



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 .058 and .093 diameter “clinch type” and “press fit type” formed printed circuit (pc) board pins and disconnect receptacle contacts. These requirements are applicable to hand or automatic machine application tools.

This document supersedes 114 series specifications 114-1023 and 114-1024.

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.

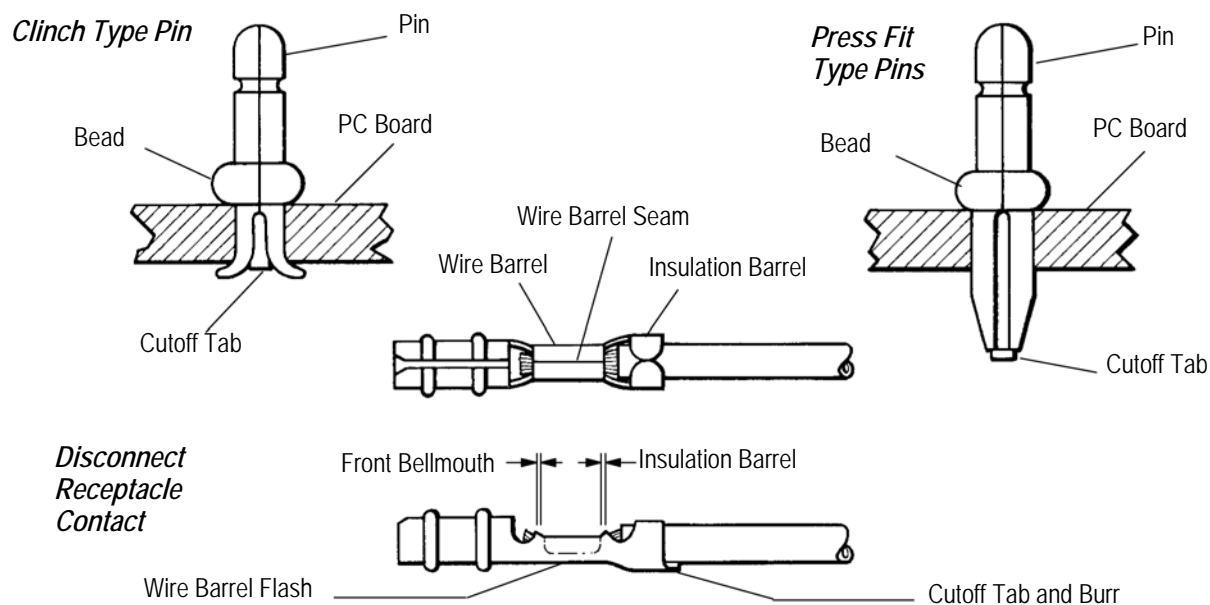


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Since the previous release of this document, the new company logo has been applied

### 2.2. Customer Assistance

Reference Part Number 61137 and Product Code 1330 are representative numbers of the .058 and .093 Diameter pc board product line. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local representative (field service representative) or, after purchase, by calling the Tooling Assistance Center or Product Information at the bottom of this page.

## 2.3. Drawings

Customer drawings for specific products are available from the responsible TE 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 by TE.

## 2.4. Specifications

Product specification 108-1025 provides applicable performance requirements for the .058 diameter system, and 108-1059 for the .093 diameter system.

## 2.5. Instructional Material

Instruction sheets (408-series) provide assembly procedures for product, operation, maintenance and repair of tooling; and customer manuals (409-series) provide setup, operation, and maintenance of TE machines.

408-8040	Heavy Duty Miniature Quick-Change Applicators (Side-Feed)
408-8039	Heavy Duty Miniature Quick-Change Applicators (End-Feed)
408-8025	Miniature Quick-Change Applicator (Side Feed Type)
408-7914	Application and Maintenance for Hand Crimping Tool
408-7850	Application and Maintenance for Hand Crimping Tool
408-7963	Application and Maintenance for Hand Crimping Tool
408-7951	Application and Maintenance for Hand Crimping Tool
408-7698	Application and Maintenance for Hand Crimping Tool
408-7345	Application and Maintenance for Hand Crimping Tool
409-5227	Pin Insertion Machine
409-5842	AMP-O-LECTRIC* Model "G" Terminating Machine 354500-[ ]
409-5128	AMP-O-LECTRIC Model "K" Terminating Machine 565435-[ ]

## 3. REQUIREMENTS

### 3.1. Disconnect Receptacle Contacts

#### A. Wire Selection

The contacts will accept stranded wire ranging in size from 18 to 28 AWG. Wire insulation diameter must be as shown in Figure 2.

#### B. Wire Preparation

The wire strip length must be 3.56 -0.39 [.140 -.0155]. Reasonable care must be taken during the stripping operation to ensure the conductor is not nicked, scraped, or cut.

