



**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 FASTON\* Flag Receptacles with Tab-Lok Feature. This special wire barrel crimp feature provides reliable electrical and mechanical performance. The characteristic feature of the crimp is a tab which is inserted through a slot in the terminal, then crimped between the bottom of the terminal and a pair of locking lances. Receptacles are available in a variety of mating configurations, and in three series sizes: 250, 205, and 187. The series designates the width of the mating tab. Also, most receptacles are made in two standard tab thicknesses: 0.51 and 0.81 mm [.020 and .032 in]. Available types are shown in Figure 1.

When corresponding with TE Connectivity 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.

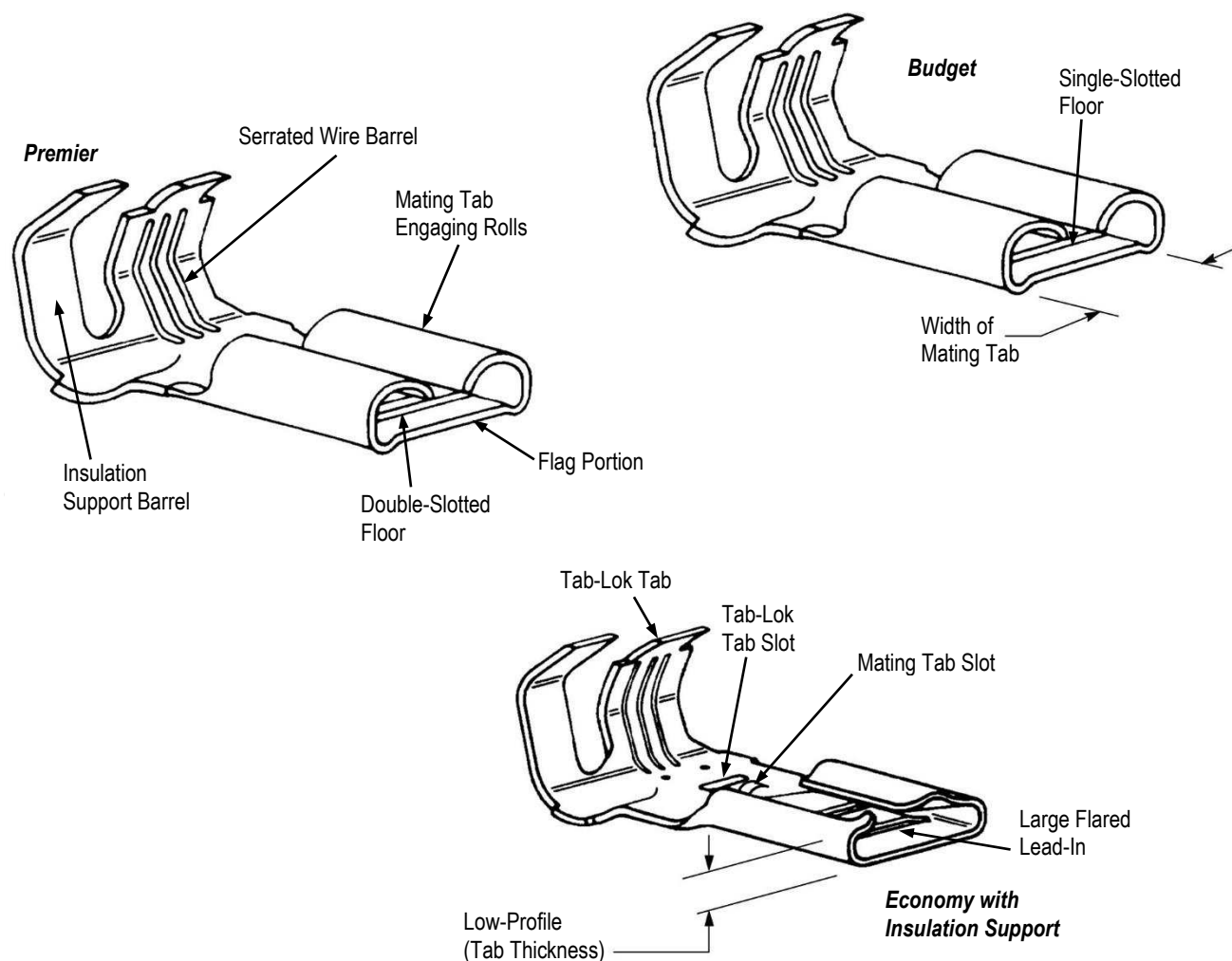


**Figure 1 (continued)**

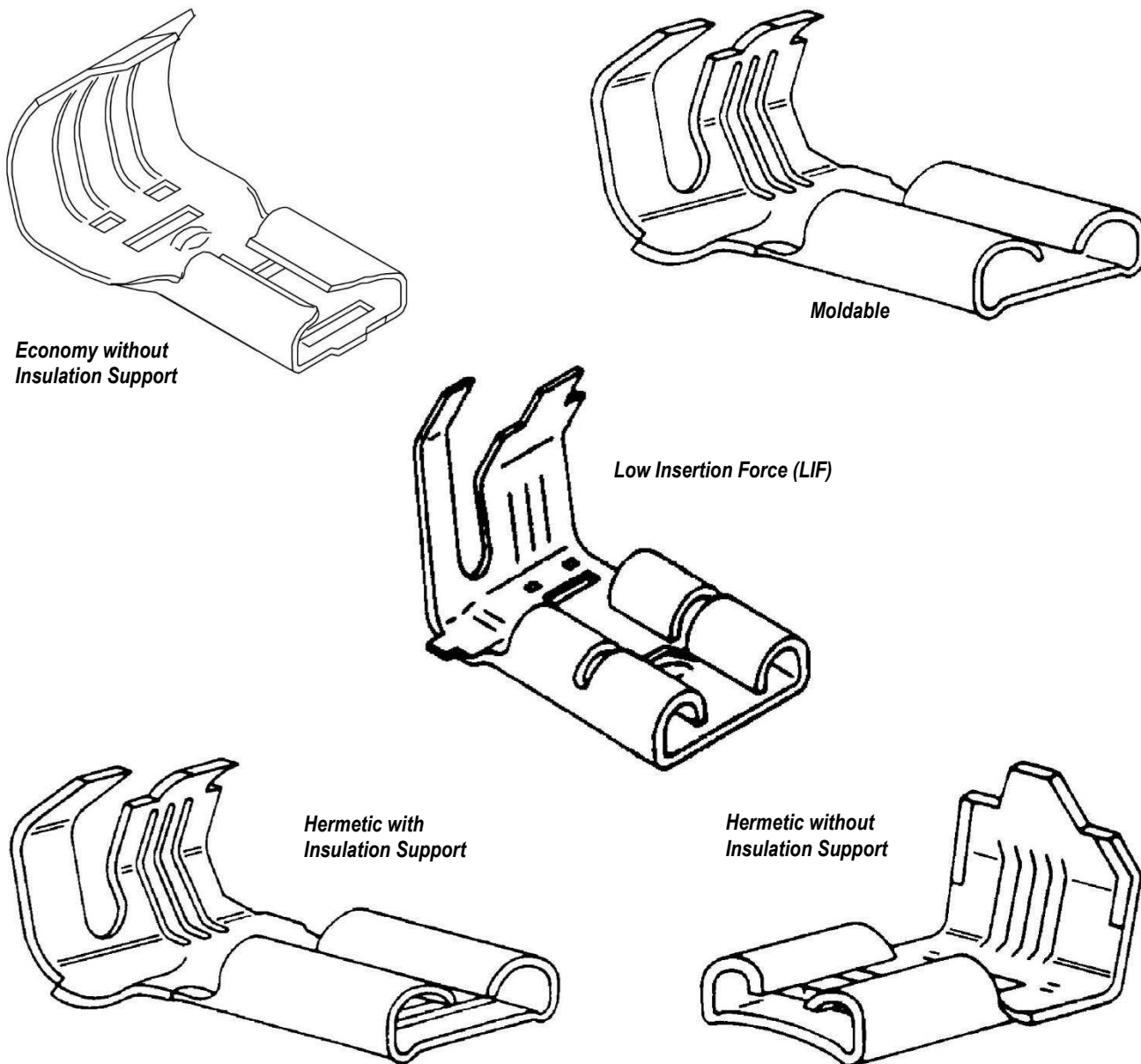


Figure 1 (end)

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

- Updated tooling information in Paragraph 2.5 and Section 5.

### 2.2. Customer Assistance

To ensure consistent and high-quality terminations, TE Connectivity (TE) product engineering has analyzed and tested the design factors of numerous terminal crimp connections with varying wire ranges defined by the terminals.

As a result, TE product engineering has defined five criteria necessary to achieve a reliable crimp: be sure to 1) use the TE product only for an application it was designed for, 2) always use the TE recommended application tooling, 3) use an appropriately selected and prepared wire, 4) adhere to the application specification described in the associated TE product print and