



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 EP 2.5 contact and receptacle housing used in wire-to-board interconnections.

The contact features an insulation barrel, wire barrel, and stabilizer barrel. The contact locking latch is designed to lock onto the housing locking ramp to ensure proper depth of the contact in the housing.

The receptacle housing consists of a housing and terminal position assurance (TPA). The housing and TPA are available in 2 through 20 positions. The housing features contact cavities, a locking ramp for each contact cavity, and locking latch. After all contacts are inserted into the housing, the TPA is designed to ensure that the contacts are fully inserted, and prevent them from backing out. The locking latch secures the mating connector to the receptacle housing.

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.

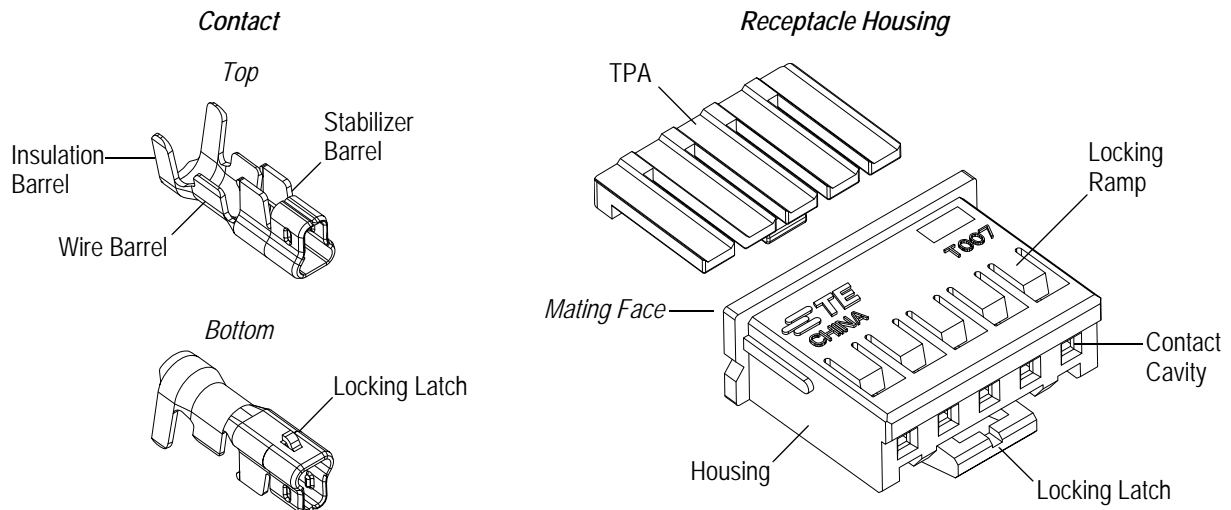


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Revisions to this application specification include:

- Updated application specification to corporate requirements
- Changed product code in Paragraph 2.2, added documents to Paragraph 2.5, and added Paragraphs 3.7 and 3.8
- Added wire brush and rear bellmouth dimensions for hand tool to Figure 3, and added tools to Section 5

### 2.2. Customer Assistance

Reference Product Base Part Number 2110989 and Product Code D950 are representative of Economy Power 2.5 contact and receptacle housing. Use of these numbers will identify the product line and help you to obtain product and tooling information. Such information can be obtained through a local Representative, by visiting our website at [www.te.com](http://www.te.com), or by calling PRODUCT INFORMATION or the TOOLING ASSISTANCE CENTER at the numbers 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 Drawings and this specification or with any other technical documentation supplied, the information in the Customer Drawings takes priority.

## 2.4. Specifications

Design Objective 108-2418 provides expected product performance and test information.

