

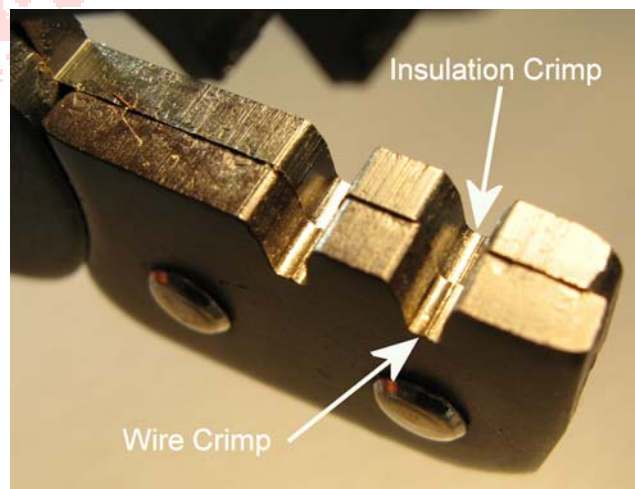
Servo Cable Connector Crimping Guide



The Crimping Tool showing the smaller slot (marked 24 - 28), the larger slot (marked 20 - 24) and the wire cutter



Crimping Tool head showing the slots and markings



The jaws of the crimping tool showing that it is "handed"

Left or right-hand use: Although the crimping tool may be used with equal ease whether you are left-handed or right-handed, it is important to note that the tool itself is "handed". The wider crimp (that grips the insulation) is on the side of the tool that bears the printed labelling, and the narrower crimp (that goes round the bared wire and makes the electrical connection) is on the plain side. Connectors must therefore always be offered to the tool with the cable on the lettered side of the tool and with the metal connector the correct way up. The following illustrations and descriptive text are for right-handed use of the tool, but we have provided notes at the end of this article detailing where procedures need to be "reversed" for left-hand use.

This crimping guidance covers the "universal" JR / Spektrum / Hitec type plugs, but the procedure is exactly the same for the Futaba type plugs.

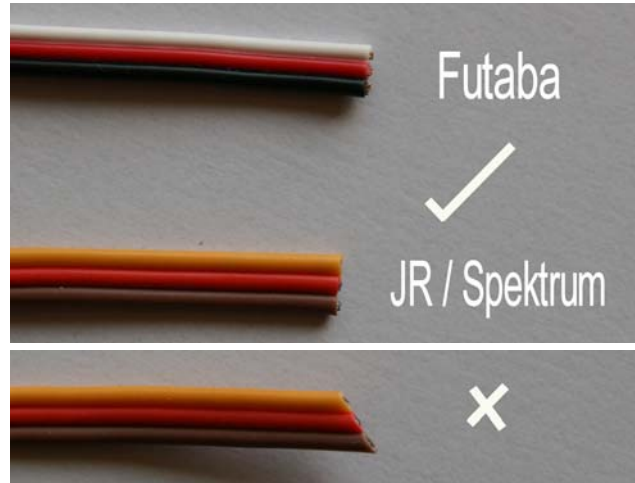
The gender terminology used in this guidance refers to the metal connectors and NOT the plastic plugs; i.e. the male connectors are the metal pins and the female connectors the metal sockets.

Important: For both the male and female connectors, crimping is a two-stage process. The larger crimping tool slot is used first, followed by the smaller slot. The larger slot guides the crimp tabs around the cable and the smaller slot completes the crimping process and fully tightens the crimp.