application documentation (such as the TE 114- Application Specification, and TE Applicator “Log Sheet” print), and 5) have the product handled by trained operators only. TE product performance according to TE product specification can be achieved using the methods described in this application specification with the use of the recommended, properly maintained tooling and applicator.

If tooling or termination equipment is used other than what is recommended by TE, where such tooling or equipment was not used for agency validation and/or the product qualification process, TE does not make any representation or warranty, expressed or implied, and disclaims liability for non-performance per TE product specification. Customer accepts the sole responsibility for the evaluation, application, and use of the terminals in such circumstances.

Reference Product Base Part Number 41531 and Product Code 1091 are representative of FASTON\* Flag Receptacle with Tab-Lok Feature. 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

These terminals are designed to perform to the test described by Underwriters Laboratories Inc. Specification UL 310.

## 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:

- [408-8011](#) Applicator Instructions for Hinge Bar Applicators
- [408-8031](#) Miniature Quick-Change Applicators for Applying Tab-Lok Terminals
- [409-32035](#) Customer Manual – AMP-O-LECTRIC\* Model GII Terminators
- [2338133-1](#) Terminator Overview Catalog

## 3. REQUIREMENTS

### 3.1. Storage

#### A. 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 above environmental conditions exist, use phosphor-bronze receptacles instead of brass.

