



# THE SIMPLE GUIDE TO CRIMPING

SOLDERLESS CLOSED BARREL TERMINATION TRAINING MANUAL



THIS GUIDE HAS BEEN PRODUCED TO HELP YOU ACHIEVE A PROPERLY CRIMPED TERMINAL OR SPLICE EVERY TIME. THE FOLLOWING PAGES ILLUSTRATE THE DOS AND DON'TS OF CRIMPING, AND HIGHLIGHT THE ADVANTAGES OF USING MATCHED CABLE, TERMINAL AND TOOLING FROM THE EXTENSIVE TE CONNECTIVITY PRODUCT RANGE.



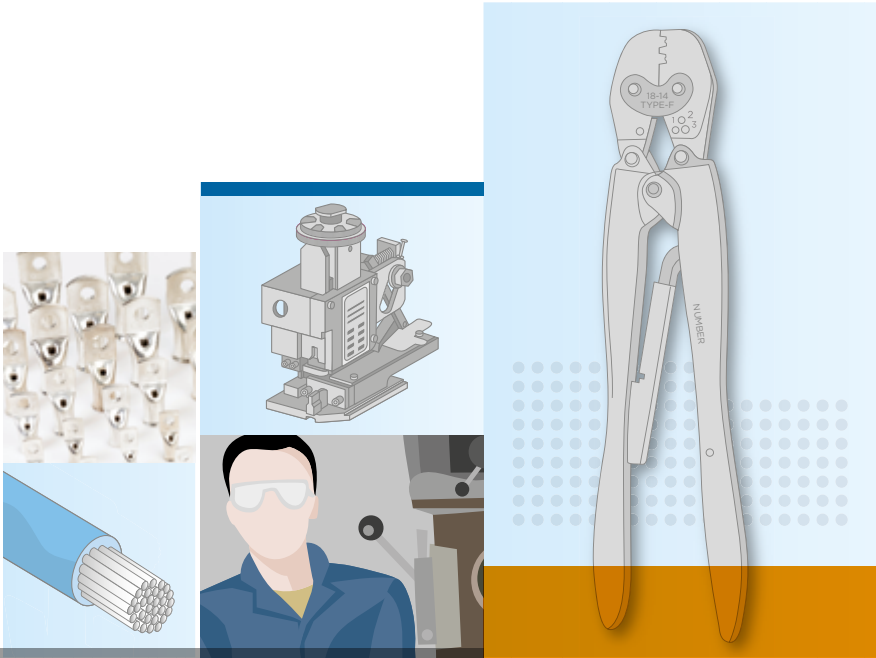
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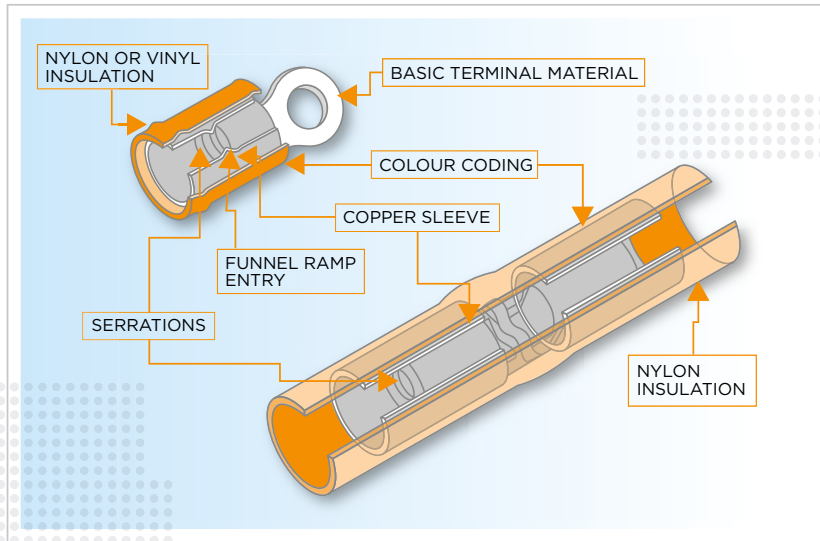
## The compents of a good connection

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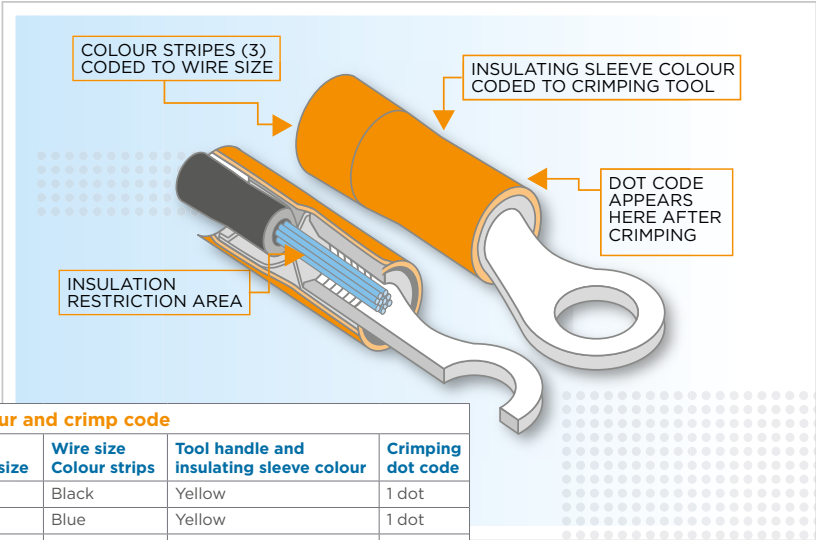
The following is a guide to basic crimp techniques - designed to provide for quality terminations and to prevent poor connections. The components of a good connection include:

- A. Correct tooling for terminal and wire
- B. Correct terminals for application
- C. Properly prepared wire
- D. A properly trained operator.