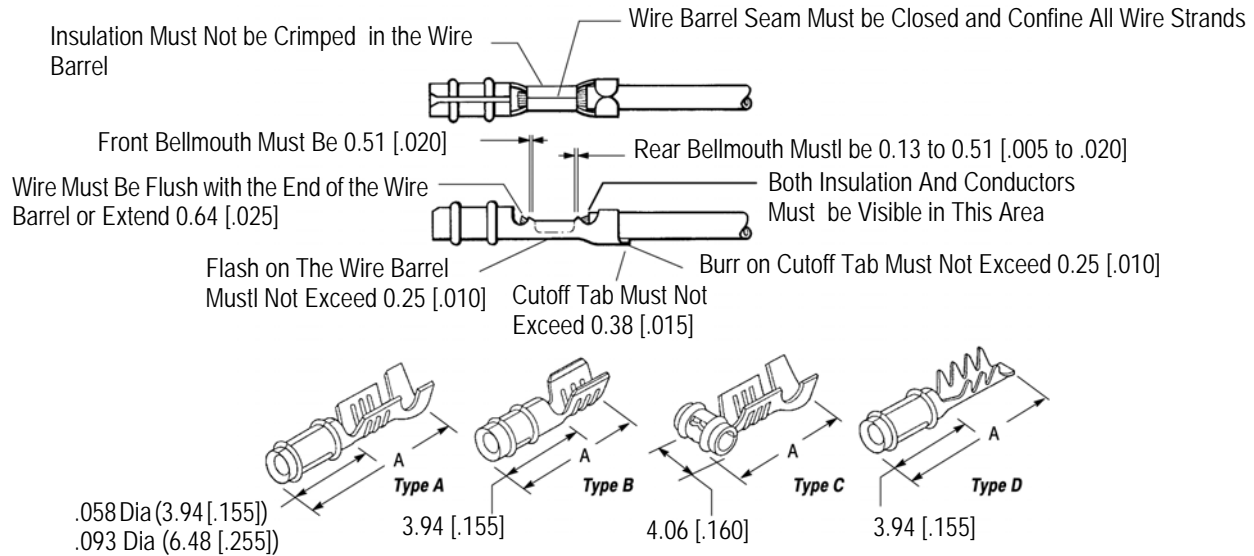
#### C. Carrier Cutoff Tab and Burr

Cutoff tab must not exceed 0.38 [.015]. Burr on cutoff tab must not exceed 0.25 [.010].

#### D. Wire Barrel Crimp Inspection

Contacts must be crimped in accordance with the material packaged with the tooling; refer to Figure 2.

- 1) Crimp height and width must be as shown in Figure 2.
- 2) The wire barrel seam must be closed adequately to confine all strands of the wire. There must be no loose wire strands. Wire strands must not be embedded in the seam of the wire barrel.
- 3) The rear bellmouth must be 0.13-0.51 [.005-.020]. The front bellmouth must be 0.51 [.020] maximum.
- 4) The end of the wire must be flush with the front end of the wire barrel, or extend 0.64 [.025] maximum. Both insulation and conductor must be visible between the insulation barrel and wire barrel.
- 5) Care must be taken not to allow insulation to be crimped in the wire barrel.



**AUTOMATIC MACHINE (APPLICATOR) WIRE CRIMP DIMENSIONS**

RECEPTACLE CONTACT			WIRE		WIRE BARREL		INSULATION BARREL CRIMP WIDTH
DIA	TYPE	DIM. A	SIZE (AWG)	INSULATION DIAMETER	CRIMP HEIGHT ± 0.05 [.002]	CRIMP WIDTH	
.058	A	9.65 [.380]	28	0.89 - 1.14 [.035 - .045]	0.63 [.025]	1.40 [.055]	1.78 [.070]
			26		0.68 [.027]		
.058	A	9.65 [.380]	26	0.89 - 1.65 [.035 - .065]	0.66 [.026]	1.40 [.055]	1.78 [.070]
			24		0.74 [.029]		
			22		0.81 [.032]		
.058	A	10.03 [.395]	26	0.89 - 1.65 [.035 - .065]	0.99 [.039]	1.40 [.055]	2.03 [.080]
			24		1.02 [.040]		
			22		1.12 [.044]		
.058	A	9.65 [.380]	24	1.14 - 1.78 [.045 - .070]	0.86 [.034]	1.40 [.055]	2.03 [.080]
			22		0.94 [.037]		
			20		1.04 [.041]		
	A	10.03 [.395]	24	1.52 - 2.29 [.060 - .090]	0.86 [.034]	1.40 [.055]	2.29 [.090]
			22		0.94 [.037]		
			20		1.04 [.041]		
.058	B	7.62 [.300]	22	1.52 - 2.29 [.060 - .090]	1.02 [.040]	1.78 [.070]	2.29 [.090]
			20		1.09 [.043]		
			18		1.22 [.048]		
			17		1.32 [.052]		