## 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. Documents available that pertain to this product are:

- 408-3295 Preparing Reel of Contacts for Application Tooling
- 408-7424 Checking Terminal Crimp Height or Gaging Die Closure
- 408-8040 Heavy Duty Miniature Quick-Change Applicators (Side-Feed Type)
- 408-8053 Conversion Guide for Miniature Quick-Change Applicators
- 408-9816 Handling of Reeled Products
- 408-32041 EP 2.5 Contact 2110989-1, Receptacle Housings 1969442-[ ], and Terminal Position Assurance (TPA) 1969443-[ ]
- 408-32061 Extraction Tool 2161958-1 for EP 2.5 Contacts
- 408-32091 Mini Single Action Hand Tool (SAHT) 2217074-1
- 409-5842 AMP-O-LECTRIC\* Model "G" Terminating Machines 354500-[ ]
- 409-5852 AMPOMATOR\* CLS Model III-G Lead-Making Machines 122500-[ ]
- 409-5878 AMPOMATOR CLS IV Lead-Making Machines 122500-2 and -3

## 3. REQUIREMENTS

### 3.1. Material

The receptacle housing is made of flame retardant rated nylon (UL 94 V-0).

### 3.2. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

### 3.3. Storage

#### A. Ultraviolet Light

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

#### B. Shelf Life

The receptacle housings should remain in the shipping containers until ready for use to prevent deformation to the contacts. The receptacle housings should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

#### C. Chemical Exposure

Do not store receptacle housings near any chemical listed below as they may cause stress corrosion cracking in the contacts.

Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur	Nitrites	Tartrates

#### D. Reeled Products

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

### 3.4. Wire Selection and Preparation

The contacts accept stranded copper wire sizes 0.13 to 0.30 mm [22 to 26 AWG] having an insulation diameter of 1.3 through 1.7. The wire must be stripped within the dimensions given in Figure 2.



*The wire conductors must not be nicked, cut, or scraped during the stripping operation.*

Note: Not to Scale

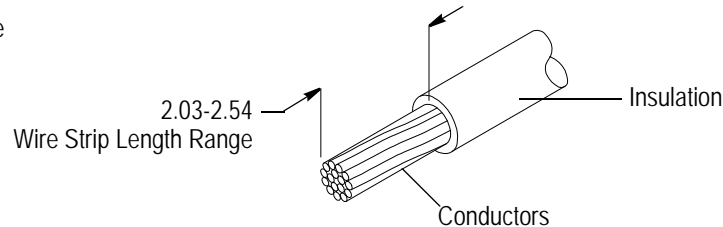


Figure 2

### 3.5. Crimp Requirements

Contacts must be terminated according to the instructions packaged with the tooling.

#### A. Bellmouth

The rear bellmouth shall be evident and be within the dimensions given in Figure 3.

#### B. Cutoff Tab and Burr

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

#### C. Wire Barrel Flash

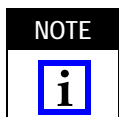
The wire barrel flash shall not exceed the dimension given in Figure 3.

#### D. Crimp Height

The crimp applied to the wire portion of the contact is the most compressed area and is most critical in ensuring optimum electrical and mechanical performance of the crimped contact. The wire barrel crimp height and width and insulation barrel crimp width must be within the dimensions provided in Figure 3.

#### E. Effective Crimp Length

Effective crimp length shall be defined as that portion of the wire barrel, excluding the rear bellmouth, fully formed by the crimping tool. Refer to Figure 3.



*The effective crimp length depends on the crimping dies used and should not be measured for inspection purposes.*

#### F. Wire Location

After crimping, the wire insulation and conductors must be visible in the transition area between the wire barrel and insulation barrel. See Figure 3.