1. Available in terminals and splices for a broad range of wire sizes
2. Main features include:
  - A. Body – high grade copper, tin plated
  - B.
    1. Insulation support
    2. Funnel entry
  - C. Insulation sleeve:
    - i. Colour-coded to wire range
    - ii. Colour code matched to crimp tool cavity identifier **RB**Y.

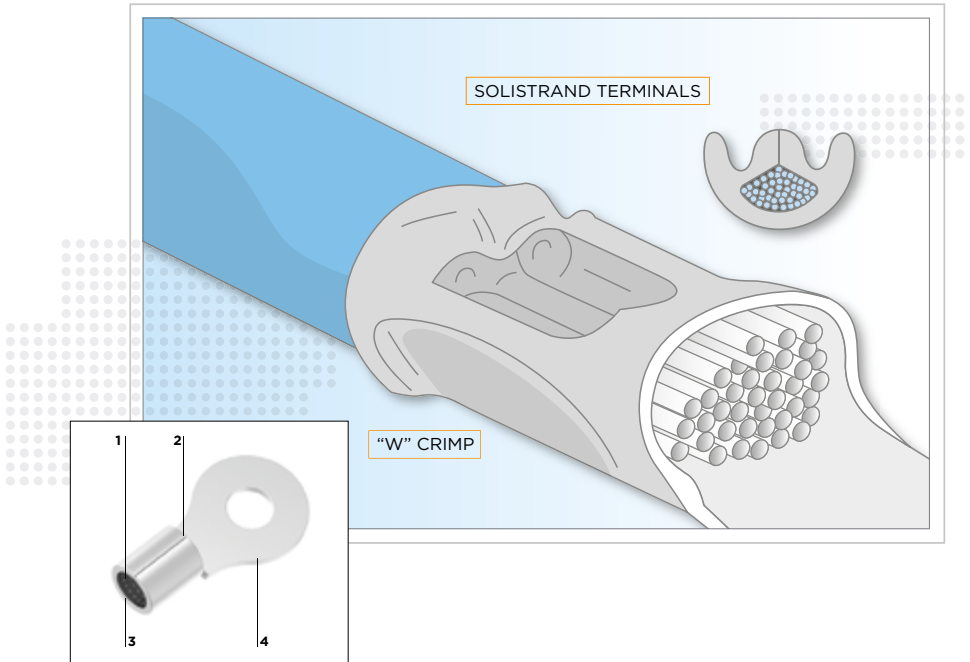
# Insulation Restricting PIDG Terminal



Colour and crimp code			
AWG Wire size	Wire size Colour strips	Tool handle and insulating sleeve colour	Crimping dot code
26	Black	Yellow	1 dot
24	Blue	Yellow	1 dot
22	Green	Red	1 dot
20	Red	Red	1 dot
18	White	Red	1 dot
16	Blue	Blue	2 dots
14	Green	Blue	2 dots
12	Yellow	Yellow	1 dot
10	Brown	Yellow	1 dot

1. PIDG terminals for thin-wall wire insulation
2. Main features include:
  - A. Body – high grade copper, tin plated
  - B.
    1. Insulation support
    2. Insulation restricting portion - provides lead-in entry for wire and prevents wire insulation from entering wire barrel

Note: Only one wire size for each terminal
  - C. Insulation sleeve:
    - i. Colour stripes (3) coded to wire size
    - ii. Sleeve colour-coded to crimp tool cavity identifier **RGBY**
3. Uses standard PIDG tooling.



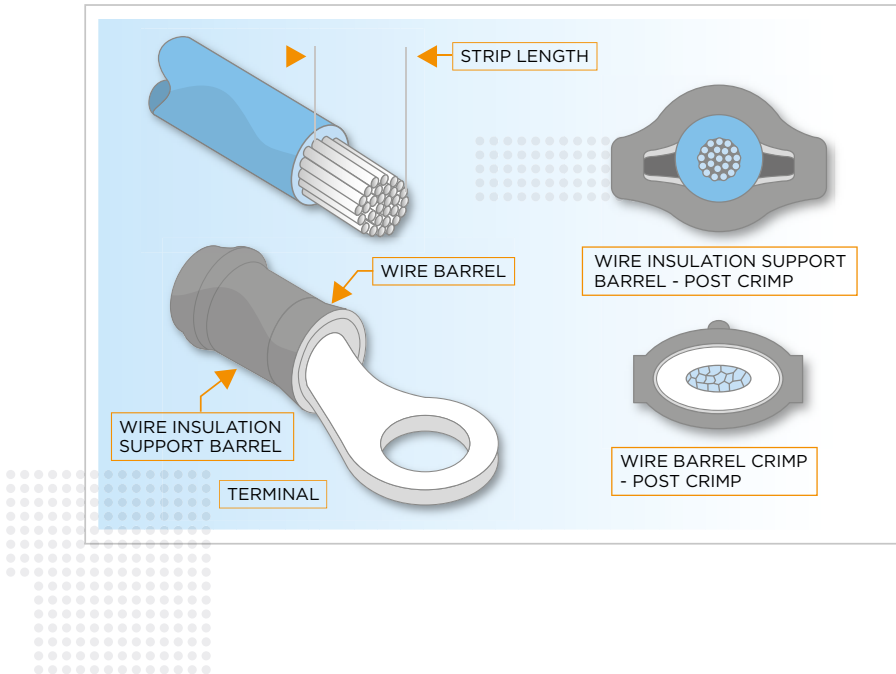
SOLISTRAND Terminals are uninsulated Lugs with tooling that leaves a “W” crimp shape on the barrel.

Four features of a SOLISTRAND Terminal include:

1. Dimples or Serrations for optimum tensile strength and electrical contact
2. Brazed Seam completely closes wire barrel for uniform metal strength
3. Tapered entrance makes insertion of wires easier
4. Copper material with Tin Plating provides corrosion resistance.

When crimping a SOLISTRAND Part, always ensure the W crimp is on each side of the brazed seam.

