Open Barrel Pigtail and Through Splices

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 [±.005] and angles have a tolerance of ±2°. 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 through splices. These splices are available in end feed and side feed. The splices will accept wire sizes and combinations within the range of 400 to a combined total of 30,000 circular mill area (CMA). The splices feature serrations that help to hold the wire in place after crimping. All are available in strip form to be crimped using precision crimping dies and various power assist units.

When corresponding with personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of this product are provided in Figure 1.

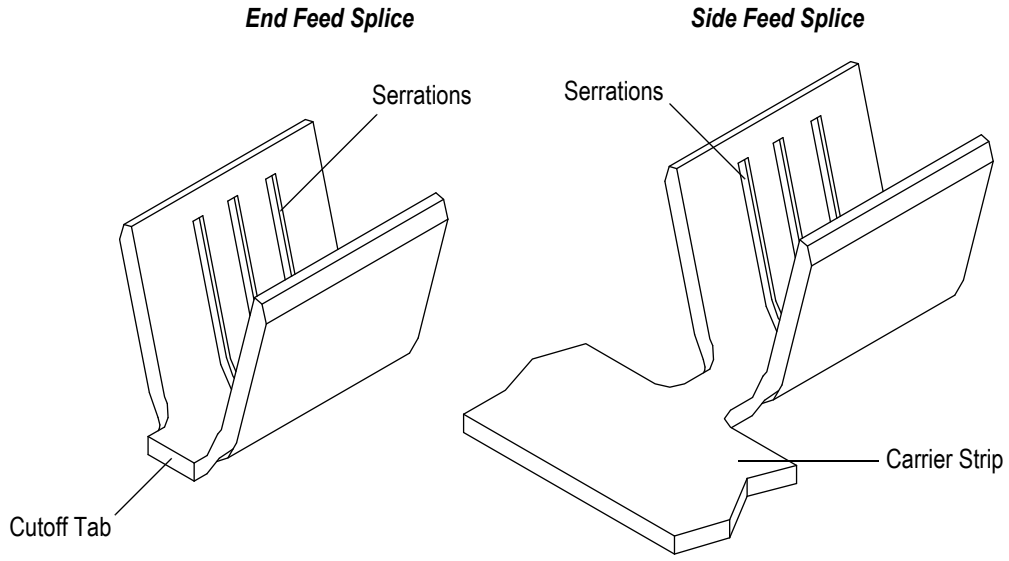


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- Changed “thru” to “through”
- Changed company name and logo

2.2. Customer Assistance

Reference Product Base Part Number 61299 and Product Code 1041 are representative of open barrel pigtail and through splices. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local Representative or, after purchase, by calling PRODUCT INFORMATION at the number at the bottom of page 1.

2.3. Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, the information contained in the Customer Drawings takes priority.

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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. Documents that pertain to this product are:

408-4357 AMP-O-LECTRIC* 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 Quick-Change Applicators
408-8059 General Preventative Maintenance for Applicators
408-9816 Handling of Reeled Products
409-5128 AMP-O-LECTRIC Model “K" Terminating Machines 1-471273-3 and 565435-5
409-5842 AMP-O-LECTRIC Model “G" Terminating Machine 354500-1
409-5852 AMPOMATOR* CLS III-G Lead-Making Machines 122500-[ ]
409-5878 AMPOMATOR CLS IV+ Lead-Making Machines 356500-[ ]

2.1. 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. Splices 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 splices 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.

NOTE

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

2.2. Wire Size and Preparation

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

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.

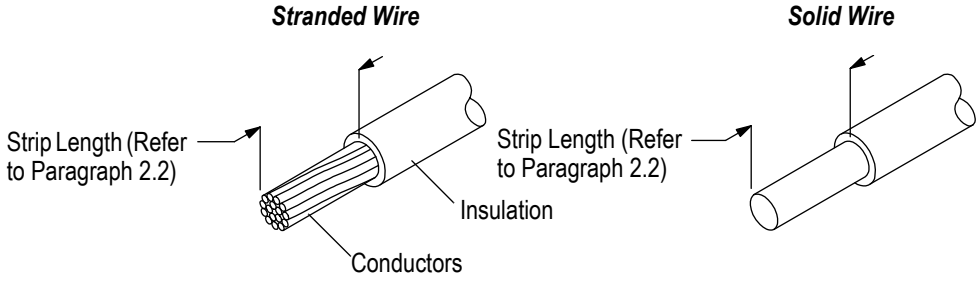


Figure 2

2.3. Crimped Splice Requirements

Crimp features that must apply to pigtail and through splices after termination are illustrated in Figure 3.