#### G. Wire Brush

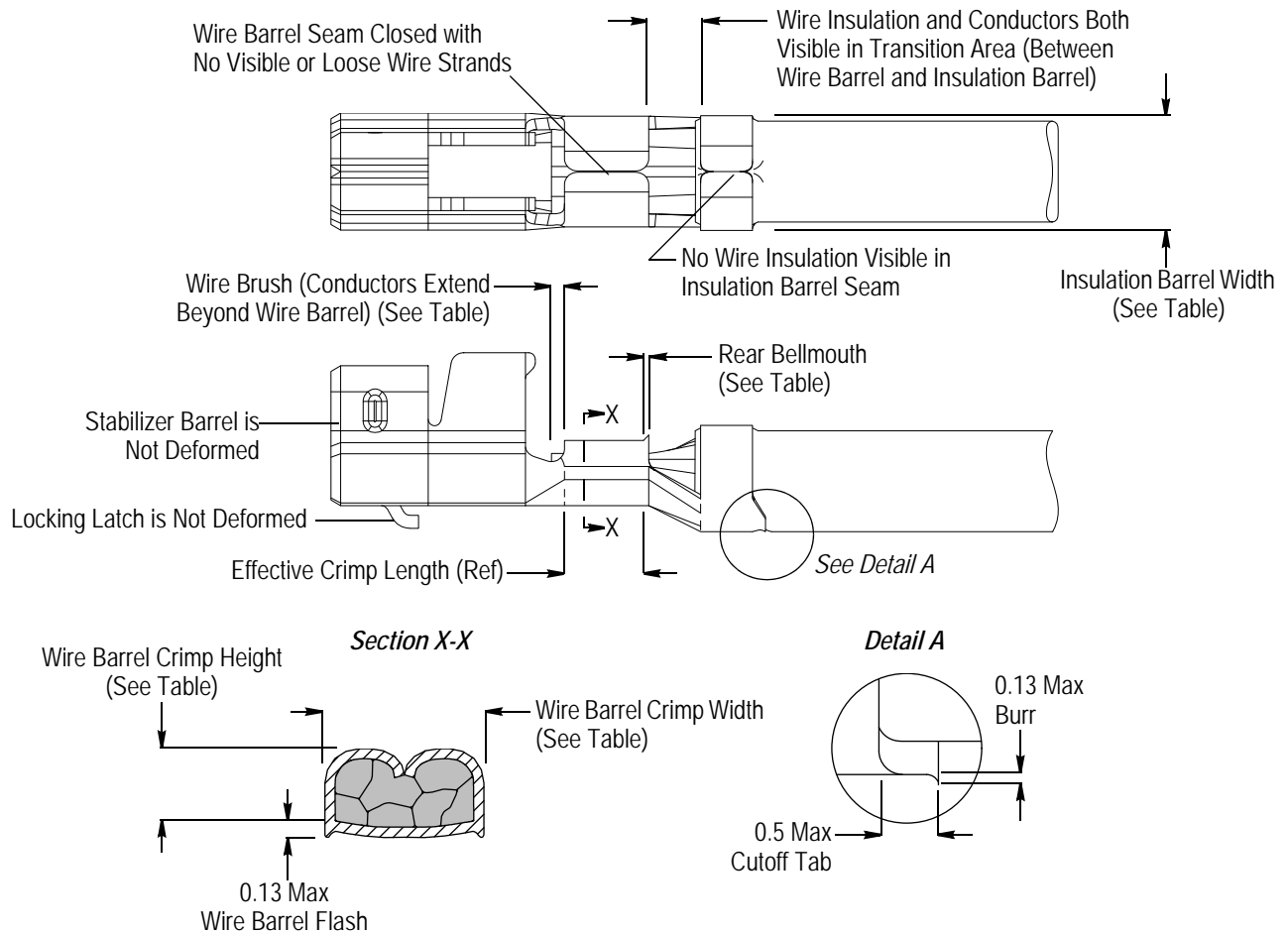
The conductors may extend beyond the wire barrel within the dimensions given in Figure 3.

#### H. Wire Barrel Seam

The wire barrel seam must be closed with no evidence of loose wire strands visible in the seam.

#### I. Stabilizer Barrel

The stabilizer barrel must not be deformed.



WIRE SIZE		CONTACT						
mm <sup>2</sup>	AWG	WIRE BARREL CRIMP		INSULATION BARREL CRIMP WIDTH	WIRE BRUSH		REAR BELLMOUTH	
		HEIGHT $\pm 0.05$	WIDTH		Hand Tool	Applicator	Hand Tool	Applicator
0.13-0.30	26	0.58	1.40	1.78	0.7 Max	0.1-0.2	0.05-0.7	0.1-0.7
	24	0.64						
	22	0.71						

Figure 3

### J. Locking Latch

The locking latch must not be deformed.

### K. Twist and Roll

There shall be no twist, roll, deformation, or other damage to the mating portion of the crimped contact that will prevent proper mating.

### L. Straightness

The force applied during crimping may cause some bending between the crimped wire barrel and the mating portion of the contact. Such deformation is acceptable within the following limits.

