

**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  $\pm 0.13$  [ $\pm 0.005$ ] 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 Universal MATE-N-LOK II housings and the contacts used with the housings. The housings are available in 2- through 15-circuit versions and are intended for use in wire-to-wire panel-mounted applications.

When corresponding with Tyco Electronics 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.

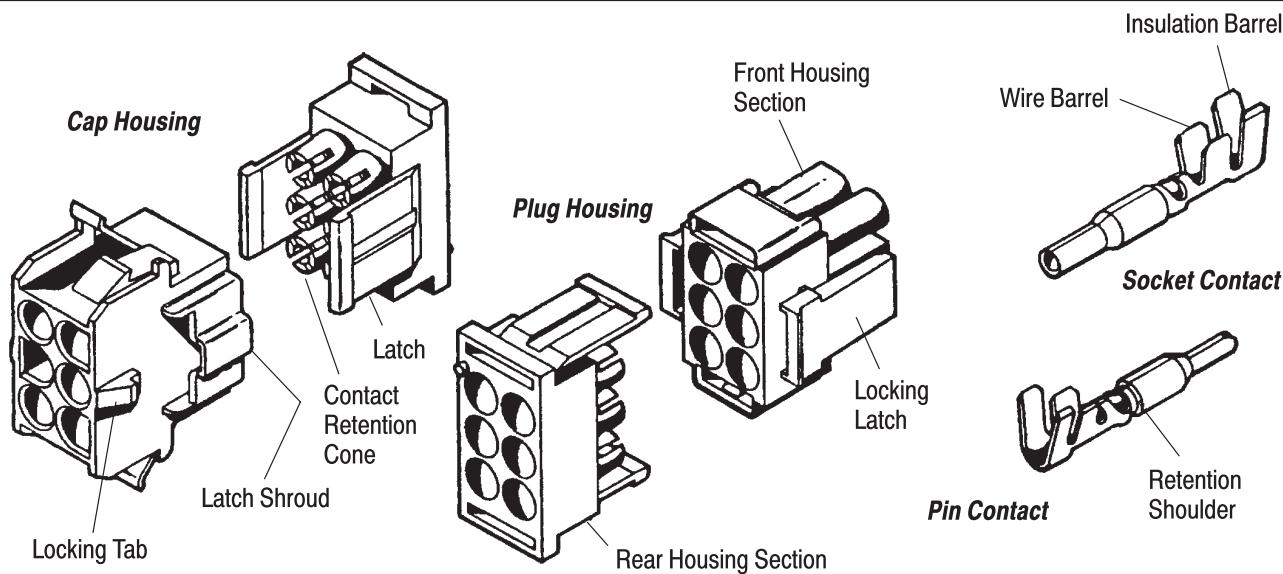


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

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

- Updated document to corporate requirements
- Changed applicator crimp heights in first table of Figure 2
- Added new Section 4 and renumbered

### 2.2. Customer Assistance

Product Part Number 770020 and Product Code 1408 are representative of the Universal MATE-N-LOK II product line. 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 Tyco Electronics Representative or, after purchase, by calling the Product Information Center at the number at the bottom of this page.

### 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 drawing and this specification or with any other technical documentation supplied by Tyco Electronics, call the Product Information Center at the number at the bottom of this page.

## 2.4. Specifications

Product Specification 108-1090 provides performance tests for the connectors.

## 2.5. Instructional Material

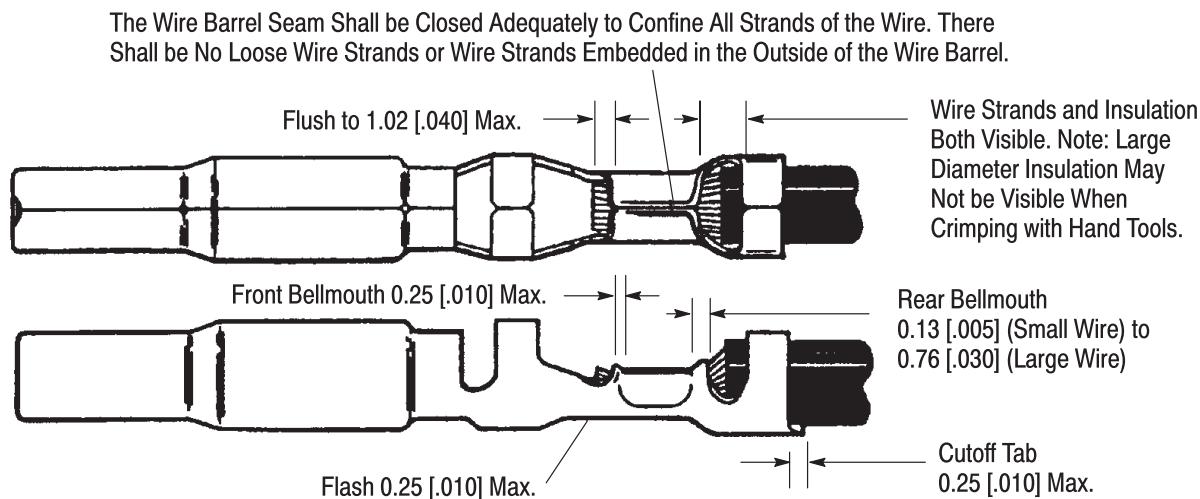
Instruction material for automatic and hand application tooling is shipped with the appropriate tooling. Refer to Figure 2 for referenced documents.

