



NOTE

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ± 0.13 [$\pm .005$] and angles have a tolerance of $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of FASTON 187 Series Low Insertion Force (LIF) Straight Receptacles with the “F”-Crimp wire barrel feature. The receptacles have an “F”-crimp and accept a mating tab with a hole feature. The mating tab must have a width of 4.8mm [.187] inch, with a thickness of either 0.51 mm [.020 inch] or 0.81 mm [.032 inch].

Basic terms and features of this product are provided in Figure 1.

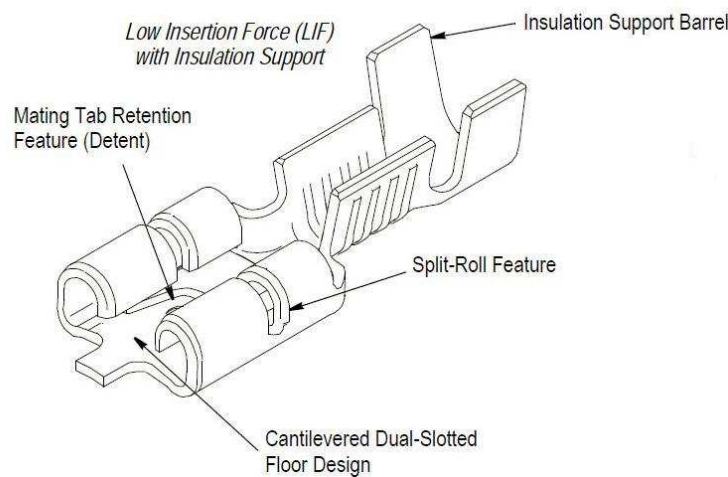


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

This paragraph is reserved for a revision summary covering the most recent additions and changes made to this specification which include the following:

Rev.1: This is the initial release of the application specification.

Rev.A: Released for production.

Rev.B: Adding the hand tool and VDE certificate information.

2.2. Customer Assistance

Reference Product Base Part Number 100651 and Product Code 1089 are representative of 187 Series FASTON Low Insertion Force (LIF) Straight Receptacles and Tabs. Use of these numbers will identify the product line and help you obtain product and tooling information, which can be obtained by visiting www.te.com or by calling the Product Information number at the bottom of page 1.

2.3. Drawings

Customer drawings for product part numbers are available from www.te.com. Information contained in the customer drawing takes priority.

2.4. Instructional Material

Instruction sheets (408-series) provide product assembly instructions or tooling setup and operation procedures and customer manuals (409-series) provide machine setup and operating procedures. A variety of instruction sheets for FASTON products are available from TE and can be obtained by visiting www.te.com or by calling the Product Information number at the bottom of page 1. Instructional material that pertain to this product are:

- [408-3295](#) Preparing Reel of Contacts for Applicator Tooling
- [408-7424](#) Checking Contact Crimp Height
- [408-9816](#) Handling of Reeled Products
- [408-10390](#) Ocean End-Feed Applicators

2.5. Specifications

Product Specification [108-106242](#) provides product performance and test results.

3. REQUIREMENTS

3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

3.2. Storage

A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the product material.

B. Reel Storage

When using reeled contacts, store coil wound reels horizontally and traverse wound reels vertically.

C. Shelf Life

The product should remain in the shipping containers until ready for use to prevent deformation to components. The product should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

D. Chemical Exposure

Do not store product near any chemical listed below as they may cause stress corrosion cracking in the material.

- | | | | | | |
|----------|------------|----------|-----------------|----------|------------------|
| Alkalies | Ammonia | Citrates | Phosphates | Citrates | Sulfur Compounds |
| Amines | Carbonates | Nitrites | Sulfur Nitrites | | Tartrates |



NOTE

When the above environmental conditions exist, phosphor-bronze contacts are recommended instead of brass if available.

3.3. Wire Selection and Preparation

The contacts accept 1 stranded copper wire within the following sizes and insulation diameter range:

Part Number	Wire Sizes	Insulation Diameter Range
2293255-1	0.5 mm ² – 1.5 mm ²	2.3 mm – 3.3 mm
2293895-1	1.0 mm ² – 2.5 mm ²	3.0 mm – 4.3 mm

Figure 2

Each wire must be stripped to the dimension given in Figure 3.