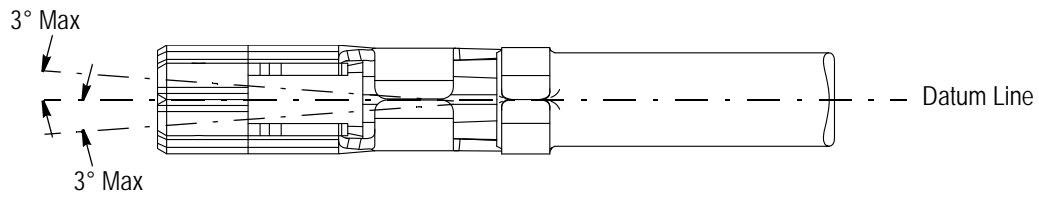
#### — Side-to-Side

The side-to-side bending of the contact may not exceed the limits provided in Figure 4.

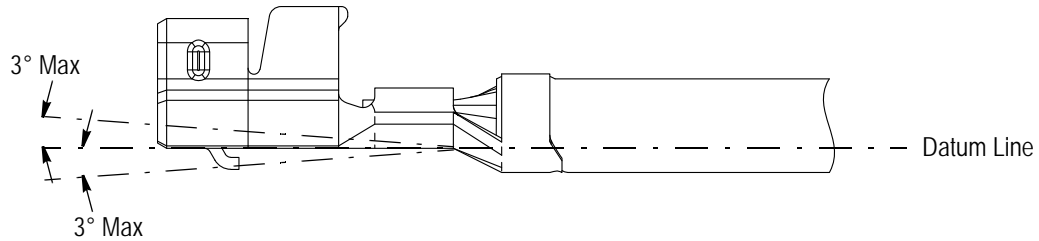
#### — Up and Down

The crimped contact, including cutoff tab and burr, shall not be bent above or below the datum line more than the amount given in Figure 4.

### Side-to-Side Alignment



### Up and Down Alignment



**Note:** Angles are drawn for clarification only and are not drawn to scale.

Figure 4

## 3.6. Assembly

### A. Contact Insertion

The crimped contact must face the contact cavity from the wire end of the receptacle housing so that the locking latch is aligned with the receptacle housing locking ramp. The contact must be inserted into contact cavity until it bottoms. There should be audible and tactile “click”. The wire should be pulled back lightly to ensure retention of the crimped contact. For proper receptacle housing mating, each contact locking latch must show in the window of its contact cavity. See Figure 5.

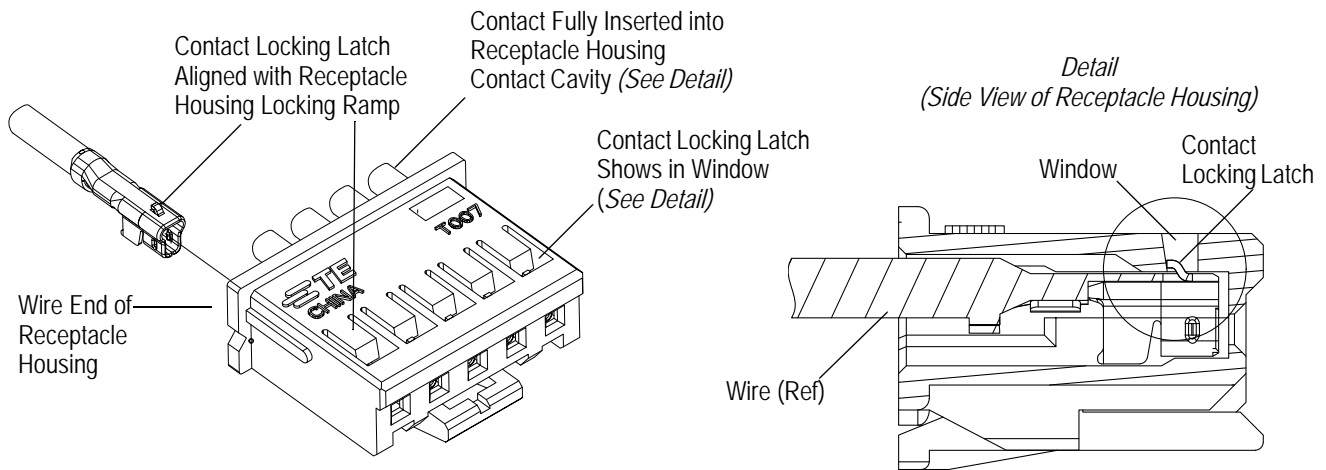
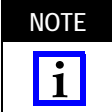


Figure 5

### B. TPA Installation

After inserting all of the crimped contacts, the TPA must be inserted into the receptacle housing. The TPA must be oriented with the positions facing the wire end of the receptacle housing and the locking latch(es) aligned with the nub(s) of the receptacle housing. Then the TPA must be inserted so that the positions enter the receptacle housing contact cavities over the wires and the locking latch(es) engages the receptacle housing nub(s). There should be audible and tactile “click”. See Figure 6.