A. Crimp Height and Width

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 by 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. Crimp Length

For optimum crimp length effectiveness, the crimp must be within the area shown in Figure 3.

Effective crimp length shall be defined as that portion of the splice, excluding bellmouths, fully formed by the crimping tool. The crimp length must meet the dimensions provided in Figure 3.

C. Bellmouths

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. Front and rear bellmouths shall conform to the dimensions given in Figure 3.

D. Cutoff Tab

The cutoff tab shall not exceed the dimension given in Figure 3.

E. Cutoff Burr

The cutoff burr shall not exceed the dimension given in 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 given in Figure 3.

G. Conductor Extension

Conductors must extend completely through the splice, but to the maximum dimension given in Figure 3.

H. Seam

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

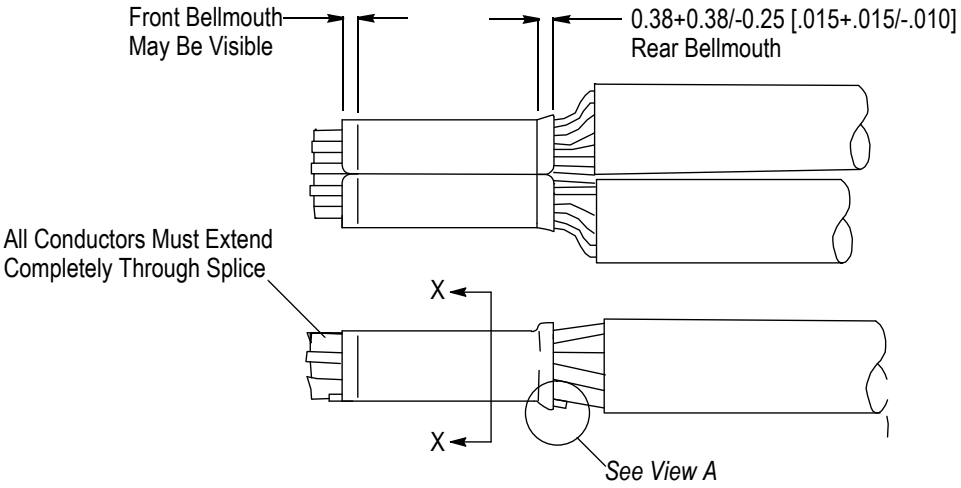
I. Tensile Strength

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

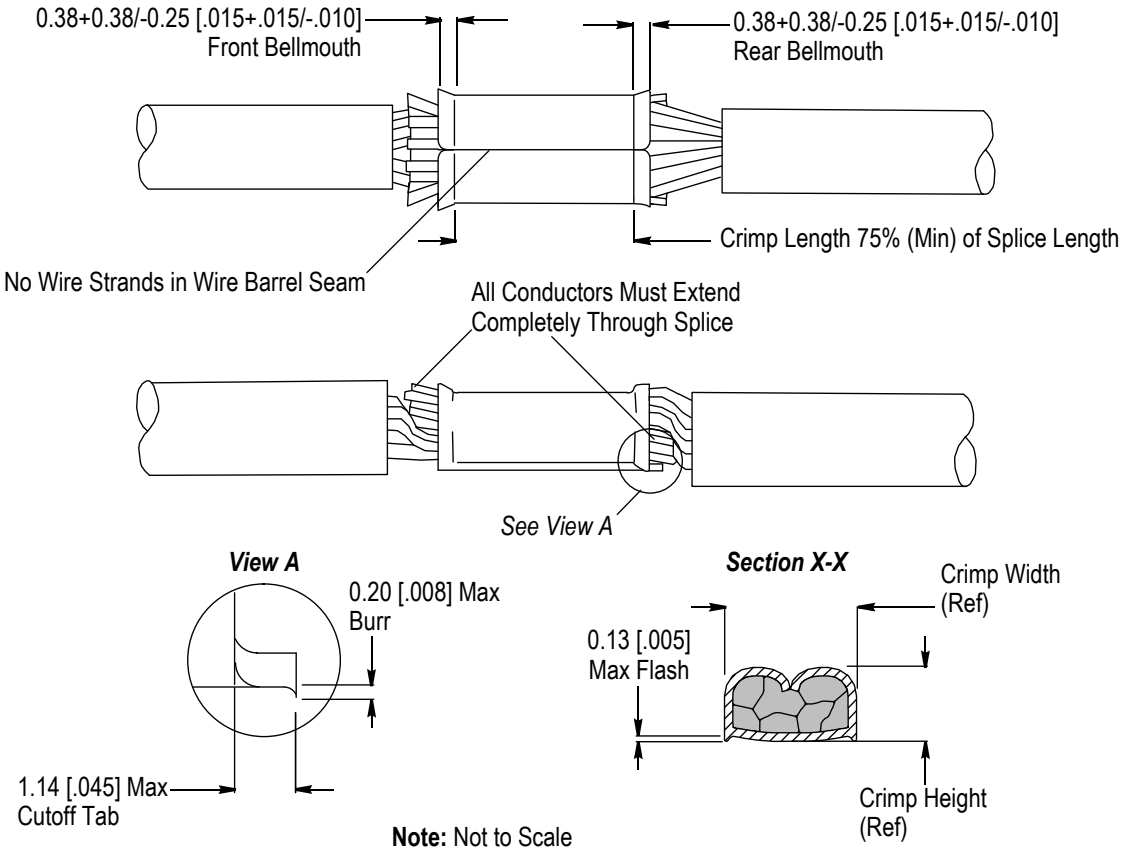
NOTE

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

Pigtail Splice



Through Splice



Note: Not to Scale

Figure 3

2.4. Repair

If a splice is not crimped correctly or it has been damaged, it cannot be repaired or re-terminated. It must be cut from the wire and replaced with a new splice.

3. QUALIFICATIONS

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

4. TOOLING

Tooling for crimping these splices include semi-automatic and automatic machines for power-assisted application of strip-form splices. Modified designs and additional tooling concepts may be available to meet other application requirements. See Figure 4.