### 3.2. Product Selection

These receptacles have been designed to accommodate specific design requirements. The mating tab thickness and width for each are provided in Figure 2.

| RECEPTACLE TYPE           |                            | MATING TAB THICKNESS AND WIDTH (SERIES)                 |             |             |             |             |
|---------------------------|----------------------------|---------------------------------------------------------|-------------|-------------|-------------|-------------|
|                           |                            | 250 SERIES<br>0.81 [.032] (Only<br>Thickness Available) | 205 Series  |             | 187 Series  |             |
|                           |                            |                                                         | 0.81 [.032] | 0.51 [.020] | 0.81 [.032] | 0.51 [.020] |
| Premier                   |                            | X                                                       | X           | X           | X           |             |
| Budget                    |                            | X                                                       |             | X           | X           |             |
| Economy                   | with Insulation Support    | X                                                       | X           | X           | X           |             |
|                           | without Insulation Support | X                                                       |             |             |             |             |
| Moldable                  |                            | X                                                       |             |             | X           |             |
| Hermetic                  | with Insulation Support    | X                                                       |             |             |             |             |
|                           | without Insulation Support | X                                                       |             |             |             |             |
| Low Insertion Force (LIF) |                            | X                                                       |             | X           | X           |             |

Figure 2

Terminals are divided into 6 types:

#### A. Premier

Resilient rolls and a double slotted floor allow maximum compliance toward mating tabs. Each receptacle is thermally stress-relieved to help resist the effects of overstressing, often caused by production situations. Premier receptacles also are further processed to clean and lubricate the surface prior to shipping.

#### B. Budget

Construction and characteristics are much the same as the Premier, but the Budget receptacles have only one floor slot, and do not receive special processing.

#### C. Economy

Distinguishable by a large, flared lead-in and relatively low profile of the mating end rolls.

#### D. Moldable

Available with no floor slots or openings, allowing over-mold processing.

#### E. Hermetic

Designed specifically to mate with posted header tabs in hermetic motor applications. Provides all the features and benefits of the Premier line.

#### F. LIF

A cantilevered floor design, a generous lead-in, and a two-stage roll (split-roll) feature provide reduced insertion forces for this line of receptacles. Minimum withdrawal forces are maintained by the design.

### 3.3. Wire Selection and Preparation

#### A. Selection

There are receptacle designs to accommodate a wire size range of 20 through 10 AWG and an insulation diameter range of 1.32 through 5.08 mm [.052 through .200 in.]. Selection is based on the application requirements (i.e., electric or signal carrying parameters).

#### B. Preparation

Strip the wire insulation according to the dimension provided in Figure 3.

| RECEPTACLE SERIES | STRIP LENGTHS ( $\pm 0.38$ [.015]) |                            |
|-------------------|------------------------------------|----------------------------|
|                   | WITH INSULATION SUPPORT            | WITHOUT INSULATION SUPPORT |
| 250               | 5.59 [.220]                        | 9.60 [.378]                |
| 205               | 5.59 [.220]                        | ---                        |
| 187               | 4.78 [.188]                        | ---                        |

Figure 3


**CAUTION**

Do NOT nick, scrape, or cut the wire conductor during the stripping operation.

### 3.4. Crimped Requirements

Locate the receptacle to be crimped in the appropriate tooling and perform the crimping operation according to the instructions packaged with that tooling. Check the appearance and crimping dimensions of the crimped terminal as follows.

#### A. Appearance

The locking lances should be visually within the indent made by the tooling anvil. **Additionally, the Tab-Lok tab must be compressed into the terminal, under the same anvil indent.** These and other special features of crimped terminals are shown in Figure 4. Various tooling to position the terminal may be required in the applicator set-up to properly locate the tab and the lances into the anvil indent.