CAUTION

Care must be taken not to nick, scrape, or cut any part of the wire during the stripping operation.

Note: Not to Scale

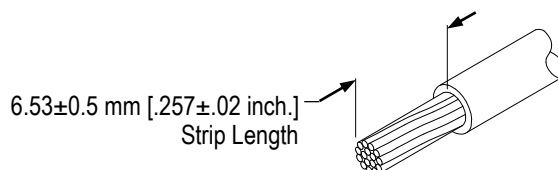


Figure 3

3.4. Contact Crimp



CAUTION

Terminal insulation should not be cut or broken during the crimping operation. Exercise of reasonable care by tooling operators should be sufficient to provide undamaged terminals. Damaged terminals should not be used. If a damaged product is evident, it should be cut from the wire and replaced with a new one.



NOTE

Periodic inspections should be made to ensure crimped contact formation is consistent as shown in Figure 4.

A. Cutoff Tab and Burr

The cutoff tab is the remaining portion of the carrier strip after the contact is cut from the strip, and the burr is the result from the cutoff tab shearing. The cutoff tab and burr must not exceed the dimension given in Figure 4

B. Bellmouths

The front bellmouth and rear bellmouth shall be evident and conform to the dimensions given in Figure 4.

C. Wire Barrel Flash

Wire barrel flash is the formation that may appear on both sides of the wire barrel as the result of the crimping process. It must not exceed the dimension provided in Figure 4.

D. Wire End Extrusion

The wire conductor ends must extend beyond the end of the wire barrel within the dimensions given in Figure 4.

E. Wire Barrel Crimp

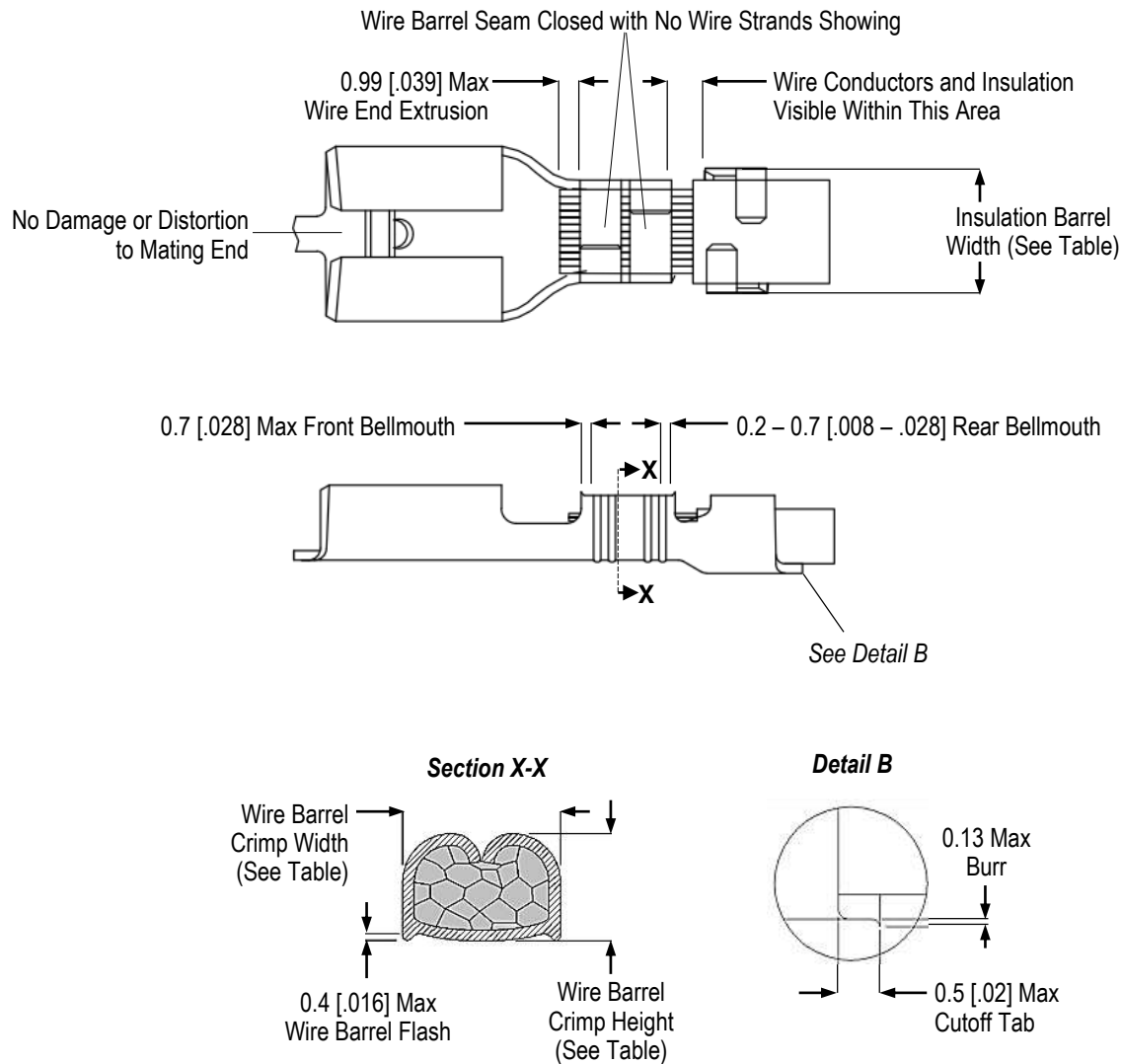
The crimp applied to the wire barrel portion of the contact is the most compressed area and is most critical in ensuring optimum electrical and mechanical performance of the crimped contact. The crimp must be centered on the closed wire barrel and care must be taken to ensure that insulation does not enter the wire barrel crimp. The crimp must result in an “F” crimp where the wire barrel forms a closed seam with no evidence of loose wire strands or wire strands visible in the seam. The crimp height and width must be within the dimensions provided in Figure 4.

