Economy Power (EP)-II
Contacts and Receptacle Housings

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

1. INTRODUCTION

This specification covers the requirements for application of EP-II contacts and receptacle housings used in wire-to-board interconnections.

The contact is available in sizes 26-24, 22-18 and 20-16. Each contact features a wire barrel, insulation barrel, and locking window. The wire barrel has serrations, which aid in wire retention. The contact is available with or without an internal tongue. The internal tongue provides a higher mating force and current rating and are typically used with a receptacle housing having a lower amount of positions. The contact without an internal tongue has a lower mating force and current rating and are typically used with a receptacle housing having a higher amount of positions. The contacts are available in strip-form for termination using an automatic machine.

The receptacle housing is available in 2 through 12 positions with contact cavities on 3.96 centerline spacing. Circuit positions are identified by a raised number on the back of the receptacle housing. Each contact cavity has a locking ramp that seats in the contact locking window and holds the contact in the receptacle housing. A 12-position break-away contact retainer is available for use as a secondary locking device that will prevent the contacts from backing out in applications with random vibration. The retainer locking tabs of the receptacle housing are designed to secure the break-away contact retainer to the receptacle housing. The receptacle housing features a mating latch that is used to prevent the mated connectors from inadvertently separating. The receptacle housing mates with standard EP headers.

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.

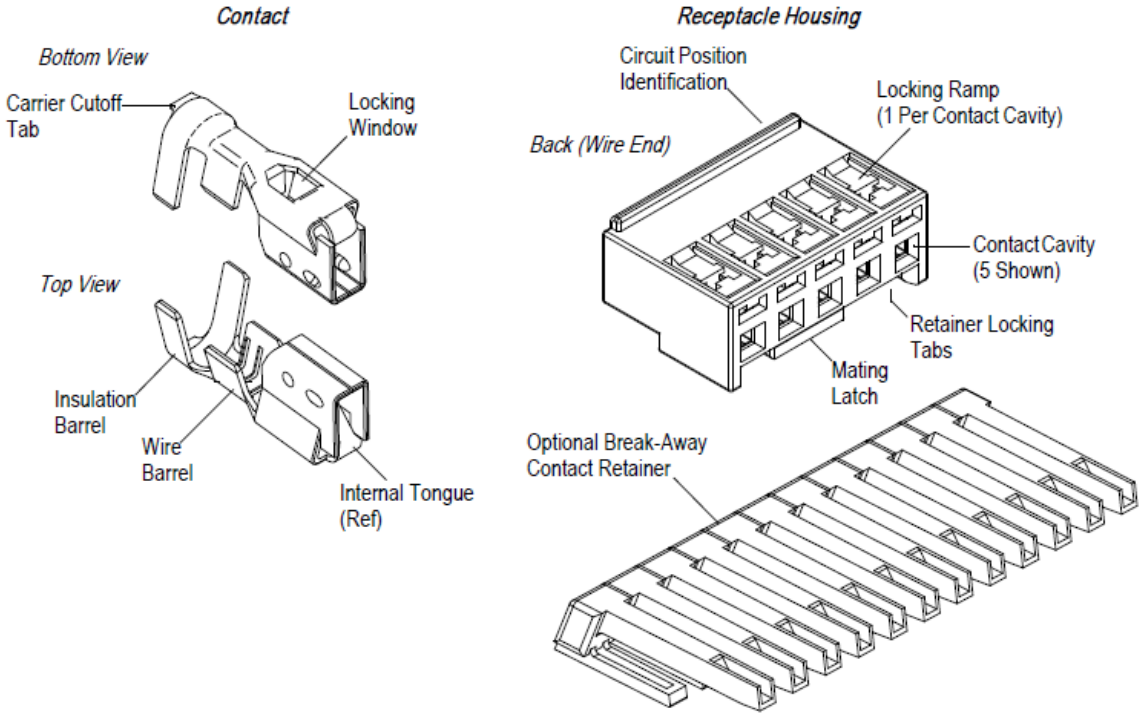


Figure 1

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2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- Removed 13 through 24 housing positions, removed solid wire, added contact sizes, added product descriptions, and break-away contact retainer to Section 1
- Replaced housing reference part number and added product code to Paragraph 2.2
- Changed housing color in Paragraph 3.3
- Removed copper wire from Paragraph 3.4
- Removed crimp length requirement from Paragraph 3.5 and modified NOTE in Paragraph 3.5, F
- Changed Section 4
- Modified contact illustration in Figures 5 and 7
- Edited paragraph 5.3 to reference Micro Precision Tweezer PN 986170-2
- Add contact 26-24 AWG crimp information in paragraph 3.4, 3.5, add PN in paragraph 3.4, 3.5, 5.0.