## Functions of closed wire barrel and insulation support barrel

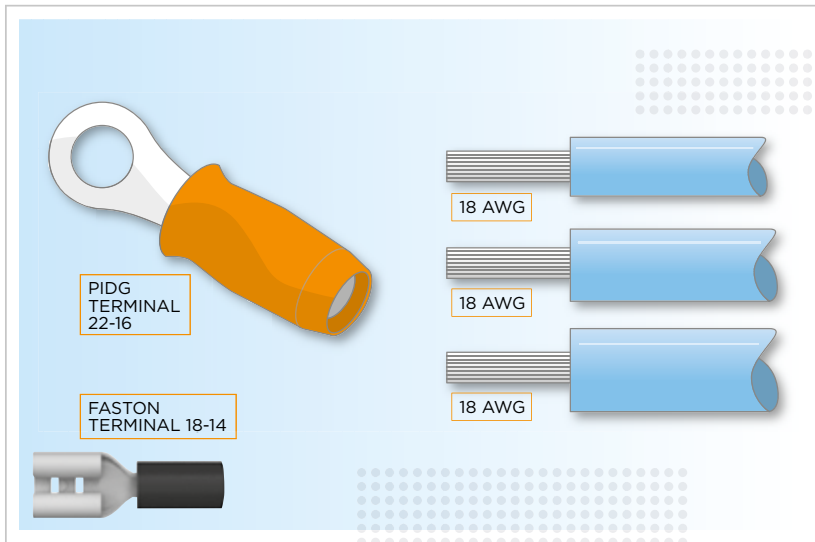


1. Wire barrel:
  - A. Provides electrical and mechanical connection to wire conductor(s)
2. Insulation barrel:
  - A. Provides strain relief for wire insulation
  - B. Requires a more relaxed crimp than wire barrel crimp
  - C. Provides no electrical connection or appreciable mechanical strength.



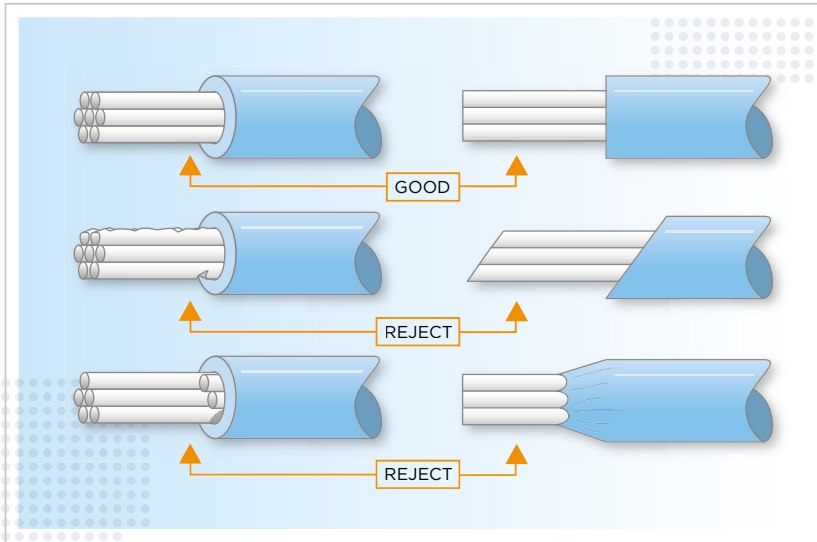
## Wire insulation variations

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1. Wire insulation diameters vary among wire of the same AWG wire size
2. Terminal insulation barrel must be designed to accommodate insulation O.D. of wire being used
3. Tooling with correct insulation crimp range must be used to provide for good insulation support crimp