F. Insulation Barrel Crimp

The crimp applied to the insulation barrel of the contact must result in an “F” crimp where the insulation barrel forms a closed seam with no evidence of wire insulation in the seam. The crimp height and width must be within the dimensions provided in Figure 4.

G. Wire Location

All conductors must be held firmly inside the wire barrel. No strands can be folded back over the wire insulation. The wire insulation must be inside the insulation barrel, but must not enter the wire barrel. The wire conductors and insulation must be visible within the area between the wire barrel and insulation barrel as shown in Figure 4.



Crimping Parameters with applicator

Terminal Part Number	Wire Size mm ²	Wire Barrel Crimp		Insulation Barrel Crimp
		Width (See Note)	Height	Width
2293255-1	0.5	2.29mm [0.09inch]	1.11±0.05mm [0.044+/-0.002inch]	3.30mm [0.130inch]
	0.75	("F")	1.22±0.05mm	("F")

			[0.048+/-0.002inch]	
	1.0		1.31±0.05mm [0.052+/-0.002inch]	
	1.5		1.47±0.05mm [0.058+/-0.002inch]	
2293895-1	1.0	3.05mm [0.12inch] ("F")	1.27±0.05mm [0.05+/-0.002]	3.94mm [0.155inch] ("F")
	1.5		1.37±0.05mm [0.054+/-0.002inch]	
	2.5		1.58±0.05 [0.062+/-0.002inch]	

Crimping Parameters with hand Tool

Receptacle Part Number	Wire Size Range	Insulation Diameter Range	Wire Barrel Crimping		Insulation Barrel Crimping
			Width	Height	Width
2293255-1	0.5 mm ² - 1.5 mm ²	2.3 mm – 3.3 mm	2.29mm [0.09inch] ("F")	1.40+/-0.05mm [0.055+/-0.002inch]	3.30mm [0.130inch]
2293895-1	1.0 mm ² - 2.5 mm ²	3.0 mm – 4.3 mm	2.54mm [0.10inch] ("F")	1.52+/-0.05mm [0.060+/-0.002inch]	3.93mm [0.155inch]

Figure 4

H. Bend Allowance

The bend allowance between the wire barrel and cable is acceptable within the limits given in Figure 5.