2.2. Customer Assistance

Reference Product Base Part Numbers 1744144 and 2132781 and Product Codes D950 and K885 are representative of EP-II contacts and receptacle housings. 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, or by calling PRODUCT INFORMATION or the TOOLING ASSISTANCE CENTER at the number at the bottom of page 1.

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 contained in the Customer Drawings takes priority.

2.4. Specification

Application Specification 114-32134 provides header assembly application information.

Design Objective 108-2297 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 Quick-Change Applicators (Side-Feed Type) with Mechanical Feed System
408-8053	Conversion Guide for Miniature Quick-Change Applicators
408-9816	Handling of Reeled Products
408-10116	Extracting EP-II Contacts from Receptacle Housing
409-5128	Basic AMP-O-LECTRIC* Model “K” Terminating Machine 565435-5
409-5842	AMP-O-LECTRIC Model “G” Terminating Machines 354500-[ ]
409-5852	AMPOMATOR* CLS III-G Lead-Making Machines 122500-[ ]
409-5878	AMPOMATOR CLS IV Lead-Making Machines 356500-[ ]
409-10027	AMP 3K/40* and AMP 5K/40* Terminating Machines with Stripping Module 1725910-[ ]
409-10029	AMP-O-LECTRIC Model “G” Terminating Machine with Stripping Module 1490501-1
409-10047	AMP 3K/40 Terminating Machines 1725950-[ ] and AMP 5K/40 Terminating Machines 1725900-[ ]
409-10078	DT-3000 and DT-5000 Machines with SLE SL Crimp Quality Monitor

3. REQUIREMENTS

3.1. Safety

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

3.2. Storage

A. Ultraviolet Light

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

B. Shelf Life

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

C. Reeled Products

Store coil wound reels horizontally and traverse wound reels vertically.

D. Chemical Exposure

Do not store contacts 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

3.3. Material

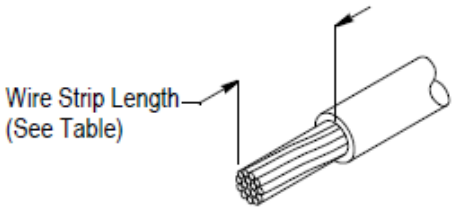
The contacts are made of phosphor bronze, pre-tinned over copper; and the receptacle housings are made of natural (color) flame-retardant rated (UL 94V-0) nylon.

3.4. Wire Selection and Preparation

The contacts accept stranded wire sizes 22 through 16 with an insulation diameter range of 1.7 to 2.9.

The wire must be stripped to the dimension provided in Figure 2.

CAUTION
The wire conductor must not be nicked, cut, or scraped during the stripping operation.



Base Part Number	Contact Size	Wire Size (AWG)	Wire Strip Length Range
1744144 2377991	22-18	22, 20, 18	2.69 – 3.30
1744201 2377997	20-16	20, 18, 16	2.46 – 2.84
2356981	26-24	24, 26	2.69 – 3.30

Figure 2

3.5. Crimp Requirements

The contact must be crimped according to the instructions provided with the tooling. Reasonable care should be taken to provide undamaged wire terminations.

NOTE
Periodic inspections must be made to ensure crimped contact formation is consistent with the requirements given in Figure 3.

