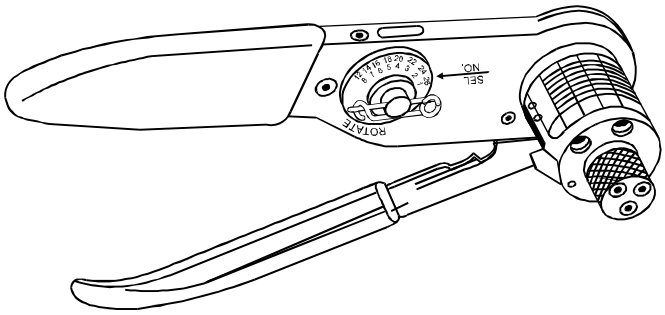
Attachment 1



CRIMPING TECHNIQUES

Overview

This topic details crimping methods and tools currently available. It describes the correct method in using these tools, terminating aircraft wire to a variety of connectors, terminals, and splices.

Wire Preparation

Introduction

The satisfactory performance of a modern aircraft depends, to a great extent, on the reliability of its electrical systems. Improperly or carelessly installed wiring can be a source of potential danger, and many malfunctions and failures of an electrical system can be traced to this cause. The continued proper performance of the electrical systems depends on the 'know-how' of the personnel who do the inspection and repair.

It is important that maintenance is carried out in accordance with the best available techniques in order to eliminate possible failures, or at least to minimise them.

Crimping a wire, like other termination techniques, requires appropriate wire preparation. The preparations will vary according to the type of termination to be made and the wire type to be terminated. However, each method will include several common steps that must be performed correctly if a reliable connection is to be made.

To begin, suitable wire must be selected and cut to the required length. It is then stripped of insulation, exposing the centre conductor. Finally, the wire is ready to be assembled with connectors, terminals, or splices using approved crimping tools and techniques.

Note: The tools and equipment discussed in this attachment are used as an example only. The methods and techniques may be used when using alternative equipment.

NOTE:

Polytetrafluoroethylene (PTFE) which includes all teflon based insulation materials is an inert plastic material that decomposes at approximately 400°C. At this temperature, the Teflon particles become airborne and, if inhaled, can cause a type of poisoning known as POLYMER FUME FEVER, which has influenza like symptoms. The symptoms occur for several hours after exposure and usually subside within 24 to 48 hours.

Warning

Read this warning!

Do not smoke in areas where PTFE materials are used. Do not carry cigarettes or tobacco into PTFE work areas as contamination of these products may occur. After working with PTFE material wash hands thoroughly before smoking. Do not incinerate PTFE waste.

Wire and Cables

Wire

For the purposes of electric and electronic installation in aircraft, an insulated wire consists of a metal conductor covered with a dielectric or insulating material. Wires used in aircraft contain stranded conductors for flexibility. The insulation may consist of several materials and layers to provide:

- dielectric insulation,
- thermal protection,
- abrasion resistance,
- moisture resistance, and
- fluid resistance.

Cable

The term ‘cable’, as used in aircraft applications, may refer to any of the following:

- two conductors twisted together (twisted pair),
- a single centre conductor with a metallic braided outer conductor (coaxial cable),
- two or more insulated conductors contained in a common covering (multi conductor cable), or
- one or more insulated conductors with an overall shield (shielded cable).

Wire Cutting

There are several wire cutting tools available and it is important that the correct tool is chosen for the job.

Cutting Tools

The choice of cutting tool will depend on whether wire or cable is to be cut, and the diameter of the wire or cable. Diagonal pliers tend to crush the wire/cable deforming the conductor. For this reason, diagonal pliers should not to be used.

To produce a clean square cut on copper wire or copper alloy of light gauge, a shear type cutter as shown in Figure 1-1 should be used.

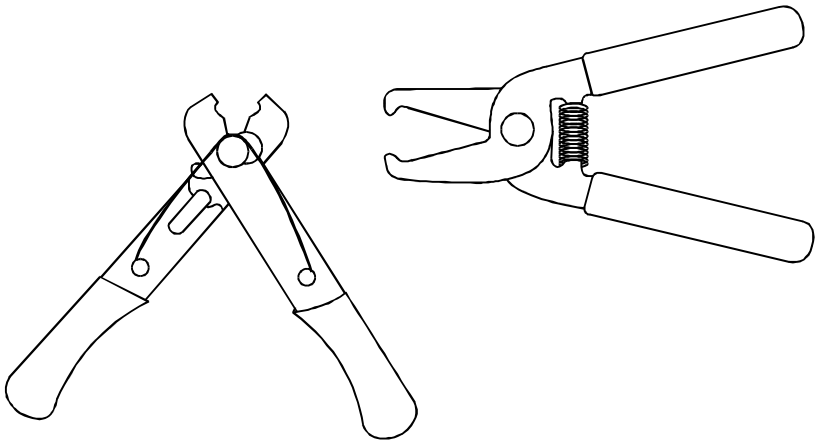


Figure 1-1
Shear Type Cutting Tools

Heavy gauge wire may be cut with a fine toothed hacksaw (a fine toothed hacksaw blade consists of 20 teeth or more per inch).

To hold the wire/cable while cutting, a jig similar to that shown in Figure 1-2 is ideal. Do not place the wire/cable directly in the jaws of the vice as this is likely to crush or deform it.

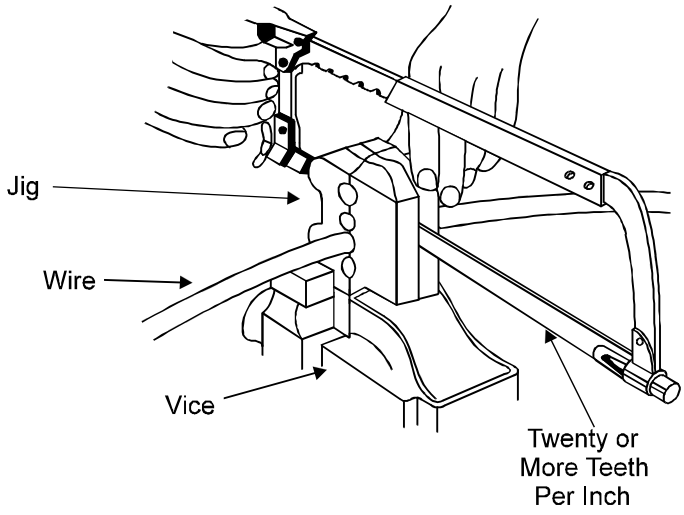


Figure 1-2
A Jig to Hold Heavy Gauge Wire

Cutting aluminium wire presents a problem. The reciprocating cutting action of a hack saw 'work hardens' aluminium. This is not a problem for light gauge aluminium wire as cable shears can be used. Heavy gauge aluminium wire is cut by using a power saw fitted with a metal cutting disk. Note in Figure 1-3, that the cutting disk used for this purpose has no teeth.

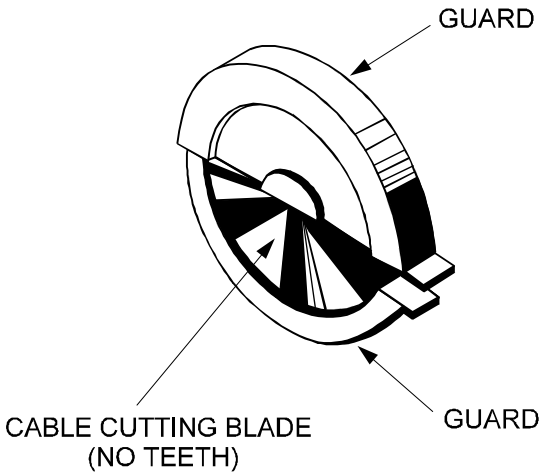


Figure 1-3
Power Saw Fitted With a Metal Cutting Disk

Regardless of the type of wire/cable to be cut, or cutting tool utilised, always exercise care and ensure wire is cut clean, square, and not deformed, as illustrated in Figure 1-4. If necessary, after cutting carefully reshape large diameter conductors with a pair of pliers.