**CAUTION**

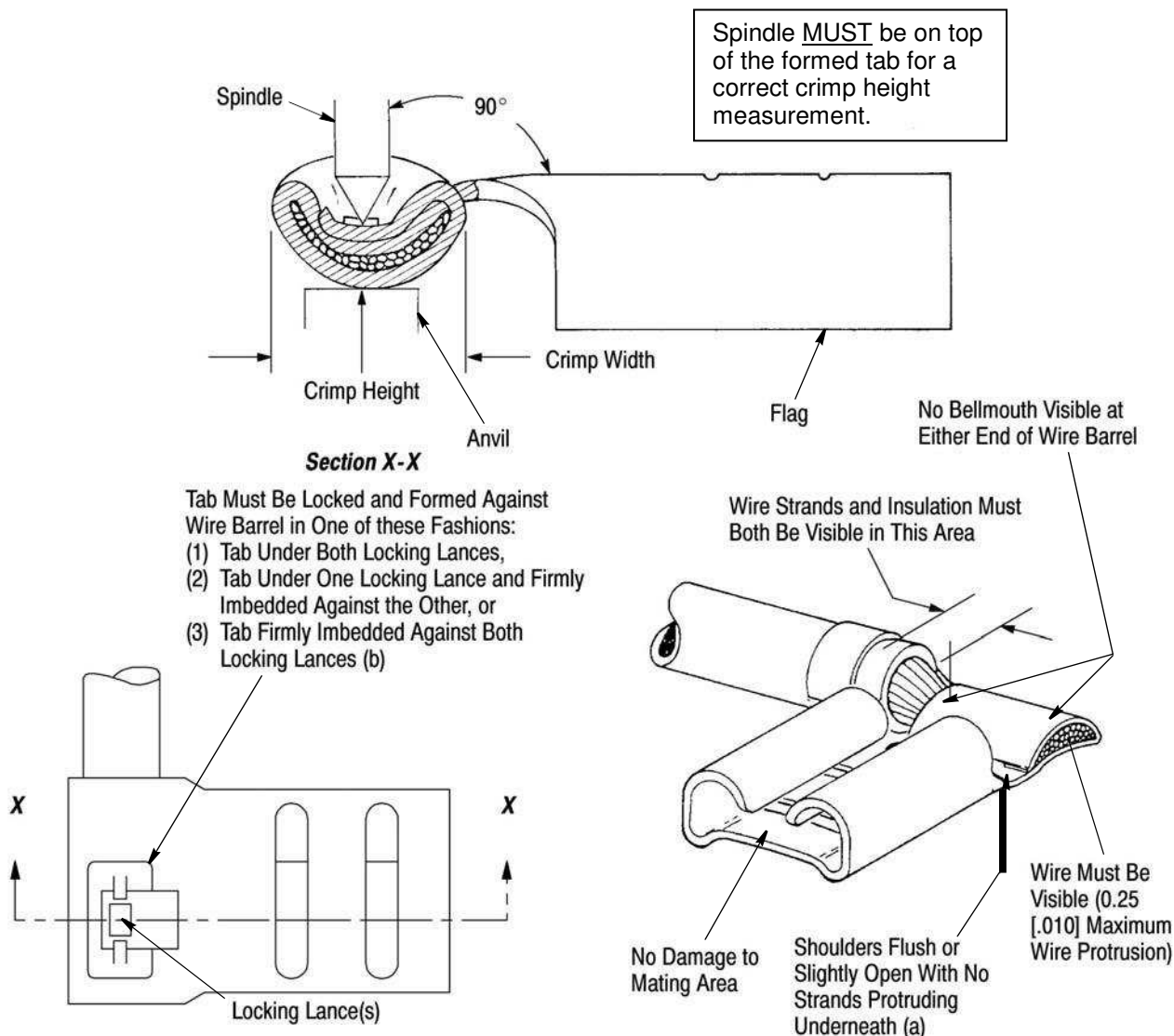
Wire insulation shall NOT be cut or broken during the crimping operation. Reasonable care and handling by tooling operators should prevent this type of damage.

#### B. Crimp Dimensions

When checking crimp height, the measurement must be taken perpendicular to the flag portion of the receptacle with a micrometer. The anvil and spindle must be centered and in line with the tooling anvil indent as shown in Figure 4.

The applied crimp dimension (within the functional range of the product) is dependent on the termination tooling being used. Crimp dimensions for P/N 2238142-1 are included in Figure 4. For all other products, refer to the documentation (applicator logs and instruction sheets) supplied with the termination tooling for the applied crimp height. See Section 5 (Tooling) for additional details.

The Tab-Lock crimps are sometimes challenging to measure crimp height over the crimped tab in the anvil indentation with the cone, and between serrations with the blade. This sometimes requires thinner crimp micrometer blade (depending upon the crimp micrometers being used), or alternatively using cross-sectional measurements. Tab-Lok crimps may have voids at one, or both, ends of the crescent shaped crimp; however, testing has shown when the wire compression is within the targeted 10% to 30% reduction, the crimp tensile strength meets specification, and the length of the crimp meets the TE qualified applicator tooled dimensions, the crimp reliability is maintained. Cross sections of Tab-Lok crimps should be asymmetric, and the crimp legs may contact the opposite side of the terminal.



- NOTES:** (a) Hairline fracture allowable on floor at slot a *maximum* of half the distance from slot to terminal edge.
- (b) Fractures on locking lances are NOT permitted. The lances may, however, be slightly extruded or flattened without affecting crimp reliability.

| Terminal P/N | Applicator P/N | Crimping Data   |                   |              |
|--------------|----------------|-----------------|-------------------|--------------|
|              |                | Wire Size [AWG] | Crimp Width (Ref) | Crimp Height |
| 2238142-1    | 567372-2       | 16              | 0.140             | 0.054±0.002  |
|              |                | 18              |                   | 0.050±0.002  |
|              |                | 20              |                   | 0.044±0.002  |
|              |                | 22              |                   | 0.040±0.002  |

**NOTE**  
The applied crimp dimension (within the functional range of the product) is dependent on the termination tooling being used. Crimp dimensions for P/N 2238142-1 are included in Figure 4. For all other products, refer to the documentation (applicator logs and instruction sheets) supplied with the termination tooling for the applied crimp height.

