

|     |                        |  |                          |
|-----|------------------------|--|--------------------------|
| REV | REASON                 | <b>SEALED UNIVERSAL<br/>MATE-N-LOK*<br/>CONNECTORS</b> | ENGINEERING RELEASE DATE |
| A   | Add Additional Contact |  | 1-18-89                  |
|     |                        |  | APPROVAL                 |
|     |                        |  | ROBERT LUNDERGAN         |

**1. INTRODUCTION**

This specification covers the requirements for application of AMP\* Sealed Universal MATE-N-LOK connectors and the contacts used with the connectors. The free-hanging, wire-to-wire, plug and cap housings will accept multiple pin and socket contacts.

Figure 1 shows typical products and their features. The terms identifying the features are used throughout this specification.

**NOTE** All dimensions are given in inches unless otherwise specified. All dimensional tolerances are  $\pm 0.005$  and angular tolerances are  $\pm 1$  unless otherwise specified. Metric equivalents (mm) can be calculated by multiplying the given dimension by 25.4.

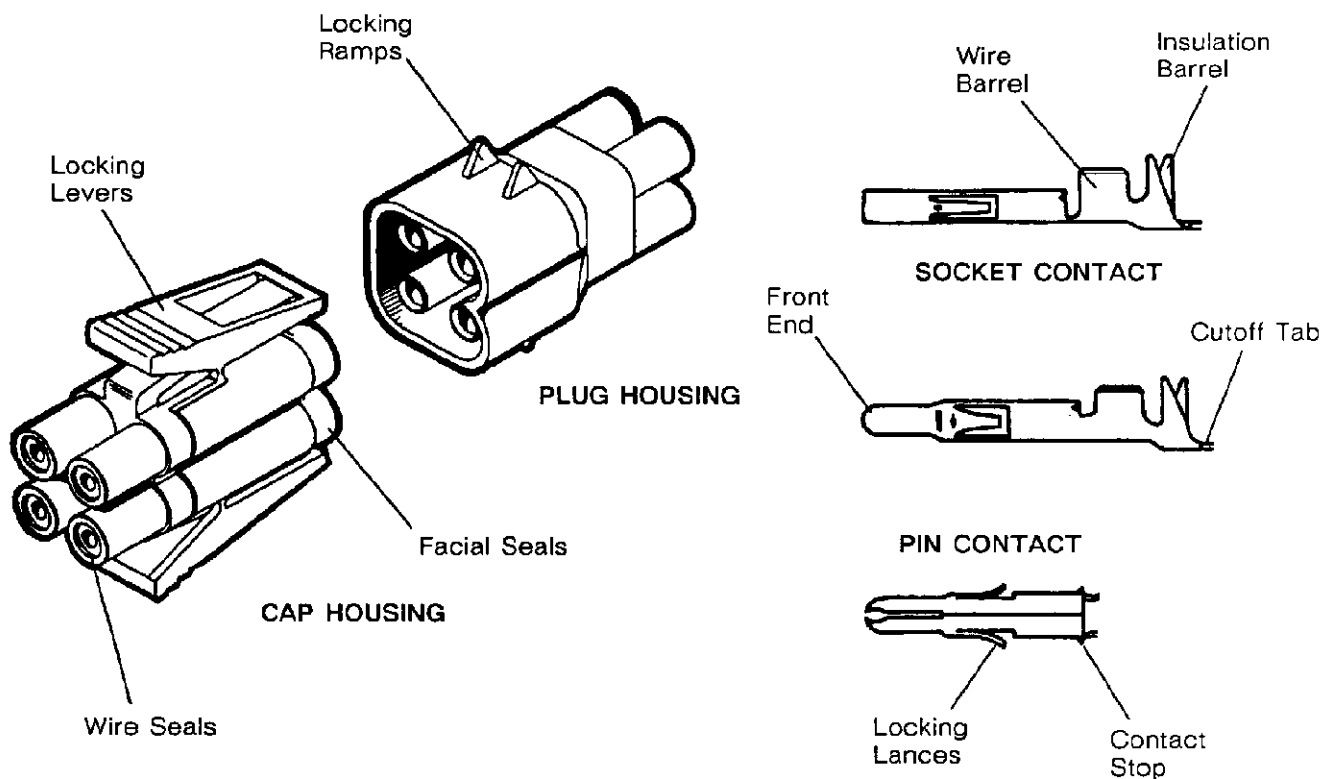


Fig. 1. Product Features

## 2. REFERENCE MATERIALS

### 2.1. Specification

AMP Product Specification 108-1100 covers applicable performance requirements.