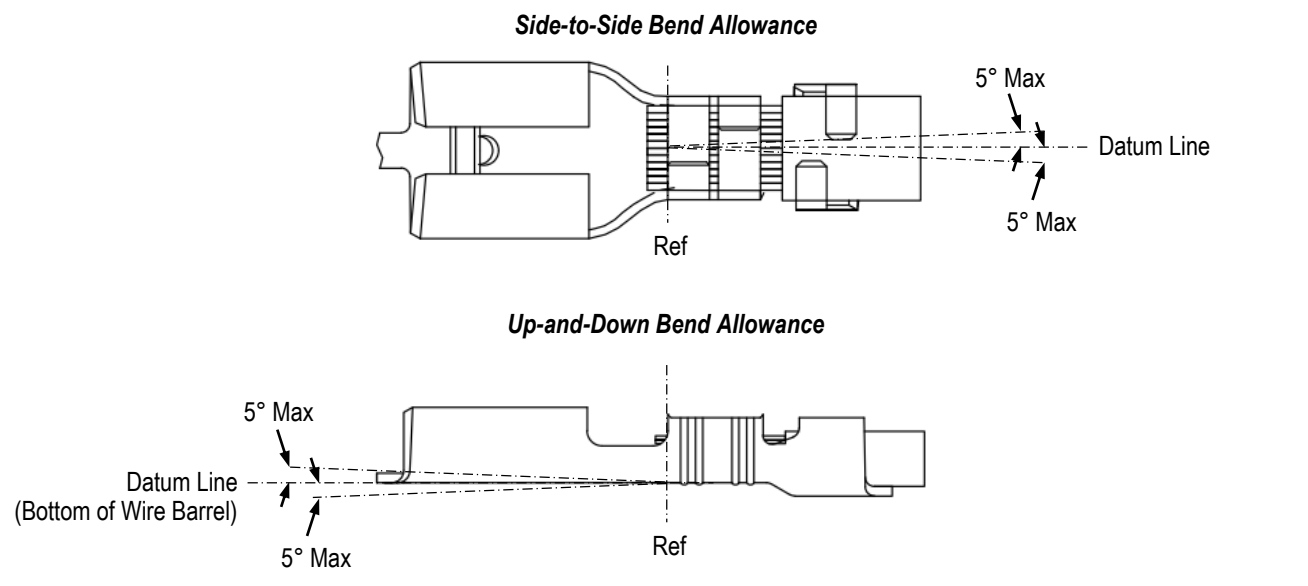


Figure 5

3.5. Crimp Tensile Test

Crimped receptacles shall not be separated from their associated wires when subjected to forces as specified in Figure 6.



NOTE

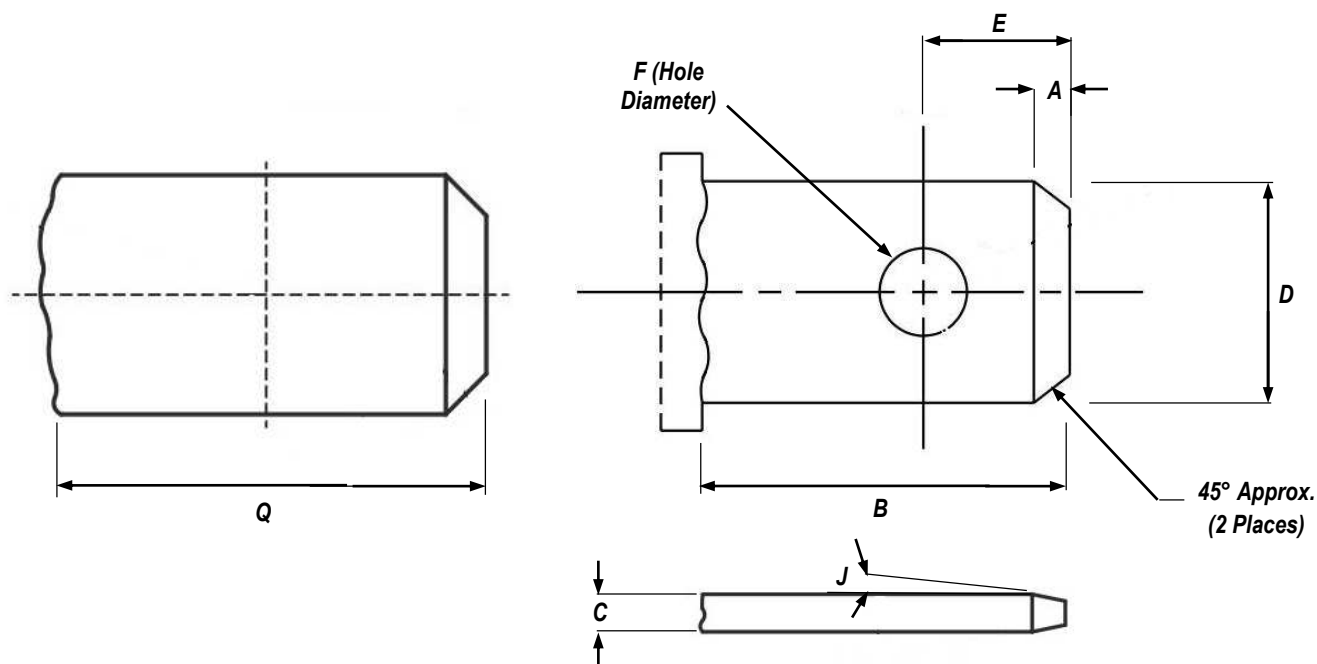
Adjust tensile testing machine for head travel of 25.4 mm [1 inch] per minute. Directly and gradually apply force for 1 minute.