A. Cutoff Tab and Burr

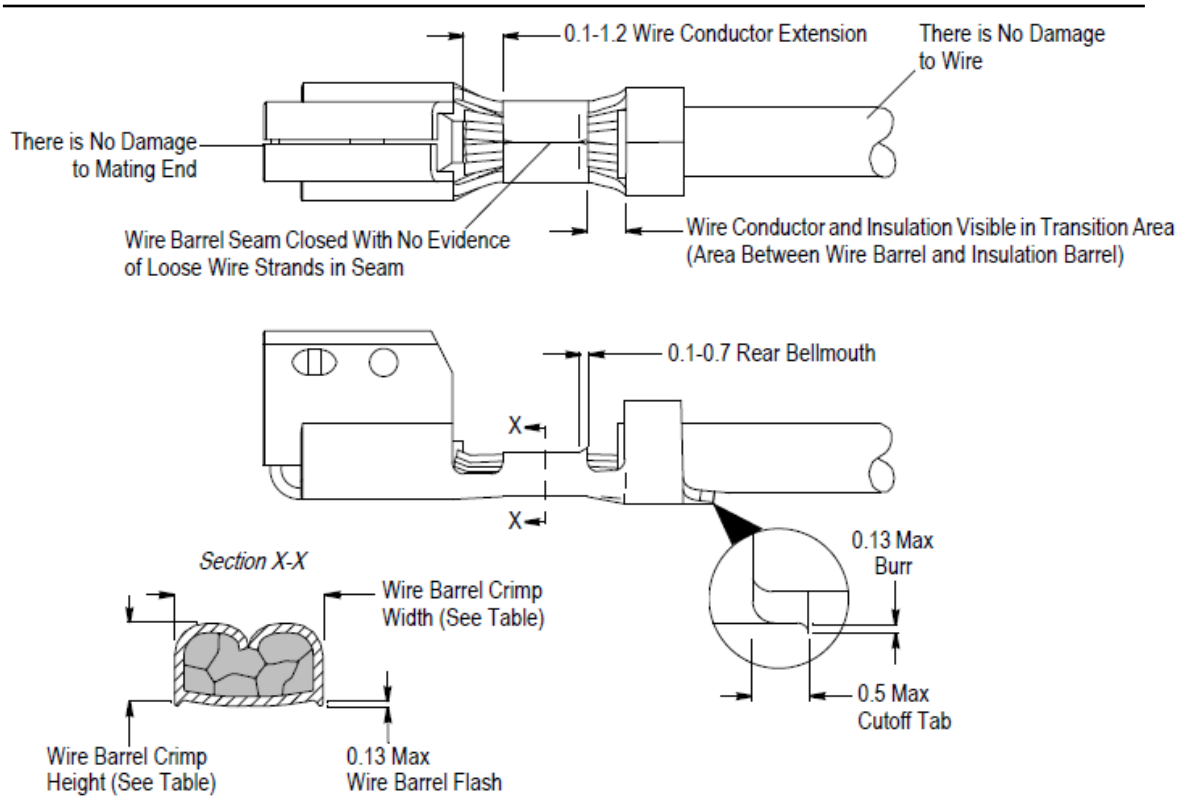
The cutoff tab shall meet the dimension, and cutoff burr shall not exceed the dimension given in Figure 3.

B. Bellmouths

There shall be no front bellmouth. The rear bellmouth shall be evident and conform to the dimension given in Figure 3.

C. Wire Barrel Flash

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



Base Part Number	Contact Size	Wire Size (AWG)	Wire Barrel Crimp		Insulation Barrel Crimp Width
			Height ±-0.05	Width	
1744144 2377991	22 - 18	22	1.00	1.78	2.60
		20	1.10		
		18	1.15		
1744201 2377997	20 - 16	20	1.12	1.78	
		18	1.27		
		16	1.47		
2356981	26 - 24	26	0.69	1.16	1.90 max. with OV shape
		24	0.75		

Figure 3

D. Wire Conductor and Insulation Location

The wire conductor and insulation must be visible in the transition area (area between the wire barrel and insulation barrel). The insulation must not be broken and must not be crimped into the contact wire barrel. The conductor may extend beyond the wire barrel within the dimension range given in Figure 3.

E. Wire Barrel Seam

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

F. Crimp Height and Width

The crimp applied to the wire portion of the contact is the most compressed area (not including the flash) and is most critical in ensuring optimum electrical and mechanical performance of the contact. The wire barrel and insulation barrel crimp height and width must conform to the dimensions provided in Figure 3.