Figure 2 (Cont'd)

## AUTOMATIC MACHINE (APLICATOR) WIRE CRIMP DIMENSIONS

RECEPTACLE CONTACT			WIRE		WIRE BARREL		INSULATION BARREL CRIMP WIDTH
DIA	TYPE	DIM. A	SIZE (AWG)	INSULATION DIAMETER	CRIMP HEIGHT ± 0.05 [.002]	CRIMP WIDTH	
.058	C	8.38 [.330]	26	0.89-1.65 [.035-.065]	0.71 [.028]	1.40 [.055]	1.78 [.070]
			24		0.74 [.029]		
			22		0.84 [.033]		
.058	C	8.38 [.330]	24	1.14 - 1.78 [.045 - .070]	0.86 [.034]	1.40 [.055]	2.03 [.080]
			22		0.94 [.037]		
			20		1.04 [.041]		
.058	C	8.51 [.335]	24	1.02 - 2.54 [.040 - .100]	0.86 [.034]	1.40 [.055]	2.79 [.110]
			22		0.94 [.037]		
			20		1.04 [.041]		
.058	D	9.65 [.380]	Tinsel Wire	0.76 - 1.02 [.030 - .040]	0.96 [.038]	1.40 [.055]	2.79 [.110]
.093	A	13.84 [.545]	28	0.81 - 1.45 [.032 - .057]	0.74 [.029]	1.40 [.055]	2.29 [.090]
			26		0.74 [.029]		
.093	A	13.97 [.550]	22	1.52 - 2.79 [.060 - .110]	1.09 [.043]	1.78 [.070]	3.05 [.120]
			20		1.17 [.046]		
			18		1.29 [.051]		
.058	A	10.03 [.395]	22	2.79 [.110] MAX	0.94 [.037]	1.78 [.070]	2.29 [.090]
			20		1.02 [.040]		
			18		1.14 [.0405]		
.058	A	10.03 [.395]	26	1.02 - 2.79 [.040 - .110]	0.81 [.032]	1.40 [.055]	3.05 [.120]
			24		0.86 [.034]		
			22		0.94 [.037]		
			20		1.04 [.041]		
.093	B	10.03 [.395]	22	1.02 - 2.79 [.040 - .110]	1.09 [.043]	1.78 [.070]	3.05 [.120]
			20		1.17 [.046]		
			18		1.30 [.051]		

Figure 2 (Cont'd)

## HAND TOOL WIRE CRIMP DIMENSIONS

RECEPTACLE CONTACT			WIRE		WIRE BARREL		INSULATION BARREL CRIMP WIDTH
DIA	TYPE	DIM. A	SIZE (AWG)	INSULATION DIAMETER	CRIMP HEIGHT $\pm 0.05$ [.002]	CRIMP WIDTH	
.058	A	9.65 [.380]	28-26	0.89 - 1.14 [.035 - .045]	0.61 [.024]	1.40 [.055]	1.57 [.062]
.058	A	9.65 [.380]	26-22	0.89 - 1.65 [.035 - .065]	0.66 [.026]	1.40 [.055]	1.57 [.062]
.058	A	9.65 [.380]	24-20	1.14 - 1.78 [.045 - .070]	0.84 [.033]	1.40 [.055]	2.03 [.080]
.058	A	10.03 [.395]	24-22	1.52 - 2.29 [.060 - .090]	0.81 [.032]	1.40 [.055]	2.29 [.090]
.058	B	7.62 [.300]	22-20	1.52 - 2.29 [.060 - .090]	0.94 [.037]	1.78 [.070]	2.29 [.090]
			18-17		1.24 [.049]		
.058	C	8.51 [.335]	24-20	1.02 - 2.54 [.040 - .100]	0.84 [.033]	1.40 [.055]	2.79 [.110]
.093	A	13.97 [.550]	22-18				

Figure 2 (End)

**E. Insulation Barrel Crimp Inspection**

- 1) Crimp height and width must be as shown in Figure 2.
- 2) Care must be taken not to cut or break the insulation during the crimping operation.

**F. Alignment**

- 1) The contact, including the cutoff tab and burr, must not be bent above or below the datum line more than the amount shown in Figure 3.
- 2) The side-to-side bending of the contact must not exceed the limits specified in Figure 3.
- 3) There must be no twist or roll in the crimped portion that will impair usage of the contact.

