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 ±0.13 [±.005] and angles have a tolerance of ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of miniature AMP-IN contacts and miniature AMP-IN 2000 contacts. These contacts are designed to hold the strands of wire together so that the wire can be inserted into holes in a printed circuit (pc) board.

Each contact features a wire barrel, insulation barrel, locking lance(s), and stabilizer barrel or insulation stop/ positive board stop. The locking lance is designed to prevents the contact from backing out of the pc board hole. The stabilizer barrel holds the contact steady during the soldering process, and the insulation stop/positive board stop prevents the wire insulation from being inserted and the contact from being over inserted into the pc board hole. These requirements are applicable to automatic termination machines.

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.

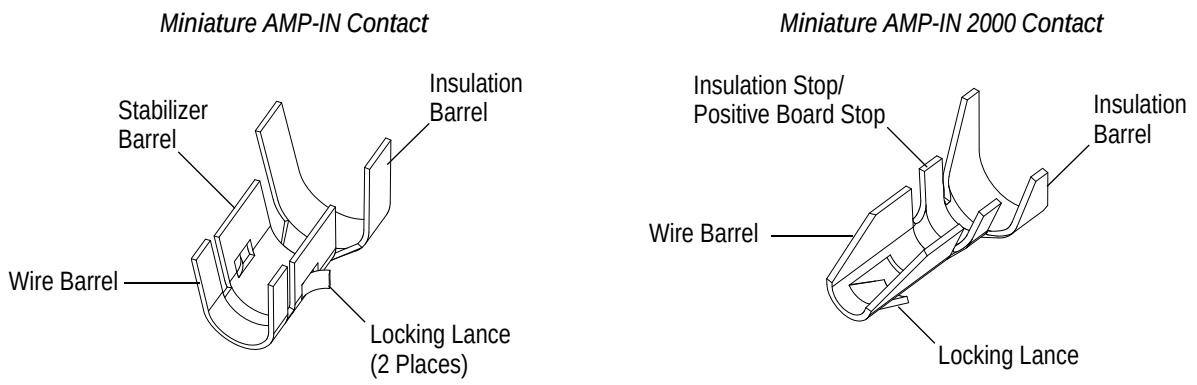


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this application specification include:

- Corrected inch conversion for pc board thickness in Paragraph 3.4

2.2. Customer Assistance

Reference Product Base Part Numbers 640401 and 794121 and Product Code 1326 are representative of miniature AMP-IN contacts and miniature AMP-IN 2000 contacts. 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 numbers at the bottom of this page.

2.3. Drawings

Customer Drawings for specific products are available from the responsible Engineering Department via the service network. The information contained in the Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied.

2.4. Manuals

Manual 402-40 can be used as a guide to soldering. This manual provides information on various flux types and characteristics with the commercial designation, flux removal procedures, and a guide for information on soldering problems.

2.5. Specifications

Product Specification 108-1081 provides product performance and test information.

2.6. 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:

408-8040	Heavy Duty Miniature Quick-Change Applicators with Mechanical Feed System
408-9640	Crimp Quality Monitor (CQM) Applicators for Side-Feed and End-Feed Applications
409-5128	AMP-O-LECTRIC* Model “K" Terminating Machine (Obsolete)
409-5842	AMP-O-LECTRIC Model “G" Terminating Machine
409-5866	AMPOMATOR* CLS IV Lead-Making Machine

3. REQUIREMENTS

3.1. Safety

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

3.2. Wire Selection and Preparation

The contacts accept stranded wire sizes 26 to 10 AWG with an insulation diameter range given in Figure 2.

Wire strip length shall be as given in Figure 2.

Care shall be taken during the stripping operation to ensure the conductor is not nicked, scraped, or cut.

3.3. Crimp Requirements

The contacts must be crimped according to the instructions packaged with the machine.

Care shall be taken to ensure that the wire insulation is not cut or broken during the crimping operation and ensure that the insulation is not crimped into the wire barrel nor the stabilizer barrel.

A. Crimp Height and Width

The wire barrel, insulation barrel, and stabilizer barrel crimp height and width must not exceed the dimensions given in Figure 3.

B. Stabilizer Barrel

The stabilizer barrel seam may be open only if the contact is crimped to wire sizes 10 or 12 AWG.
The stabilizer barrel can have an F-crimp or “O” crimp.