## 3. REQUIREMENTS

### 3.1. Wire

#### A. Wire Selection

The contacts will accept wires ranging in size from 10 to 30 AWG. Wire insulation diameter shall have minimum and maximum dimensions according to the wire sizes indicated in Figure 2.



WIRE			WIRE BARREL		INSULATION BARREL CRIMP WIDTH	APPLICATOR PART NUMBER●
SIZE (AWG)	INSUL DIA. RANGE	STRIP LENGTH $\pm 0.38 [.015]$	CRIMP HEIGHT $\pm 0.05 [.002]$	CRIMP WIDTH		
30	0.81 to 1.45 [.032 to .057]	.3.58 [.141]	0.71 [.028]	1.40 [.055]	2.29 [.090]	567252-1 567252-2
28			0.71 [.028]			
26			0.76 [.030]			
24	1.02 to 2.54 [.040 to .100]	4.37 [.172]	0.97 [.038]	1.78 [.070]	2.54 [.100]	567214-1 567214-2
22			1.02 [.040]			
20			1.09 [.043]			
18			1.22 [.048]			
20			1.19 [.047]			
18	1.52 to 3.30 [.060 to .130]	4.37 [.172]	1.32 [.052]	2.29 [.090]	3.30 [.130]	567213-1 567213-2
16			1.50 [.059]			
14			1.75 [.069]			
20			1.19 [.047]			
18	3.30 to 5.08 [.130 to .200]	4.37 [.172]	1.32 [.052]	2.29 [.090]	5.08 [.200]	567212-1 567212-2
16			1.50 [.059]			
14			1.75 [.069]			
12			1.80 [.071]			
10	5.08 [.200] Max.	6.76 [.266]	2.18 [.086]	3.56 [.140]	—	567211-1 567211-2

- Dash 1 is used in a "T" Terminator with automatic equipment. Dash 2 is used in the AMP-O-LECTRIC\* Model "K" Machine 565435-5. Refer to instruction sheet 408-8040 for applicator information. Refer to customer manual 409-5128 for Model "K" Machine information.

Figure 2 (cont'd)

WIRE			WIRE BARREL		INSULATION BARREL CRIMP WIDTH	HAND TOOL PART NUMBER (Instruction Sheet)
SIZE (AWG)	INSUL DIA. RANGE	STRIP LENGTH	CRIMP HEIGHT ± 0.05 [.002]	CRIMP WIDTH		
30	0.81 to 1.45 [.032 to .057]	4.45 to 5.08 [.175 to .200]	0.71 [.028]	1.40 [.055]	2.29 [.090]	58439-1 (408-9591)
28			0.71 [.028]			
26			0.71 [.028]			
24	1.27■ to 2.54 [.050■ to .100]	4.45 to 5.08 [.175 to .200]	1.02 [.040]	1.78 [.070]	2.54 [.100]	90300-2 (408-9479)
22			1.02 [.040]			
20			1.17 [.046]			
18			1.17 [.046]			
20	1.52 to 3.30 [.060 to .130]	4.45 to 5.08 [.175 to .200]	1.27 [.050]	2.29 [.090]	3.30 [.130]	90296-2 (408-9476)
18			1.27 [.050]			
16			1.60 [.063]			
14			1.60 [.063]			
20	3.30 to 5.08 [.130 to .200]	4.45 to 5.08 [.175 to .200]	1.24 [.049]	2.29 [.090]	5.08 [.200]	90298-2 (408-9477)
18			1.24 [.049]			
16			1.60 [.063]			
14			1.60 [.063]			
12	5.08 [.200] Max.	6.35 to 7.14 [.250 to .281]	2.11 [.083]	3.56 [.140]	—	69710-1◆ (408-2095)
10			2.44 [.096]			

■ Smaller diameter insulation 1.02 to 1.27 mm [.040 to .050 in.] may be inadvertently placed in wire barrel.