### 2.2. Instructional Material

AMP Customer Manual CM 5128 and Applicator Instruction Sheet AI 8040 provide information relating to automatic application tooling.

Instruction material for hand application tooling is shipped with the appropriate tooling.

AMP Instruction Sheet IS 7982 provides information pertaining to contact extraction tooling.

### 2.3. Customer Drawing

An AMP Customer Drawing is available for each part number assigned to this product line. In the event of a conflict between this specification and the customer drawing, the customer drawing information will take precedence.

### 2.4. Product Numbers and Product Code

Product Part Number 770161 and Product Code 1401 are representative of the AMP Sealed Universal MATE-N-LOK Connector product line. Use of these numbers will identify the product line and expedite your inquiries through an AMP service network established to help you obtain product and tooling information. Such information can be obtained through a local AMP Representative (Field Sales Engineer, Field Application Engineer, etc.) or, after purchase, by calling the CUSTOMER HOTLINE at the top of the first page.

## 3. REQUIREMENTS

### 3.1. Wire

#### A. Wire Selection

The contacts will accept wires ranging in size from 10 to 20 AWG. Wire insulation diameter shall be a minimum dimension of .090 and a maximum dimension of .170.

#### B. Wire Preparation

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

#### C. Wire Length

Wires used in a single connector must be of the same length to equalize any pulling force that could be applied to wires during connector disengagement.

3.2. Crimped Contact

A. Contact Design

Contacts used in sealed connectors are designed to prevent damage to the rubber seal. They can be used in unsealed connectors; however, unsealed connector contacts can not be used in sealed connectors. The contacts shall be crimped in accordance with the requirements shown in Figure 2.

**NOTE** Wire stripping tool jaws may leave corrugated indentations on the surface of the wire insulation. This is especially severe with polyethylene (high temperature) insulation. If these indentations are at the sealing point of the wire seal, leakage will result. A length of 1.300 minimum, measured from the tip of the contact, must be smooth and free of residual indentations.

**NOTE** 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.

**NOTE** The pointed ends of the insulation barrel shall be wrapped around the wire insulation, leaving no sharp points to damage the connector seal.

