

**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  $\pm 0.13$  [ $\pm .005$ ] 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 Open Barrel Pigtail and Thru Splices. These splices will accept wire sizes and combinations within the range of 400 to a combined total of 30,000 Circular Mill Area (CMA). All are designed to be crimped with precision dies and various power assist units.

When corresponding with Tyco Electronics Personnel, use the terminology provided on this specification to help facilitate your inquiry for information. Basic terms and features of connectors are provided in Figure 1.

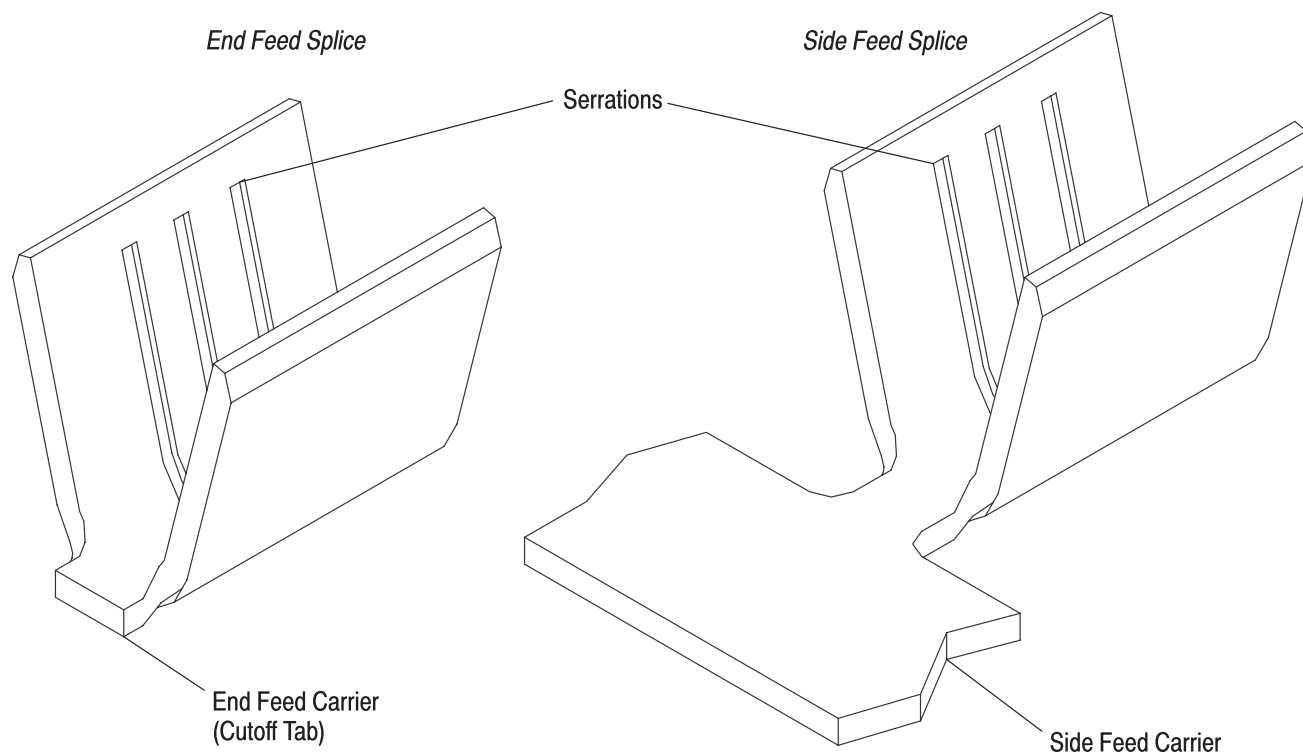


Figure 1

**2. REFERENCE MATERIAL**

**2.1. Revision Summary**

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

Per EC: 0990-1461-04

- Updated document to corporate requirements
- Added new text to Section 1, INTRODUCTION, Paragraphs 2.3, 2.4, 3.1.A, 3.1.C, 3.2, 3.3, 3.3.A, 3.3.B, 3.3.C, 3.3.D, 3.3.E, 3.3.F, 3.3.G, 3.3.H, 3.3.G, 3.3.I, 3.4, Section 4, QUALIFICATIONS, and Section 5, TOOLING
- Changed callouts in Figure 3 and deleted table in Figure 4
- Added new art to Figures 1 and 5

## 2.2. Customer Assistance

Reference Part Number 61299 and Product Code 1041 are representative of Open Barrel Pigtail and Thru Splices. These numbers are used in the network of customer service to access tooling and product application information. This service is provided by your local Tyco Electronics Representative (Field Sales Engineer, Field Application Engineer, etc) or, after purchase, by calling the Tooling Assistance Center or the FAX/Product Information number at the bottom of page 1.

