



**NOTE**

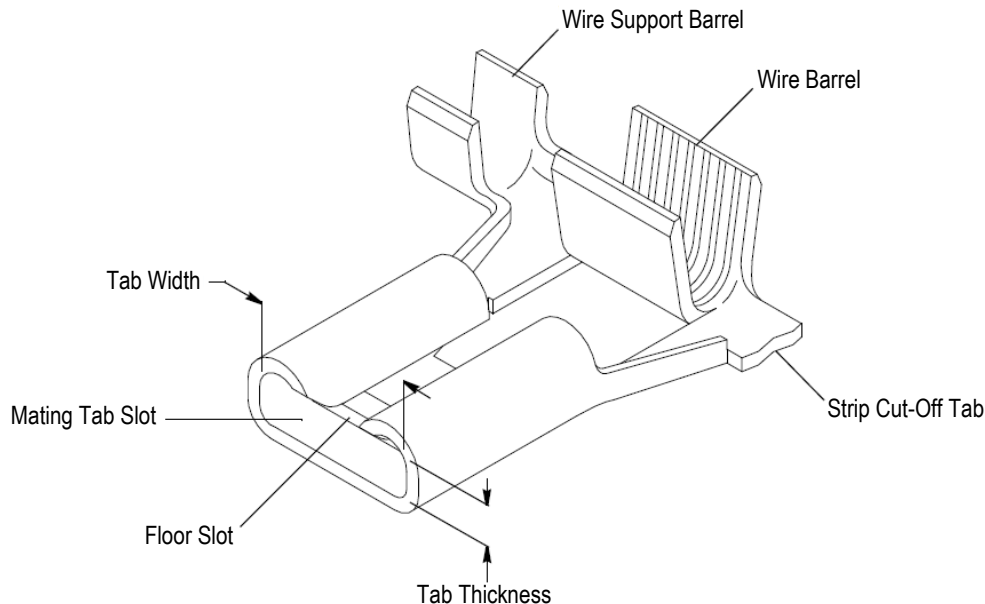
All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of  $\pm 0.13$  [ $\pm .005$ ] and angles have a tolerance of  $\pm 2^\circ$ . Figures and illustrations are for identification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

**1. INTRODUCTION**

This specification covers the requirements for application of AMPLIVAR\* FASTON\* flag receptacles. These right-angle receptacles fit 187 Series and 250 Series tabs. The 187 Series receptacle mates with 4.75 x 0.51 [.187x.020] and 6.35 x 0.81 [.250x.032] tabs, while the 250 Series mates with 6.35 x 0.81 [.250x.032] tabs. The flag receptacles are designed to be crimped onto magnet wire using an automatic machine.

The flag receptacle features a wire support barrel, a wire barrel with serrations that provide maximum contact and tensile strength, a mating tab slot, and floor slot.

When corresponding with personnel, use the terminology provided in this specification to facilitate your inquires 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:

- ◆ Correcting maximum front bellmouth dimension
- ◆ Update document to corporate formatting standards

**2.2. Customer Assistance**

Reference Product Base Part Number 63940 and Product Code 1091 are representative of AMPLIVAR\* FASTON\* flag receptacles. Use of these numbers will identify the product line and help you to obtain product and tooling information when visiting [www.te.com](http://www.te.com) or calling the number at the bottom of page 1.

## 2.3. Drawings

Customer drawings for product part numbers are available from [www.te.com](http://www.te.com). Information contained in the customer drawing takes priority.

## 2.4. Specifications

Product Specification [108-2086](#) provides product performance and test results.

Application Specification [114-2070](#) provides product description and application requirements of AMPLIVAR\* FASTON\* tab contacts.

## 2.5. 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. Instructional material that pertain to this product are:

- [408-3295](#) Preparing Reel of Contacts for Application Tooling
- [408-4357](#) AMP-O-LECTRIC\* Model "G" Terminating Machines 356462-[ ]
- [408-7424](#) Checking Terminal Crimp Height or Gaging Die Closure
- [408-8039](#) Heavy Duty Miniature Quick-Change Applicators (End Feed Type)
- [408-9816](#) Handling of Reeled Products

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Ultraviolet Light

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

#### B. 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.

#### C. Reeled Products

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

### 3.2. 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

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

### 3.3. Wire Selection and Preparation

The flag receptacles accept copper or aluminum magnet wire. The 187 Series accepts wire sizes 500 to 6000 CMA, and the 250 Series accepts wire sizes 3000 to 7000 CMA.