The TPA should be pulled back lightly to ensure retention.



*TPAs with 5 positions or less have one locking latch and corresponding receptacle housings have one nub located under the receptacle housing locking latch. TPAs with more than 5 positions have more than one locking latch and corresponding receptacle housings have more than one nub, which are located on both sides of the receptacle housing locking latch. See Figure 6.*

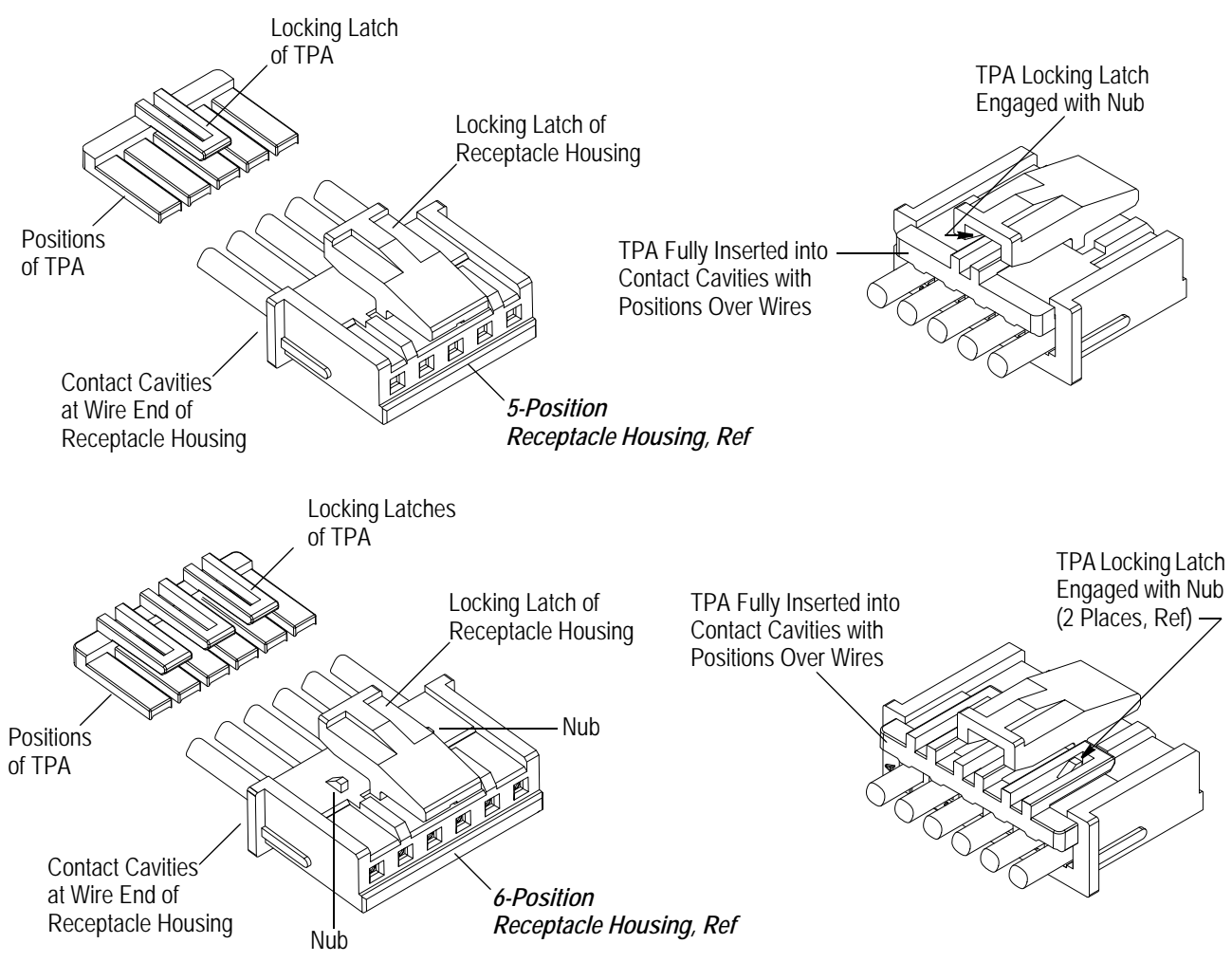


Figure 6

### 3.7. Disassembly

The TPA must be removed from the receptacle housing by releasing the locking latch(es) from the nub(s) of the receptacle housing and pulling the TPA straight from the receptacle housing. No contact can be extracted until the TPA is removed.

The contacts can be extracted by deflecting the locking latch from the receptacle housing locking ramp. Refer to Section 5 for tooling. A contact must not be re-inserted after extraction.

### 3.8. Replacement and Repair

Defective or damaged contacts or receptacle housings must not be used. Contacts must not be re-used by removing the wire nor after they have been extracted from the receptacle housing.

## 4. QUALIFICATION

No outside agency approvals was defined at the time of publication of this document.

## 5. TOOLING

Recommended tooling and instructional material packaged with the tooling that covers the full wire size range to crimp the contacts are shown in Figure 7.

### 5.1. Hand Tool

The hand tool crimps a loose-piece contact onto a pre-stripped wire. This hand tool features a flip locator that positions the contact in the crimping dies.