4.1. Applicator

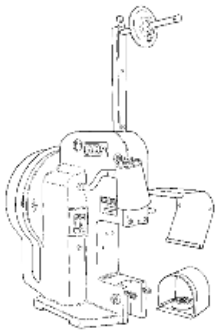
Applicators are designed for the full wire size range of strip-form, precision formed splices, and are used in high volume, heavy duty, production requirements. The applicator can be used in a bench or floor model power unit.

4.2. Power Unit

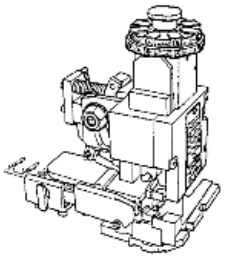
A power unit is an automatic or semi-automatic machine used to assist in the application of a product. A power unit includes the power source used to supply the force or power to an applicator.

NOTE

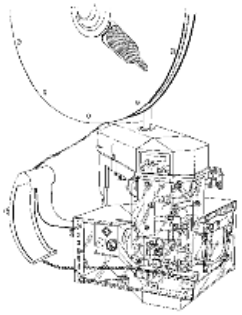
AMP-O-LECTRIC Model “K” Terminating Machine 565435-5 has been superseded by Model “G” Terminating Machine 354500-1. For existing applications, the Model “K” will still be supported.



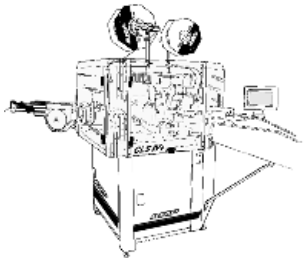
AMP-O-LECTRIC Model “K” Terminating Machines 1-471273-3 or 565435-5 (409-5128)



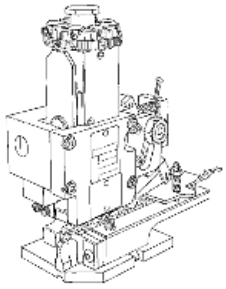
Heavy Duty Miniature Quick-Change Applicators (Side-Feed Type) (408-8040)



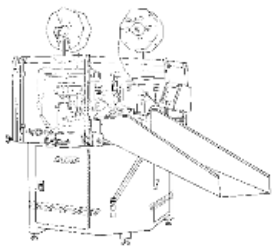
AMP-O-LECTRIC Model "G" Terminating Machines 354500-[ ] (409-5842) or 356462-[ ] (408-4357)



AMPOMATOR CLS IV+ Lead-Making Machines 356500-[ ] (409-5878)



Heavy Duty Miniature Quick-Change Applicators (End-Feed Type) (408-8039)



AMPOMATOR CLS III-G Lead-Making Machines 122500-[ ] (409-5852)

Not Shown: Standard-Type Side-Feed Applicators (408-8012), Standard-Type End-Feed Applicators (408-8014), Miniature Quick-Change Applicators (End-Feed Type) (408-8024), Miniature Quick-Change Applicators (408-8053)

Figure 4

5. 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.