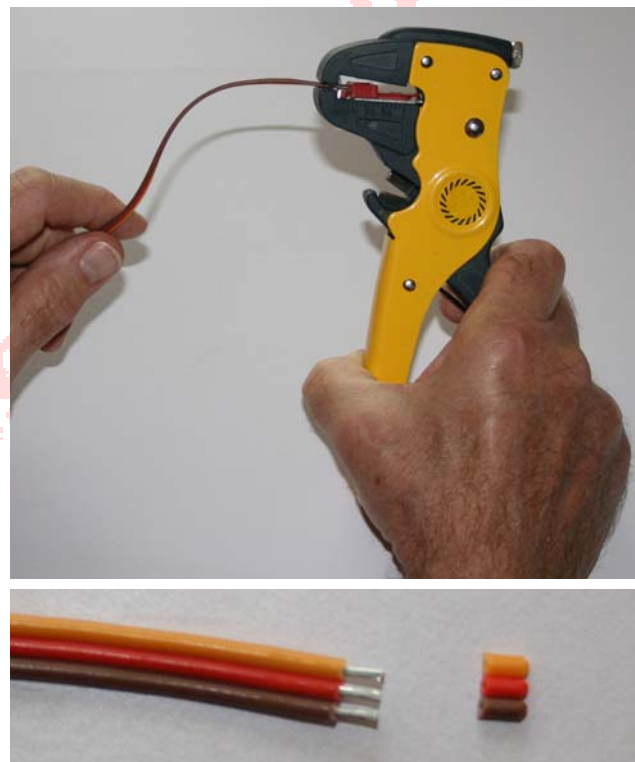
Please do not be tempted to try to form the crimp in one go by just using the smaller slot - you will almost certainly distort or break the tangs of the metal connector, and the resultant crimp will be of inferior quality and reliability.

Crimping Procedure

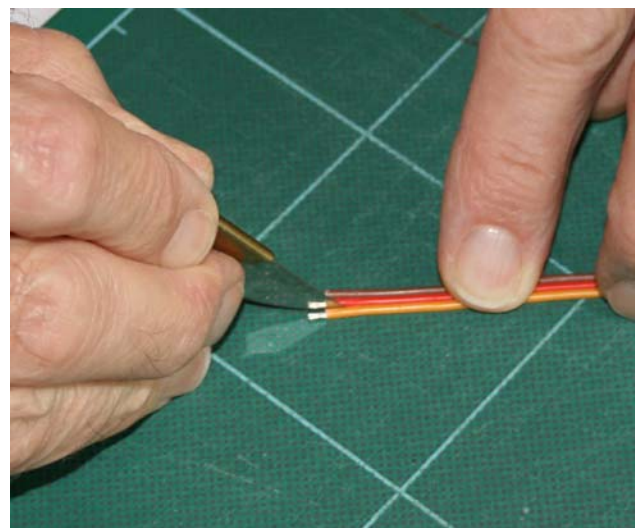
- 1 Ensure that the cable is cut square (the crimping tool has wire-cutter blades between the handles for this purpose).



- 2 Use a cable stripper (or other means if you prefer) to strip approximately 4 mm of insulation from the cable. We strongly advise the use of a cable stripper (also available from Modelaccessories.co.uk) because it reliably removes the correct length of insulation without any risk of damage to the wire itself.



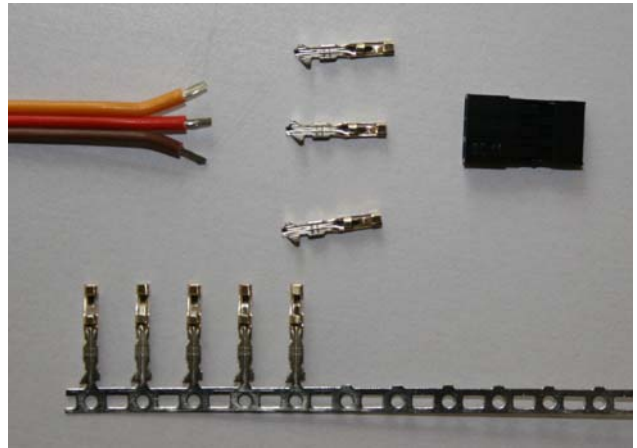
- 3 If you are using a "flat" servo cable, carefully separate the individual cables with a craft knife. The length of separation is down to personal preference. As a guide, 6 mm gives a really neat finish but makes the handling and crimping of the individual cables and connectors more difficult. 10 mm - 15 mm results in a more flexible combination of cable and plug and makes crimping easier. If this is the first time that you have used a servo crimping tool, we suggest that you use the 10 mm - 15 mm separation of the individual cables until you have mastered the technique of producing good quality crimped connections. After separating the individual cables, twist the stripped ends of each cable between finger and thumb to help eliminate any 'stray' strands of wire.



Crimping the Female Connector

The female connector components are shown in the photograph.