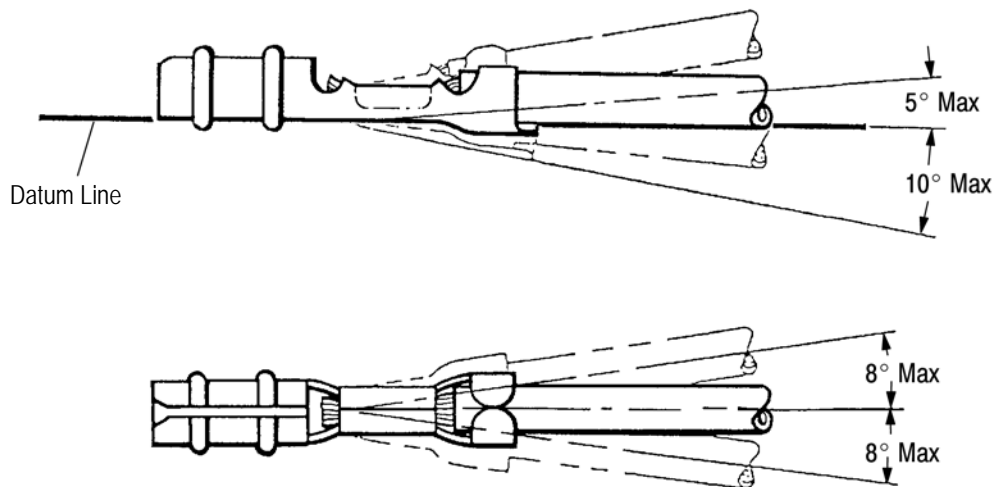


Figure 3

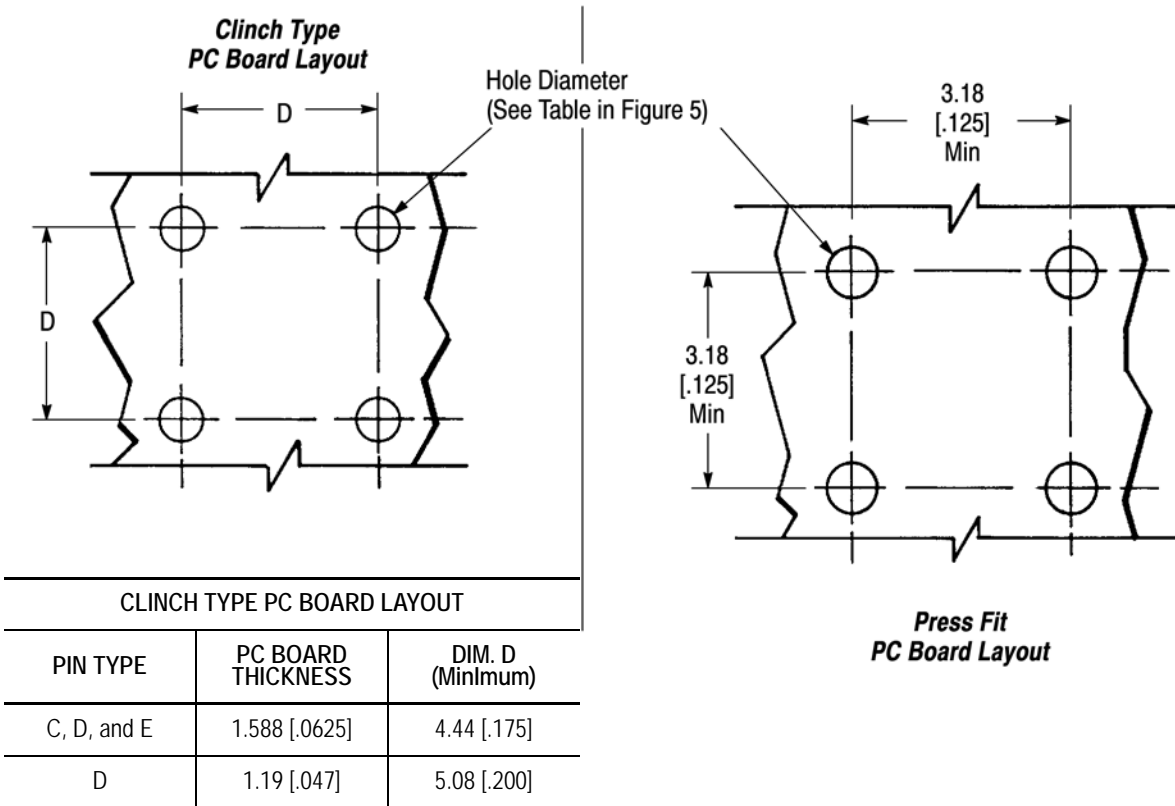


Figure 4

### 3.2. PC Board Pins

#### A. PC Board Layout

The pc board layout must be as shown in Figure 4.