C. Insulation Stop/Positive Board Stop

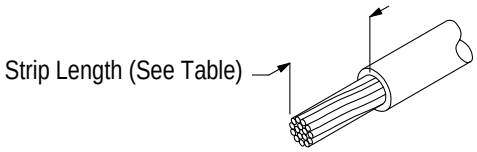
The insulation stop/positive board stop must not be terminated; it must remain in the open U shape.

D. Wire Barrel Seam

The wire barrel seam can be closed or slightly open, but shall have no wire strands protruding from the seam.

E. Wire Barrel Flash

The wire barrel flash must be no more than the dimension given in Figure 3.



CONTACT		WIRE		
TYPE	BASE PART NUMBER	SIZE (AWG)	INSULATION DIAMETER	STRIP LENGTH (±0.38 [±0.15])
Miniature AMP-IN	350566	22-18	1.52-2.79 [.060-.110]	4.51 [.178]
	640108	26-22	1.52-2.54 [.060-.100]	
	640311	22-18	1.52-2.79 [.060-.110]	4.83 [.190]
	640401	26-22	1.02-2.54 [.040-.100]	
	640663	26-22	1.02-1.78 [.040-.070]	4.51 [.178]
	770060	18-14	2.29-3.81 [.090-.150]	5.21 [.205]
	770565	22-18	1.52-2.79 [.060-.110]	4.33 [.170]
	794013	12	2.29-3.81 [.090-.150]	5.21 [.205]
	794037	12-10	5.08 [.200] Max	
Miniature AMP-IN 2000	794121	22-18	1.27-2.79 [.050-.110]	5.08 [.200]
	794122	26-22	1.27-2.79 [.050-.110]	