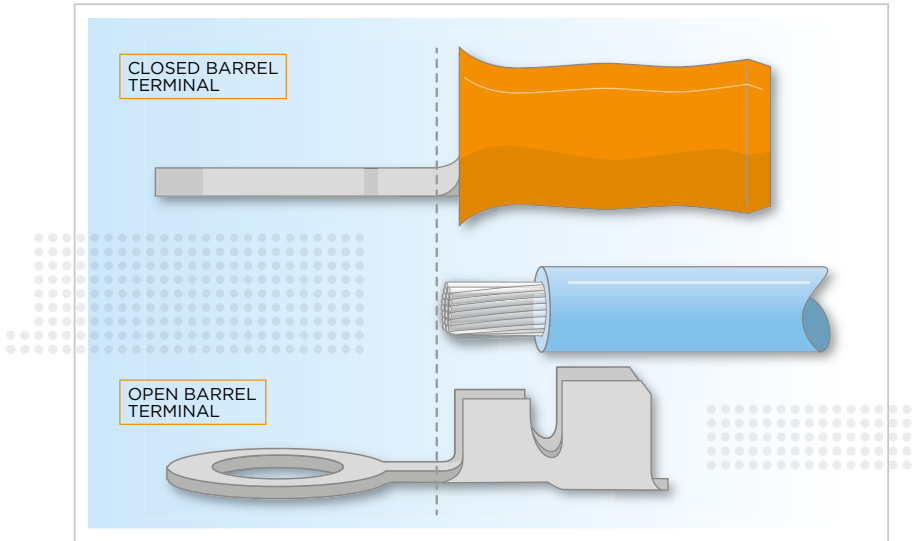
## Wire preparation



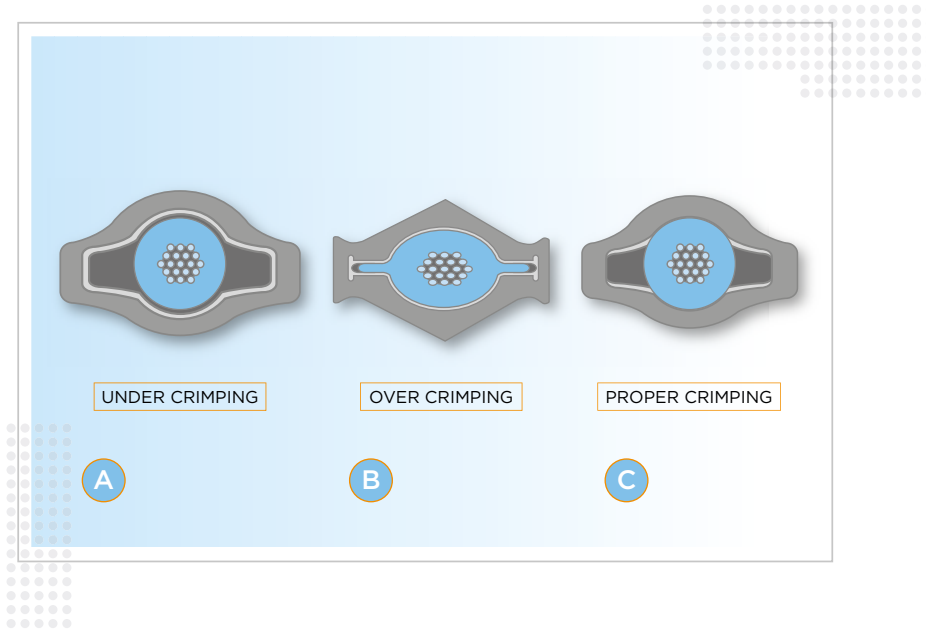
1. Remove proper length of insulation cleanly - no nicking or breaking of wire strands
2. Shown – good strips vs. poor (reject) strips.

## Proper strip length and wire placement

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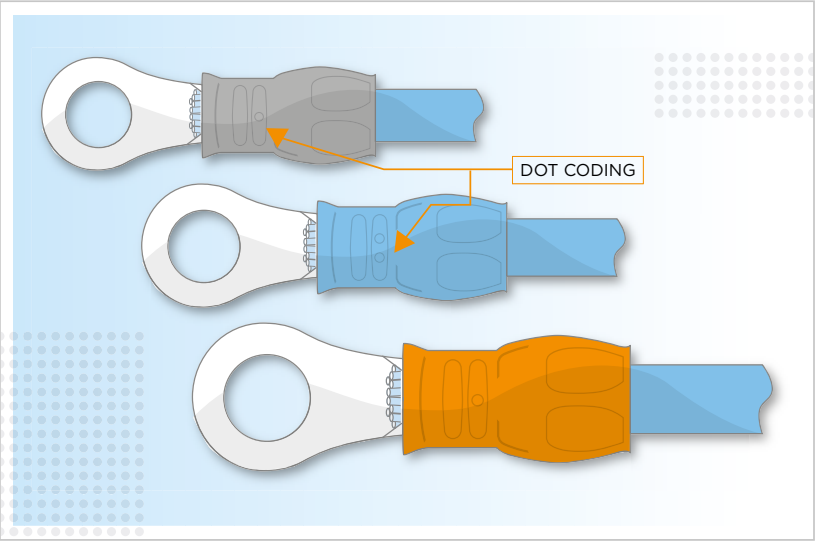
1. With properly stripped wire and correct placement in terminal:
  - A. Wire strands are crimped in wire barrel
  - B. Only insulation is crimped in insulation support barrel.



Examples of insulation support crimp cross sections:

- A. Under crimping - Insulation not sufficiently pinched, no mechanical support or strain relief for wire
- B. Over crimping - Insulation & strands are crushed, barrel digs into wire strands and can actually break wire strands
- C. Proper crimping - Wire insulation held firmly, slight indenting of insulation, good mechanical support and strain relief.

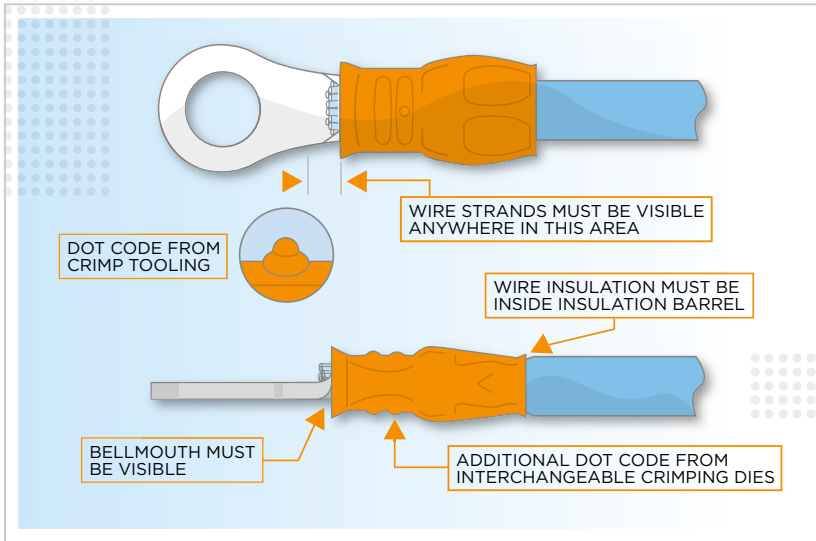
# Standard PIDG dot code



- 1. The purpose of dot coding is to:
  - A. Identify tool with terminal
  - B. Show wrong combination of tool and terminal.

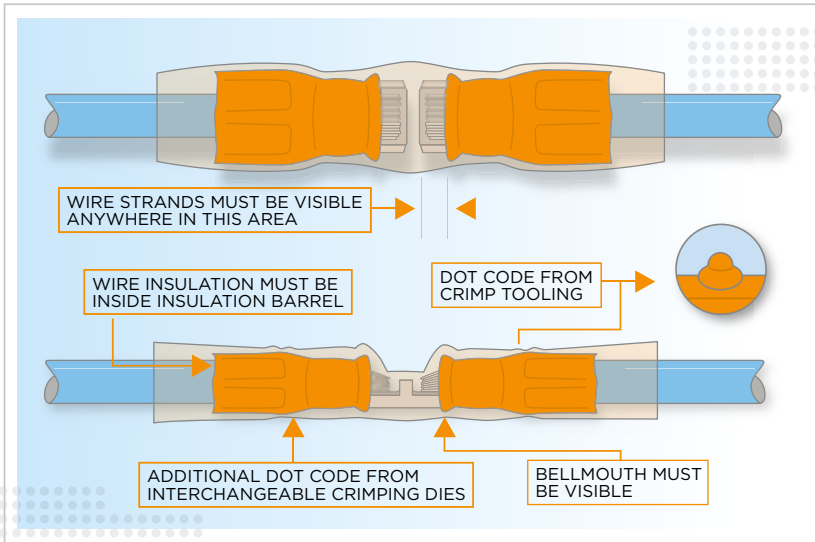
Wire range	Colour	Dot code
26-22	Yellow	1 dot
24-20	White	2 dots
22-18	Red	1 dot
16-14	Blue	2 dots
16-14HD	Black(BR)	1 dot
12-10	Yellow	1 dot