No wire preparation is necessary.

### 3.4. Crimp Requirements

Receptacles must be crimped according to the instructions packaged with the application tooling. There must be no damage to the wire.

**A. Crimp Height**

The crimp applied to the wire barrel of the flag receptacle is the most compressed area and is most critical in assuring optimum electrical and mechanical performance. See Figure 2.

**B. Tensile Strength**

Required tensile strength is provided in Figure 2.

**C. Bellmouths**

The front and rear bellmouths are caused by the extrusion of metal during crimping. The front and rear bellmouths must be within the range specified in Figure 2.

**D. Cutoff Tab and Burr**

The cutoff tab and burr resulting from the flag receptacle being cut from the carrier strip (front and back) must be within the limits given in Figure 2.

**E. Wire Barrel Flash**

The wire barrel flash located at the bottom of the wire barrel results from applied crimp pressure and must not exceed the dimension provided in Figure 2.

**F. Wire Support Barrel**

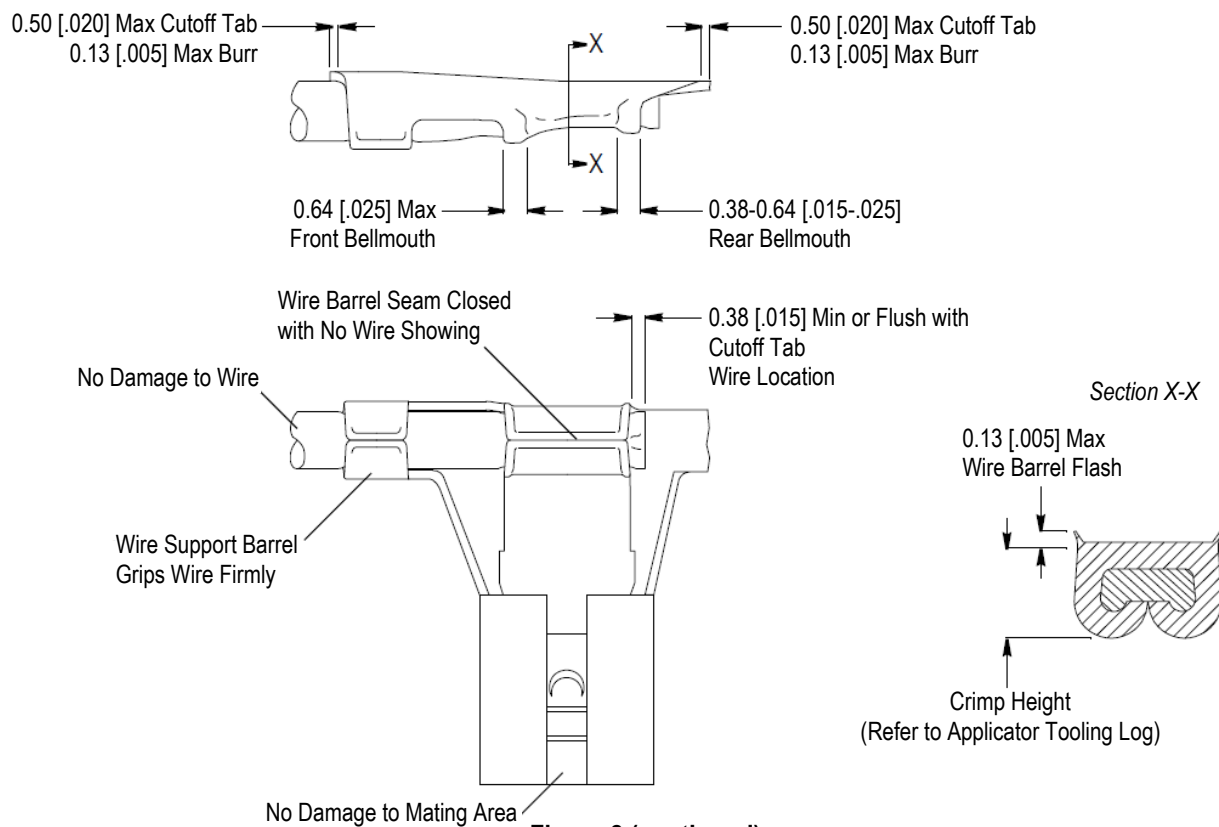
The wire support barrel must grip the wire firmly without cutting into it. Care must be taken to prevent cutting, nicking, or scraping the wire.