## 2.3. Drawings

Customer drawings for specific products are available directly from the Tyco Electronics website, the FAX/INFO number, or the service network numbers listed at the bottom of page 1. The information contained in the Customer Drawing takes priority if there is a conflict with this document or any other technical document supplied by Tyco Electronics.

## 2.4. Instructional Material

The following list includes available Instruction Sheets (408-series) that provide product related procedures along with operation, maintenance, and repair of tooling; and Customer Manuals (409-series) that provide setup, operation, and maintenance of machines.

<u>Document Number</u>	<u>Document Title</u>
408-4357	AMP-O-ELECTRIC* Model "G" Terminating Machine 356462-[ ]
408-7424	Checking Terminal Crimp Height or Gaging Die Closure
408-8012	Standard-Type Side-Feed Applicators
408-8014	Standard-Type End-Feed Applicators
408-8024	Miniature Quick-Change Applicators (End-Feed Type)
408-8039	Heavy Duty Miniature Quick-Change Applicators (End-Feed Type)
408-8040	Heavy Duty Miniature Quick-Change Applicators (Side-Feed Type)
408-8053	Miniature (Mini) Quick-Change Applicators
408-8059	General Preventative Maintenance for Applicators
408-9816	Handling of Reeled Products
409-5128	AMP-O-ELECTRIC Model "K" Terminating Machines 1-471273-3 and 565435-5
409-5842	AMP-O-ELECTRIC Model "G" Terminating Machine 354500-1
409-5852	AMPOMATOR* CLS III-G Lead-Making Machine 122500-[ ]
409-5878	AMPOMATOR CLS IV Lead-Making Machines 356500-[ ]

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Shelf Life

Reeled splices should remain in the shipping containers to prevent deformation and limit exposure to environmental elements until ready for use. Splice products should be used on a first in, first out basis to avoid long term storage contamination that could adversely affect crimp performance.

#### B. Ultraviolet Light

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

#### C. Reeled Splices

Care must be taken to prevent twisting, bending, or other distortion that would prevent smooth feeding of the reeled product through automatic machine feed mechanisms. Store coil wound reels horizontally and traverse wound reels vertically. Review reel tag data to determine if breaks in the strip are present within the reel.

#### D. Chemical Exposure

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

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

**NOTE**

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

### 3.2. Wire Size and Preparation

Open barrel splices accept bare solid and/or stranded copper wire of various sizes and combinations. Strip length, as shown in Figure 2, shall be 1.14–2.16 [.045–.085] longer than the splice or as needed to ensure that all conductors are laced completely through the splice without any insulation extending into the crimp area.

**CAUTION**

*Reasonable care must be taken not to nick, scrape, or cut any strands during the stripping operation.*

**NOTE**

*Do not twist multiple wires together prior to crimping.*

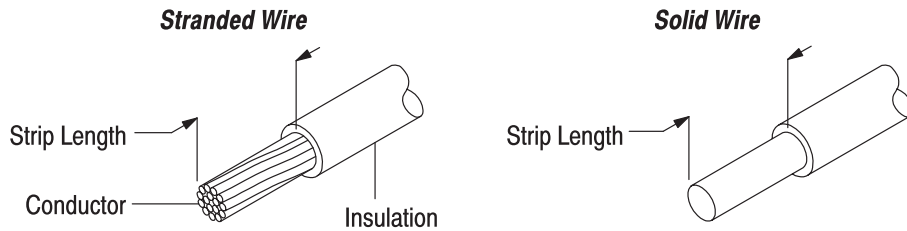


Figure 2

### 3.3. Crimped Splice Requirements

Figure 3 illustrates the crimp features required as they apply to typical pigtail and thru type splices after termination.

#### A. Crimp Width and Crimp Height

Optimum electrical and mechanical performance is achieved by reducing the cross-sectional area of the wires and splice by a pre-determined percentage. Crimp width is fixed in the application tooling. Crimp height must be set and maintained as determined from the crimp height formula provided on the splice Customer Drawing. See Figure 3.

**B.** For optimum crimp length effectiveness, the crimp must be within the area shown and must meet the crimp dimensions provided in Figure 3. Effective crimp length shall be defined as that portion of the splice, excluding bellmouth(s), fully formed by the crimping tool. Instructions for adjusting, repairing, and inspecting tools are packaged with the tools. See Sections 2.4, Instructional Material and Section 5, TOOLING.