Figure 4

### 3.5. Crimp Pull-Out Test

Crimped receptacles shall not separate from wires when subjected to forces specified in Figure 5. **These performance verifications are a crimp integrity set-up REQUIREMENT.**



#### NOTE

Adjust tensile testing machine for head travel of 24.5 mm [1.00 in] per minute. Directly and gradually apply force for 1 minute. (Hold the receptacle so that the force is applied straight-parallel to the crimp.)

| WIRE SIZE<br>(AWG) | MINIMUM FORCE |              | WIRE SIZE<br>(AWG) | MINIMUM FORCE |              |
|--------------------|---------------|--------------|--------------------|---------------|--------------|
|                    | NEWTONS (N)   | POUNDS (LBS) |                    | NEWTONS (N)   | POUNDS (LBS) |
| 22                 | 36            | 8            | 14                 | 222           | 50           |
| 20                 | 58            | 13           | 12                 | 311           | 70           |
| 18                 | 89            | 20           | 10                 | 356           | 80           |
| 16                 | 133           | 30           | ---                |               |              |

Figure 5

### 3.6. Mating Tab Dimensions

Features and dimensional requirements for tab terminals to be mated with FASTON\* Flag Receptacles are shown in Figure 6.

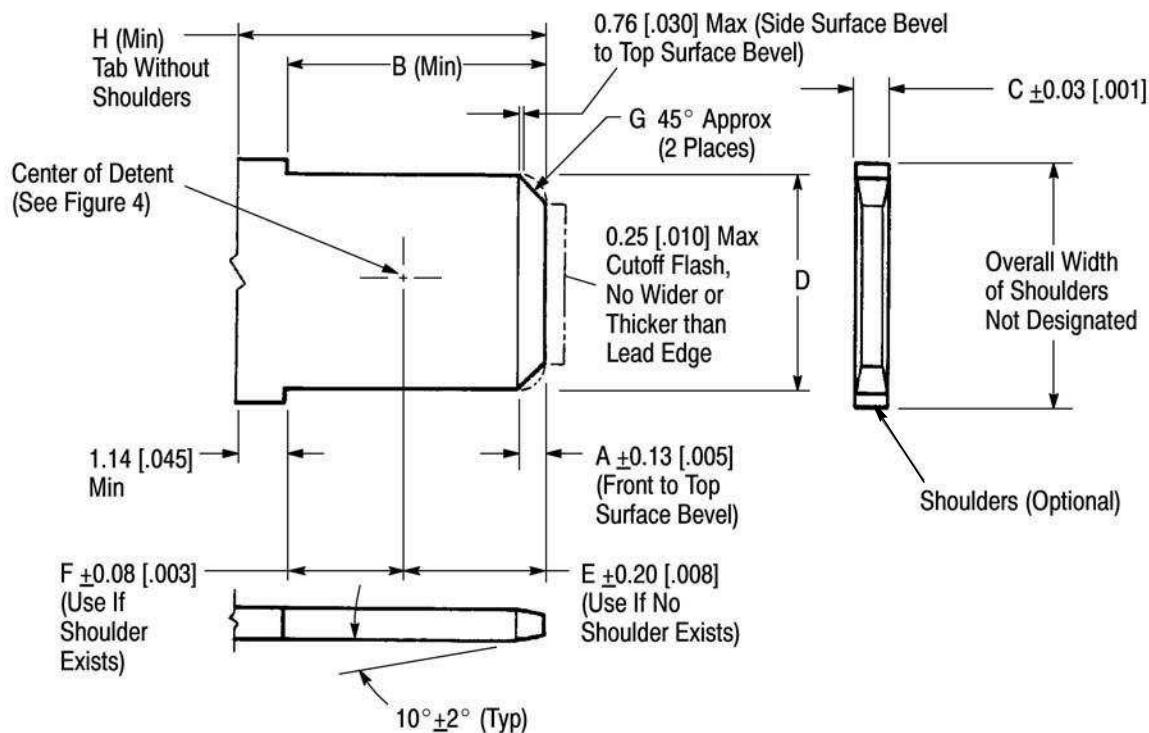


Figure 6 (continued)