Wire Size	Minimum Force
0.5 mm ²	56
0.75 mm ²	84
1.0 mm ²	108
1.5 mm ²	150
2.5 mm ²	230

Figure 6

3.6. Mating Tab Dimensions

Figure 7 shows features and dimensional requirements for tab terminals intended for mating with FASTON receptacles.



NOTE

The FASTON Straight Receptacle may not mate with a 0.51 mm [.020 inch] tab after it has mated with a 0.81 mm [.032 inch] tab.

Dimensions of production and test tabs in millimeters

Nominal Size	A	B(min)	C	D	E	F	J	Q(min)
4.8x0.51	0.6-0.9	6.2	0.47-0.54	4.67-4.90	3.0-3.4	1.3-1.5	8° - 12°	7.3
4.8x0.81	0.6-1.0	6.2	0.77-0.84	4.67-4.90	3.0-3.4	1.3-1.5	8° - 12°	7.3

Dimensions of production and test tabs in inches

Nominal Size	A	B(min)	C	D	E	F	J	Q(min)
.187 x .020	.024 - .035	.244	.019 - .021	.184 - .193	.117 - .134	.050 - .060	8° - 12°	.287
.187 x .032	.024 - .040	.244	.030 - .033	.184 - .193	.117 - .134	.050 - .060	8° - 12°	.287

Figure 7

3.7. Repair

These receptacles are not repairable once termination has been made. Any defective receptacles should be removed and replaced with a new one.

4. QUALIFICATIONS

FASTON 187 Series Low Insertion Force (LIF) Straight Receptacles with “F”-Crimp Feature with Part Number 2293255-1 meet UL-310 and IEC61210 specification for quick-connect terminals. They are listed in Underwriters Laboratories (UL) listing program Electrical File E66717 and VDE certificate No.40045816.

5. TOOLING

Tooling part numbers and instructional material packaged with the tooling are given in Figure 8

5.1. Machine (Power Unit)

The machine provides the force required to drive an applicator for crimping the contacts. These machines can be set up to automatically measure, cut, strip, and terminate the wire.

5.2. Applicator

The applicators are designed to crimp reeled contacts onto pre-stripped wire. The applicator must be installed onto a power unit.

5.3. Hand Tool

The hand tool consists of a tool frame and die assembly that has two crimping chambers.

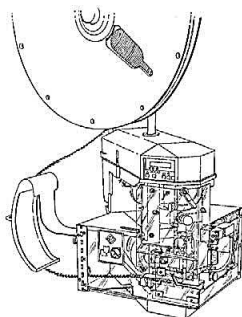
Hand tool can be used for general repair and maintenance of harness. Suitable for small volume production only.