#### C. Bellmouths

Front and rear bellmouths shall conform to the dimensions given in Figure 3. Bellmouths contribute to crimp effectiveness and reduce the risk of nicked and/or broken conductor strands due to sharp material edges at the ends of the splice.

#### D. Cutoff Tabs

Cutoff tabs shall not exceed the dimension shown in View A, Figure 3.

#### E. Cutoff Burrs

Cutoff Burrs shall not exceed the dimension shown in View A, Figure 3.

#### F. Wire Barrel Flash

Wire barrel flash, which can be caused by incorrect set-up and/or worn and broken crimp tooling, shall not exceed the dimension shown in Section X-X, Figure 3.

#### G. Conductor Extension

Conductors must extend completely through the splice, but to the maximum dimension shown in Figure 3 for each splice type.

#### H. Splice Seam

The splice seam must be closed with no evidence of loose wire strands visible in the seam as shown in Figure 3.

**I. Tensile Strength**

Crimp quality shall be judged solely on proper crimp width, crimp height, and conformance to the requirements shown in Figure 3.

**NOTE** When crimped as specified, crimp tensile strength will be approximately 70% of the tensile strength of the smallest wire in the splice.

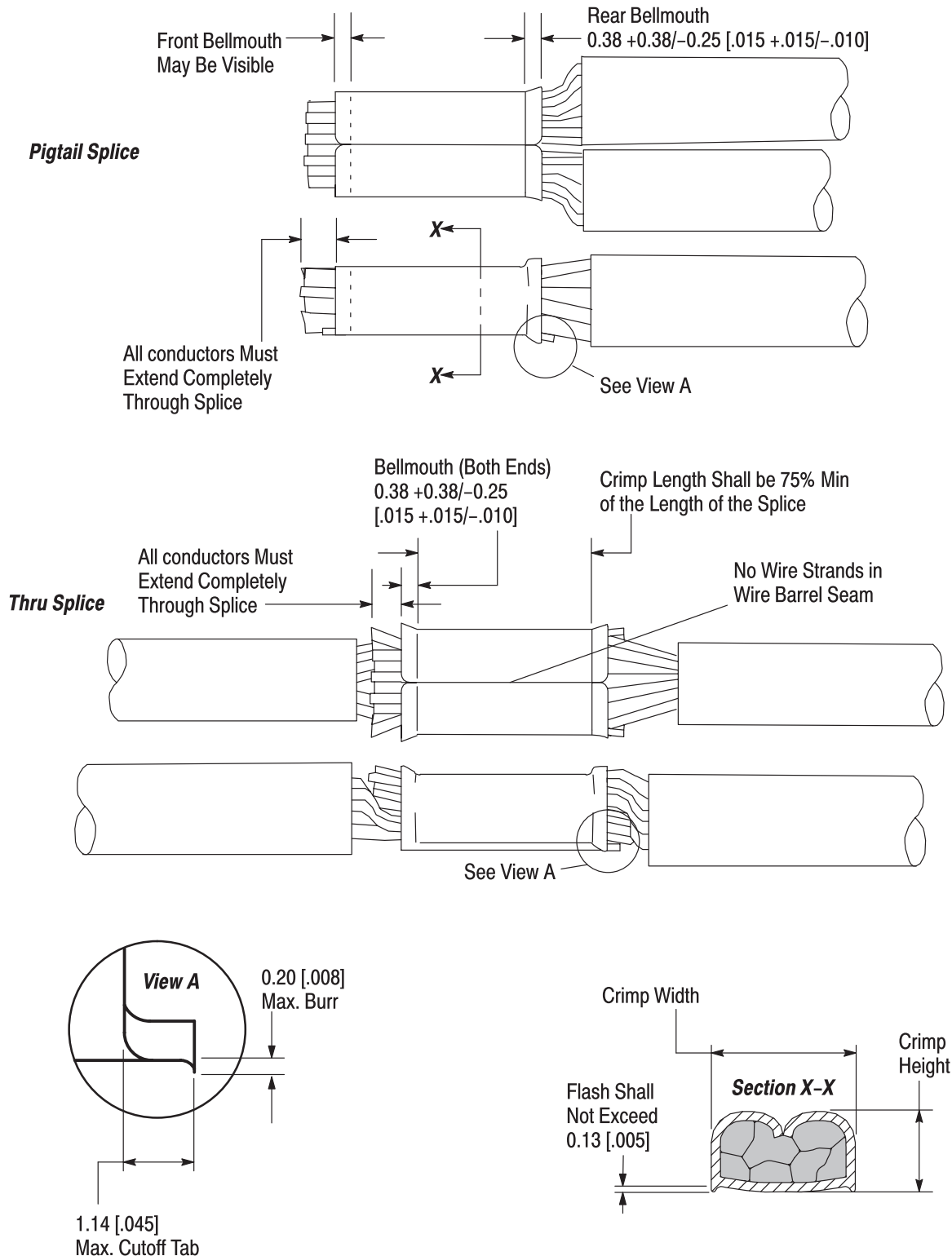


Figure 3

### 3.4. Splice Repair

If a splice is not crimped correctly or it has been damaged, it can not be repaired or reterminated. It must be cut from the wires and replaced with a new splice.

### 4. QUALIFICATIONS

Due to numerous wire sizes and combinations, Underwriters Laboratories Inc. (UL) and CSA International will not grant blanket approval for Open Barrel Splice part numbers. Customers must submit their end product to these agencies for application approval.

### 5. TOOLING

This section provides a selection of tools for various application requirements. They include semi-automatic and automatic machines for power-assisted application of strip form contacts. Modified designs and additional tooling concepts may be available to meet other application requirements. See Figure 4.