NOTE
The applied crimp dimensions are dependent on the termination tooling. The applicator log and instruction sheet supplied with the applicator give specific settings to achieve proper crimp dimensions. Applicable termination tooling is given in Section 5.

G. Twist and Roll

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

H. Straightness

The force applied during crimping may cause some bending between the 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.

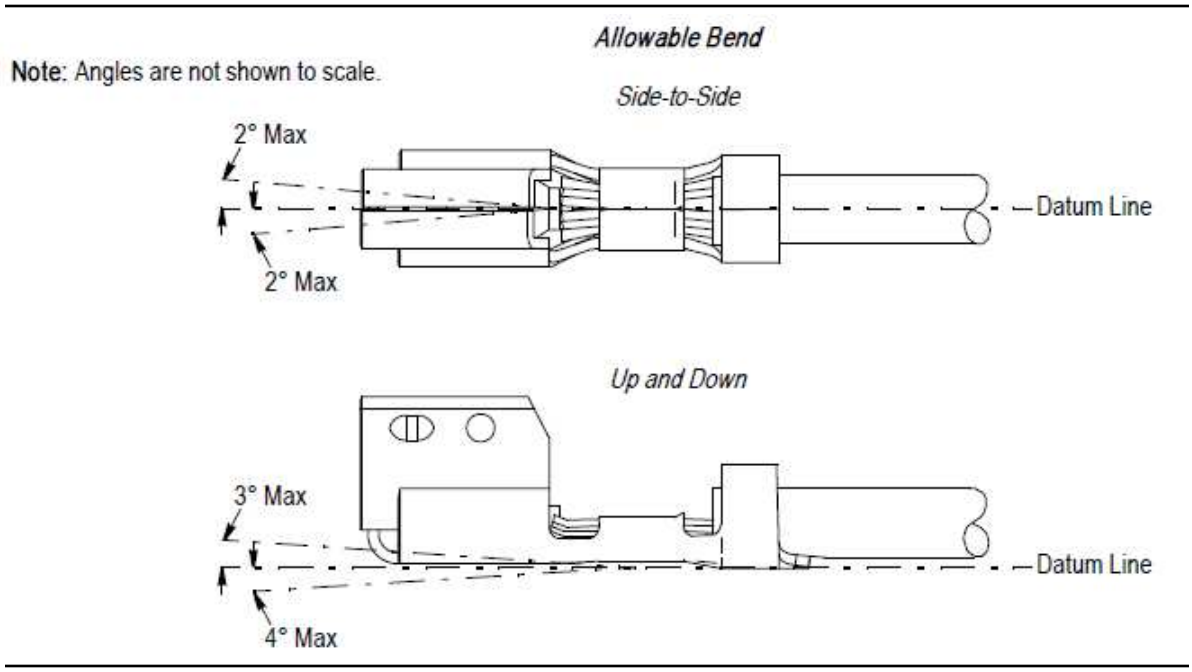


Figure 4

3.6. Contact Insertion and Extraction

The crimped contact must be aligned with the contact cavity from the back of the receptacle housing, and oriented so that the locking window is aligned with the receptacle housing locking ramp. The contact must be inserted straight into the receptacle housing until it bottoms and there is an audible or tactile click. The wire must be pulled back lightly to ensure retention of contact in receptacle housing. Refer to Figure 5.

A contact can be removed from the receptacle housing using the tool specified in Section 5.