◆ Hand tool uses Crimping Die Assembly 58380-1 for 12 gauge wire and 58380-2 for 10 gauge wire.

Figure 2 (end)

**NOTE**

AMP-O-LECTRIC Model "K" Terminating Machine 565435-5 has been superseded by the Model "G" Terminating Machine 354500-1 for new applications. For existing applications, the Model "K" can still be used.



## B. Wire Preparation

The wire strip length shall be according to the wire sizes as indicated in Figure 2. Reasonable care shall be taken during the stripping operation to ensure the conductor is not nicked, scraped, or cut.

### 3.2. Crimped Contacts

#### A. Contact Crimping

Contacts shall be crimped in accordance with the material packaged with the tooling. Refer to the tables in Figure 2.

**CAUTION**

Care shall be taken to ensure that the wire insulation is not cut or broken during the crimping operation, and to ensure that the insulation is not crimped into the wire barrel.



#### B. Inspection

Inspect crimped contacts for conditions shown in Figure 2.

#### C. Alignment

The axial concentricity of the crimped wire barrel shall fall into an area defined by a 4.19 mm [.165 in.] diameter circle whose center is the centerline of the contact. The axial concentricity of the crimped insulation barrel shall fall into an area defined by a 5.59 mm [.220 in.] diameter circle whose center is the centerline of the contact. See Figure 3.

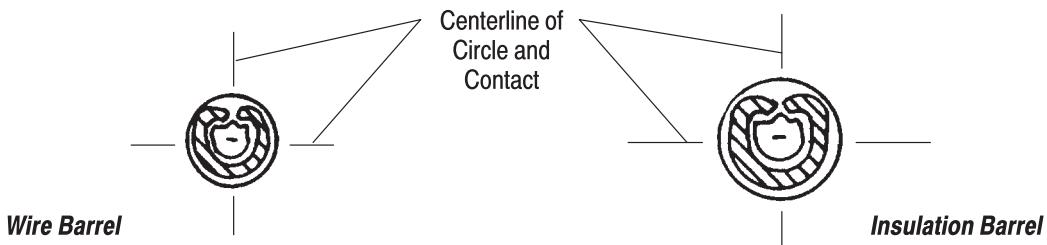


Figure 3

### 3.3. Housings

A connector assembly consists of a two-piece plug housing and a two-piece cap housing that accept lanceless contacts. The two-piece housings provide three-point stabilization and shock protection for the enclosed contacts. Both the plug and cap housing assemblies have individually numbered circuit identification on the back surface, plus an identification rib or button indicating the number one circuit location. The housings feature polarizing cavities on the mating faces and are intermateable with conventional Universal MATE-N-LOK connectors and headers.

#### A. Assembly

Crimped pin and socket contacts shall be manually inserted in either the plug or cap rear housing section, or they may be intermixed in each rear housing to provide multiple keying combinations. Refer to Figure 4 and insert contacts and join housing sections together as follows:

1. Align and insert rear housing section into front housing section and snap into first locking stage. Pull back to ensure proper engagement and to prevent any deformation to the locking mechanism.
2. Align contact with desired circuit cavity at BACK of rear housing section. Push contact straight into cavity, forcing the retention cones open. Continue to push until the cone re-closes behind the contact retention shoulder.
3. When all necessary contacts have been inserted, complete assembly of the connector by forcing the latches into the full locked position. An additional squeeze across the latch shrouds will help the latches fully engage behind the locking edges. Visually inspect the latches have fully engaged behind locking edges and all contact insulation barrels are within housing. There will be little or no gap between front and rear housing sections when fully assembled.