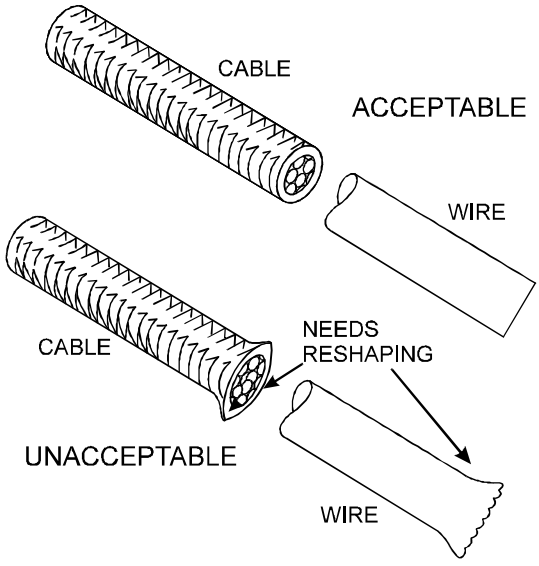


Figure 1-4
Examples of Clean and Deformed Cuts

Wire Stripping

With the wire/cable cut to the correct length, sufficient insulation needs to be stripped to accommodate the termination. There are numerous ways do this, the method chosen will depend on the type of wire or cable intended for use and the termination to be made.

The general wire stripping procedures and precautions are listed below.

- Use the correct tool for the task.
- In cases where the insulation to be stripped is greater than two centimetres in length, carry out the task in two or more operations.
- Adjust stripping tools carefully, and follow manufacturer's instructions to avoid nicking, cutting, or otherwise damaging the conductor.
- Where stripped insulation remains on the wire, remove by twisting the insulation in the direction of the natural lay of the wire strands.
- Ensure that insulation is cut cleanly, with no frayed edges, and trim if necessary.
- Ensure that all insulation is removed from the stripped wire end, including the transparent layer between the conductor and the insulation if present.
- If necessary, retwist conductor strands by hand or by pliers to restore the natural lay and tightness of strands.
- Examine the stripped wire for damage to the exposed conductor ensuring adequate insulation has been removed.
- Nicks and broken strands must be within tolerance. As tolerances are different between aircraft, always refer to relevant manufacturer's information whenever available.
- If conductor strands are nicked, cut, or damaged beyond tolerance, reject wire or cut off damaged portion, readjust tool and re-strip.

The exact technique will depend on the type of wire/cable and wire stripping tool used. The various types of wire stripping tools are as follows:

- thermal strippers,
- mechanical strippers,
- coaxial strippers, and
- the knife.

Thermal Strippers

Although thermal wire stripping is highly recommended for wires with PVC insulation, this method is not suitable for most types of aircraft wiring. Aircraft wire often has insulation made from heat resistant materials, making it difficult to remove using thermal wire strippers.

Mechanical Strippers

Mechanical wire strippers are used for the removal of insulation from solid core wire. These strippers are also suitable for removing insulation from multi-stranded wire; however care should be exercised so as not to damage the conductor.

The procedure for using the mechanical stripping tools is the same as previously described, but with the exception of the visual inspection criteria.

When visually inspecting multi-stranded wire, determine if any of the conditions illustrated in Figure 1-5 exist.

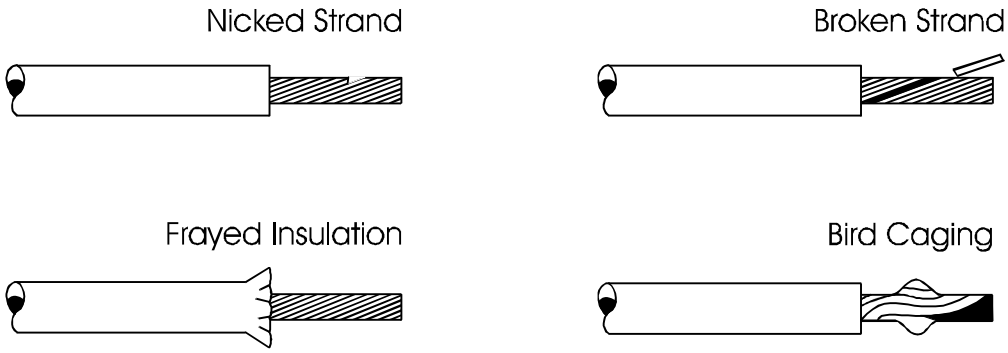


Figure 1-5
Examples to look for when Stripping Multi-Stranded Wire

When one or more of the above conditions exist but are within tolerance, correct and reshape conductor strands by twisting the strands in the direction of the natural lay of the wire. Do not overtwist.

Warning

Care should be exercised when smoothing insulation or twisting conductors as nicked, frayed, or broken strands can cause injury.

When the conditions in Figure 1-5 exist, but are out of tolerance, cut off the stripped portion and start the procedure again. If the wire length does not permit, restart with a new length of wire.

Coaxial Cable Strippers

As their name implies, coaxial cable strippers are used for preparing coaxial cable. Coaxial cable strippers are unique in that they have two blades located on each side of the tool and a round blade attached to the front, as can be seen in Figure 1-6.

There are several types of coaxial cable strippers available, so, where available, always make sure the tool instructions are referred to when selecting the correct tool for cable type.

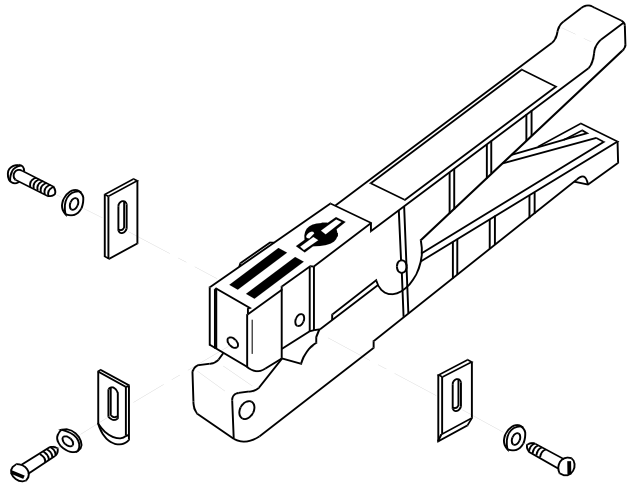


Figure 1-6
Coaxial Cable Strippers

As depicted in Figure 1-6, the two blades located on each side of the tool may be adjusted individually to vary the stripping dimension and the depth of the cut. The axial stripping blade attached to the front of the stripper is used to slit the cable axially (along the length of the cable).

To strip coaxial cable using coaxial cable strippers.

1. Adjust the blades to the applicable stripping dimensions, ensuring the depth of the blades is set so that the jacket will be scored without damage to the inner shielding.
2. Position the tool on the cable so that an excess length of cable will be left after the stripping operation is complete.
3. Spin the tool around the cable, as demonstrated in Figure 1-7 until the maximum cutting depth is obtained.

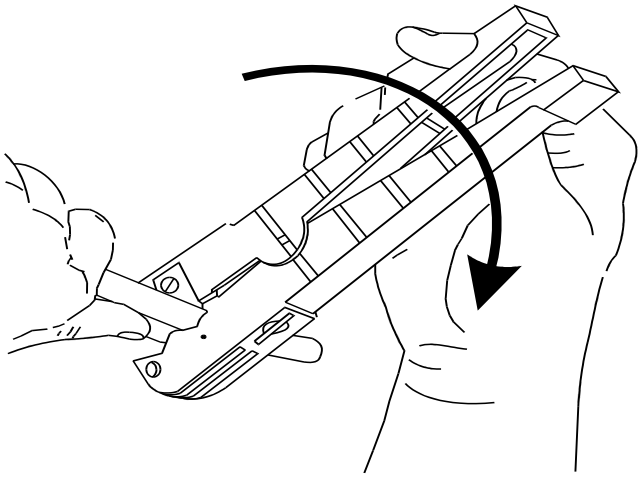


Figure 1-7
Procedure For Stripping Co-axial Cable

4. Slit the cable jacket by simply placing the cable in the front notch of the tool and pulling it through.

5. Peel off the jacket.

6. Steps one to three are repeated to strip the excess shielding. Be careful not to damage the inner dielectric.

7. Remove the excess shielding.

8. The dielectric may be stripped by hand using a knife or by repeating steps one to three.

9. To remove excess dielectric, flex the scored cut to separate the dielectric. Slide the excess dielectric off the inner conductor.

Coaxial cable strippers are particularly useful if a large quantity of cables need to be stripped. However, they require accurate setting up that can be time consuming. To strip individual cables, it is often quicker to use a knife.

Striping Coaxial Cable Using A Knife

1. Cut dimensions are detailed in the manufacture's instructions.

2. The first cut is to remove the desired length of the outer jacket. After placing the cable on a solid surface, position the knife blade at the desired strip point and press gently, using sufficient pressure to score the jacket without damaging the inner shielding. Figure 1-7 illustrates this process.