**NOTE**

*Tyco Electronics Tool Engineers have designed machines for a variety of application requirements. For assistance in setting up prototype and production line equipment, contact Tyco Electronics Tool Engineering through your local Tyco Electronics Representative or call the Tooling Assistance Center number at the bottom of page 1.*

- **Applicator**

Applicators are designed for the full wire size range of strip-fed, precision formed contacts, and provide for high volume, heavy duty, production requirements. The applicators can be used in bench or floor model power units.

**NOTE**

*Each applicator is shipped with a metal identification tag attached. DO NOT remove this tag or disregard the information on it. Also, a packet of associated paperwork is included in each applicator shipment. This information should be read before using the applicator; then it should be stored in a clean, dry area near the applicator for future reference. Some changes may have to be made to the applicators to run in all related power units. Contact the Tooling Assistance Center number at the bottom of page 1 for specific changes.*

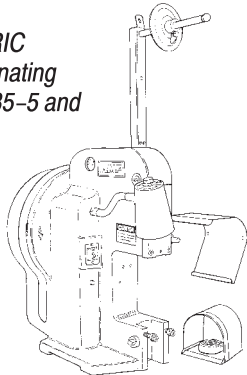
- **Power Units**

A power unit is an automatic or semi-automatic device used to assist in the application of a product. Power unit includes the power source used to supply the force or power to an applicator.

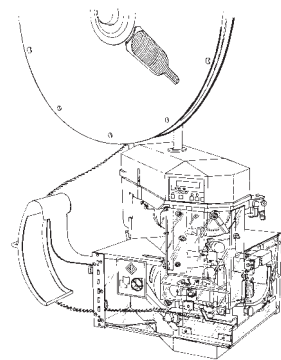
**NOTE**

*The Model "K" AMP-O-LECTRIC Terminating Machine PN 565435-5 has been superseded by the Model "G" Terminating Machine PN 354500-1 (409-5842) for new applications. For existing applications, the Model "K" is still supported because of the large number of installed machines.*

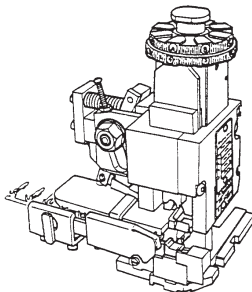
AMP-O-LECTRIC  
Model "K" Terminating  
Machines 565435-5 and  
1-471273-3



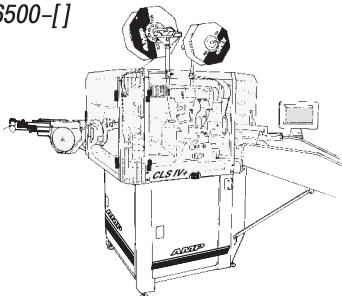
AMP-O-LECTRIC Model  
"G" Terminating Machine  
354500-[], and 356462-[]



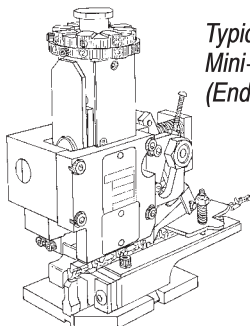
Typical Heavy Duty  
Mini-Applicator  
(Side-Feed)



AMPOMATOR CLS IV+  
Lead-Making Machines  
356500-[]