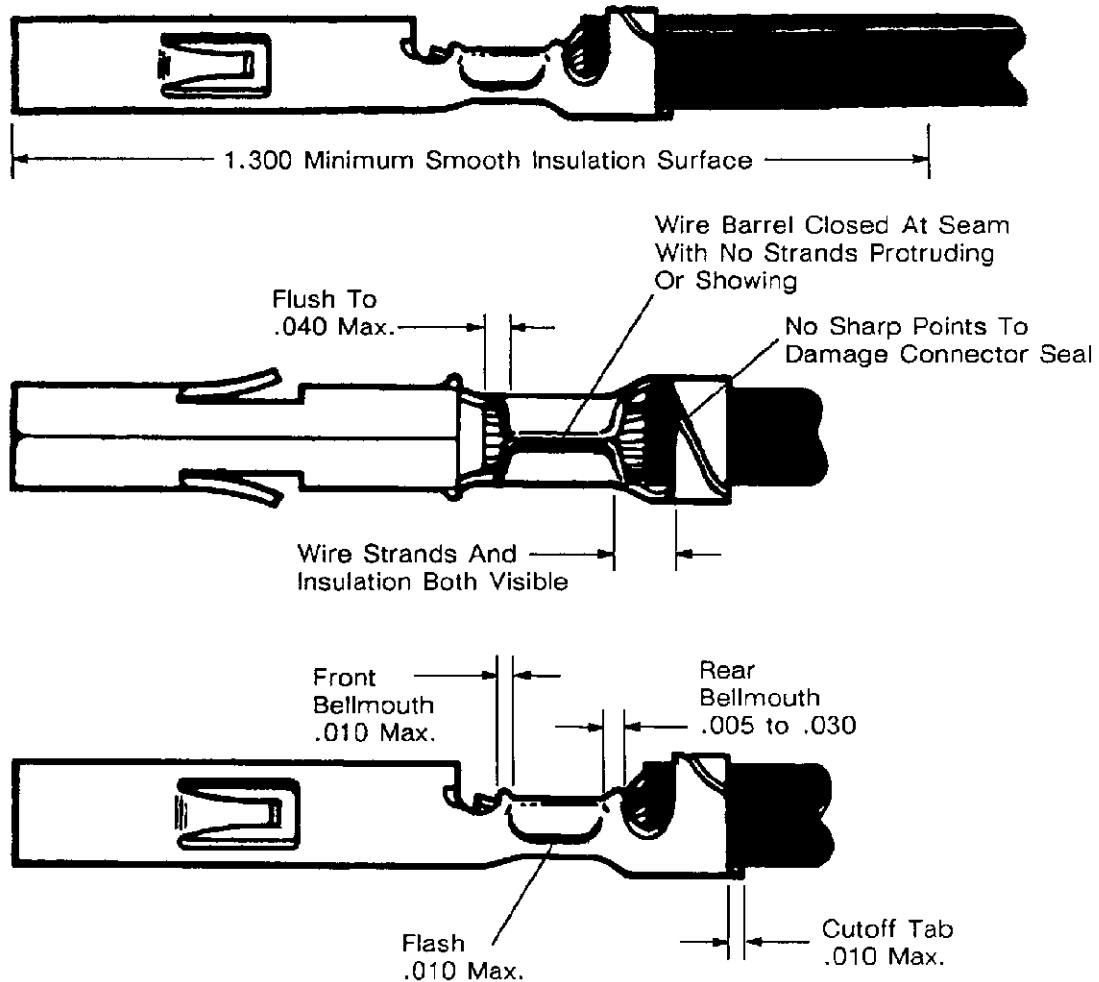


Fig. 2. Crimping Requirements (cont'd)

| WIRE       |                    |                         | WIRE BARREL             |                   | INSUL BARREL            |                   | APPLICATOR PART NUMBER* |
|------------|--------------------|-------------------------|-------------------------|-------------------|-------------------------|-------------------|-------------------------|
| SIZE (AWG) | INSUL DIA RANGE    | STRIP LENGTH $\pm .015$ | CRIMP HEIGHT $\pm .002$ | CRIMP WIDTH (Nom) | CRIMP HEIGHT $\pm .005$ | CRIMP WIDTH (Nom) |                         |
| 20         | .090<br>to<br>.130 | .172                    | .047                    | .090              | .100                    | .130              | 567229-2                |
| 18         |                    |                         | .052                    |                   |                         |                   |                         |
| 16         |                    |                         | .059                    |                   | .120                    |                   |                         |
| 14         |                    |                         | .069                    |                   |                         |                   |                         |
| 12         | .170<br>Max.       | .265                    | .077                    | .140              | —                       | —                 | 466597-1, -2            |
| 10         |                    |                         | .095                    |                   |                         |                   |                         |

- Dash 1 is used in "T" Terminator with automatic equipment. Dash 2 is used in the AMP-O-LECTRIC\* Model "K" Machine 565435-5. Refer to Applicator Instruction Sheet AI 8040 for applicator information. Refer to Customer Manual CM 5128 for Model "K" Machine information.

| WIRE       |                    |                         | WIRE BARREL             |                   | INSUL BARREL            |                   | HAND TOOL PART NUMBER (Instruction Sheet) |
|------------|--------------------|-------------------------|-------------------------|-------------------|-------------------------|-------------------|---|
| SIZE (AWG) | INSUL DIA RANGE    | STRIP LENGTH $\pm .015$ | CRIMP HEIGHT $\pm .002$ | CRIMP WIDTH (Nom) | CRIMP HEIGHT $\pm .005$ | CRIMP WIDTH (Nom) |   |
| 20         | .090<br>to<br>.130 | .172                    | .050                    | .090              | .100                    | .110              | 58344-1<br>(IS 9423)                      |
| 18         |                    |                         | .063                    |                   |                         |                   |   |
| 16         |                    |                         |                         |                   | .120                    |                   |   |
| 14         |                    |                         | .130                    |                   |                         |                   |   |
| 12         | .170<br>Max.       | .265                    |                         | .083              | .140                    | —                 | —   |
| 10         |                    |                         | .096                    |                   |                         |                   |   |

- Hand Tool uses Crimping Die Assembly 90367-1 (IS 7902).