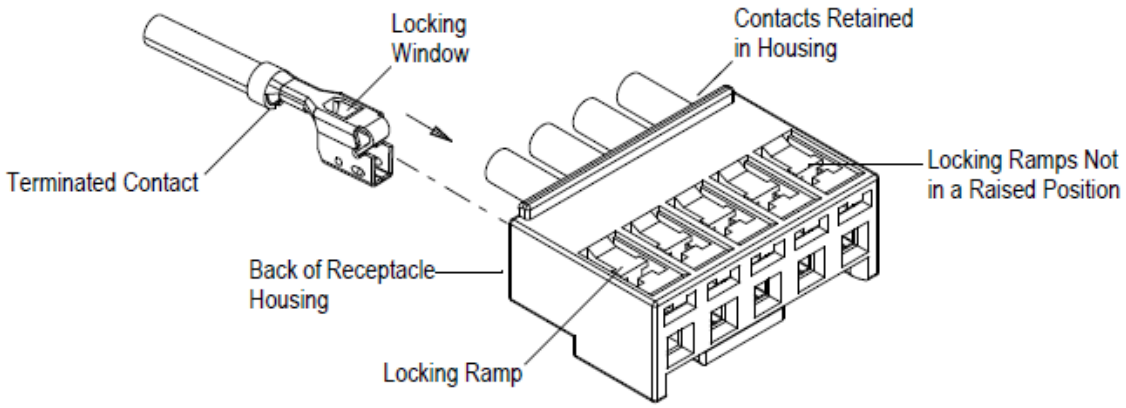


Figure 5

3.7. Contact Secondary Locking Device

All contacts must be fully inserted before the break-away contact retainer can be installed onto the receptacle housing. Sections (positions) of the break-away contact retainer must be snapped off to match the number of receptacle housing contact cavities. Then, each leg of the break-away contact retainer must fit into a contact cavity with the legs on top of the wires. When installed, the locking slots of the retainer must be locked onto the locking tabs of the receptacle housing. See Figure 6.

The break-away contact retainer can be removed by lifting the locking slots away from the locking tabs and pulling the retainer straight out of the receptacle housing.

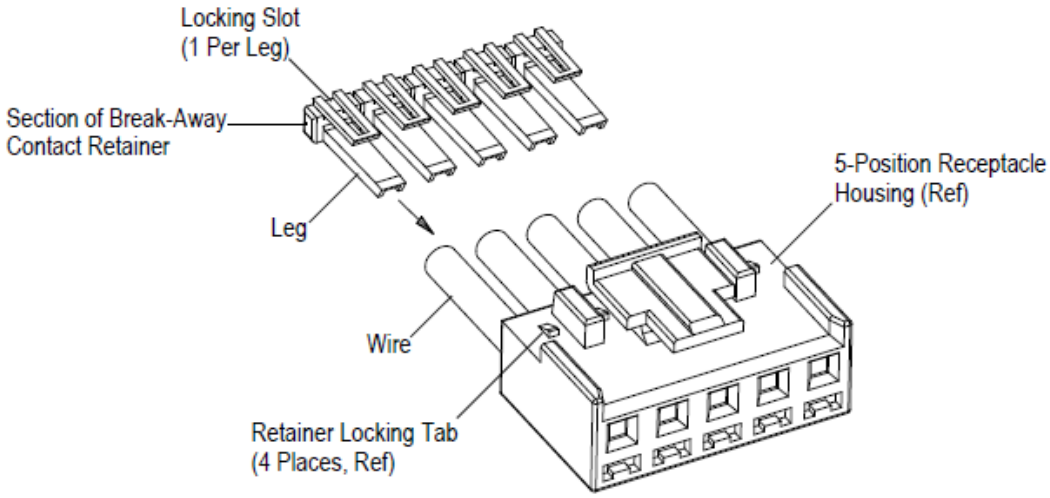


Figure 6

3.8. Replacement and Repair

Damaged or defective contacts or receptacle housings must not be used. The contact and receptacle housing cannot be repaired.

4. QUALIFICATIONS

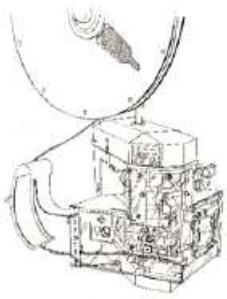
No outside agency approvals were defined at the time of publication of this specification.

5. TOOLING

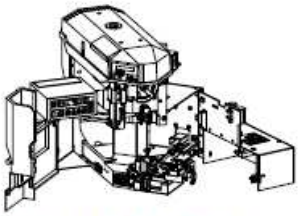
Tooling part numbers and instructional material packaged with the tooling are shown in Figure 7.