**NOTE**

*The front and rear housing sections cannot be fully locked together if any contact retention cone is open, indicating the contact is only partially inserted.*

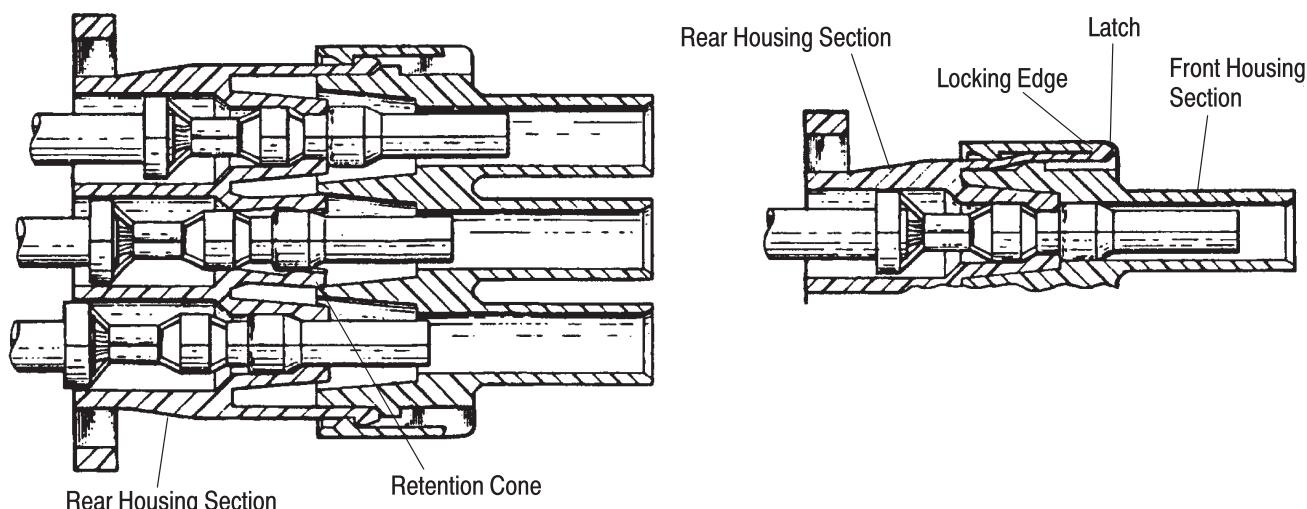


Figure 4

## B. Disassembly

Damaged contacts may be replaced on an individual basis. Refer to Figure 4 and separate housing section and remove contact as follows:

1. Depress both latch heads and pull on the rear housing section to separate the housings.
2. Move the contact in a slight circular motion while pulling on the wire; this releases the retention shoulder from the housing cone.

## 3.4. Strain Relief Clamps

Strain relief clamps are designed to relieve the stress of the wires on the contacts. An adjusting insert is used with smaller wire bundles. Two identical clamps are inserted into slots in the back of the plug and/or cap connector and are secured together with two No. 6 pan head self-tapping screws (not included). See Figure 5.

## 3.5. Keying Plugs

Keying plugs provide additional polarization for the connectors. The keying plug may be inserted into the front of the plug or the cap connector. See Figure 5.