#### B. Carrier Cutoff Tab

Cutoff tab must not exceed 0.25 [.010] as shown in Figure 5.

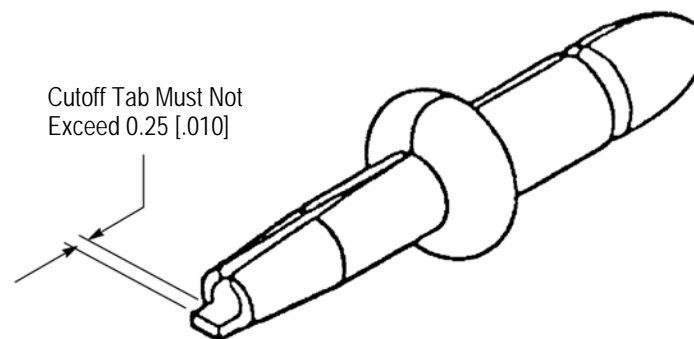
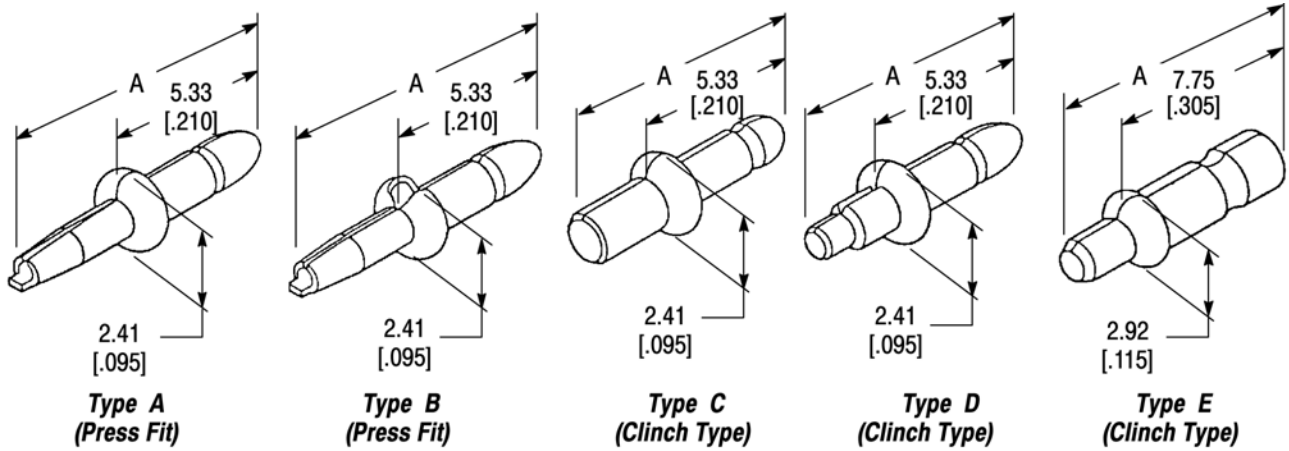


Figure 5

### C. Pin Insertion Inspection

- 1) The pin must be perpendicular to the pc board within 5° maximum.
- 2) An inserted pin must not be able to rotate, nor must it exhibit looseness when a torque is applied by finger force.



FORMED PIN			PRINTED CIRCUIT BOARD	
DIA	TYPE	DIMENSION A	HOLE DIAMETER	THICKNESS
1.47 [.058]	A	9.14 [.360]	1.17-1.27 [.046-.050]	1.588 or 2.380 [.0625 or .0937]
		12.32 [.485]	1.17-1.27 [.046-.050]	
		9.14 [.360]	1.47-1.57 [.058-.062]	
		9.14 [.360]	1.68-1.78 [.066-.070]	
	B	9.14 [.360]	1.17-1.27 [.046-.050]	
	C	7.87 [.310]	1.70-1.85 [.067-.073]	1.588 [.0625]
	D	7.87 [.310]	1.17-1.27 [.046-.050]	1.588 [.0625]
2.36 [.093]	E	7.87 [.310]	1.40-1.55 [.055-.061]	1.19 [.047]
		7.87 [.310]	1.40-1.55 [.055-.061]	1.588 [.0625]
		10.41 [.410]	1.70-1.85 [.067-.073]	