Fig. 2. Crimping Requirements (end)

### B. Axial Concentricity

The axial concentricity of the crimped contact must fall into a zone defined by a .180 diameter cylinder whose center is the centerline of the contact front end.

### C. Contact Insertion

Crimped pin and socket contacts shall be inserted in either the plug or the cap housing, or they may be intermixed in each housing to provide additional keying combinations.

#### NOTE

*As a precaution against contact back-out during connector disengagement, place the housing in a fixed position and apply a load of 30 pounds to the wire bundle then check to see if any contacts started backing out of the housing. If any contact is noticeably recessed, the wire to that contact is short and repair is necessary.*

#### CAUTION

*It is important in any application that the far end of the cable be sealed or otherwise isolated from the environment, and that the insulation is not cut or damaged.*

**D. Contact Extraction**

Damaged contacts may be replaced on an individual basis. To remove contacts use AMP Extraction Tool 458994-1 as instructed in IS 7982. The tool is illustrated in Figure 3.

To remove a contact, first make sure the contact is fully seated in the housing. Then, use the extraction tool in the usual manner. The reason for full seating is to set the lances close to the body of the contact. In this position they will be least likely to damage the seal.

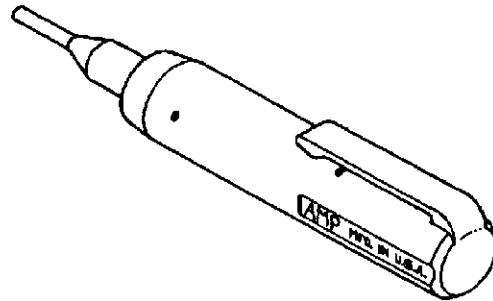


Fig. 3. Contact Extraction Tool

**3.3. Connectors**

**A. Connector Engagement**

These connectors have a positive mating feature which prevents partial mating and subsequent unmating due to vibration. Align polarizing features and start plug into cap. Push connectors together until locking latches engage locking ramps as shown in Figure 4.

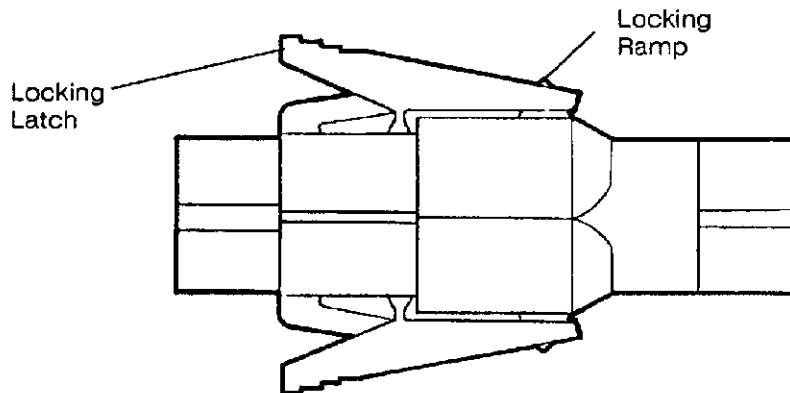


Fig. 4. Mated Connectors

**B. Connector Sealing**

The Sealed Universal MATE-N-LOK connector utilizes individual circuit sealing. The failure of a single circuit has no effect on any other circuit. As an example, a four circuit connector could be loaded with three circuits, with the fourth circuit cavity left open to the elements.

**4. TOOLING**

**4.1. Crimping**

**A. Loose Piece Contacts**

Crimp loose piece contacts with hand crimping tool. Tooling and instruction material are listed in Figure 2.

**B. Strip-Form Contacts**

Crimp strip-form contacts with mini-applicators used in automatic equipment. Applicators and instruction material are listed in Figure 2.