3. Cut dimensions are detailed in the manufacture's instructions or local instructions.

4. The first cut is to remove the desired length of the outer jacket. After placing the cable on a solid surface, position the knife blade at the desired strip point and press gently, using sufficient pressure to score the jacket without damaging the inner shielding. Figure 1-8 illustrates this process.

5. Without damaging the inner shielding, carefully slit the outer jacket, as shown in Figure 1-9.

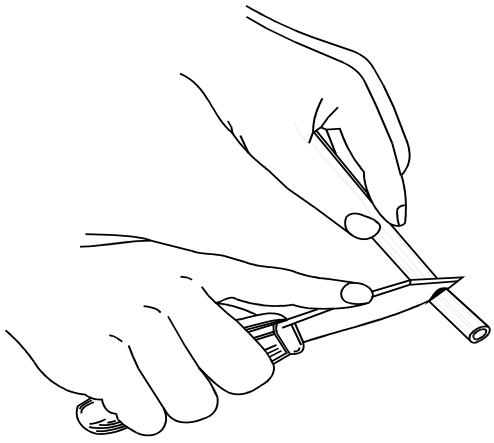


Figure 1-8
Striping Coaxial Cable using a Knife

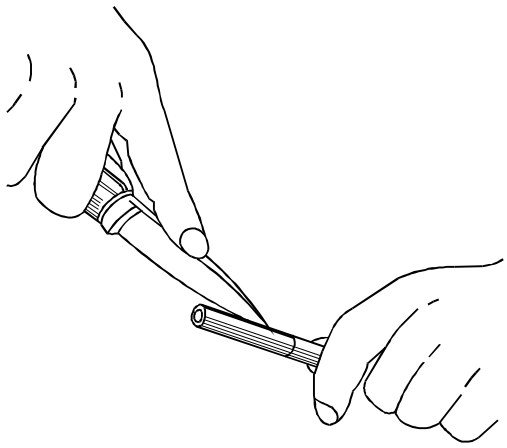


Figure 1-9
Slitting the Outer Jacket of the Wire

6. Peel away the outer jacket to expose the shielding (Figure 1-10).

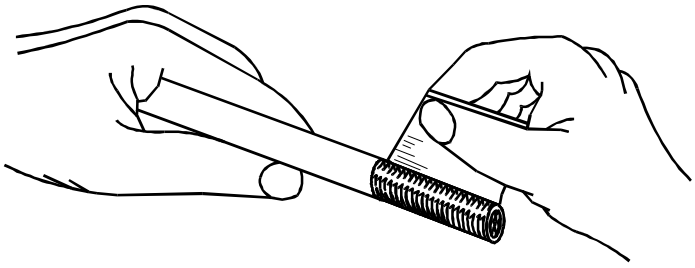


Figure 1-10
Peeling away the Outer Jacket

7. Cut away the excess braiding using side cutters to expose the insulated inner conductor (Figure 1-11). Be careful not to damage the insulation of the inner conductor with the cutters.

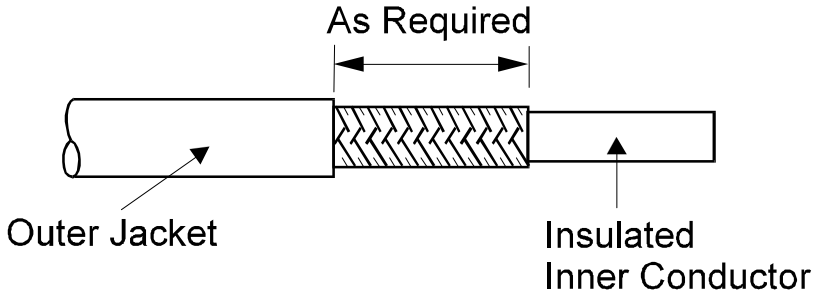


Figure 1-11
Removal of Excess Braiding

8. Using the knife, repeat step two removing the insulation surrounding the inner conductor. The finished cable will appear as depicted in Figure 1-12.

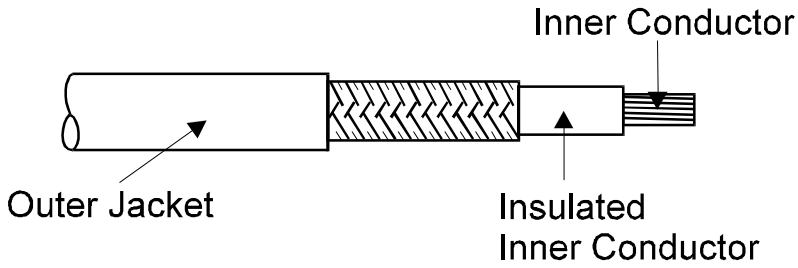


Figure 1-12
Removal of the Insulation Surrounding the Inner Conductor

Crimping

Having prepared the wire/cable, the next step is to terminate it using a crimped connection. The method for joining an electrical conductor (wire) to another current carrying item is known as compression crimping. To form a crimp connection, a crimping tool is used to compress the connection tightly onto the wire/cable. The finished connection, if formed properly, is mechanically strong and electrically sound, providing a uniform, airtight, metal-to-metal bond for stranded or solid wire.

Crimp Tools

A crimp termination can be made by squeezing the crimp barrel with an ordinary pair of pliers, or in a vice. However, proper performance of the termination could never be certain. Using pliers, or a vice to compress a crimp connection would make it impossible to ensure that the connection was squeezed by the right amount or in the proper place. To control the process, a crimping tool is necessary. Using a crimping tool allows us to easily form a crimp connection that is correctly made and can be reliably reproduced. Crimp Tools are broken into the following two types:

- Type 1, and
- Type 2.

Type 1

Type 1 crimp tools, as shown in Figure 1-13 are those which produce an indent crimp.

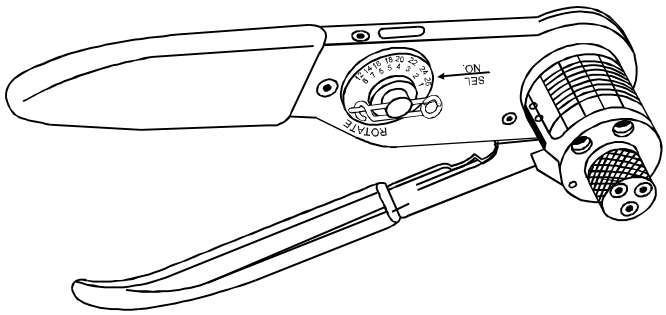


Figure 1-13
Type 1 Crimping Tool (Indent Crimp)

Indent crimp tools are used to crimp pin contacts of connectors. Figure 1-14 shows a pin contact before it is crimped and a cross sectional view of the pin after it is crimped. Note in Figure 1-14 the four indents where the pin contact barrel has been compressed onto the wire after crimping.

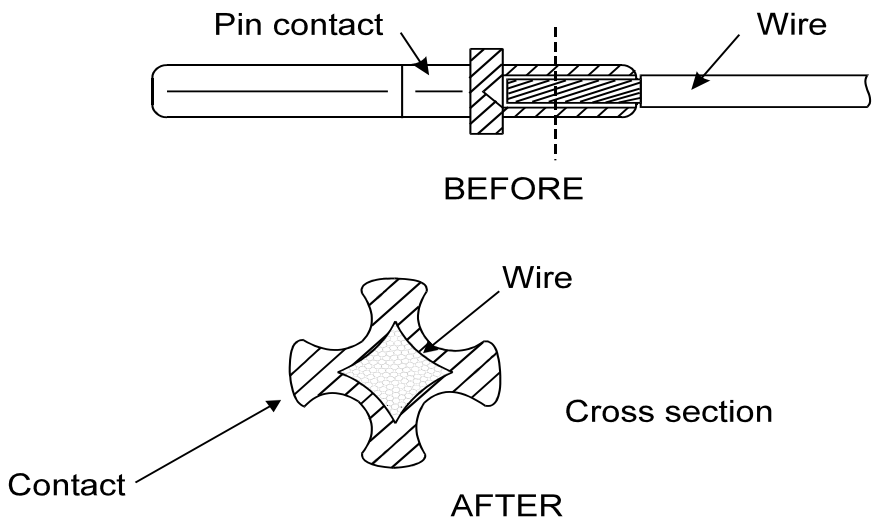


Figure 1-14
Type 1

Type 2

Type 2 crimp tools, as shown in Figure 1-15 are used to produce a formed crimp.