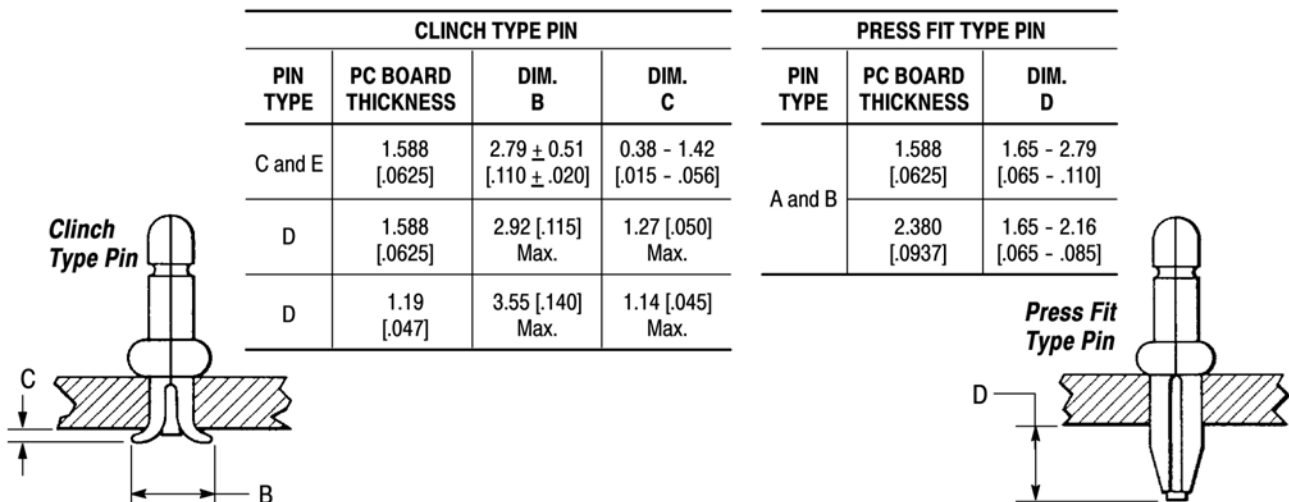


Figure 6

- 3) Bead of pin must be in contact with top surface of pc board.
- 4) Pin dimensions must be as shown in Figure 6.

### 3.3. Soldering

#### A. Flux Selection

Wire leads and contact wire barrels must be fluxed prior to soldering with a mildly active, 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 the Product Information phone number at the bottom of page 1 for consideration of other types of flux. Some fluxes that are compatible with these connectors are provided in Figure 7.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER FLUX	ALPHA FLUX
Type RMA (Mildly Activated)	Mild	Noncorrosive	186	611

KESTER and ALPHA are trademarks.

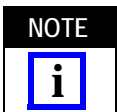
Figure 7

#### B. Cleaning

After soldering, removal of fluxes, residues, and activators is necessary. Consult with the supplier of the solder and flux for recommended cleaning solvents. The following is a listing of common cleaning solvents that will not affect the connectors for the time and temperature specified. See Figure 8.



*Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Refer to the manufacturer's Material Safety Data Sheet (MSDS) for characteristics and handling of cleaners. Trichloroethylene and Methylene Chloride can be used with no harmful affect to the connectors; however AMP does not recommend them because of the harmful occupational and environmental effects. Both are carcinogenic (cancer-causing) and Trichloroethylene is harmful to the earth's ozone layer.*



*If you have a particular solvent that is not listed, contact the Tooling Assistance Center or Product Information number at the bottom of page 1.*

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		

ALPHA, BIOACT, CARBITOL, LONCOTERGE, and KESTER are trademarks of their respective owners.

Figure 8



**C. Drying**

When drying cleaned assemblies and printed circuit boards, make certain that temperature limitations are not exceeded: -55° to 105°C [-67° to 221°F] for standard temperature products. Excessive temperatures may cause connector degradation.

**D. Soldering Guidelines**

.058 and .093 diameter pc board pins and receptacles can be soldered using wave soldering techniques. The temperatures and exposure time must be within the ranges specified in Figure 9

SOLDERING PROCESS	TEMPERATURE		TIME (At Max Temperature)
	DEGREES CELSIUS	DEGREES FAHRENHEIT	
Wave Soldering	260	500	5 Seconds

Figure 9

**4. QUALIFICATIONS**

.058 and .093 diameter pc board pins and disconnect receptacle contacts are not required to be listed or recognized by Underwriters Laboratories Inc. (UL), or the Canadian Standards Association (CSA).

**5. TOOLING**

Refer to Figure 10.

.058 and .093 diameter disconnect receptacle contacts can be terminated by an applicator used in an automatic machine or by hand crimping tools, refer to the table in Figure 10. Printed Circuit Board Pins can be inserted by automatic machine 453973-3 or by Hand Insertion Tooling 689141-1.