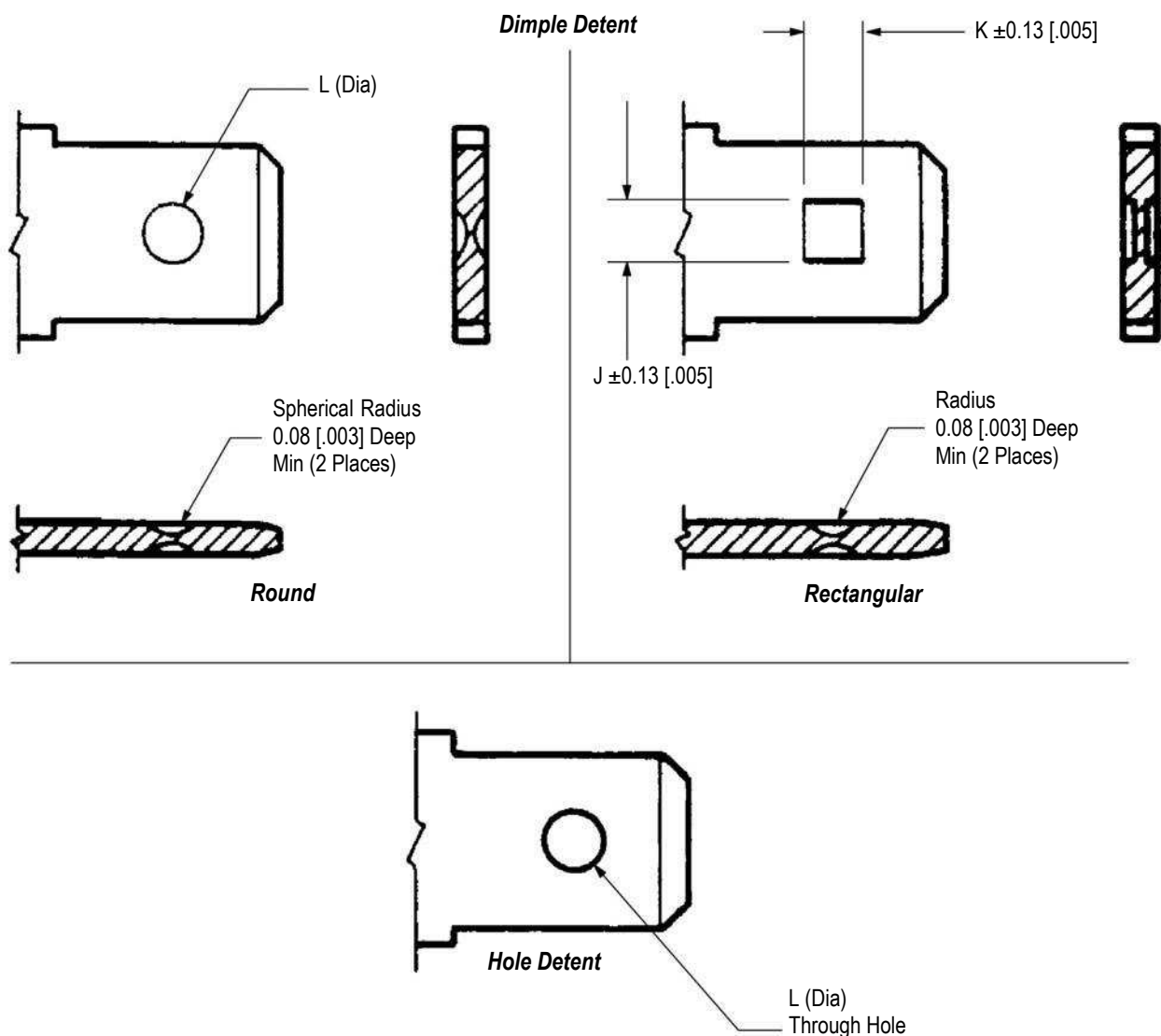
| TAB SIZE (Nominal)                 | DIMENSION   |             |             |             |             |             |             |             |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
|                                    | A           | B           | C           | D           | E           | F           | G           | H           |
| 6.35 x 0.81 [.250 x .032] w/Dimple | 0.89 [.035] | 7.80 [.307] | 0.81 [.032] | 6.35 [.250] | 3.86 [.152] | 4.06 [.160] | 1.27 [.050] | 8.94 [.352] |
| 6.35 x 0.81 [.250 x .032] w/Hole   | 0.89 [.035] | 7.80 [.307] | 0.81 [.032] | 6.35 [.250] | 4.52 [.178] | 3.40 [.134] | 1.27 [.050] | 8.94 [.352] |
| 5.21 x 0.81 [.205 x .032] w/Dimple | 0.89 [.035] | 6.22 [.245] | 0.81 [.032] | 5.26 [.207] | 2.54 [.100] | 3.81 [.150] | 1.27 [.050] | 7.37 [.290] |
| 5.21 x 0.81 [.205 x .032] w/Hole   | 0.89 [.035] | 6.22 [.245] | 0.81 [.032] | 5.26 [.207] | 3.17 [.125] | 3.17 [.125] | 1.27 [.050] | 7.37 [.290] |
| 5.21 x 0.51 [.205 x .020] w/Hole   | 0.89 [.035] | 6.22 [.245] | 0.51 [.020] | 5.26 [.207] | 3.17 [.125] | 3.17 [.125] | 1.14 [.045] | 7.37 [.290] |
| 4.75 x 0.81 [.187 x .032] w/Dimple | 0.89 [.035] | 6.22 [.245] | 0.81 [.032] | 4.75 [.187] | 2.54 [.100] | 3.81 [.150] | 1.27 [.050] | 7.37 [.290] |
| 4.75 x 0.81 [.187 x .032] w/Hole   | 0.89 [.035] | 6.22 [.245] | 0.81 [.032] | 4.75 [.187] | 3.17 [.125] | 3.17 [.125] | 1.27 [.050] | 7.37 [.290] |
| 4.75 x 0.51 [.187 x .020] w/Dimple | 0.76 [.030] | 6.22 [.245] | 0.51 [.020] | 4.75 [.187] | 2.54 [.100] | 3.81 [.150] | 1.14 [.045] | 7.37 [.290] |
| 4.75 x 0.51 [.187 x .020] w/Hole   | 0.76 [.030] | 6.22 [.245] | 0.51 [.020] | 4.75 [.187] | 3.17 [.125] | 3.17 [.125] | 1.14 [.045] | 7.37 [.290] |