5. VISUAL AID

Figure 5 illustrates a properly crimped typical contact and a typical mating connector. This figure is to be used by production personnel to visually ensure a properly assembled product.

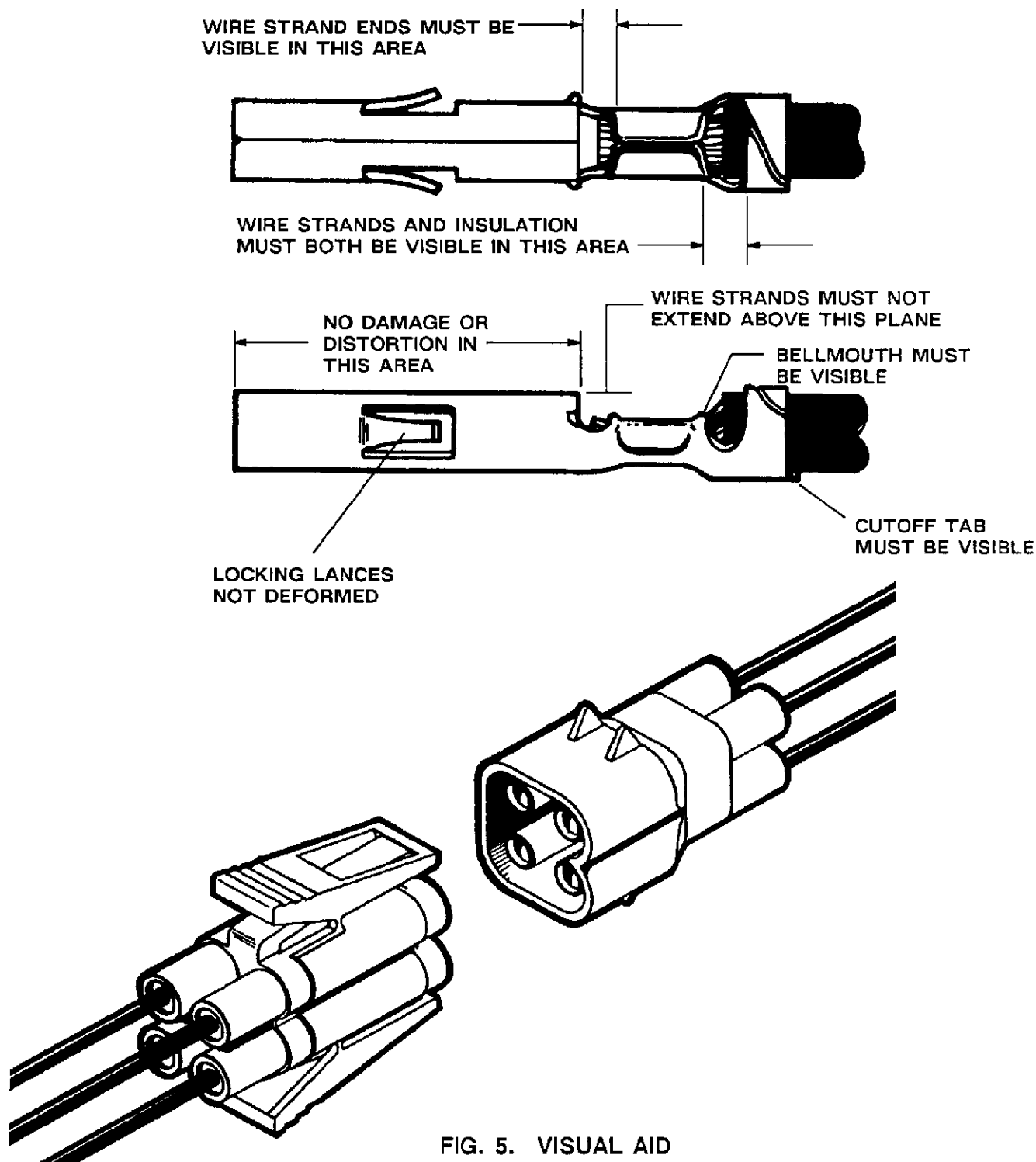


FIG. 5. VISUAL AID