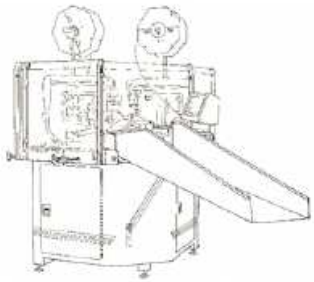
Basic AMP-O-LECTRIC Model "K" Terminating Machine 565435-5 (Refer to 409-5128)



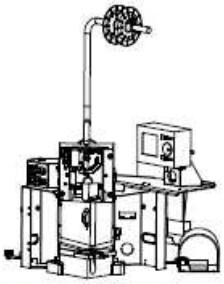
AMP-O-LECTRIC Model "G" Terminating Machines 354500-1, -2 (409-5842)



AMP-O-LECTRIC Model "G" Terminating Machine with Stripping Module 1490501-1 (409-10029)



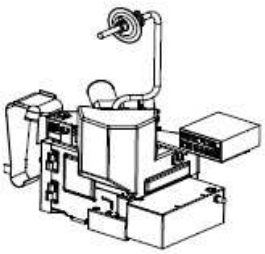
AMPOMATOR CLS III-G Lead-Making Machines 122500-2, 3 (409-5852)
AMPOMATOR CLS IV+ Lead-Making Machines 356500-1, -2 (409-5878)



DT-3000 or DT-5000 Machines 1901700-[ ] with SLE SL Crimp Quality Monitor (409-10078)



AMP 3K/40 Terminating Machines 1725950-[ ] or AMP 5K/40 Terminating Machines 1725900-[ ] (409-10047)



AMP 3K/40 or AMP 5K/40 Terminating Machines with Stripping Module 1725910-[ ] (409-10027)



Heavy-Duty Quick-Change Applicators (Side-Feed Type) with Mechanical Feed System (See Table) (408-8040)

Base Part Number	Contact Size	Applicator	Power Unit					
			Model "K"	Model "G"	CLS III-G	CLS IV+	DT-3000 or DT-5000	AMP 3K/40 or AMP 5K/40
1744144 2377991	22 - 18	1385286-1	---	---	122500-2, -3	356500-1, -2	---	---
		1385286-2	565435-5	354500-1	---	---		
		1385286-3	---	354500-1 1490501-1	---	---	1901700-[ ]	1725900-[ ], 1725950-[ ], 1725910-[ ]
1744201 2377997	20 - 16	1852347-1, -6	---	356500-1, -2	122500-2, -3	---	---	---
		1852347-2	565435-5	354500-1	---			
		1852347-3 -	---	354500-1, 1490501-1	---		1901700-[ ]	1725900-[ ], 1725950-[ ], 1725910-[ ]

Figure 7

5.1. Applicators

The applicator is designed to crimp strip-form contacts onto pre-stripped wire, and provide high volume, heavy-duty production requirements. The applicator must be installed onto a power unit.

5.2. Power Units

The semi-automatic and automatic machines are available to assist in application of the contacts. The machine supplies the power necessary to drive the applicator.

5.3. Contact Removal

Contacts can be removed from the receptacle housing using Micro Precision Tweezer PN 986170-2. The proper extraction procedure is covered in Instruction Sheet 408-10116.

CAUTION
To avoid damage to the contact and/or receptacle housing, the proper extraction procedure must be used.

If the break-away contact retainer is installed in the receptacle housing, the retainer must be removed before attempting to remove any contacts.

CAUTION
Attempting to remove a contact with the break-away contact retainer installed in the receptacle housing will cause damage to the retainer.

6. VISUAL AID

Figure 8 shows a typical application of EP-II contacts and receptacle housings. 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.

