

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 [± 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 AMP* .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 AMP Application Specifications 114-1023 and 114-1024.

When corresponding with AMP personnel, use the terminology provided on this specification to help facilitate your inquiry for information. Basic terms and features of components are provided in Figure 1.

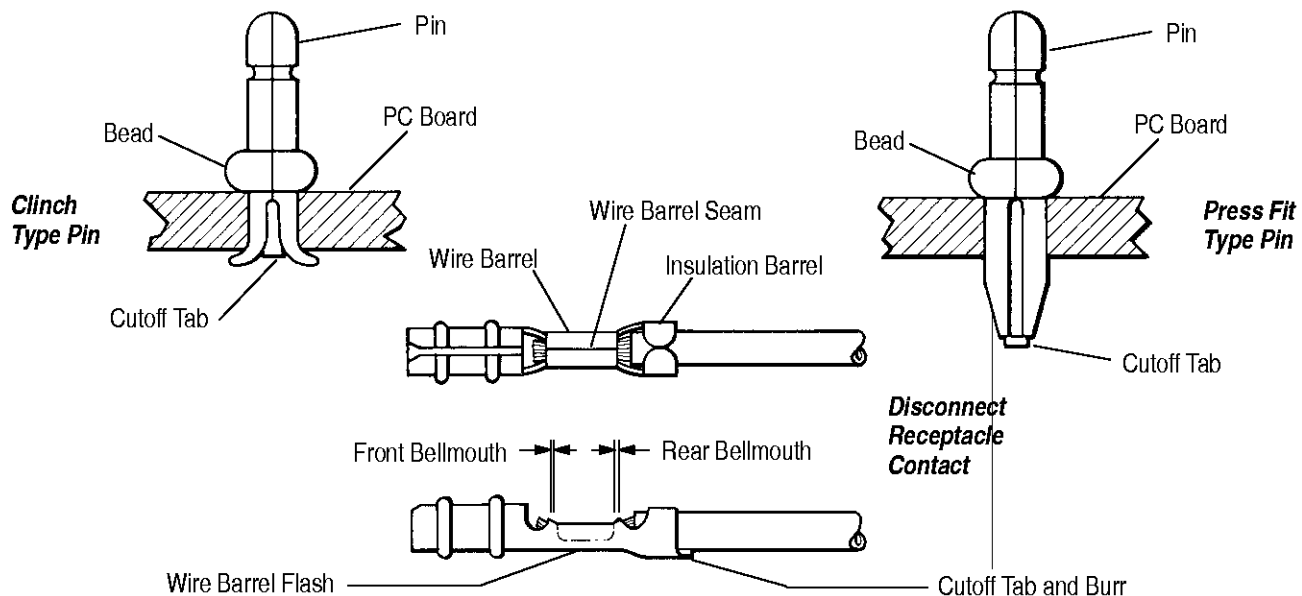


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Per EC 0990-0093-98:

- Revised title of all odd number pages
- Revised the first sentence of Paragraph 3.1.B.
- Added information to table in Figure 2.
- Added superseded information in Section 1, INTRODUCTION

2.2. Customer Assistance

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

2.3. Drawings

Customer Drawings for specific products are available from the responsible AMP 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 AMP Incorporated.

2.4. Product Specifications

AMP Product Specification 108–1025 provides applicable performance requirements for the .058 diameter system, and 108–1059 for the .093 diameter system.

2.5. Bulletins

AMP Corporate Bulletin 401–52 is available upon request and can be used as a guide in soldering. This bulletin provides information on various flux types and characteristics along with the commercial designation and flux removal procedures. A checklist is attached to the bulletin as a guide for information on soldering problems.

2.6. Instructional Material

The following list includes AMP instruction sheets (408–series) that provide assembly procedures for product, operation, maintenance and repair of tooling; and customer manuals (409–series) that provides setup, operation, and maintenance of AMP machines.

<u>Document Number</u>	<u>Document Title</u>
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 shall conform to the dimensions according to the wire sizes indicated in Figure 2.