**G. Wire Barrel Seam**

The wire barrel seam must be completely closed with no wire visible in it.

**H. Wire Location**

The end of the wire must be located within the limits provided in Figure 2.



**Figure 2 (continued)**

The dimensions in this table apply to the 187 Series flag receptacle only. Contact PRODUCT INFORMATION at the number at the bottom of page 1 for dimensions that apply to the 250 Series flag receptacle.

| WIRE       |      |                   |          | FLAG RECEPTACLE TENSILE STRENGTH (N [LBF]) |              |
|------------|------|-------------------|----------|--|--------------|
| SIZE       |      | CURRENT [AMPERES] |          | WIRE                                       |              |
| GAGE (AWG) | CMA  | COPPER            | ALUMINUM | COPPER                                     | ALUMINUM     |
| 24         | 455  | 2.30              | 1.50     | 22.24 [5]                                  | 6.67 [1.5]   |
| 23.50      | 511  | 2.50              | 1.60     | 25.58 [5.75]                               | 7.78 [1.75]  |
| 23         | 566  | 2.60              | 1.70     | 28.91 [6.5]                                | 8.90 [2]     |
| 22.50      | 635  | 2.80              | 1.80     | 32.25 [7.25]                               | 10.01 [2.25] |
| 22         | 708  | 3                 | 1.90     | 35.59 [8]                                  | 11.12 [2.5]  |
| 21.50      | 795  | 3.20              | 2.10     | 41.15 [9.25]                               | 13.34 [3]    |
| 21         | 888  | 3.40              | 2.20     | 46.71 [10.5]                               | 15.57 [3.5]  |
| 20.50      | 992  | 3.60              | 2.30     | 52.27 [11.75]                              | 16.68 [3.75] |
| 20         | 1116 | 4                 | 2.60     | 57.83 [13]                                 | 17.79 [4]    |
| 19.50      | 1246 | 4.60              | 3        | 66.72 [15]                                 | 21.13 [4.75] |
| 19         | 1391 | 5.30              | 3.40     | 73.40 [16.5]                               | 24.47 [5.5]  |
| 18.50      | 1560 | 6.10              | 3.90     | 83.40 [18.75]                              | 27.85 [6.26] |
| 18         | 1747 | 7                 | 4.50     | 93.41 [21]                                 | 31.14 [7]    |
| 17.50      | 1962 | 7.70              | 5        | 104.10 [23.4]                              | 34.47 [7.75] |
| 17         | 2190 | 8.30              | 5.40     | 117.88 [26.5]                              | 37.81 [8.5]  |
| 16.50      | 2460 | 9                 | 5.80     | 133.45 [30]                                | 43.37 [9.75] |
| 16         | 2746 | 10                | 6.50     | 147.90 [33.25]                             | 48.93 [11]   |
| 15.50      | 3136 | 11.30             | 7.30     | 169.03 [38]                                | 56.05 [12.6] |
| 15         | 3446 | 12.40             | 8        | 186.83 [42]                                | 62.28 [14]   |
| 14.50      | 3869 | 13.60             | 8.80     | 211.29 [47.5]                              | 69.39 [15.6] |
| 14         | 4330 | 15                | 9.70     | 235.76 [53]                                | 77.84 [17.5] |

**i**
**NOTE**

- 1) CMA values are based on standard magnet wire with single film coating.
- 2) Current values for standard copper wire gages are taken from Underwriters Laboratories Inc. (UL) 310, others are rated based on their respective CMA.
- 3) Current values for aluminum wires are 64.5% of the copper wire of equivalent gage.
- 4) Tensile strength values are calculated at 50% of the bare wire tensile.