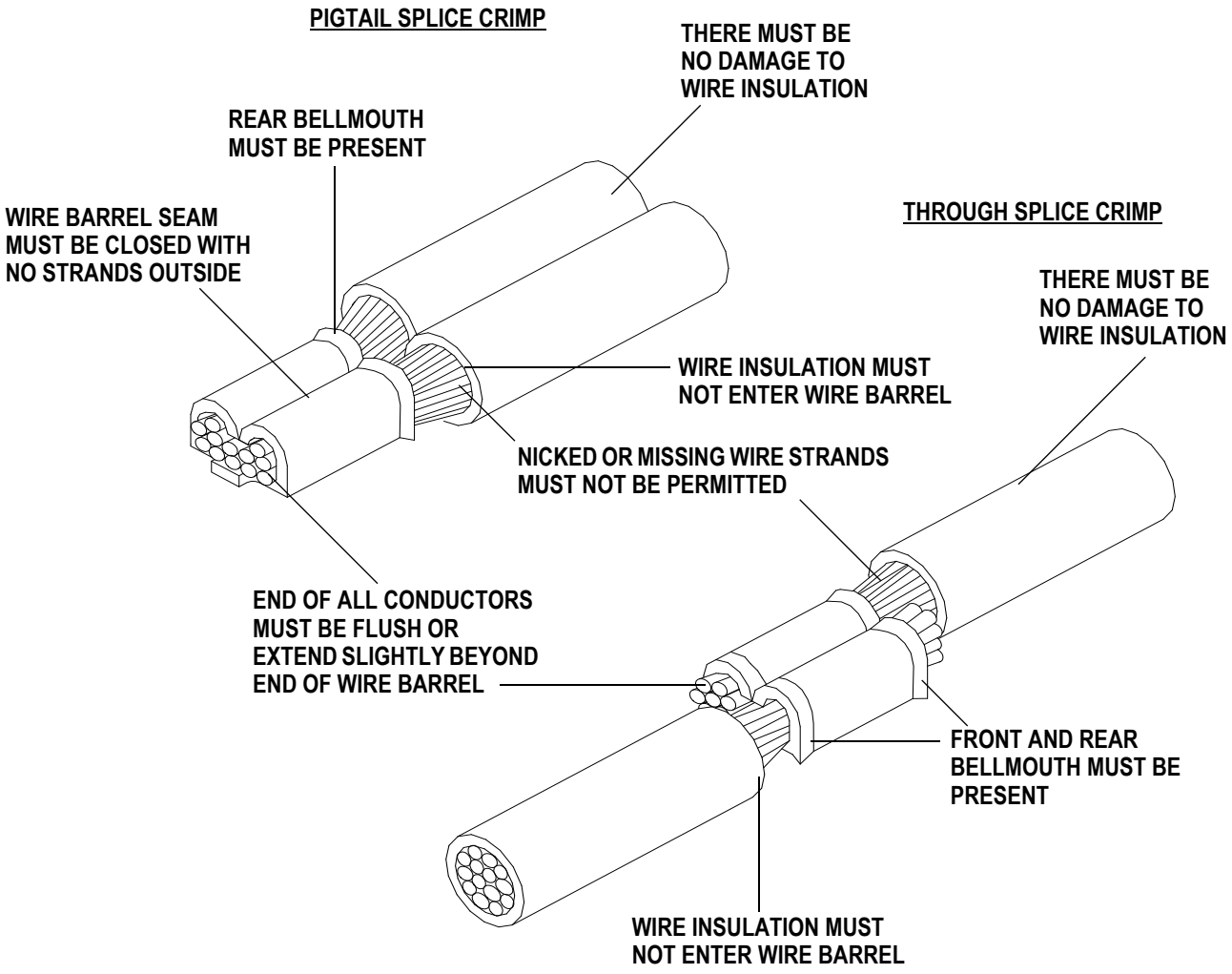


FIGURE 5. VISUAL AID