Figure 2

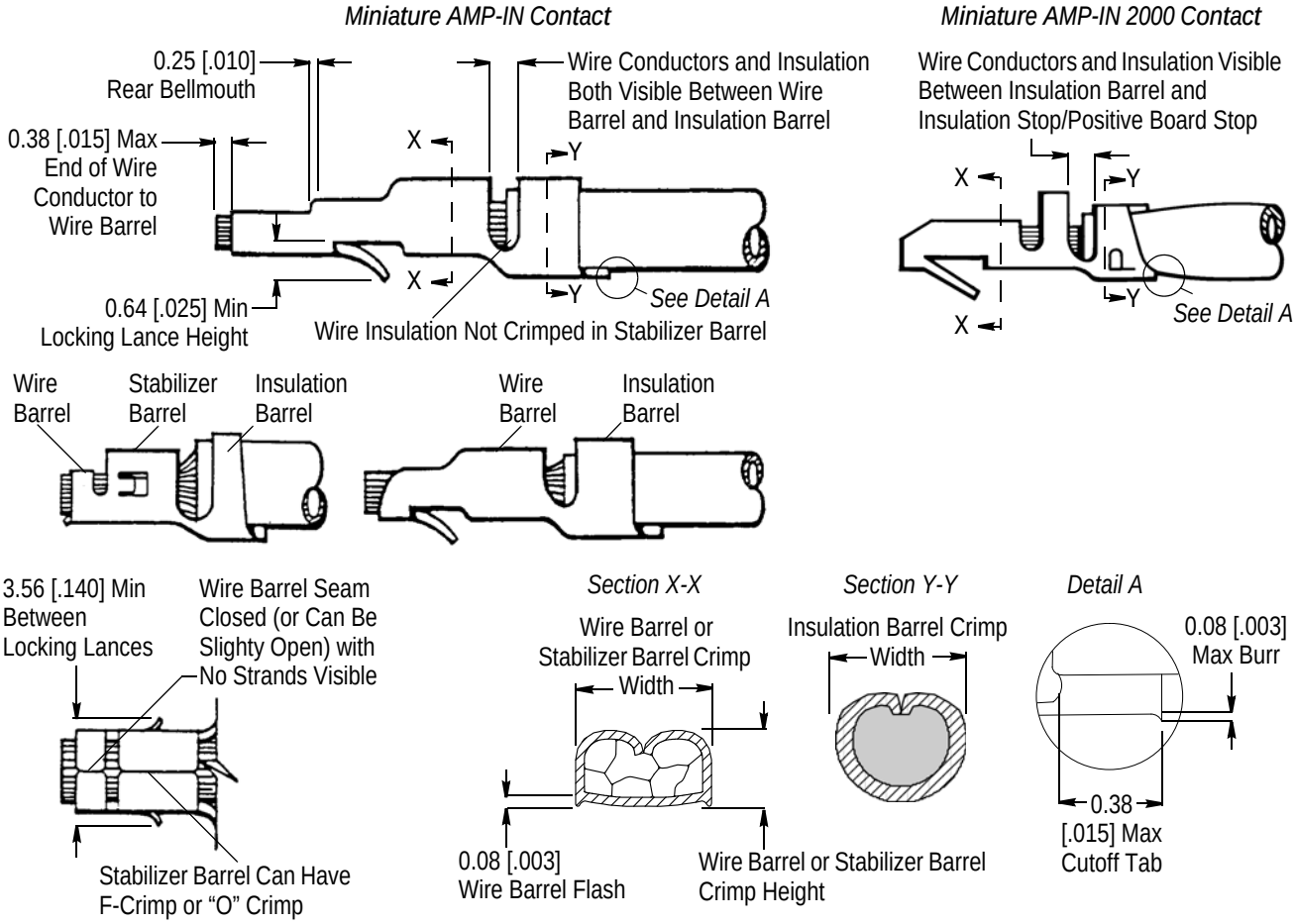


Figure 3 (Cont'd)

CONTACT		WIRE SIZE (AWG)	CONTACT				
TYPE	BASE PART NUMBER		WIRE BARREL CRIMP		STABILIZER BARREL CRIMP		INSULATION BARREL CRIMP WIDTH
			HEIGHT (±0.05 [±.002])	WIDTH	HEIGHT	WIDTH	
Miniature AMP-IN	350566	22-18	1.07 [.042]	1.57 [.062]	—	—	2.79 [.110]
	640108	26	0.81 [.032]	1.07 [.042]	—	—	
		24	0.86 [.034]				
		22	0.96 [.038]				
	640311	22-20	0.76 [.030]	1.57 [.062]	1.40±0.05 [.055±.002]	1.57 [.062]	
		18	0.94 [.037]				
	640401	26-24	0.74 [.029]	1.07 [.042]	1.02±0.05 [.040±.002]	1.07 [.042]	
		22	0.89 [.035]				
	640663	26	0.81 [.032]	1.07 [.042]	—	—	1.78 [.070]
		24	0.86 [.034]				
		22	0.96 [.038]				
	770060	18-16	1.09 [.043]	2.79 [.110]	2.40±0.10 [.094±.004]	2.79+0.13/-0.00 [.110+.005/-.000]	3.94 [.155]
		14	1.40 [.055]		2.75±0.10 [.108±.004]		
	770565	22	0.81 [.032]	1.57 [.062]	—	—	2.79 [.110]
		20	0.91 [.036]				
		18	1.07 [.042]				
	794013	12	2.16 [.085]	2.79 [.110]	2.79±0.05 [.110±.002]	2.79 [.110]	3.94 [.155]
	794037	12	2.41 [.095]	2.79 [.110]	2.79+0.05 [.110+.002]	2.79 [.110]	5.33 [.210]
		10	2.74 [.108]	3.56 [.140]		3.56 [.140]	
Miniature AMP-IN 2000	794121	22	0.76 [.030]	1.57 [.062]	—	—	3.30 [.130]
		20	0.86 [.034]				
		18	0.91 [.036]				
	794122	26	0.71 [.028]	1.07 [.042]	—	—	
		24	0.79 [.031]				
		22	0.86 [.034]				

Figure 3 (End)

F. Cutoff Tab and Burr

The carrier strip cutoff tab and burr must be no more than the dimensions given in Figure 3.

G. Rear Bellmouth

The rear bellmouth length must be no more than the dimension given in Figure 3.

H. Wire Location

The wire conductor end shall be flush with the front end of the contact wire barrel or extend past the end of the wire barrel no more than the dimension given in Figure 3.

For miniature AMP-IN contacts, the wire conductor and insulation should be visible between the insulation barrel and the wire barrel or stabilizer barrel. The wire insulation should not be crimped into the stabilizer barrel. For miniature AMP-IN 2000 contacts, the wire conductor and insulation should be visible between the insulation barrel and insulation stop/positive board stop.

I. Locking Lance(s)

The locking lance(s) shall be set to within limits given in Figure 3.

3.4. PC Board

The pc board thickness shall be 0.157±0.18 [.062±.007]. The pc board hole size for the contact should be within the tolerances specified in Figure 4.