## Crimp inspection



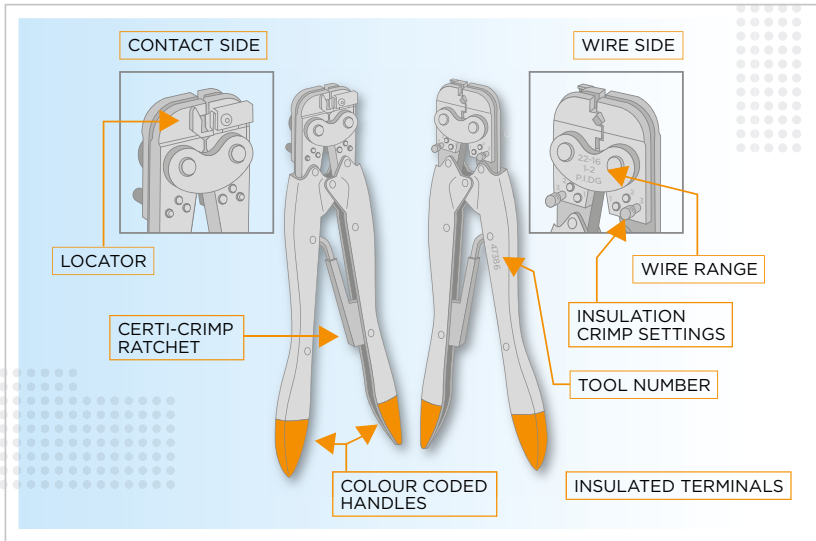
1. Wire strands must be visible at tongue end of wire barrel, but must not extend past area indicated
2. Bellmouth must be visible at tongue end of wire barrel
3. Wire insulation must be inside, and supported by, insulation barrel
4. Dot code should be in accord with instructional material packaged with crimp, tooling or dies - an additional dot code appears on terminals crimped with interchangeable crimping dies.

## Crimp inspection



1. Wire strands must be visible between wire stop and end of wire barrel
2. Dot code should be in accordance with instructional material packaged with crimp tools - additional dot code appears on splices crimped in tooling that use interchangeable crimping dies
3. Bellmouth must be visible at window end of wire barrel
4. Wire insulation must be inside insulation support sleeve.

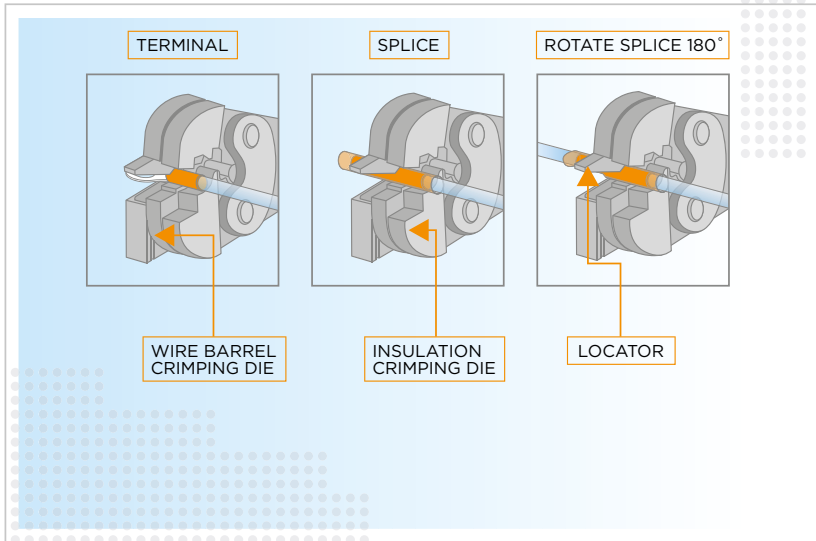
## Double action hand tool



1. One of several similar tools used for crimping a wide variety of wire sizes
2. Illustration shows:
  - A. Locator
  - B. Certi-Crimp ratchet
  - C. Colour coded handles
  - D. Insulation crimp adjustment.



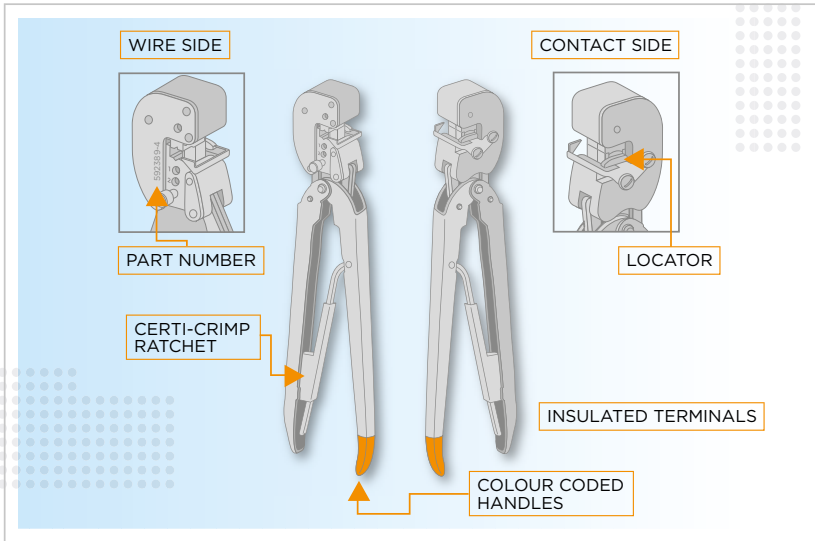
## Double action tool - locating procedure