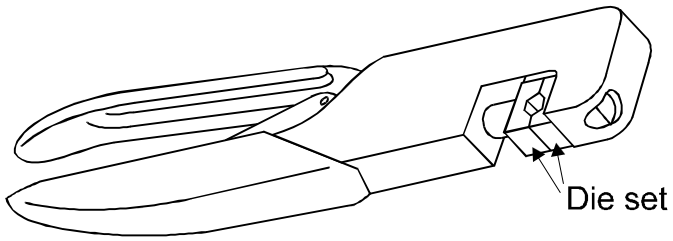


Figure 1-15
Type 2 Crimping Tool (Formed Crimp)

The tool can be fitted with a number of different die sets used to compress the barrel of a crimp into a variety of shapes.

Figure 1-16 shows a cross sectional view of various formed crimps.

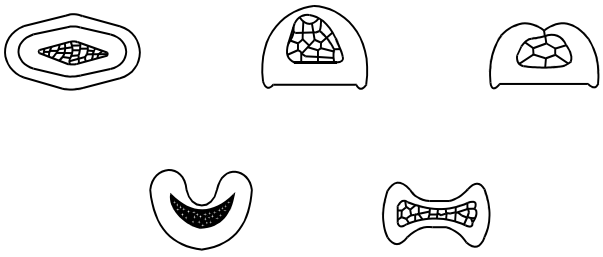


Figure 1-16
Cross Sectional Views Of Type 2 Crimps

Crimp Tool M22520/1-01 (Type 1)

There are several indent crimp tools available that conform to military specification. The M22520/1-01 is considered to be the upper range of adjustable crimp tools. M22520/1-01 is the part number of the tool.

The M22520/1-01 has a virtually limitless application within the 12 to 26 AWG (American Wire Gauge) wire range and is used to crimp removable contacts with a wire barrel size of 12 through 20 AWG (the barrel size referring to the outside diameter of the pin contact).

The crimp indent made by the tool is a standard 8 impression. This impression has been chosen to provide maximum tensile strength and is illustrated in Figure 1-17. Note in the figure that only four indents can be seen, the remaining four appear on the other side of the contact barrel. This is due to the equal spacing of the indents around the contact barrel.

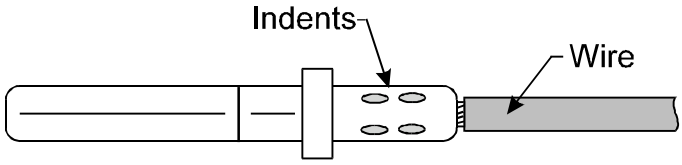


Figure 1-17
Example of a Socket Crimped with a Crimp Tool M22520/1-01 (Type 1)

Before stepping through the operation of the tool, its construction and preparation before use will be covered.

Crimp Tool Construction

Figure 1-18 identifies the major components of the tool, described in the following paragraphs.

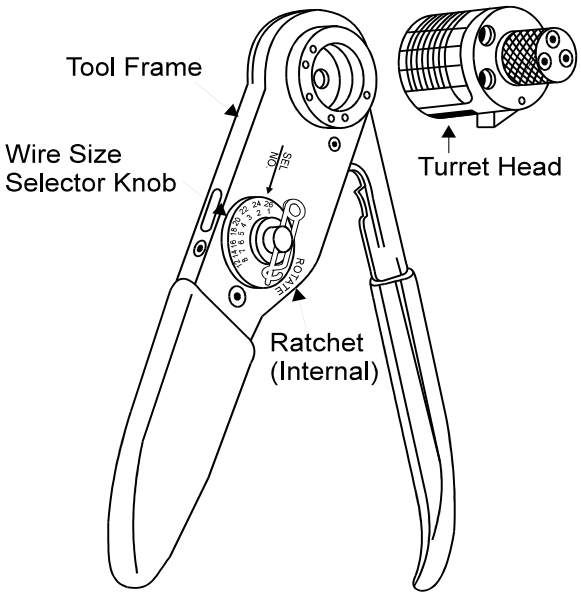


Figure 1-18
Crimp Tool Construction

The precision ratchet device is an essential component of the tool and ensures the same accurate crimp for each operation. The ratchet mechanism controls the cycling of the tool in both directions of the handle movement.

NOTE

Once the ratchet mechanism is engaged, the handles must be fully closed before they can be reopened. So be certain prior to closing the handles.

As this tool is used with a large range of pin contacts sizes, the crimp depth needs to be adjustable. If the indent travel were not adjustable, then small pin contacts would not be sufficiently compressed and larger diameter pin contacts over-compressed.

To achieve this control, a positive crimp depth is set by an eight position selector knob located on the tool frame. The operator dials in the desired step for the wire being used and locks the setting with a locking pin as shown in Figure 1-19.

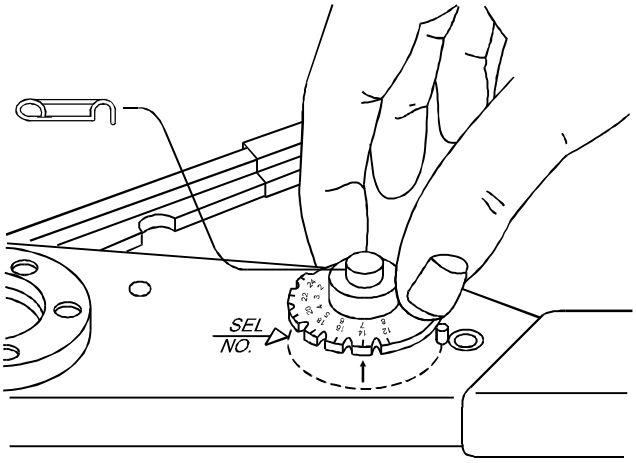


Figure 1-19
8 Position Selector Knob Located on the Tool Frame

The turret head, shown in Figure 1-20, is a device which when attached to the tool frame locates or positions the contact for crimping. A range of turret heads is available to accommodate different size contacts. Each individual turret head contains three positioners used to locate different size contacts into the crimping dies. The three locaters are colour coded for identification and are selected by rotating the circular barrel on top of the turret head.

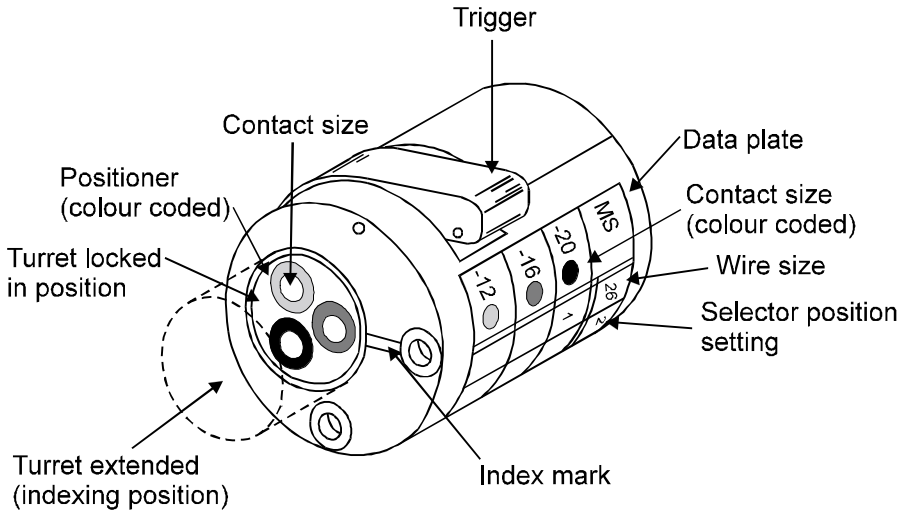


Figure 1-20
Turret Head

To assist in selecting the appropriate locater, a data plate is permanently affixed to all turret heads. The plate lists specific contact part numbers, corresponding position colour code of the locater, and suggested position selector knob depth settings.

Crimp Tool Inspection

Prior to use, the crimp tool must be carefully inspected to determine correct operation. The indenters should be checked for equal travel and simultaneous movement, as the handles are closed. The indenter closing selector should also be checked to ensure a positive detent at each selector setting.

To ensure proper crimp dimensions during operation, a suitable 'Go/No Go' gauge is to be used for tool verification. The inspection gauge, illustrated in Figure 1-21 should be used prior to commencing any crimp operation.

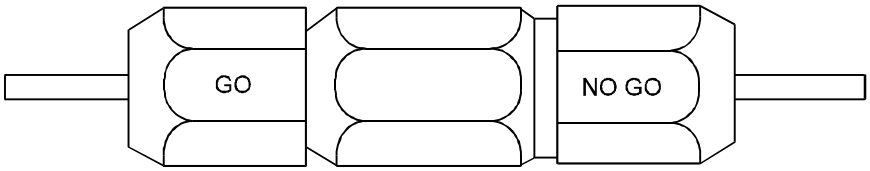


Figure 1-21
'Go/No Go' Gauge

The gauge ends are colour coded green for 'Go' and red for 'No Go'. The 'Go' end of the gauge should freely pass through indenters when the tool is in the fully closed position. Conversely, the 'No Go' gauge should not pass through indenters when the tool is in the fully closed position. When either gauging fails, reject the tool and have it sent for repair or calibration.