CONTACT		WIRE SIZE (AWG)	PC BOARD HOLE SIZE
TYPE	BASE PART NUMBER		
Miniature AMP-IN	350566	22-20	1.83±0.08 [.072±.003]
		18	1.96±0.08 [.077±.003]
	640108	26-22	1.40±0.10 [.055±.004]
	640311	22-20	1.83±0.08 [.072±.003]
		18	1.96±0.08 [.077±.003]
	640401	26-22	1.40±0.10 [.055±.004]
	640663	26-22	1.40±0.10 [.055±.004]
	770060	18-14	3.18±0.08 [.125±.003]
	770565	22-20	1.83±0.08 [.072±.003]
		18	1.96±0.08 [.077±.003]
	794013	12	3.18±0.08 [.125±.003]
	794037	12	3.18±0.08 [.125±.003]
		10	3.76±0.08 [.148±.003]
Miniature AMP-IN 2000	794121	22-20	1.83±0.08 [.072±.003]
		18	1.96±0.08 [.077±.003]
	794122	26-22	1.40±0.10 [.055±.004]

Figure 4

3.5. Inserting Contact into PC Board Hole

The contact must be inserted into the pc board hole until the locking lance(s) are through the pc board hole. For the miniature AMP-IN 2000contact, the insulation stop/positive board stop will prevent the contact from being further inserted in the hole. See Figure 5.

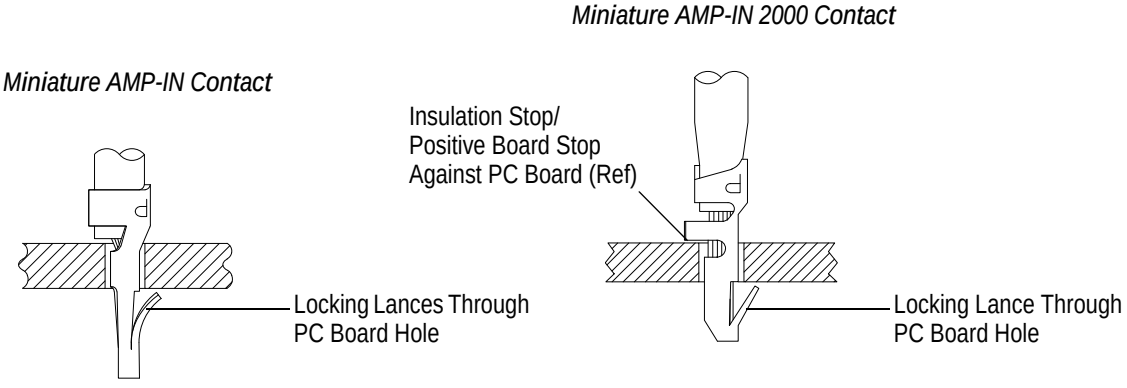


Figure 5

3.6. Soldering

A. Process

The contacts can be soldered using wave soldering or equivalent soldering techniques. Temperature and exposure time shall be as specified in Figure 6.

SOLDERING PROCESS	TEMPERATURE	TIME (At Max Temperature)
Wave	260°C [500°F] (Wave Temperature)	5 Seconds
Vapor Phase	215°C [419°F]	5 Minutes
Infrared Reflow	230°C [446°F]	5 Minutes

Figure 6

B. Flux Selection

The contact wire barrel must be fluxed prior to soldering with a rosin base flux. Selection of the flux will depend on the type of pc board and other components mounted on the board. Additionally, the flux must be compatible with the wave solder line, manufacturing, health, and safety requirements. Call PRODUCT INFORMATION at the number at the bottom of page 1 for consideration of other types of flux. Flux that is compatible with these connectors are provided in Figure 7.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER	ALPHA
RMA	Mild	Noncorrosive	185/197	611
Center (Activated)	Medium	Corrosive or Noncorrosive	1544, 1545, 1547	711, 809, 811

Figure 7

C. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. Cleaners must be free of dissolved flux and other contaminants. It is recommended that cleaning takes place with the pc board on its edge. If using an aqueous cleaner, it is recommended using standard equipment, such as a soak tank or automatic in-line machine. Common cleaning solvents with times and temperatures that will not affect these contacts is specified in Figure 8.