**NOTES:** (1) Bevel may be a straight line or a radius within  $G \pm 0.51 \text{ mm}$  [ $\pm 0.020 \text{ in.}$ ]. (2) Tab shall be flat (.001 inch/inch); and free from burrs greater than 10% of tab thickness, or raised plateaus, except as noted in Paragraph 3.8. (3) Measurements shall not include plating, burrs, or flatness tolerance.

**Figure 6**

### 3.7. Tab Retention and Detent Configurations

A tab configuration 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 meeting specific requirements should be used. Hole detents provide the greatest retention forces, while dimples provide acceptable medium-range forces. Requirements are shown in Figure 7.



| TAB WIDTH<br>(Nominal) | DIMENSION      |                |                                      |
|------------------------|----------------|----------------|--------------------------------------|
|                        | J (See Note 1) | K (See Note 1) | L                                    |
| 6.35 [.250]            | 2.36 [.093]    | 1.90 [.075]    | 1.78 +0.25/-0.13 [.070 +0.10/-0.005] |
| 5.21 [.205]            | 2.36 [.093]    | 1.90 [.075]    | 1.78 +0.13 [.070 +.005]              |
| 4.75 [.187]            | 1.57 [.062]    | 1.37 [.054]    | 1.40 +0.13 [.055 +.005]              |

Figure 7

### 3.8. Mating Over-Cycle and Testing

The forces required to mate and unmate test mating tabs and receptacles shall be as specified in the following table. Measure the force using a testing device capable of holding the reading. It must also provide accurate alignment with slow and steady mating and unmating of the test tab and receptacle.



#### NOTE

Testing may be done using a gage as described in *Residential Controls-Quick-Connect Terminals, ANSI/NEMA DC2-1982*. Test tabs shall be dimensioned as shown in Figure 6 and Figure 7 of this specification, except that the "C" dimension shall have a tolerance of 0.008 mm [.0003 in.] for brass tabs and 0.013 mm [.0005 in.] for steel; and raised plateaus around detents shall be limited to a total of 0.025 mm [.001 in.] for both sides. Test tabs meeting these requirements and assuring accurate test results can be purchased from TE.

| TAB SIZE                           | FORCE (N [lb])                          |                          |            |                          |            |
|------------------------------------|-----------------------------------------|--------------------------|------------|--------------------------|------------|
|                                    | FIRST MATING<br>(Maximum)<br>INDIVIDUAL | FIRST UNMATING (Minimum) |            | SIXTH UNMATING (Minimum) |            |
|                                    |                                         | AVERAGE                  | INDIVIDUAL | AVERAGE                  | INDIVIDUAL |
| TEST TAB AND UNPLATED RECEPTACLE   |                                         |                          |            |                          |            |
| 6.35 [.250]                        | 80 [18]                                 | 27 [6]                   | 18 [4]     | 22 [5]                   | 18 [4]     |
| 5.21 [.205]                        | 67 [15]                                 | 22 [5]                   | 13 [3]     | 13 [3]                   | 9 [2]      |
| 4.75 [.187]                        |                                         |                          |            |                          |            |
| TEST TAB AND TIN-PLATED RECEPTACLE |                                         |                          |            |                          |            |
| 6.35 [.250]                        | 76 [17]                                 | 22 [5]                   | 13 [3]     | 18 [4]                   | 13 [3]     |
| 5.21 [.205]                        | 67 [15]                                 | 22 [5]                   | 13 [3]     | 13 [3]                   | 9 [2]      |
| 4.75 [.187]                        |                                         |                          |            |                          |            |

Figure 8

### 3.9. Repair

These receptacles are not repairable once termination has been made. Any defective receptacles should be removed and replaced with a new one.

## 4. QUALIFICATION

### 4.1. Underwriters Laboratories, Inc. (UL)

Products meet UL-310 specification for quick-connect terminals and are Listed in UL Component Listing Program-Electrical File E-66717.



#### NOTE

UL does not qualify this type of terminal for application to 24 AWG or smaller wire.

### 4.2. CSA International

CSA Certified in File LR7189.

### 4.3. National Electrical Manufacturers Association (NEMA)

These receptacles meet NEMA DC-2 mechanical requirements standard for quick-connect terminals.

## 5. TOOLING

Although hand crimping tooling is available for FASTON\* Flag Receptacles with the Tab-Lok feature, applicators and automatic machines are recommended for all applications. Applicators contain the tooling for feeding and crimping strip-form terminals. Automatic machines provide the power to operate the applicator. See Figure 9 for representative images.