The following sequence details the gauging procedure:

1. Remove the safety pin from the position selector knob located on the tool frame. Pull the wire size selector knob upwards and rotate knob to setting '4'. Reinstall the safety pin.
2. Close the handles completely and hold in fully closed position.

CAUTION

Do not crimp down on the gauge pin as this will prevent the tool from cycling to release position.

3. Axially align the 'Go' end of the gauge (Green) with the indenter opening, as depicted in Figure 1-22.

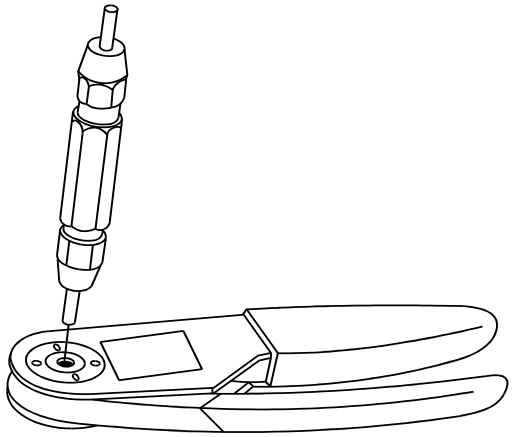


Figure 1-22
Testing the Crimp Tool

4. Slide the gauge into the indenter opening and through the indenters. The gauge should pass freely through the indenters, as shown in Figure 1-23. If not, the tool should no longer be used until it has been repaired.

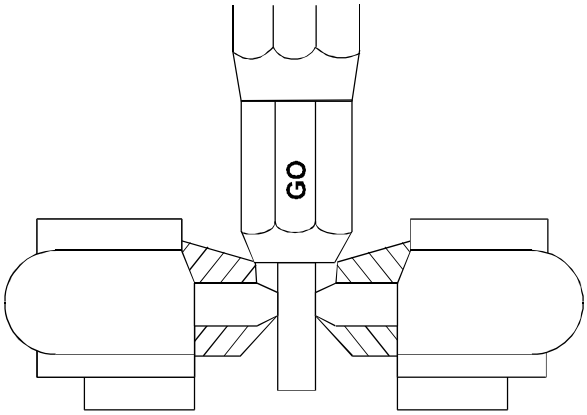


Figure 1-23
Testing a Crimp Tool

5. Invert the inspection gauge while continuing to hold the handles in the fully closed position. Insert the 'No Go' gauge (Red) into the indenter opening, as shown in Figure 1-24. The gauge should not pass between the indenters. If the 'No Go' gauge does pass through the indenters, have the tool repaired.

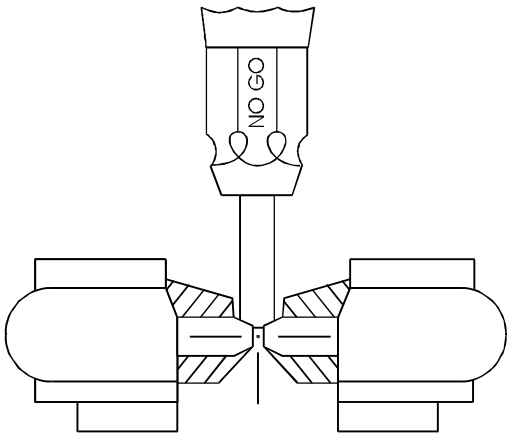


Figure 1-24
Testing a Crimp Tool

Crimp Tool Build Up and Adjustment

To achieve a mechanically and electrically sound crimp contact, the proper combination of locater and selector setting is necessary. The selection of an appropriate turret head and fitment to the crimping tool is referred to as 'tool build up'. Tool build up and adjustment is performed using the following procedure:

1. Using Figure 1-25 below, determine the selector setting matching the contact and wire size intended to crimp.

Contact Size	Wire Size	Selector Setting	Turret Bushing
20	24	2	Red
20	22	3	Red
20	20	4	Red
16	20	4	Blue
16	18	5	Blue
16	16	6	Blue
12	14	7	Yellow
12	12	8	Yellow

Figure 1-25
Calibration Table

2. Remove the safety pin from the position selector knob and rotate the knob to the required setting. Reinstall the safety pin.

3. Select the turret to suit the connector pin or socket. This is achieved by referring to AC21-99 Aircraft Wiring and Bonding. Each connector has a complete breakdown of information such as pin and contactor size, and the crimping tool required.

4. Press the trigger on the turret head to release the positioner into the extended or indexing position, as illustrated in
Figure 1-26.

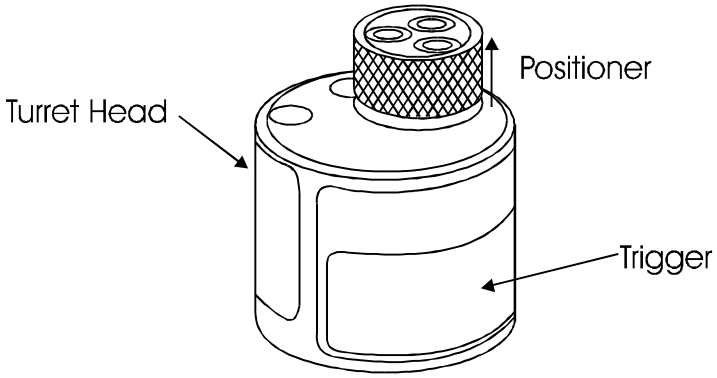


Figure 1-26
Crimp Tool Build Up and Adjustment

5. Seat the turret head onto the retainer ring on the back of the tool. Align the screws with the tapped holes ensuring correct orientation of the turret.

6. Tighten the cap screws with an appropriately sized Allen key as shown in Figure 1-27.

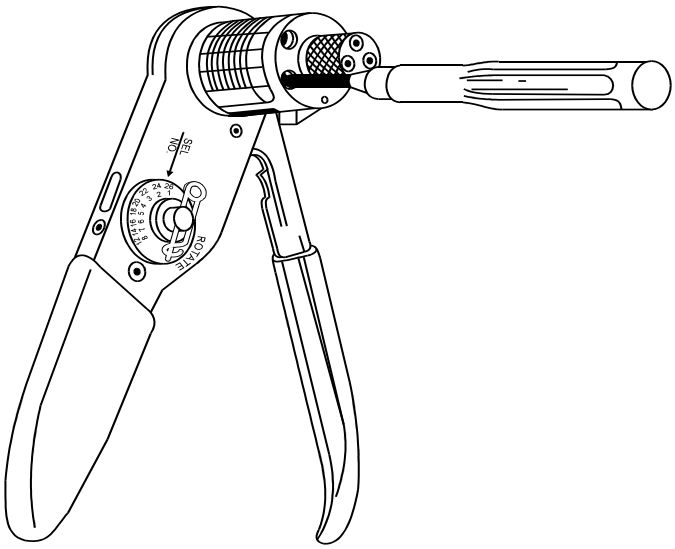


Figure 1-27
Crimp Tool Build Up and Adjustment

7. With the positioner extended, rotate, as shown in Figure 1-28 to select the matching colour index mark as per Figure 1-25.

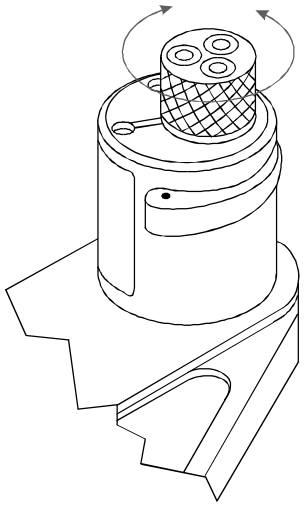


Figure 1-28
Crimp Tool Build Up and Adjustment

8. Push the positioner back in until an audible click is heard. The tool is now ready to use.

Crimp Tool Operation

Insert the contact and wire into the crimp tool indenters on the front of the tool until contact bottoms out in turret head, as shown in Figure 1-29. While holding the wire and contact in place, squeeze the crimp tool handles together smoothly until the ratchet releases and the tool opens.