CLEANER		TIME (Minutes)	TEMPERATURE (Maximum)
NAME	TYPE		
ALPHA 2110	Aqueous	1	132°C [270°F]
BIOACT EC-7	Solvent	5	100°C [212°F]
Butyl CARBITOL	Solvent	1	Ambient Room
Isopropyl Alcohol	Solvent	5	100°C [212°F]
KESTER 5778	Aqueous		
KESTER 5779	Aqueous		
LONCOTERGE 520	Aqueous		
LONCOTERGE 530	Aqueous		
Terpene	Solvent		

Figure 8

D. Drying

When drying cleaned contacts and pc boards, temperature limitations must not be exceeded: -55° to 105°C [-67° to 221°F]. Excessive temperatures may cause contact degradation.

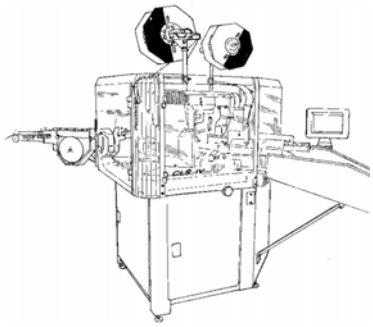
4. QUALIFICATION

Miniature AMP-IN contacts and miniature AMP-IN 2000 contacts are not required to have outside agency approval.

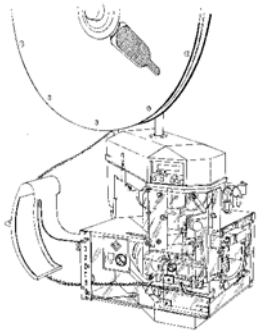
5. TOOLING

Tooling part numbers and instructional material packaged with the tooling are shown in Figure 9.

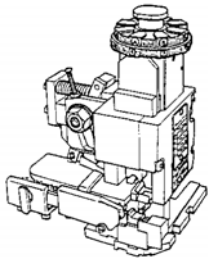
Each applicators is designed to crimp contacts onto pre-stripped wire and provide for high volume, heavy duty production requirements. These applicators accept interchangeable crimping dies and must be installed onto a power unit. The crimp quality monitor applicator is designed to be connected to the crimp quality monitor used with the power unit.



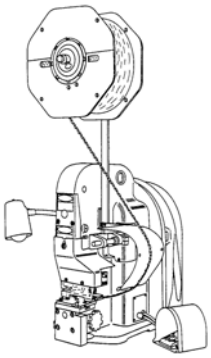
AMPOMATOR CLS IV Lead-Making Machines 217500-[ ] (409-5866)



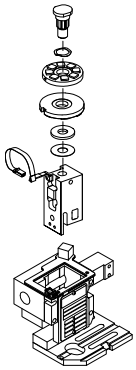
AMP-O-LECTRIC Model “G” Terminating Machines 354500-[ ] (409-5842)



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



AMP-O-LECTRIC Model “K” Terminator Machine 565435-5 (409-5128) (Obsolete)



Crimp Quality Monitor (CQM) Applicators for Side-Feed and End-Feed Applications (See Table) (408-9640)