**Figure 2 (end)**

### 3.5. Mating Tab

#### A. Dimensions

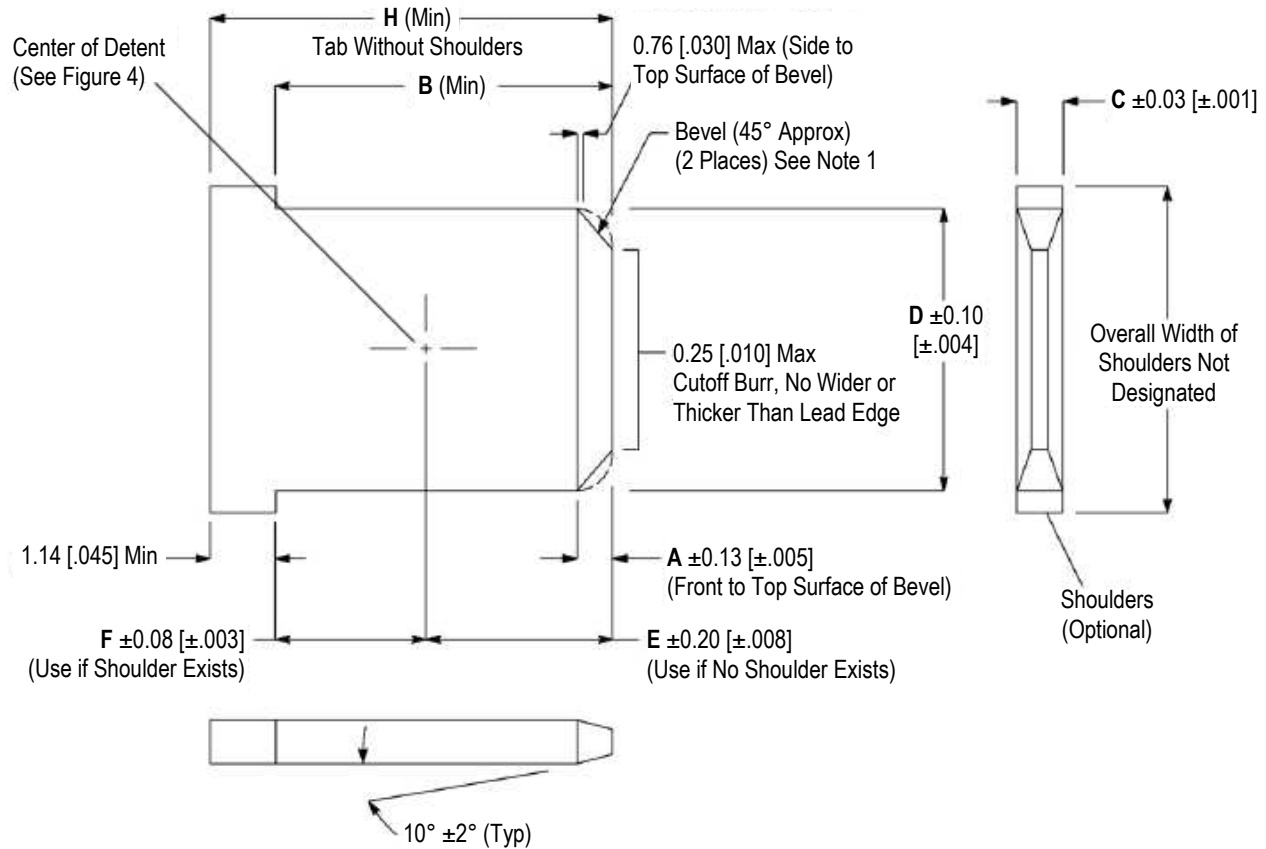
Features and dimensional requirements for the mating tabs are given in Figure 3.

#### B. Retention and Detent Configurations

A tab having no locking feature may be used for applications where low mating retention forces are desirable. Where higher forces are sought, a tab with a detent should be used that meet the requirements given in Figure 3.