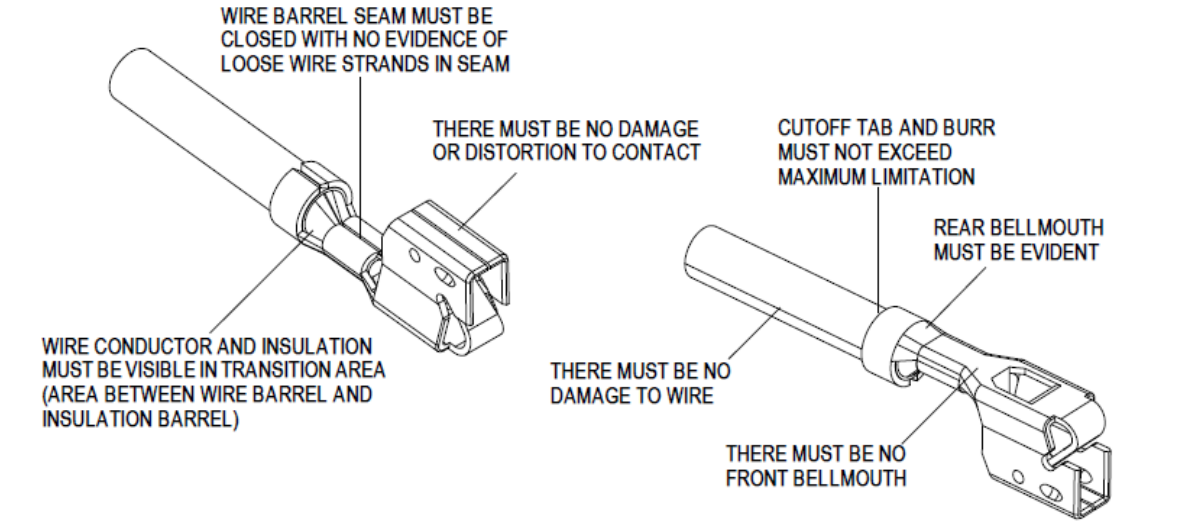


Figure 8 (cont'd)

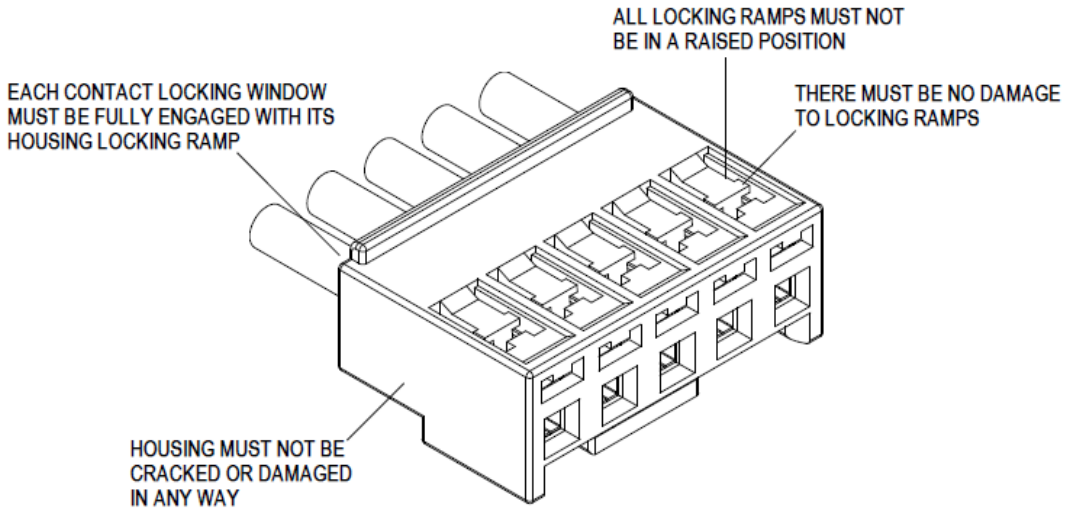

ALL LOCKING RAMPS MUST NOT
BE IN A RAISED POSITION
EACH CONTACT LOCKING WINDOW
MUST BE FULLY ENGAGED WITH ITS
HOUSING LOCKING RAMP
THERE MUST BE NO DAMAGE
TO LOCKING RAMPS
HOUSING MUST NOT BE
CRACKED OR DAMAGED
IN ANY WAY

Figure 8 (end)

Unikeyic Electronics

Global Electronic Components Distributor

Click to view pricing, inventory, delivery, and lifecycle information:

TE Connectivity:

SBCHE154R7K 1-794222-0 3631B101LL 936348-1 SBCHE64R7K TE50BR39J 2-292161-3 2377783-2 650075-000 3430B2F51RTDF 917696-1 2834055-1 RH73H2A40MKTN 1393431-1 1903112-2 2380312-2 3-1393225-0 ROX05SJ18R 2005330-1 2310537-1 CRGCQ2010J3K3 SMW73R0JT 1-962915-1 141991-2 1743455-2 175977-2 1969656-1 CPF0402B37K4E1 MPT100C18RF U5254-000005-030PA