Tooling information for product part numbers is available from [www.te.com](http://www.te.com) or by calling the Product Information Center at the number at the bottom of page 1.



#### CAUTION

Tool life may be significantly reduced when crimping comparable steel/nickel plated steel terminals.

### 5.1. Applicators

Applicators for product part numbers are available from the [Applicator Search Portal](#) on [www.te.com](http://www.te.com) or by calling the Product Information Center at the bottom of page 1.

### 5.2. Hand Tools

Hand tools for product part numbers are available from the [Hand Tool Search Portal](#) on [www.te.com](http://www.te.com) or by calling the Product Information Center at the bottom of page 1.

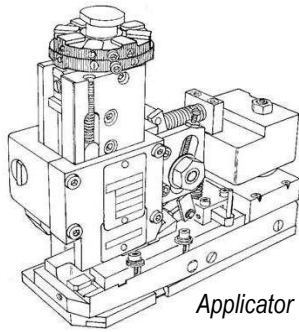


**Figure 9**

## 6. 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.

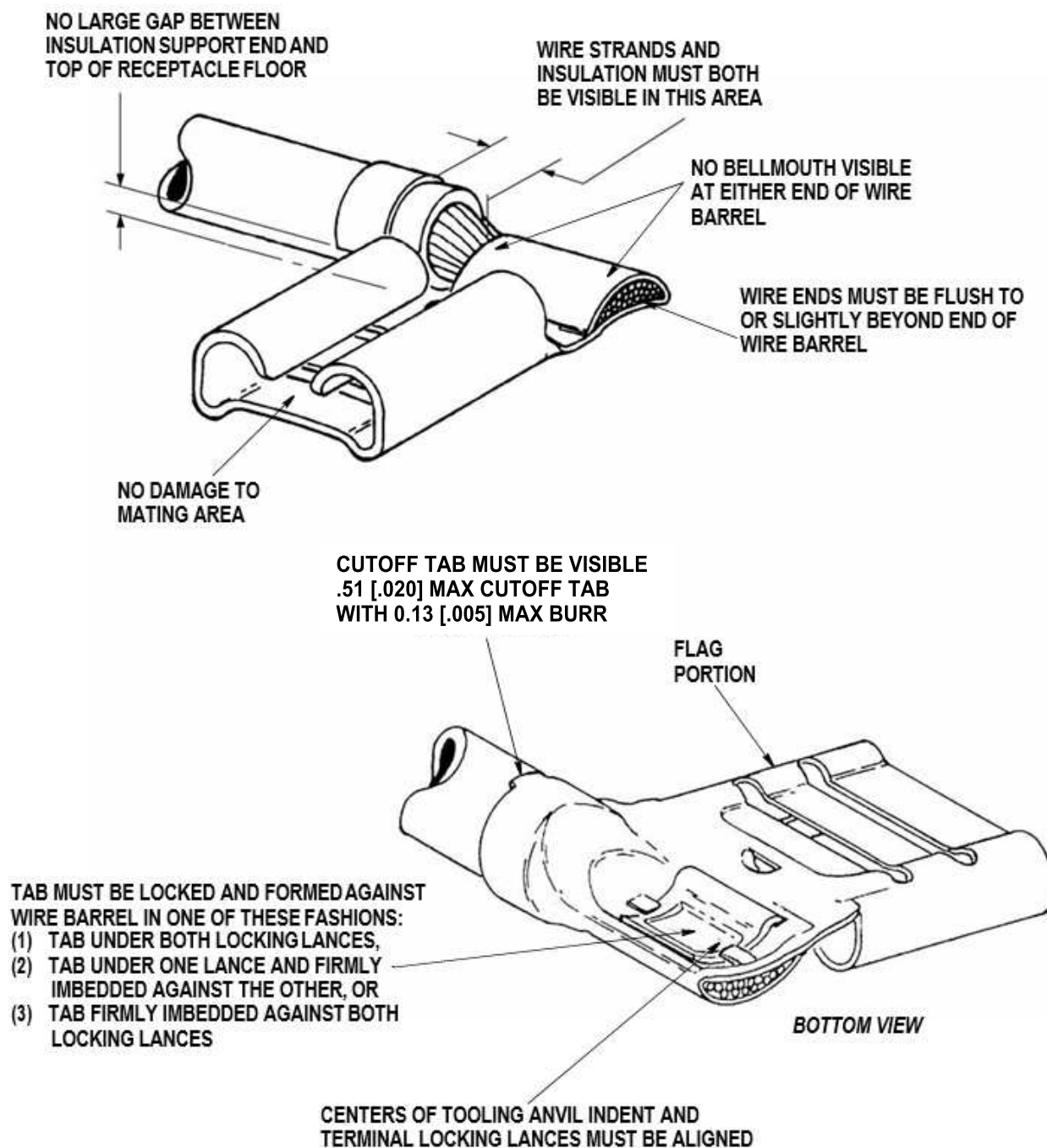


Figure 10. Visual Aid.