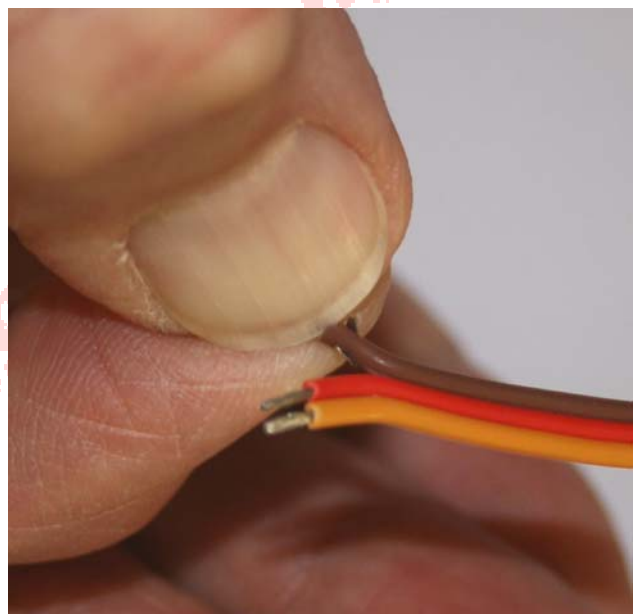
N.B. For the female connectors the signal cable (orange for JR, yellow for Hitec, or white for Futaba) goes on the left looking down on the connectors and plug.



4 Keeping the servo cable the correct way up (signal cable on the left), place the negative wire into a connector ensuring that the stripped section of the cable sits in the forward crimp as shown in the photograph.



5 Hold the cable in place in the connector using your thumbnail positioned between the two pairs of tabs / tangs as shown in the photograph.



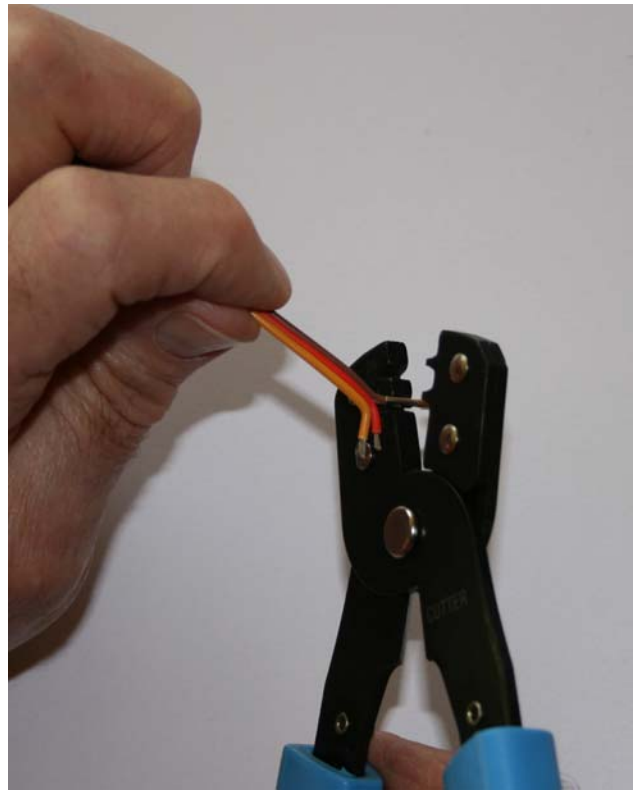
6 Gently squeeze the tabs / tangs against the insulation using either long nose pliers or your other thumbnail and fingernail. This is to ensure that the connector does not fall off the cable when it is offered up to the crimping tool.

Do not squeeze the ends of the tabs / tangs down onto the cable.



- 7 Insert the connector **upside down (i.e. with the open tags / tangs facing downwards) into the larger slot** in the crimping tool (marked 20 - 24) with the labelled side of the tool facing towards the cable and the cable end of the connector flush with the side of the crimping tool.

Slowly close the jaws of the crimping tool until they grip the connector (be careful not to tug on the cable as you do so) and then, once you have assured yourself that the connector is still properly aligned in the tool (i.e. that it has not rotated as it was gripped) apply steady, firm pressure to close the jaws completely and make the crimp. **Do not "snatch" the jaws closed - steady, progressive pressure is what is required.**



- 8 After crimping the connector, move it to the front, smaller crimp slot (marked 24 - 28), ensuring, as in the previous step, that the connector is upside down in the slot and that the cable end of the connector is flush with the side of the crimping tool, and crimp again.