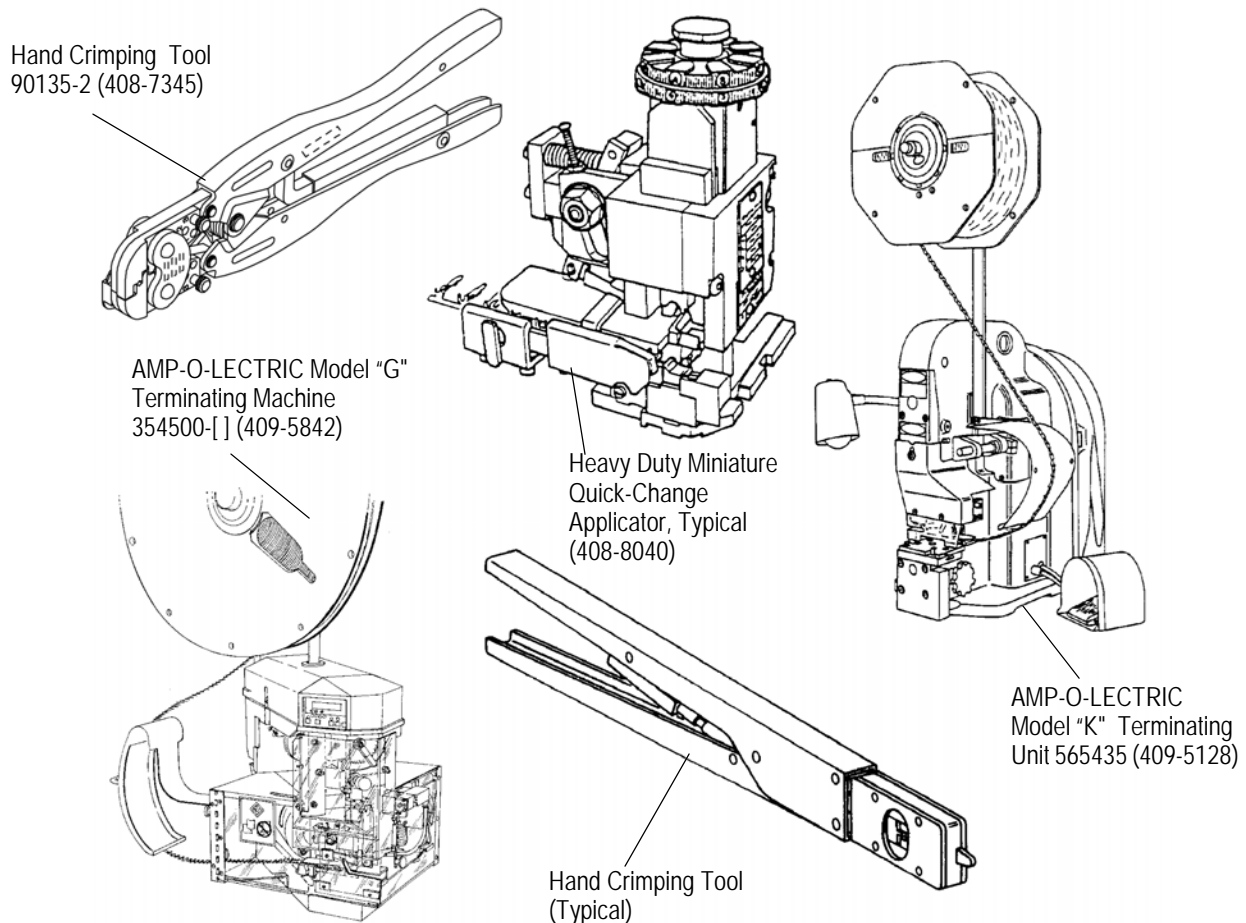


Figure 10 (Cont'd)

WIRE		APPLICATOR (DOCUMENT)	POWER UNITS (DOCUMENT)	HAND CRIMPING TOOL (DOCUMENT)
SIZE (AWG)	INSULATION DIAMETER			
Tinsel Wire	0.76-1.02 [.030-.040]	687769-2 (408-8040)	565435-5 (409-5128) or 354500-1 (409-5842)	--
28-26	0.81-1.45 [.032-.057]	567307-2 (408-8040)	354500-1 (409-5842)	--
	0.89-1.14 [.035-.045]	466348-2 (408-8040)		90205-2 (408-7914)
26-22	0.89-1.65 [.035-.065]	466348-2 (408-8040) 466296-2 (408-8039)		90131-4 (408-7850)
26-20	1.02-2.79 [.040-.110]	687662-2 (408-8025)		--
24-22	1.52-2.29 [.060-.090]	--	--	90221-2 (408-7963)
24-20	1.02-2.54 [.040-.100]	466295-2 (408-8039)	354500-1 (409-5842)	--
	1.14-1.78 [.045-.070]	466294-2 (408-8039) 466443-2 (408-8040)		90204-4 (408-7951)
	1.52- 2.29 [.060-.090]	466453-2 (408-8040)		--
22-20	1.52-2.29 [.060-.090]	--	--	90314-1 (408-7698)
22-18	1.52-2.79 [.060-.110]	466469-1 (408-8040)	354500-1 (409-5842)	90135-2 (408-7345)
	2.79 [.110] MAX	466832-2 (408-8040)		--
	1.02-2.79 [.040-.110]	567138-2 (408-8040)	565435-5 (409-5128) or 354500-1 (409-5842)	--
22-17	1.52-2.29 [.060-.090]	466563-2 (408-8040)	354500-1 (409-5842)	--
18-17	1.52-2.29 [.060-.090]	--	--	90314-1