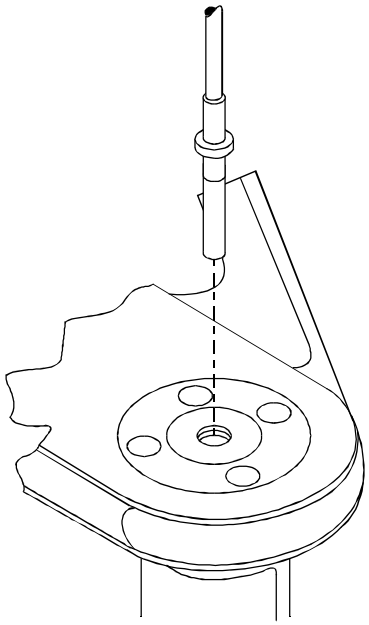


Figure 1-29
Crimp Tool Operation

Remove contact from the crimp tool and inspect for the following:

- two series of four indents securing contact to the wire;
- wire strands visible in the contact inspection hole indicating that the wire is crimped into contact at the correct depth;
- verify the insulation gap is within limits specified in the applicable connector series;
- wire strands not nicked or loose; and
- contact not nicked, bent, or distorted.

Crimp Tool M22520/5-01 (Type 2)

The M22520/5-01 is an open frame crimp tool illustrated in figure 1-30.

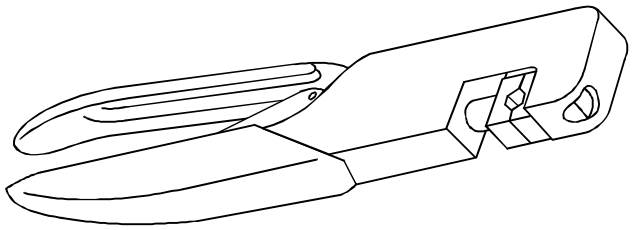


Figure 1-30
Crimp Tool M22520/5-01 (Type 2)

The tool is used with hexagonal dies which are available in a variety of configurations including single, double, and triple cavity design. It is used to crimp most coaxial and triaxial connectors and contacts. Dies of various other crimp patterns are also available for insulated and uninsulated terminal lugs, splices, and end caps.

Crimp Tool Construction

A positive precision ratchet controls the cycling of the tool in both directions of the handle. This ratchet mechanism ensures the same accurate crimp for each operation. Note that once the ratchet mechanism is engaged, the handles must be fully closed before they can be reopened. So once again, be certain before closing the handles.

The dimensions by which dies are sized are illustrated Figure 1-31.

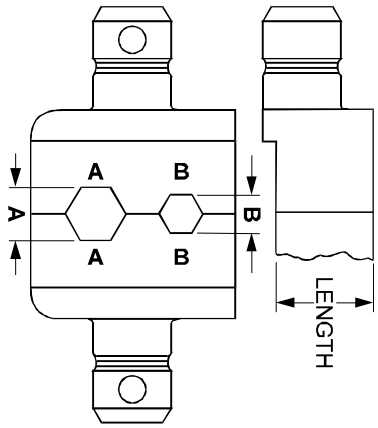


Figure 1-31
Crimp Tool Construction

Crimp Tool Buildup

As with Type 1 crimp tools, correct tool buildup is necessary to perform mechanically and electrically sound crimps. Type 2 tool build up is, however, a much simpler process. Before making a crimp connection the following is required:

- select the proper tool,
- select the required die set,
- select the appropriate inspection gauge,
- install the die set, and
- gauge the tool.

Selection of the tool and die set will be dependant on the type of crimp that is needed. Always refer to the relevant publication or instruction when making the selection.

Installation Of Dies

Die installation is performed using the following procedure:

1. Select the die set as suitable to the application.
2. Align the groove in dies with the key in crimp for the correct orientation.
3. Open the handles fully.
4. Install the dies into the tool as illustrated in Figure 1-32.

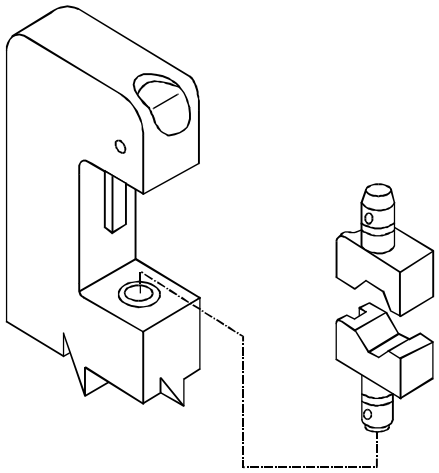


Figure 1-32
Installation of Dies

5. Close the handles completely to seat the dies.

6. After closing the handles, visually check to see that the dies are properly seated, locked in, and aligned with each other.

If a permanent die assembly is required, drive an appropriate sized pin through tool body hole and another pin of the same diameter through the push rod hole as shown in Figure 1-33.

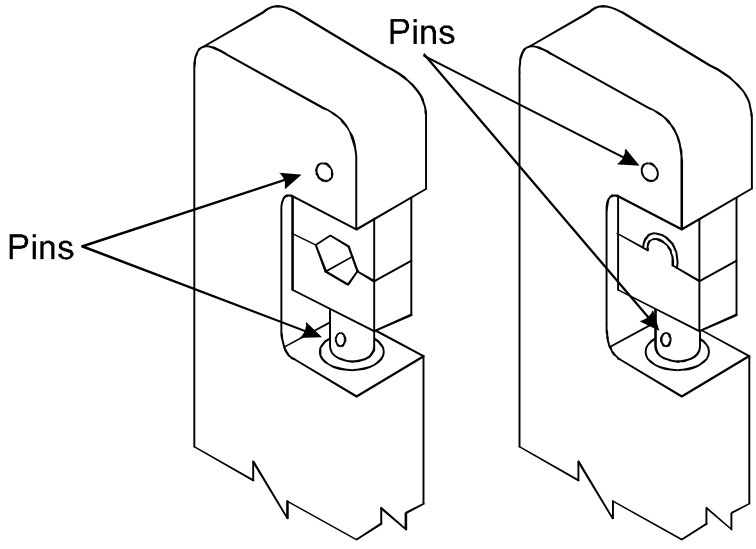


Figure 1-33
Permanent Installation of Dies

Removal Of Dies

Removal of the dies is basically the reversal of the installation procedure and performed as follows:

1. With the handles in the open position, use the die removal tool and a light shop hammer to gently tap the upper die half. Figure 1-34 illustrates the procedure to remove the dies.

NOTE

If the dies have been permanently installed, the lock pins must first be removed to prevent serious damage to tools.

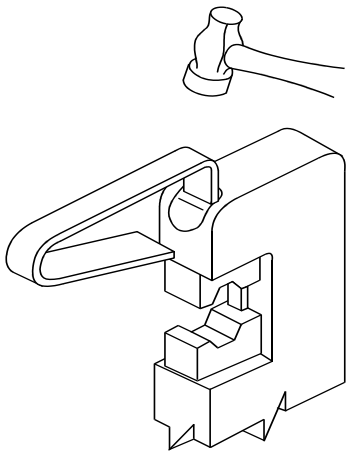


Figure 0-1
Removal of Dies

2. Using the die removal tool, the die will be released from the lock spring and ejected approximately 1.5 mm. Complete the removal by hand.

3. Close the crimp tool handles and slide the removal tool between the lower die and tool body as shown in Figure 1-35.

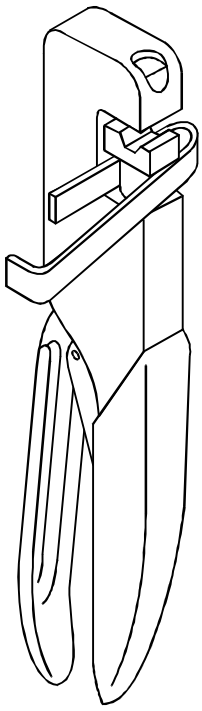


Figure 1-35
Removal of Dies

4. Pull the handles open with a snap action. The die will be released from the lock spring and can then be removed by hand.

Crimp Tool Inspection

Prior to using a Type 1 crimp tool, it is necessary to use a 'Go/No Go' gauge to verify correct operation of the indenters. To ensure proper crimp dimensions using a Type 2 tool, it is also necessary to periodically gauge the tool. Verification of a Type 2 crimp tool is performed in the following manner:

1. Activate the tool fully to mate die surfaces.
2. The 'Go' gauge should freely pass through the die.
3. The 'No Go' gauge should not pass through the die.
4. If either gauging fails, reject the tool for repair or calibration.

Figure 1-36 illustrates the procedure on how to test the crimping tool with the 'Go/No Go' gauge.