### 5.2. Applicator

The applicators are designed to crimp strip-fed, precision formed contacts onto pre-stripped wire, and provides for high volume, heavy duty production requirements. The applicator must be installed onto a power unit.

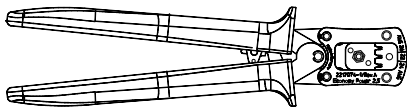
### 5.3. Power Unit

Each power unit includes the power source used to supply the force to an applicator.

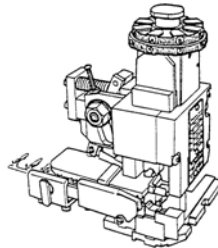
### 5.4. Contact Extraction

The extraction tool is designed to extract a contact by lifting the receptacle housing locking ramp away from the contact locking latch, allowing the contact to be pulled out of the receptacle housing.

A commercially-available small blade screwdriver can be used by inserting the tip into the window of the contact cavity of the contact to be removed, then pulling the wire of the contact to be removed until the contact is free from the receptacle housing.



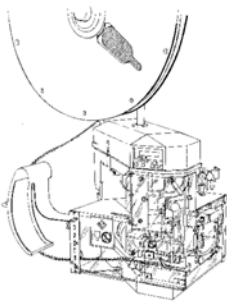
Mini Single Action Hand Tool (SAHT) 2217074-1 (408-32091)



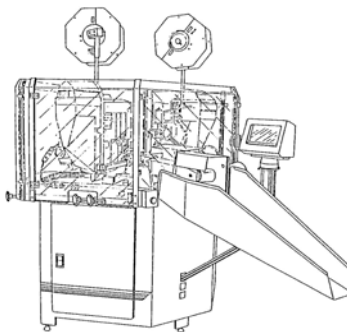
Heavy Duty Miniature Quick-Change Applicators (Side-Feed Type) 1530232-1, 1530232-2, 1530232-6, 7-1530232-1, 7-1530232-2, 7-1530232-6 (408-8040)



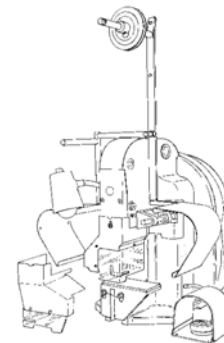
Extraction Tool 2161958-1 for EP 2.5 Contacts (408-32061)



AMP-O-ELECTRIC Model "G" Terminating Machines 354500-[] (409-5842)



AMPOMATOR CLS III-G Lead-Making Machines 122500-2 and -3 (409-5852)  
AMPOMATOR CLS IV+ Lead-Making Machines 356500-[] (409-5878)