**i**
**NOTE**

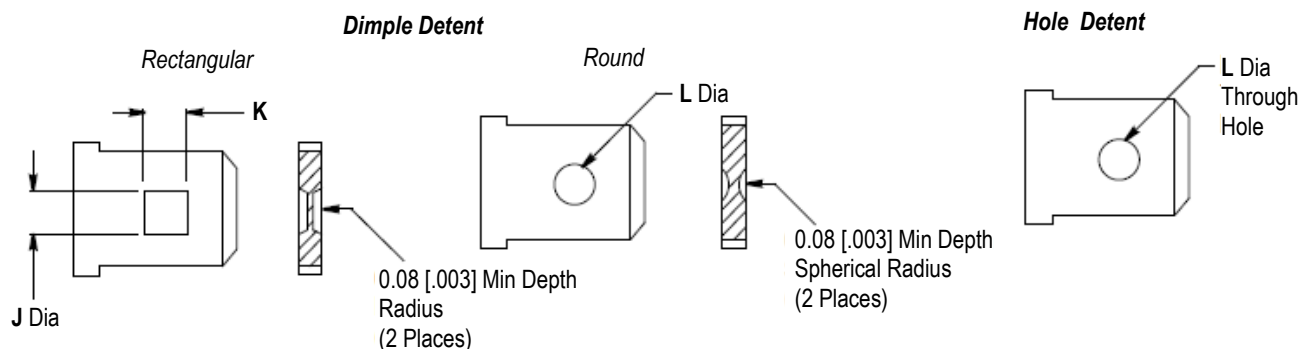
Hole detents provide the greatest retention forces, while dimple detents provide acceptable medium range forces.


**NOTE**

- 1) Bevel may be a straight line or a radius within Dimension  $G \pm 0.51 [\pm .020]$ .
- 2) Tab shall be flat ( $0.03 \text{ mm}^2/\text{mm}^2 [0.001 \text{ in.}^2/\text{in.}^2]$ ) and free from burrs greater than 10% of tab thickness or raised plateaus, except for testing as described in Paragraph 3.6.
- 3) Measurements shall not include plating, burrs, or flatness tolerance.

| TAB SIZE (Nominal)<br>AND DETENT         | DIMENSION      |                |                |                |                |                |                |                |
|--|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|  | A              | B              | C              | D              | E              | F              | G              | H              |
| 6.35 x 0.81 [.250 x .032]<br>With Dimple | 0.89<br>[.035] | 7.80<br>[.307] | 0.81<br>[.032] | 6.35<br>[.250] | 3.86<br>[.152] | 4.06<br>[.160] | 1.27<br>[.050] | 8.94<br>[.352] |
| 6.35 x 0.81 [.250 x .032]<br>With Hole   | 0.89<br>[.035] | 7.80<br>[.307] | 0.81<br>[.032] | 6.35<br>[.250] | 4.52<br>[.178] | 3.40<br>[.134] | 1.27<br>[.050] | 8.94<br>[.352] |
| 4.75 x 0.51 [.187 x .020]<br>With Dimple | 0.76<br>[.030] | 6.22<br>[.245] | 0.50<br>[.020] | 4.75<br>[.187] | 2.54<br>[.100] | 3.81<br>[.150] | 1.14<br>[.045] | 7.36<br>[.290] |
| 4.75 x 0.51 [.187 x .020]<br>With Hole   | 0.76<br>[.030] | 6.22<br>[.245] | 0.50<br>[.020] | 4.75<br>[.187] | 3.18<br>[.125] | 3.18<br>[.125] | 1.14<br>[.045] | 7.36<br>[.290] |

**Figure 3**


**NOTE**

Detents may be at the same location on the longitudinal centerline if no shoulder or obstruction is present at the base of the tab.

| TAB WIDTH<br>(Nominal) | DIMENSION                |                          |   |
|------------------------|--------------------------|--------------------------|---|
|                        | J<br>$\pm 0.13$ [.005] ■ | K<br>$\pm 0.13$ [.005] ■ | L                                       |
| 6.35 [.020]            | 2.36 [.075]              | 1.91 [.075]              | 1.77 +0.25/-0.13<br>[.070 +.010/- .005] |
| 4.75 [.187]            | 1.57 [.062]              | 1.37 [.054]              | 1.40 $\pm 0.13$<br>[.055 $\pm$ .005]    |

■ Dimension applies to rectangular dimple detent only.