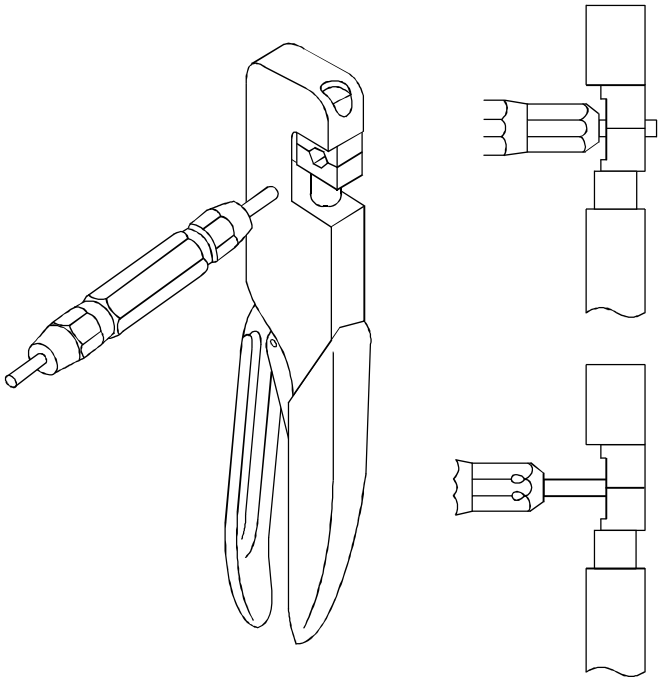


Figure 1-36
Testing the Type 2 Crimp Tool

Crimping Procedure

1. Prepare the wire/cable and assemble connector, contact, or lug in accordance with the applicable work instruction.

2. Hold the crimp barrel centred in the die set as shown in Figure 1-37. Squeeze the tool handles smoothly until the ratchet releases.

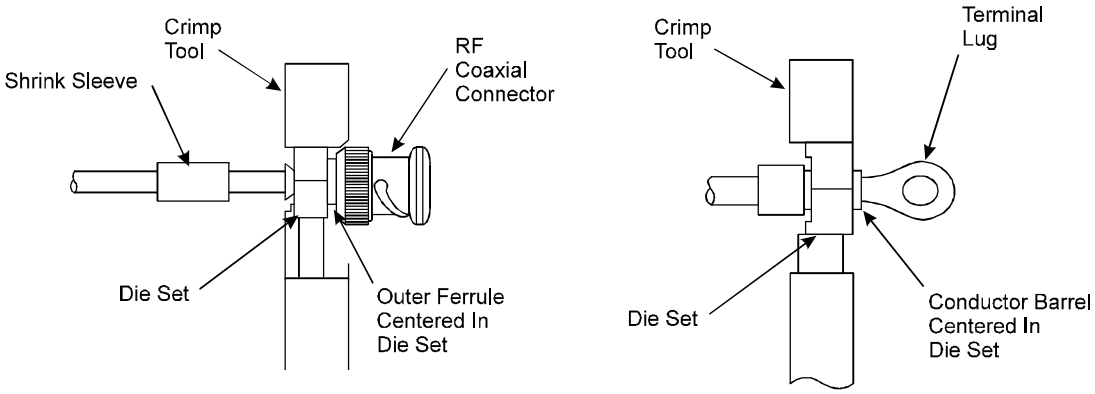


Figure 1-37
Holding the Connector / Crimp

3. Remove crimped device from tool and inspect for the following:

- the crimp should secure the wire to the device and not be nicked, bent or distorted;
- the wire strands should be visible in the contact inspection hole, indicating that the wire was crimped into contact at the correct depth;
- the insulation gap is within limits specified in the manufacturers instructions; and
- the wire strands are not nicked or loose.

Aircraft Electrical Plug Contact Insertion/Extraction

Contact Insertion

Having previously crimped the pin contact using a Type 1 crimp tool, the contact is now ready to install it into a connector plug. To assist the contact installation, an insertion/extraction tool is used. Although both ends of the insertion/extraction tool look similar in Figure 1-38, they are actually slightly different. Each tool is identified by a different colour according to contact size, with the coloured end used for insertion and the white end for extraction.

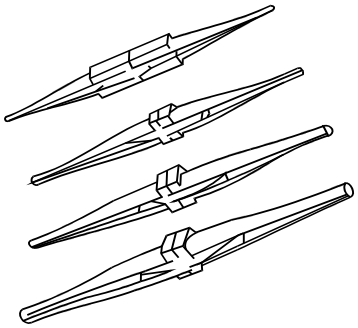


Figure 1-38
Contact Insertion

To insert a contact, complete the following procedure:

1. Assemble the crimp.

2. Select the insertion tool specified for the contact size. Normally the manufacturer will supply an insertion/extraction tool with the connector.

3. Lay the wire in the groove of the insertion tool. Slide the contact into the front of the tool until properly located and seated as shown in Figure 1-39.

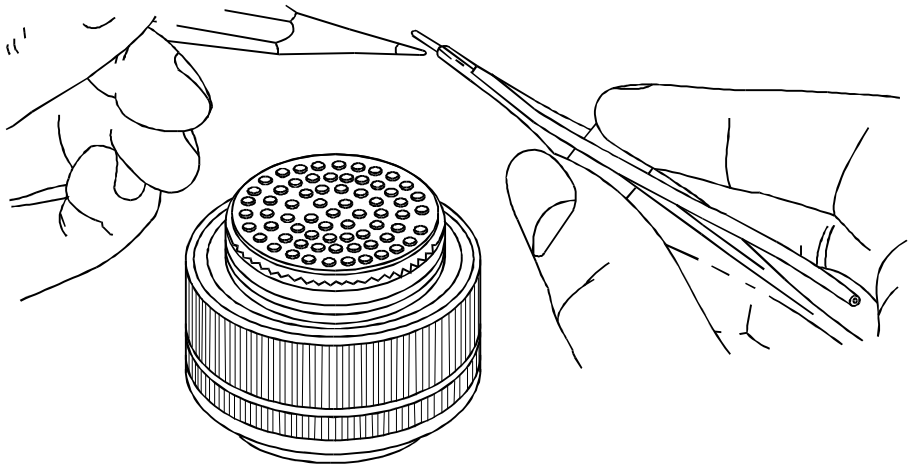


Figure 1-39
Contact Insertion

4. Insert contacts using either the alternate row, or centre outward method. The method chosen will depend on the style of plug used.

Alternate Row Method

The alternate row method is used on plugs, as shown in Figure 1-40.

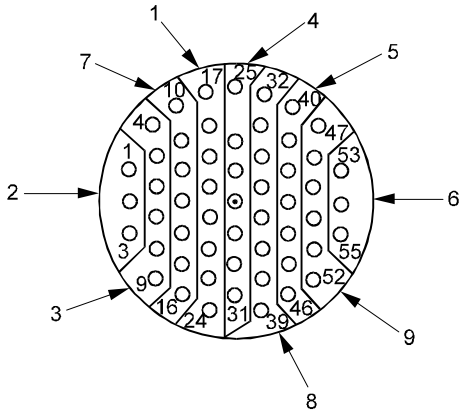


Figure 1-40
Alternate Row Method

Using the alternate row method, insert the first contact in the centre row, skip one row and insert the second contact; repeat until all contacts are installed.

Centre Outward Method

Insert the first contact in the centre of the plug, inserting the remaining following the pattern in Figure 1-41.

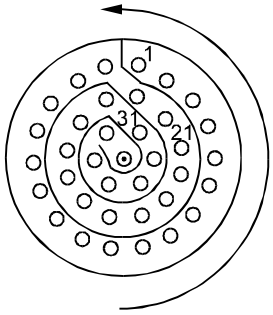


Figure 1-41
Centre Outward Method

5. Working from the rear of connector, hold the tool with contact at right angles to the rubber grommet face placing the contact into the proper hole as shown in Figure 1-42.

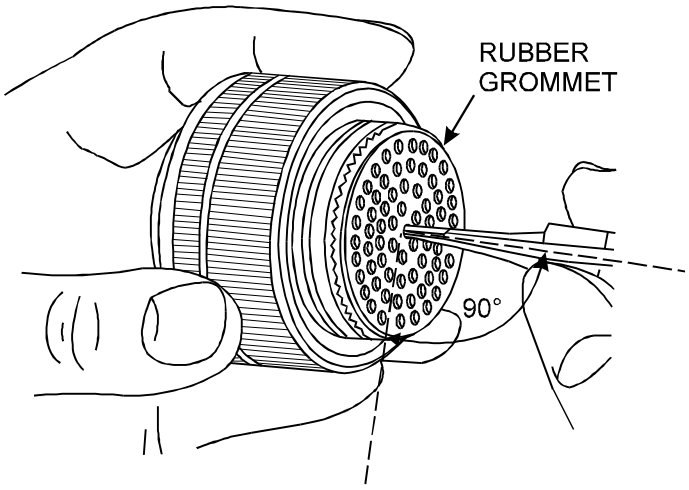


Figure 1-42
Locating the Contact within the Hole

6. Keeping the contact and tool centred in the hole, apply smooth even pushing pressure until the contact is seated. A faint audible snap will be heard when the contact seats, as Figure 1-43 illustrates.