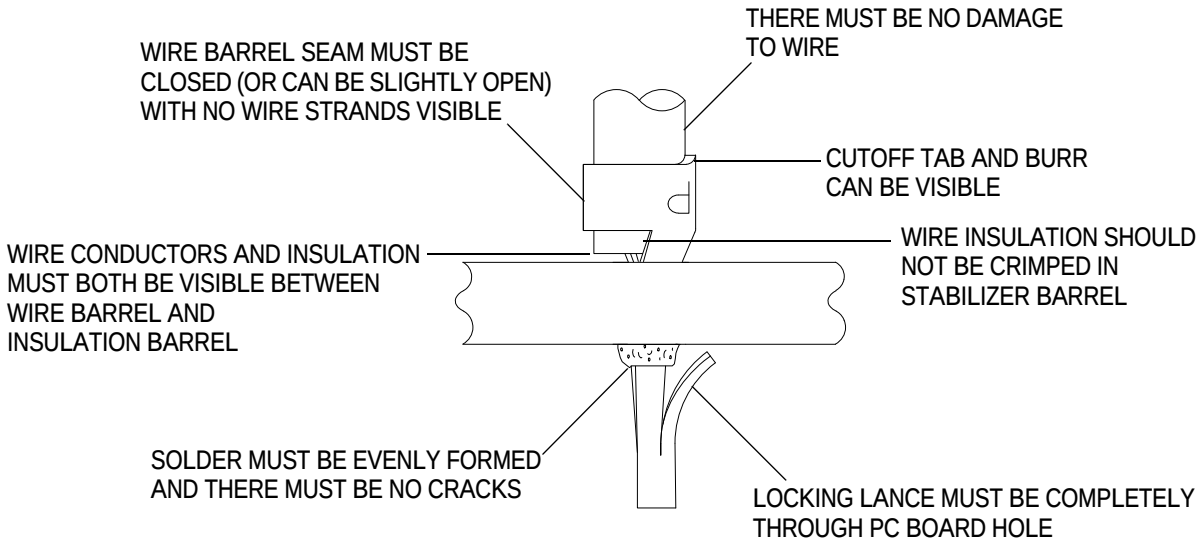
CONTACT TYPE	WIRE		APPLICATOR FOR POWER UNIT			CQM APPLICATOR
	SIZE (AWG)	INSULATION DIAMETER	AMPOMATOR CLS IV Lead-Making Machine	AMP-O-LECTRIC Model "G" Terminating Machine	AMP-O-LECTRIC Model "K" Terminating Machine	
Miniature AMP-IN	26-22	1.02-1.78 [.040-.070]	466739-1	466739-4	466739-3	466991-1
		1.02-2.54 [.040-.100]	466676-3	—	466676-4	—
		1.52-2.54 [.060-.100]	466062-1	—	466062-6	
	22-18	1.52-2.79 [.060-.110]	567336-1	—	567336-2	567840-1
		1.52-2.79 [.060-.110]	687911-1	687911-8	687911-7	567924-1
		1.52-2.79 [.060-.110]	466648-3	—	466648-4	—
	18-14	2.29-3.81 [.090-.150]	567183-8	—	567183-7	567923-1
	12	2.29-3.81 [.090-.150]	567183-8	—	567183-7	567923-1
	12-10	5.08 [.200] Max	680078-1	680078-3	680078-2	—
					680078-4	
Miniature AMP-IN 2000	26-22	1.27-2.79 [.050-.110]	680423-1	680423-3	680423-2	—
	22-18		680422-1	680422-3	680422-2	

Figure 9

6. VISUAL AID

The illustration below shows a typical application of miniature AMP-IN contacts and miniature AMP-IN 2000 contacts. 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.

MINIATURE AMP-IN CONTACT



MINIATURE AMP-IN 2000 CONTACT

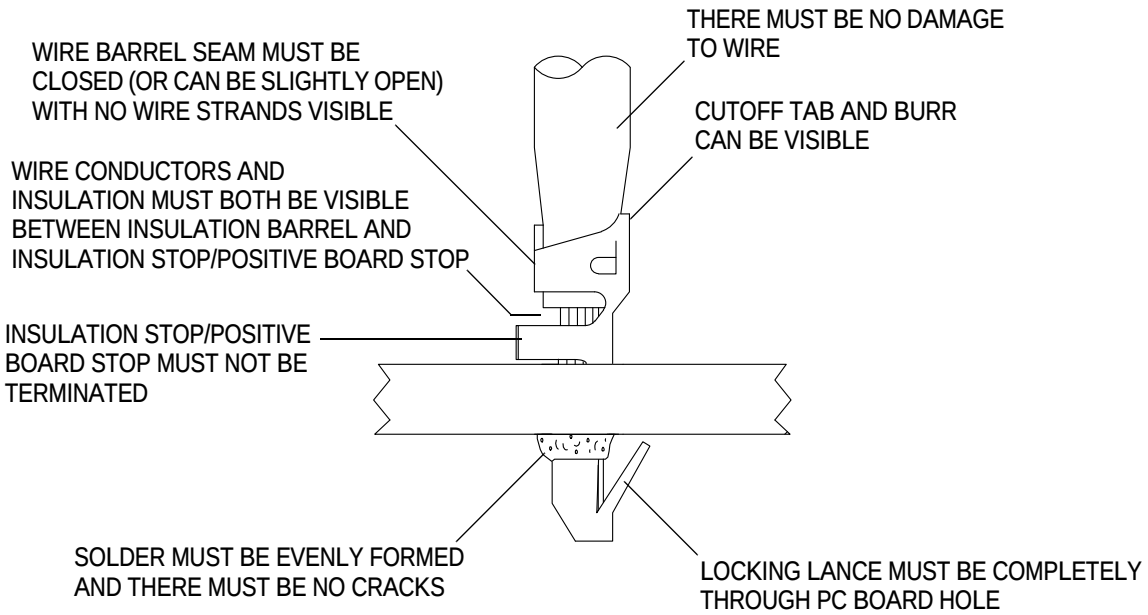


FIGURE 10. VISUAL AID