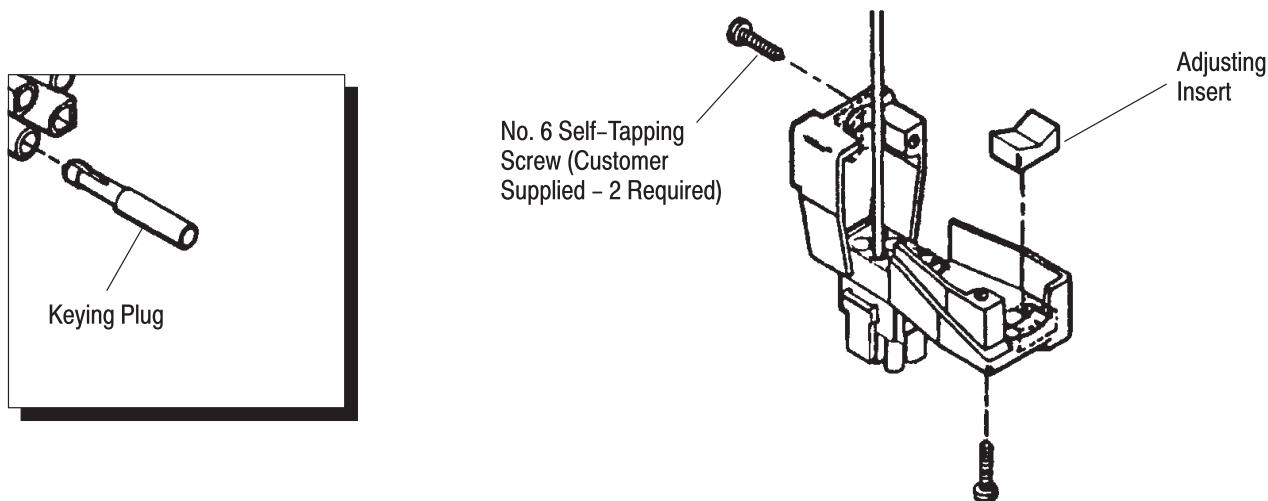
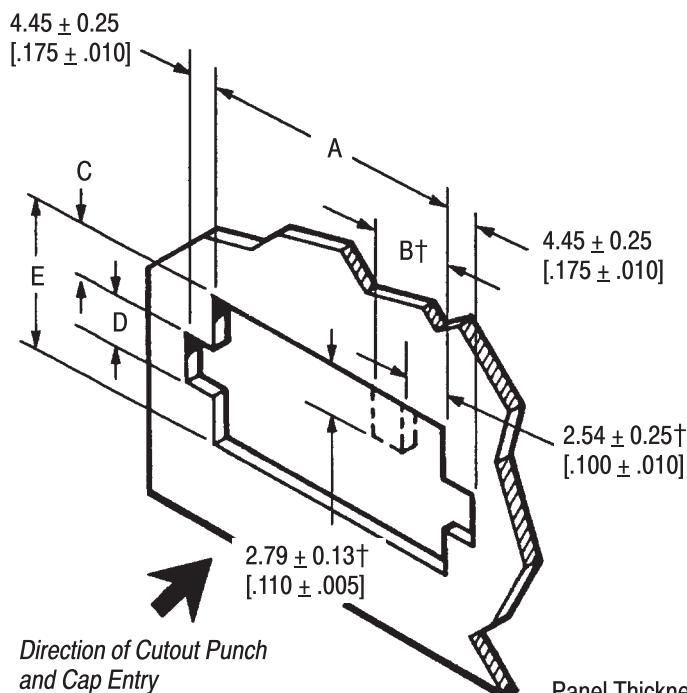


Figure 5

## 3.6. Panel Cutout

Cap connector panel mounting cutouts shall be as indicated in Figure 6. (No mounting hardware is required.)

The cap housing features flexible mounting tabs for insertion into the panel. Push the cap connector through the panel, in the same direction as the cutout was made, until it snaps in place.



NUMBER OF CIRCUIT POSITIONS	DIMENSIONS				
	A ± 0.13 [.005]	B† ± 0.25 [.010]	C ± 0.25 [.010]	D ± 0.25 [.010]	E ± 0.13 [.005]
2	14.35 [.565]	6.35 [.250]	2.41 [.095]	8.64 [.340]	13.46 [.530]
3	20.70 [.815]				
4	27.05 [1.065]				
6	14.35 [.565]				
9	20.70 [.815]				
12	27.05 [1.065]		8.89 [.350]	12.19 [.480]	26.16 [1.030]
15	33.40 [1.315]		8.89 [.350]		

† Optional panel cutout dimensions for cap and panel polarization.

Panel Thickness - 0.76 to 2.29 mm [.030 to .090 in.]

Figure 6

### 3.7. Connector Mating

These connectors have a positive lock feature which prevents accidental unmating. Align polarizing features as shown in Figure 7 and start plug into cap. Push connectors together until locking latches engage locking tabs.