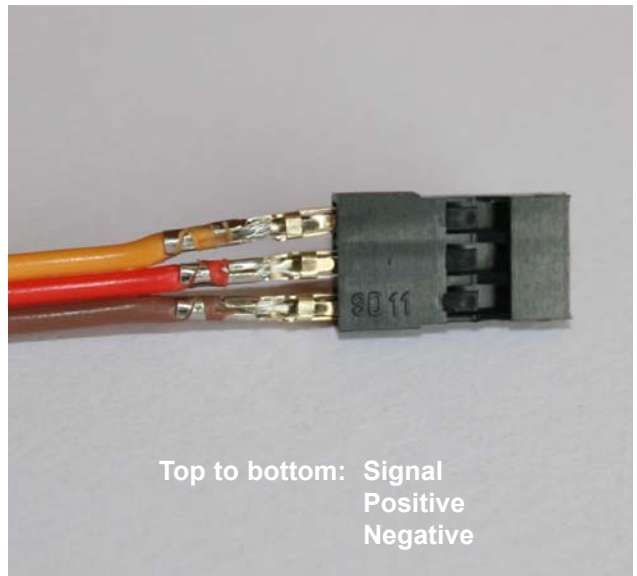
- 9 Carefully remove the crimped connection from the crimping tool. Sometimes the connector 'sticks' in the crimping tool slot (more likely with heavy gauge servo cable) and may bend slightly when it's removed from the tool.

Check the crimped connector and if it has bent on removal from the tool (upper photo), carefully straighten it using finger and thumb (lower photo) - avoid using pliers as you may distort the connector. If the connector is not straight, you will experience difficulty pushing it fully home in the plastic plug.

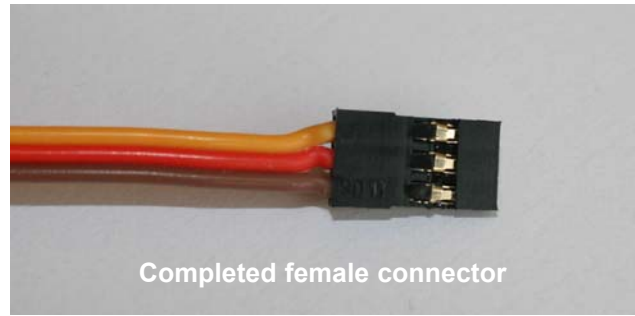


- 10 Crimp the positive and signal cables in the same manner then offer the crimped connectors up to the plug with the crimps on the connectors and the retaining clips on the plug both facing upwards.

Important: the ground, positive and signal wires must be inserted into the correct locations in the plug as shown in the photograph (if you have followed the preceding steps properly then they will automatically be correctly sequenced). Be especially careful to ensure that the three wires are in the correct sequence if you are using a "twisted" servo cable rather than a "flat" one.



- 11 Carefully push the connectors into the plug until they click into position and are locked by the little plastic tongues midway down the plug. You need to ensure that the connectors are properly aligned in the plug slots or you will not be able to push them fully home. The connectors may be a little tight in the plug, especially if heavy duty servo cable is used, and can be 'persuaded' into position with the help of a watchmaker's screwdriver.



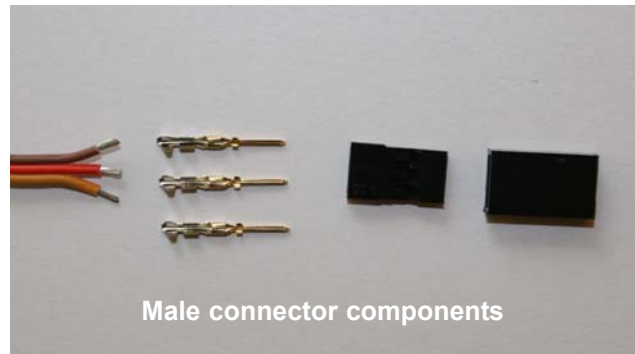
Crimping the Male Connector

The male connector components are shown in the photograph on the right.