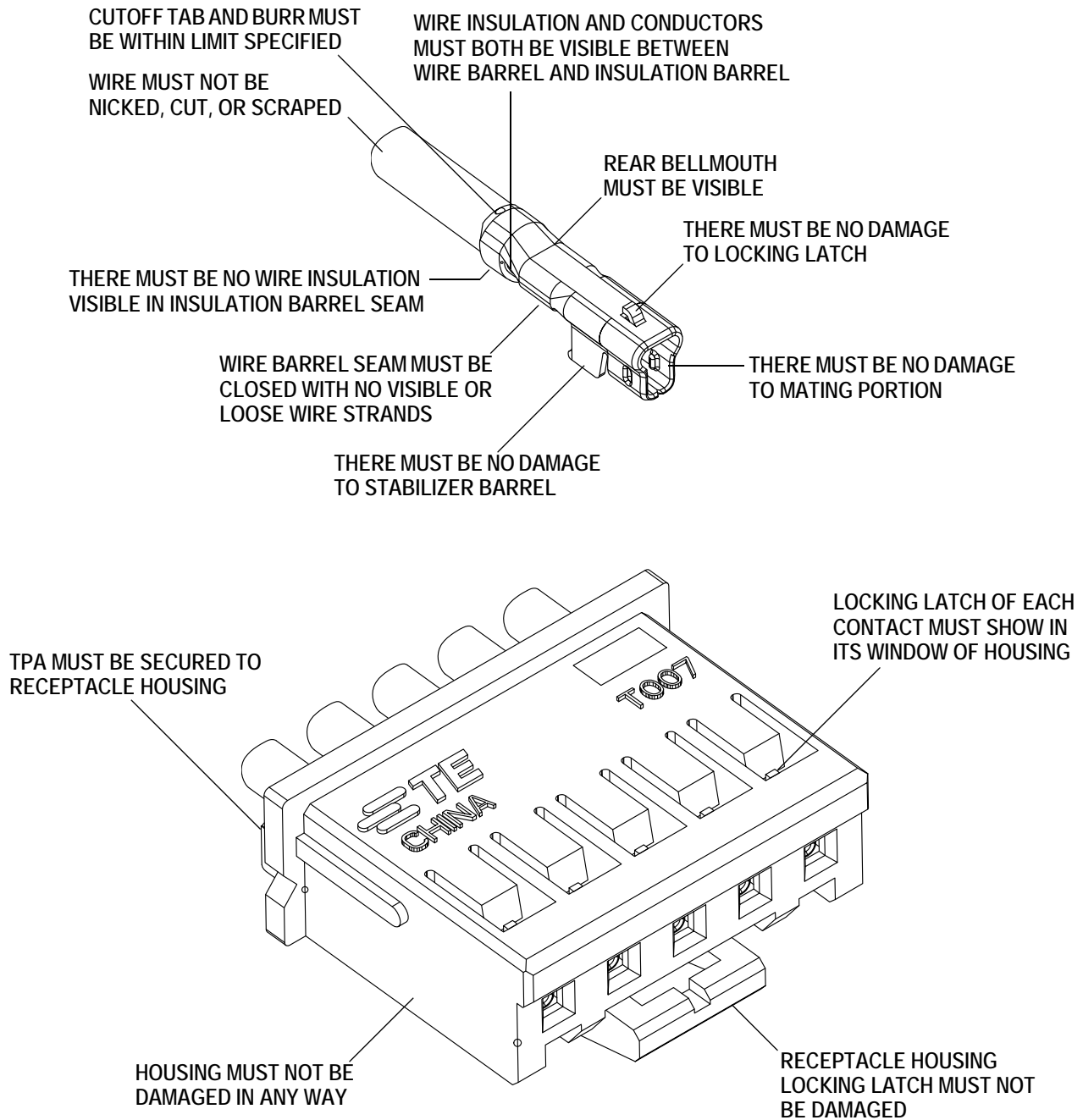


AMP-O-ELECTRIC Model "K" Terminator Machines 565435-5 or 1-471273-2 (409-5128)

Figure 7

## 6. VISUAL AID

The illustration below shows a typical application of EP 2.5 contact and receptacle housing. 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 8. VISUAL AID**