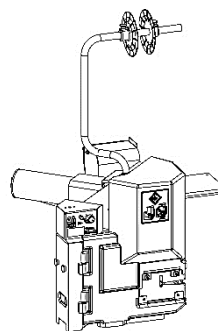
Ocean Side-Feed Applicators
X-2150081-X and X-2150298-X
(408-10390)



AMP 3K/40 Terminating
Machine MOD CE
2161400-[] and AMP 5K/40
AMP Terminating Machines
MOD CE 2151500-[]



MODEL GII TERMINATOR
2217000-[]



AMP 3K Terminating
Machines 1725950-[] and
AMP 5K Terminating
Machines 1725900-[]
(409-10047)

Receptacle Part Number	Wire Size Range	Insulation Diameter Range	Applicator Base Number
2293255-1	0.5 mm ² - 1.5 mm ²	2.3 mm – 3.3 mm	X-2150081-X
2293895-1	1.0 mm ² - 2.5 mm ²	3.0 mm – 4.3 mm	X-2150298-X

Receptacle Part Number	Wire Size Range	Insulation Diameter Range	Hand Tool Part Number
2293255-1	0.5 mm ² - 1.5 mm ²	2.3 mm – 3.3 mm	675930-1
2293895-1	1.0 mm ² - 2.5 mm ²	3.0 mm – 4.3 mm	675930-1

Figure 8

6. VISUAL AID

The illustration below shows a typical application of this product. This illustration should be used by production personnel to ensure a correctly applied product. Applications which do not appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or tooling.

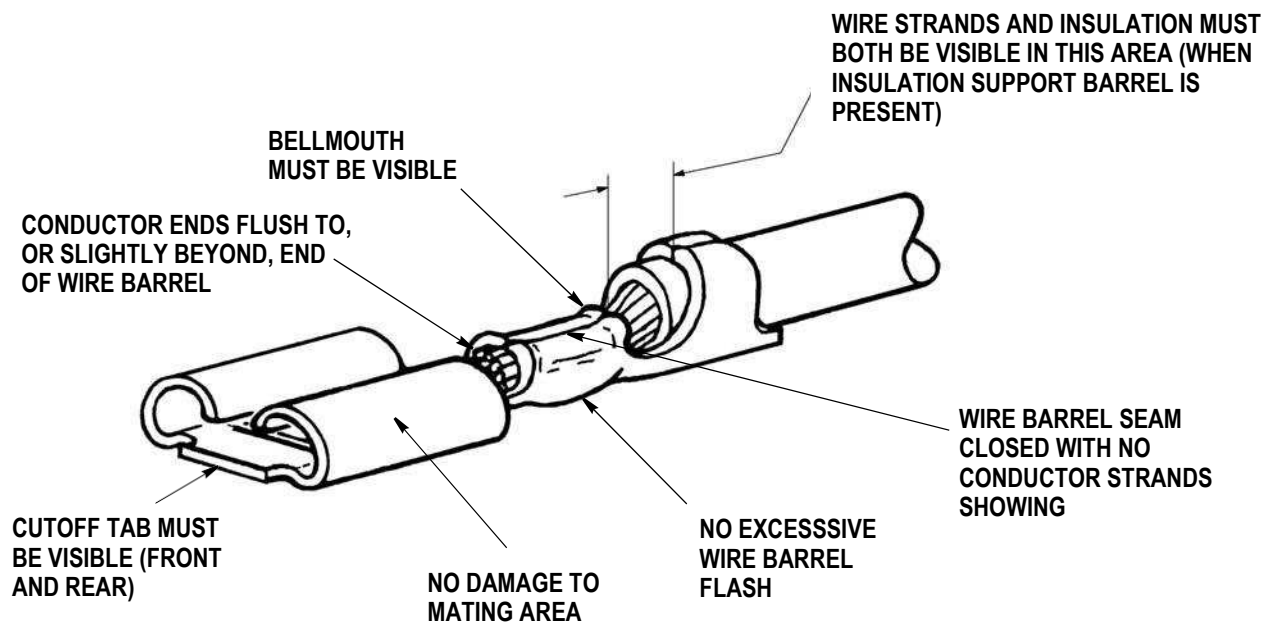


Figure 9