Figure 10 (End)

## 6. VISUAL AID

The following illustrations are to be used by production personnel to ensure properly applied product. The views suggest requirements for good applications. Applications considered visually incorrect must be inspected using the information in the main body of this document.

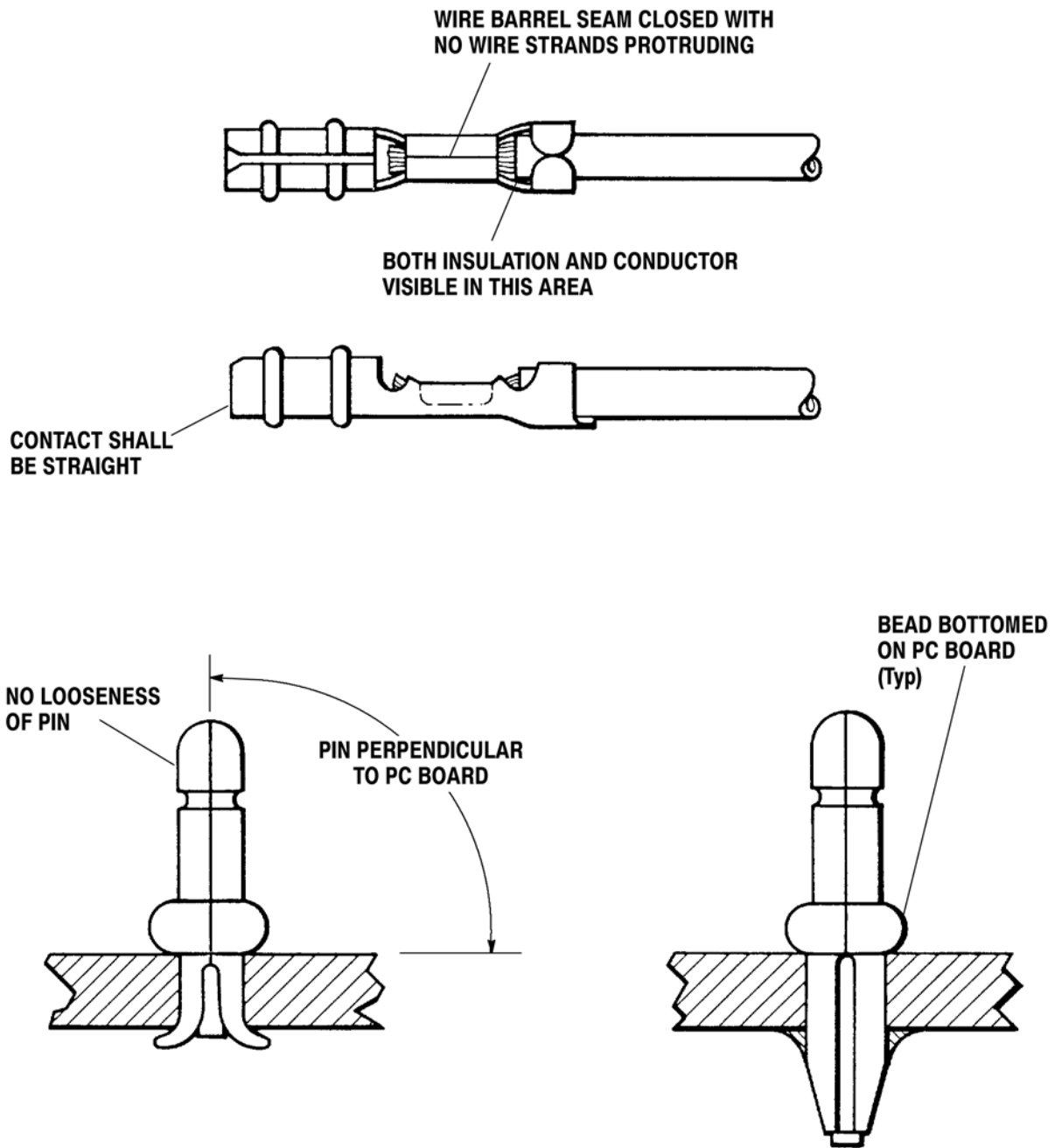


FIGURE 11. VISUAL AID