeezing it as hard as possible will be sufficient.

Crimp the Connector

There are several arguments for and against using solid core wire with crimp connections. Many believe crimping to solid core wire creates a weak point in the wire, which can lead to breakage. There is also a greater chance for a crimp connection to come loose with solid core wire because the wire will not conform to the terminal as well. If you *must* use solid core wire, it is a good idea to solder the wire in place after you crimp it.

First, the correct size wire must be chosen for the terminal size, or vice versa. Next, strip the wire. The amount of exposed wire should be equal to the length of the metal barrel on the connector, usually around $\frac{1}{4}$ " or so. If the stripped wire fits up into the metal portion of the barrel with little or no free space, the connector is the right size.



A good length of wire to barrel ratio

Remember: If the wire does not fit in the barrel, or is excessively loose, the wrong size of either wire or connector was chosen.

The wire should then be inserted until the insulation on the wire touches the end of the barrel.



Good: The wire is sticking past the barrel just a little

The wire and terminal are then inserted into the crimper. The color of the terminal's insulation needs to be matched with the same color on the crimping tool. So if the terminal's insulation is red, use the spot marked by the red dot on the crimpers. Alternatively, if the crimper does not have color markings, use the gauge markings on the side.

The terminal should be sitting horizontal with the barrel side up. The tool is then held perpendicular to the terminal and placed over the barrel, nearest to the ring (or other connection type). To finish the crimp, the tool is squeezed with a considerable force. In general, it is almost impossible to 'over crimp' a connection.



After the crimp is completed, the wire and connector should still hold together after trying to pull them apart with great force. If the connection can be pulled apart, the crimp was not done

correctly. It is better to have the crimp fail now, versus after it has been installed in its application. Below is a military spec chart for crimped connections.

Wire size	Military Requirements
22	15 lb
20	19 lb
18	38 lb
16	50 lb
14	70 lb
12	110 lb
10	150 lb

Common Mishaps

Wrong size connector for the wire or wrong size wire for the connector.



Bad crimp. Connector was too small for the gauge of wire chosen.

Be cautious not to strip too much insulation off.



Too much insulation has been stripped off, too much bare wire exposed

It is also worth mentioning that, while not necessarily harmful, The wire should not be protruding too far past the barrel. If this happens, trimming the wire is recommended.



The excess bare wire should be trimmed off

Source : <https://learn.sparkfun.com/tutorials/working-with-wire#how-to-crimp-an-electrical-connector>