**Figure 4**

### 3.6. Mating Overcycle and Testing

The forces required to mate and unmate a test mating tab and receptacle are specified in Figure 5.

A testing device capable of holding the reading must be used to measure the force. It must also provide accurate alignment with slow and steady mating and unmating of the test tab and receptacle. Testing may be performed using a gage as described in National Electrical Manufacturers Association (NEMA) DC2, Edition 82, “Residential Controls – Quick-Connect Terminals.”

Test tabs must be dimensioned as shown in Figure 3 except for Dimension C, which instead must have a tolerance of  $\pm 0.007$  [ $\pm 0.0003$ ] for brass tabs;  $\pm 0.013$  [ $\pm 0.0005$ ] for steel test tabs and the raised plateaus around the detents must be limited to a total of 0.025 [.001] for both sides.

| MATING                                  | TAB WIDTH<br>(Nominal) | FORCE (N [lb])                          |                           |            |                           |            |
|---|------------------------|---|---------------------------|------------|---------------------------|------------|
|   |                        | FIRST MATING<br>(Maximum)<br>INDIVIDUAL | FIRST MATING<br>(Minimum) |            | SIXTH MATING<br>(Minimum) |            |
|   |                        |   | AVERAGE                   | INDIVIDUAL | AVERAGE                   | INDIVIDUAL |
| Test Tab and Unplated Flag Receptacle   | 6.35 [.250]            | 80 [18]                                 | 27 [6]                    | 18 [4]     | 22 [5]                    | 18 [4]     |
|   | 4.75 [.187]            | 67 [15]                                 | 22 [5]                    | 13 [3]     | 13 [3]                    | 9 [2]      |
| Test Tab and Tin-Plated Flag Receptacle | 6.35 [.250]            | 76 [17]                                 | 22 [5]                    | 13 [3]     | 18 [4]                    | 13 [3]     |
|   | 4.75 [.187]            | 67 [15]                                 | 22 [5]                    | 13 [3]     | 13 [3]                    | 9 [2]      |

**Figure 5**

### 3.7. Replacement and Repair

Defective or damaged flag receptacles must not be used. A receptacle can be replaced by cutting it from the wire and crimping a new receptacle.

## 4. QUALIFICATION

AMPLIVAR\* FASTON\* flag receptacles have not been submitted for agency evaluation.

## 5. TOOLING

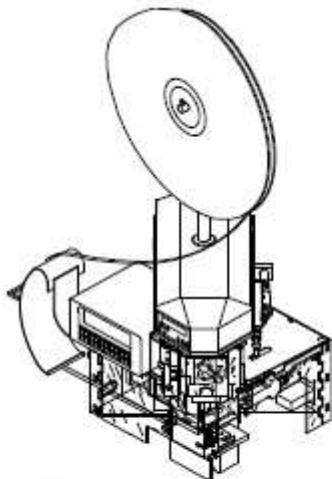
Application tooling available to be used with these flag receptacles and instructional material packaged with the tooling are given in Figure 6.

### 5.1. Machine

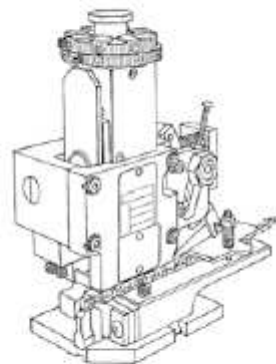
The terminating machine is bench mountable and recommended for terminating the flag receptacles attached to a carrier strip and reel-fed through the applicator. The wire must be hand fed into the wire barrel of the receptacle. This machine is intended for medium volume production applications.

### 5.2. Applicator

The applicator is designed for the full wire range of strip-fed, precision formed receptacles, and provide for high volume, heavy duty, production requirements. The applicator must be installed onto the machine.