The procedure for crimping the male connector is similar to that of the female connector but with the following differences:-

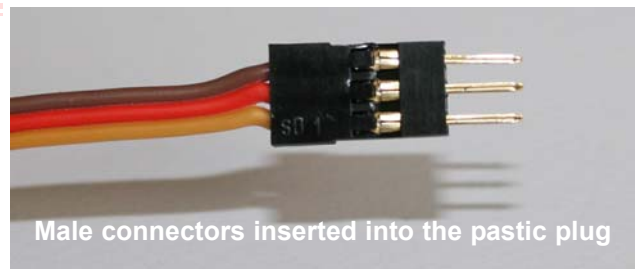
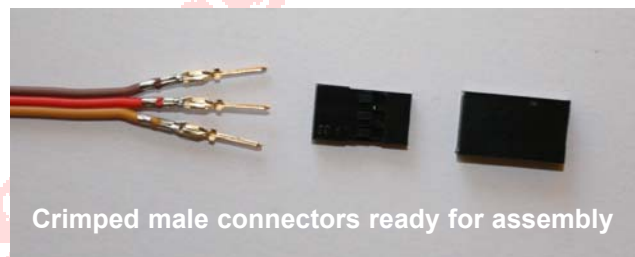
For the male connectors the signal wire goes on the right hand side of the plug.

The plug has a sleeve fitted over it to protect the connector pins and to guide the plug with the female sockets into place.

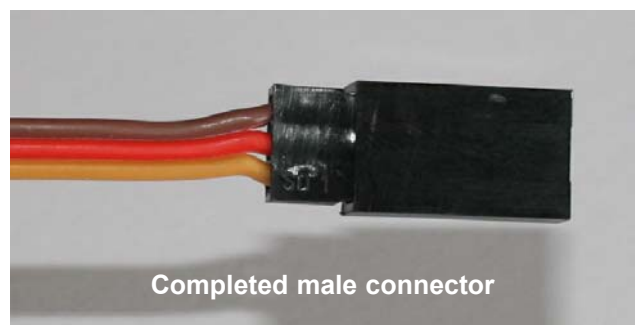
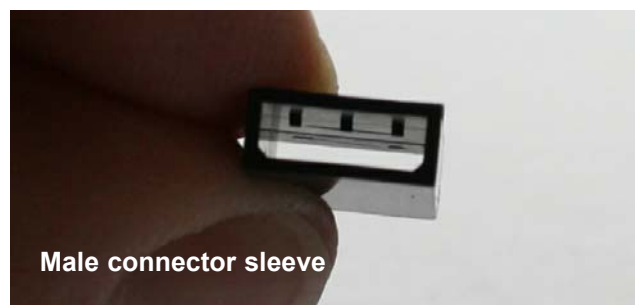


Repeat Steps 1 - 11 using the male connector pins.

- Top to bottom: Negative
Positive
Signal



- 12 Slide the sleeve over the plug with the projections on the inside of the sleeve on top of the plug and towards the cable end of the plug. The sleeve will click into place with the projections holding the plastic plug tongues down and locking the pins in place in the plug.



Quality of Connections

It's worth checking individual connector crimp quality immediately after crimping otherwise you may waste connectors should the first one you crimped be of unsatisfactory quality. You may find a magnifying glass or hand lens useful when you do this.

The examples below show you what to look for.

This photo shows a poorly made crimp. The stripped portion of the cable is only half way into the crimp and the crimp tabs / tangs are not properly folded down onto the bare wire. The connector is also slightly bent.



This photo shows a well formed crimp. The stripped portion of the cable fills the crimp and the crimp tabs / tangs are properly formed and folded down onto the bare wire. The connector is perfectly straight.



Additional Notes for Left-handed People

For steps 7 & 8 left-handed people may prefer to hold the crimping tool in the left hand with the labelled side facing to the right and with the slots uppermost. In this case the connector is offered up to the crimping tool, using the right hand, **the correct way up** (i.e with the open tags / tangs facing upwards into the slot).

All other steps in the process may be performed in exactly the same way whether you are left-handed or right-handed. Simply use whichever hand you find most convenient for each task.