Caution - make certain that the insulation crimping adjustment is correct before making production crimps

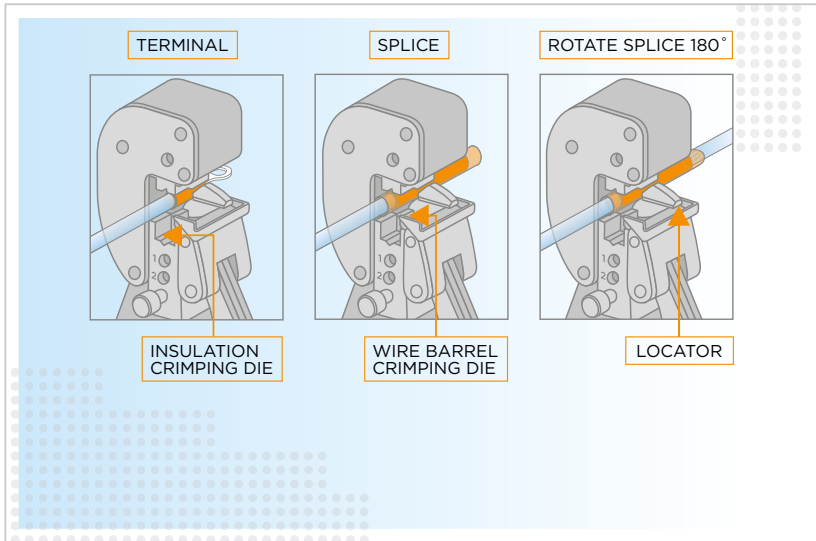
1. With tool handles in the open position:
  - A. For terminal – place in tool so tongue goes under locator (the sloped side)
  - B. For splice – centre the window indent under locator  
- the splice cannot be oriented incorrectly in locator
2. Close handles until terminal or splice is held in place without deforming wire barrel
3. Insert stripped wire until it bottoms and close handles until Certi-Crimp ratchet releases
4. To crimp other half of splice, remove splice from tool, rotate splice 180°, reposition splice in tool and complete crimp as instructed in steps 2 and 3.

## Heavy head tool



1. This heavy-head tool is used to crimp terminals and splices onto larger wires
2. Upper dies are fixed – lower dies move up and down
3. Illustration shows:
  - A. Locator
  - B. Certi-Crimp ratchet
  - C. Colour coded handle
  - D. Insulation crimp adjustment.

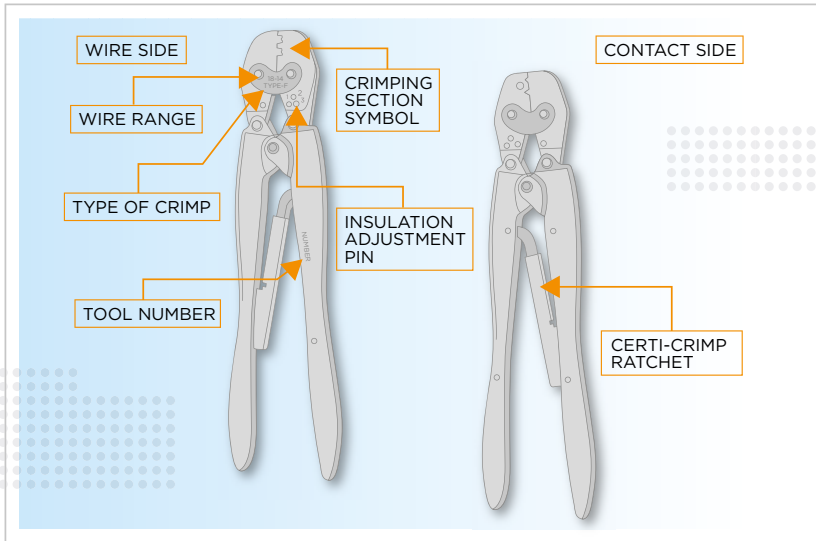
## Heavy head tool - locating procedure



Caution - make certain that the insulation crimping adjustment is correct before making production crimps.

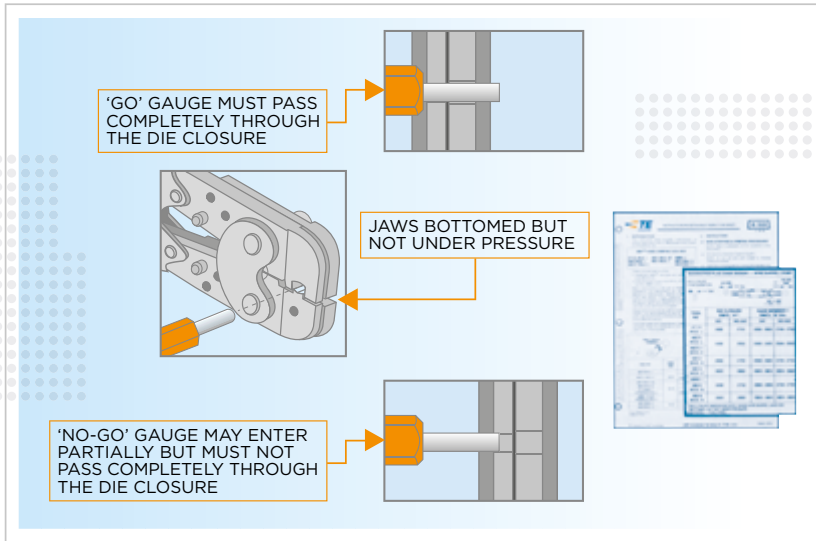
1. With tool handles in the open position:
  - A. For terminal – place in tool so tongue goes over locator
  - B. For splice – centre the window indent over locator
2. Close handles until terminal or splice is held in place without deforming wire barrel
3. Insert stripped wire until it bottoms and close handles until Certi-Crimp ratchet releases
4. To crimp other half of splice, remove splice from tool, rotate splice 180°, reposition splice in tool and complete crimp as instructed in steps 2 and 3.