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



Heavy Duty Miniature Quick-Change Applicators  
(End Feed Type) 680353-3, 680364-3, 680365-3,  
and 680421-3 (408-8039)

Figure 6

## 6. VISUAL AID

The illustration below shows a typical application of this AMPLIVAR\* FASTON\* flag receptacles. 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.

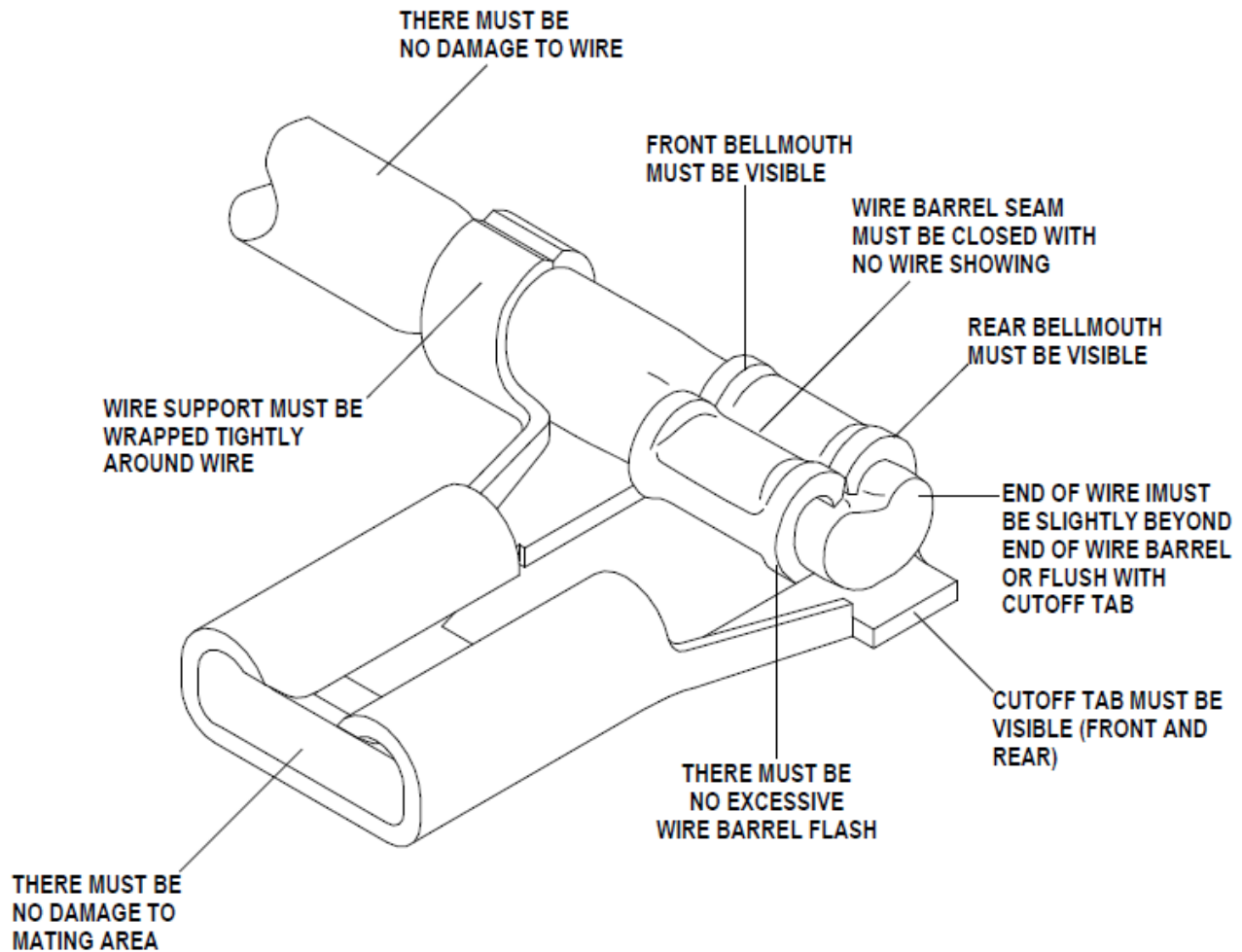


Figure 7: Visual Aid