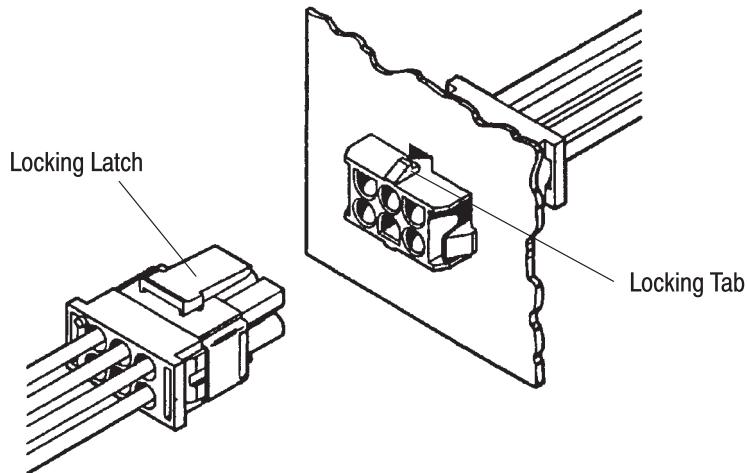


Figure 7

### 4. QUALIFICATIONS

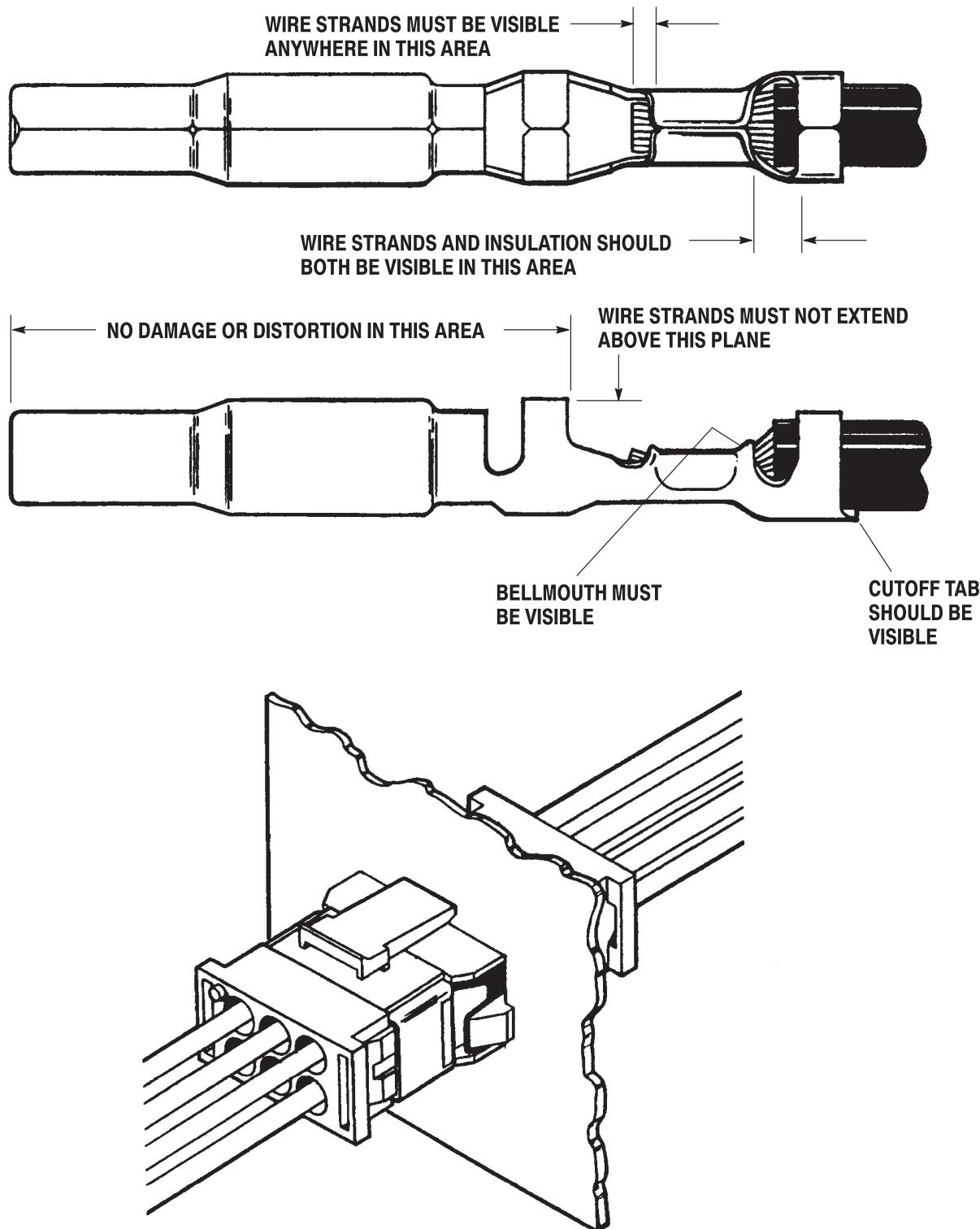
Universal MATE-N-LOK II Connectors are Recognized by Underwriters Laboratories Inc. in File E28476, and Certified with CSA International in file LR7189.

### 5. TOOLING

Loose piece contacts are designed to be crimped with a hand tool. Strip form contacts are designed to be crimped with a miniature applicator used in a semi-automatic or automatic machine. Tooling, applicators, and instruction material are listed in Figure 2.

## 6. VISUAL AID

Figure 8 shows a properly crimped contact (socket contact is shown – features illustrated also apply to pin contacts), and assembled connector. 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 document and in the instructional material shipped with the product.



**FIGURE 8. VISUAL AID**