## Hand tool - locating procedure



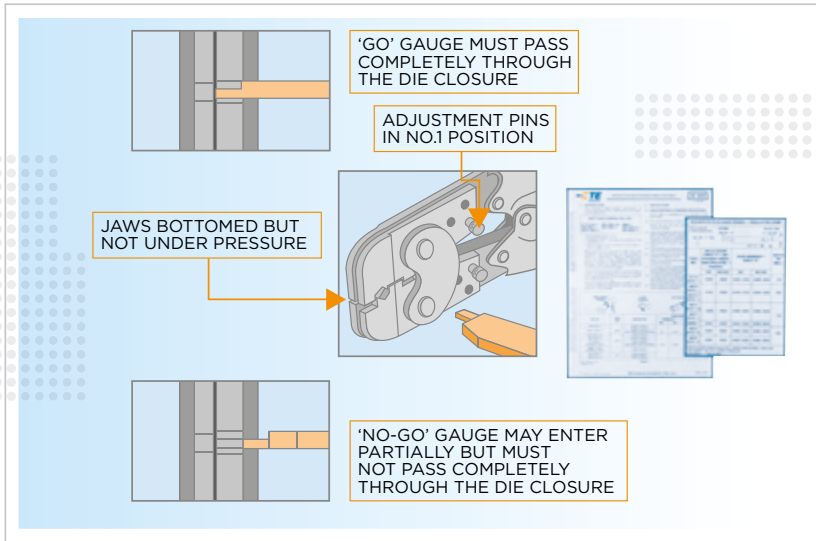
1. Wire side (back of tool) features:
  - A. Crimp section symbols
  - B. Type of crimp
  - C. Insulation adjustment pin
  - D. Wire range
  - E. Tool number
2. Contact side – side of tool from which receptacle end of terminal extends, when positioned for crimping
3. Certi-Crimp ratchet – prevents tool from opening until crimp is completed
4. Insulation adjustment pin – controls insulation crimp height.

## Inspection of wire barrel crimping dies with plug gauge



1. Die closure inspection accomplished using Go/No-Go plug gauges.

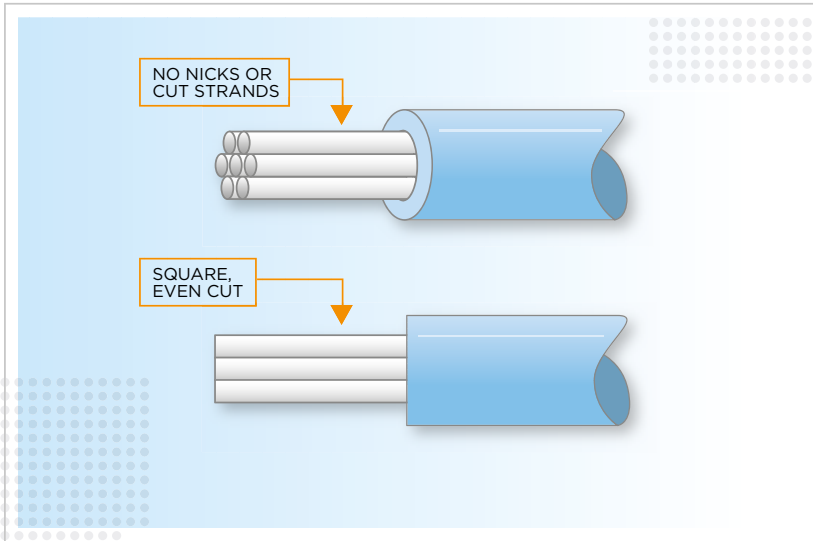
## Inspection of insulation crimping dies with plug gauge



1. Die closure inspection accomplished using Go/No-Go plug gauges.

AWG and CMA reference chart

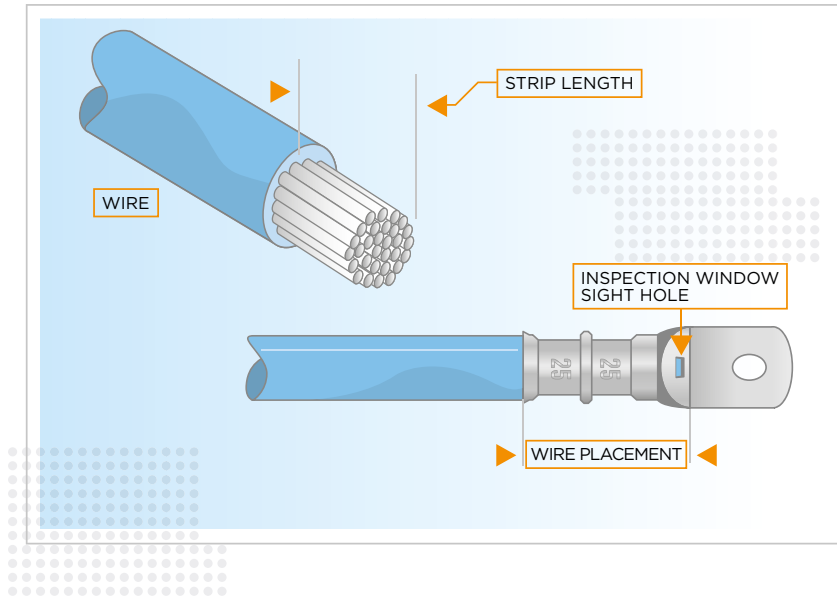
AWG	CMA Range
26-22	202-810
22-16	509-3260
16-14	2050-5180
14-12	3260-8230
12-10	5180-13.000
8	13.100-20.800
6	20.800-33.100
4	33.100-52.600
2	52.600-83.700
1/0	83.700-119.500
2/0	119.500-150.500
3/0	150.500-190.000
4/0	190.000-231.000
250-300 MCM	231.000-300.000
300-350 MCM	300.000-380.000
400MCM	380.000-478.000
500-600 MCM	478.000-600.000
250 MCM	231.000-275.000
300 MCM	275.000-325.000
350 MCM	325.000-375.000
400 MCM	375.000-450.000
500 MCM	450.000-550.000
600 MCM	550.000-650.000
700 MCM	650.000-750.000
800 MCM	750.000-850.000
900 MCM	850.000-950.000
1000 MCM	950.000-1.125.000



Safety limitations - DO NOT use larger or smaller cable sizes than those designated as this may result in increased resistance, leading to higher fire risk in some applications.