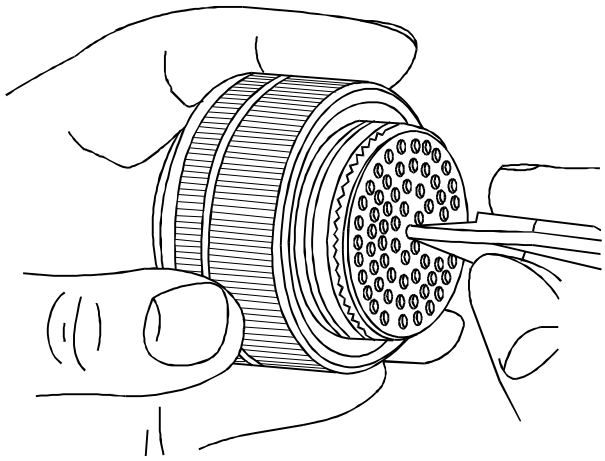


Figure 1-43
Pushing In The Contact Until It Is Seated

7. Withdraw the tool at right angle to the grommet face until completely free.

8. Insert all wired contacts first, installing unwired contacts in the remaining holes. Unwired contacts are inserted as uncrimped contacts that are used to maintain mating integrity as well as environment resistance (basically plug up the remaining holes).

Insert the sealing plug behind each unwired contact as shown in Figure 1-44.

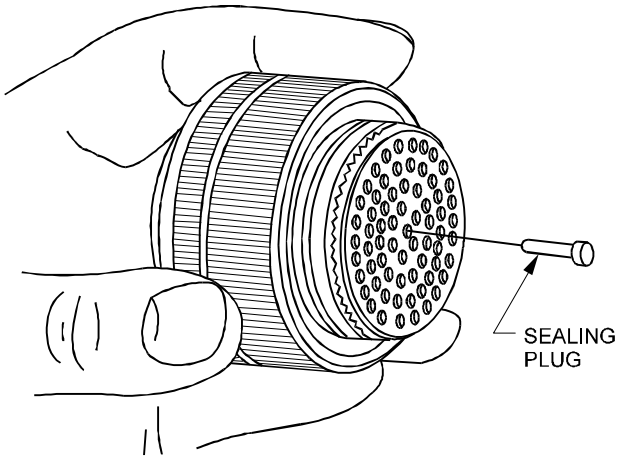


Figure 1-44
Insertion of a Sealing Plug

Wired Contact Extraction

As a result of damage or perhaps as part of a modification, it may be necessary to remove a contact from a plug. Contact extraction is performed using the other end of the insertion/extraction tool according to the following procedure:

1. Remove the back shell and accessories of the aircraft electrical plug.

2. Select the appropriate removal tool in accordance with the relevant publication.

3. Holding the tool at right angles to the grommet face, centre over the contact being removed and push wire into the groove of the tool, as shown in Figure 1-45.

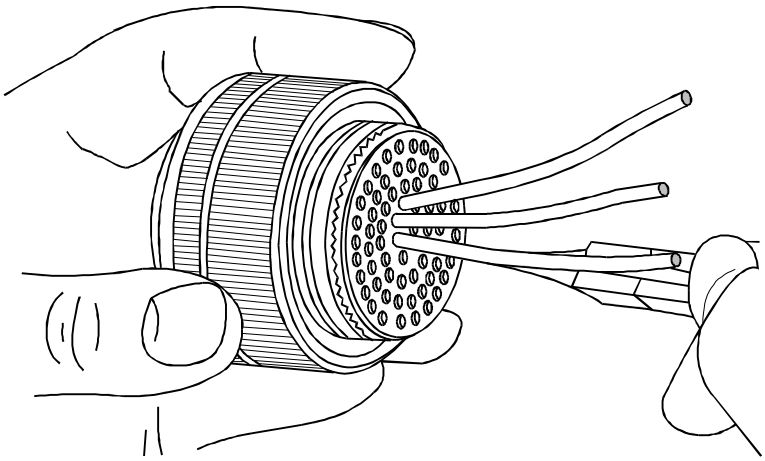


Figure 1-45
Wired Contact Extraction

4. Slide the end of the removal tool over the contact and push into the insert hole until the retention clip is fully opened. This is illustrated in a cross sectional view at Figure 1-46.

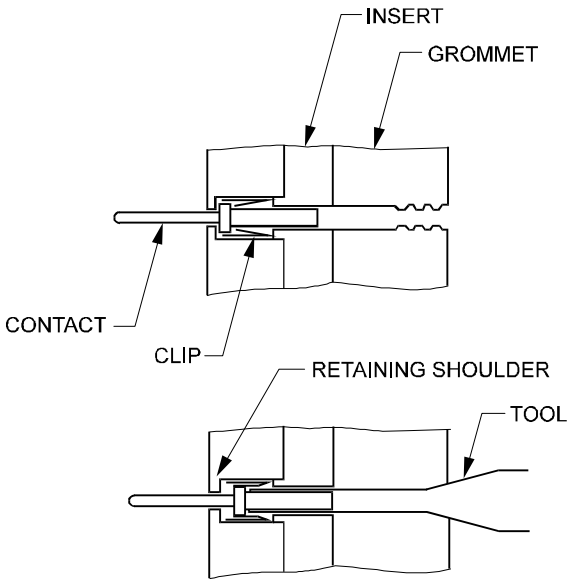


Figure 1-46
Wired Contact Extraction

5. Grasp the wire and removal tool and pull the contact from the rear of the connector. Figure 1-47 illustrates this procedure.

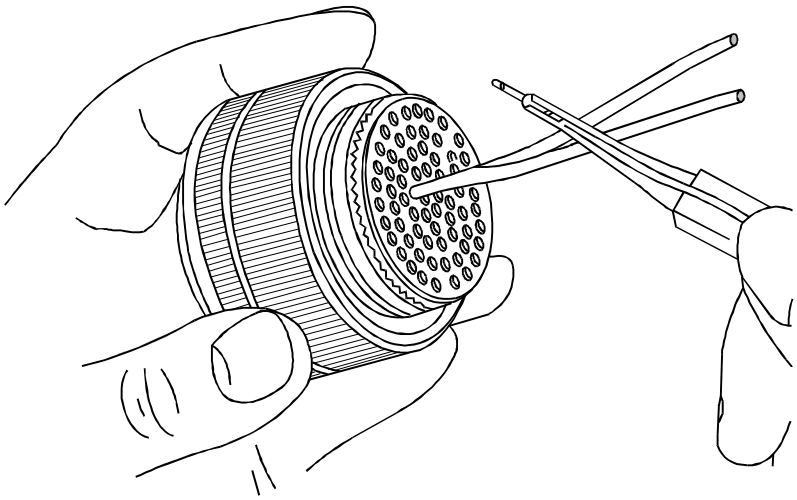


Figure 1-47
Wired Contact Extraction

Unwired Contact Extraction

Unwired contacts are inserted to complete connector configuration: To remove the unwired contact, a specially designed tool called a Unwired Contact Removal Tool as illustrated in Figure 1-48.

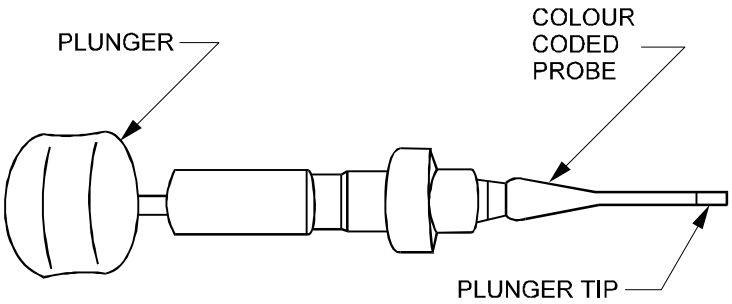


Figure 1-48
Unwired Contact Extraction

The tool is designed to be inserted into a contact hole, both releasing the contact and grasping it, so that it can be withdrawn.

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