Typical Heavy Duty  
Mini-Applicator  
(End-Feed)



AMPOMATOR CLS III-G  
Lead-Making Machine  
122500-[]

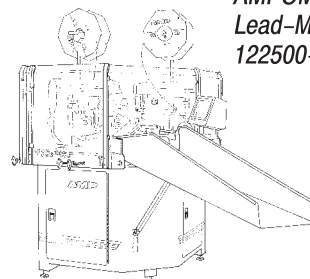
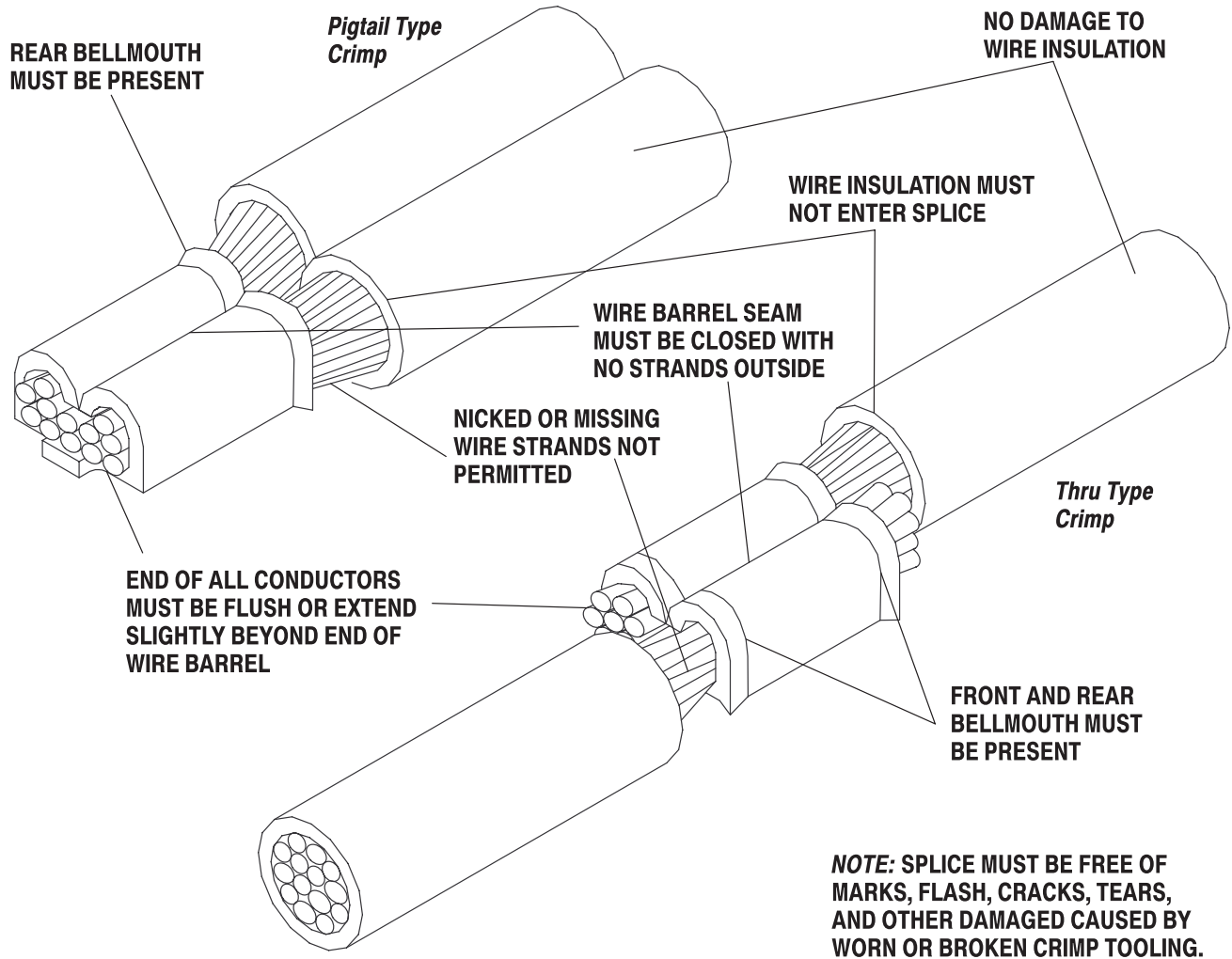


Figure 4

**6. VISUAL AID**

Figure 5 shows a typical application of an Open Barrel Pigtail and Thru Splice. 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 5. VISUAL AID**