1. Feature characteristics - AMPOWER terminals and splices are supplied with inspection slots in the barrel, allowing visibility of whether the conductors have been fully and properly inserted into the barrel
2. Cable preparation - the terminal or splice selected will be determined by the conductor type and size being used.

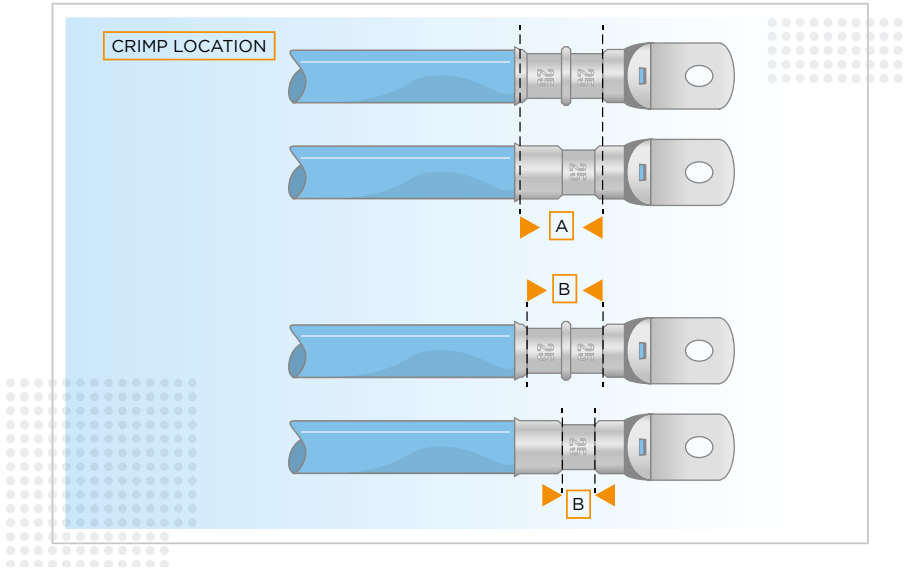




### Strip Length:

This is key to correct wire placement in the terminal. It is important that the strip length matches the terminal, and enables the correct wire placement in the terminal prior to crimping.

Visual appearance of wire brush strands present in inspection window sight hole.



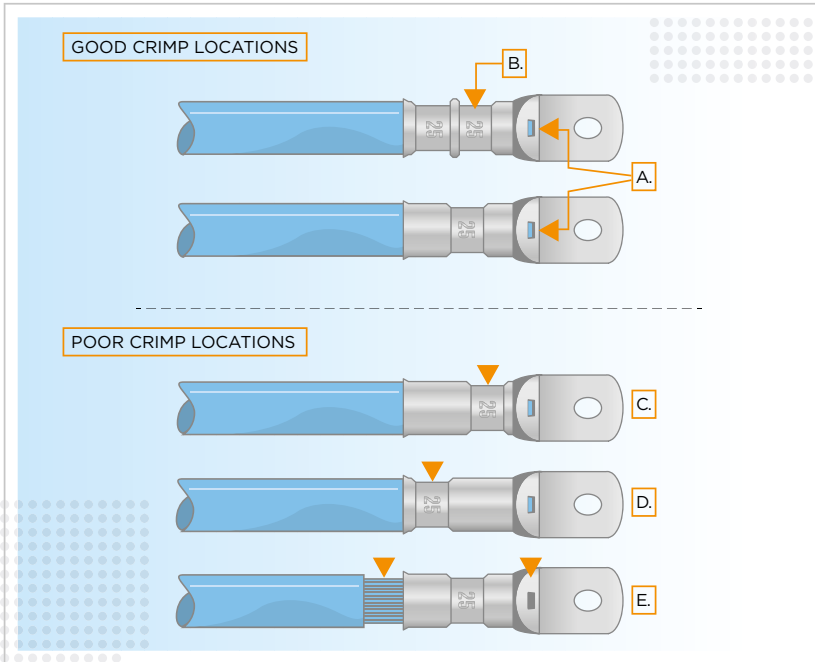
### 1. Crimp requirements:

1. Locate the terminal or splice to be crimped in the appropriate tooling, according to the instructions packaged with that tooling\*
2. Terminate the product according to the directions shipped with the appropriate tooling
3. Wire insulation should NOT be cut or broken during the crimping operation, nor should the insulation be crimped into the wire barrel
4. Reasonable care must be taken by tooling operators to provide undamaged wire terminations

### 2. Crimp location:

- A. For improved crimp effectiveness, the crimp must be within the area shown above
- B. Effective crimp length should be defined as that portion of the wire barrel, excluding the rear chamfer, fully formed by the crimping tool
- C. Instructions for adjusting, repairing, and inspecting tools are packaged with the tools.

\*Detailed instructions covering the placement of products in the tooling, and the use of such tooling, are packaged with each tool.



### 1. Good crimp location:

- A. Wire seen in correct position through site hole
- B. Correct die reference embossed upon crimp area, relates to terminal reference and wire size

### 2. Bad crimp location

- C. Crimped too near the palm
- D. Crimped too far from the palm
- E. Conductor not fully inserted.

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