B. Wire Preparation

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

C. Carrier Cutoff Tab and Burr

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

D. Wire Barrel Crimp Inspection

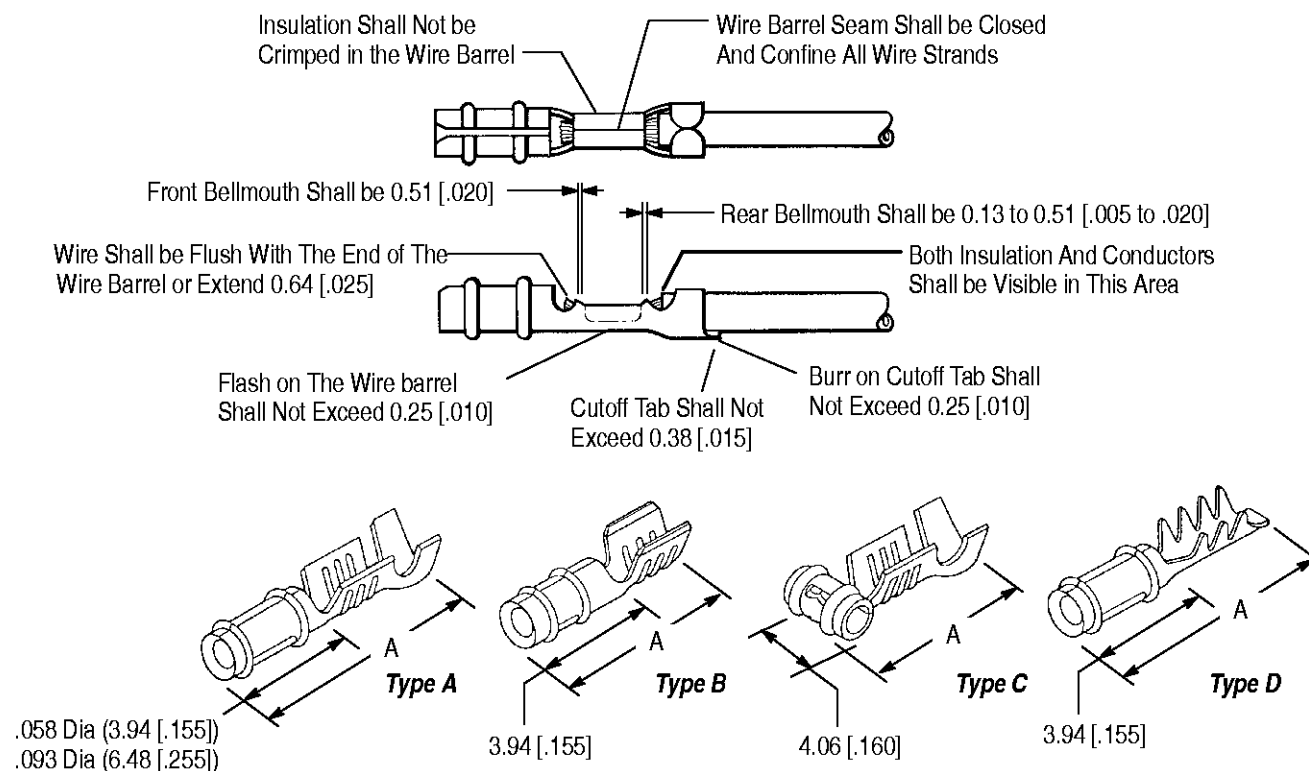
Contacts shall be crimped in accordance with the material packaged with the tooling; refer to Figure 2.

1. Crimp height and width shall be as shown in Figure 2.
2. The wire barrel seam shall be closed adequately to confine all strands of the wire. There shall be no loose wire strands. Wire strands should not be embedded in the seam of the wire barrel.
3. The rear bellmouth shall be 0.13–0.51 [.005–.020]. The front bellmouth shall be 0.51 [.020] maximum.
4. The end of the wire shall be flush with the front end of the wire barrel, or extend 0.64 [.025] maximum. Both insulation and conductor shall be visible between the insulation barrel and wire barrel. Care shall be taken not to allow insulation to be crimped in the wire barrel.
5. Flash on the wire barrel crimp shall not exceed 0.25 [.010].

E. Insulation Barrel Crimp Inspection

1. Crimp height and width shall be as shown in Figure 2.

2. Care shall be taken not to cut or break the insulation during the crimping operation.



AUTOMATIC MACHINE WIRE CRIMP DIMENSIONS

RECEPTACLE CONTACT			WIRE		WIRE BARREL		INSUL 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]		
.058	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 WIRE CRIMP DIMENSIONS

RECEPTACLE CONTACT			WIRE		WIRE BARREL		INSUL 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]		

AUTOMATIC MACHINE WIRE CRIMP DIMENSIONS

DIA	TYPE	DIM. A	SIZE (AWG)	INSULATION DIAMETER	CRIMP HEIGHT ± 0.05 [.002]	CRIMP WIDTH	INSUL BARREL CRIMP WIDTH
.058	A	10.03 [.395]	22	2.79 [.110] MAX	0.94 [.037]	1.78 [.070]	3.05 [.120]
			20		1.02 [.040]		
			18		1.14 [.045]		
.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 [.435]	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		INSUL BARREL CRIMP WIDTH
DIA	TYPE	DIM. A	SIZE (AWG)	INSULATION DIAMETER	CRIMP HEIGHT ± 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	1.52 - 2.79 [.060 - .110]	1.09 [.043]	1.78 [.070]	3.05 [.120]

Figure 2 (end)

F. Alignment

1. The contact, including the cutoff tab and burr, shall 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 shall not exceed the limits specified in Figure 3.
3. There shall be no twist or roll in the crimped portion that will impair usage of the contact.

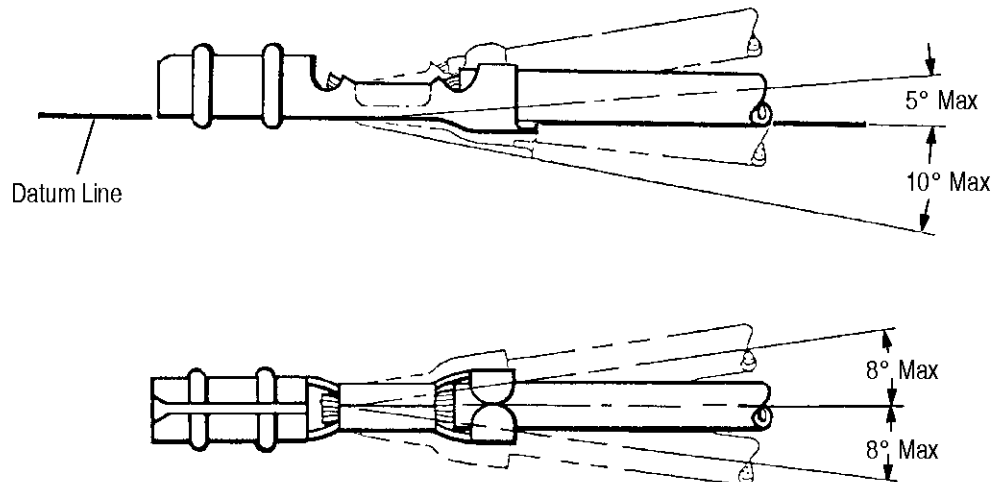
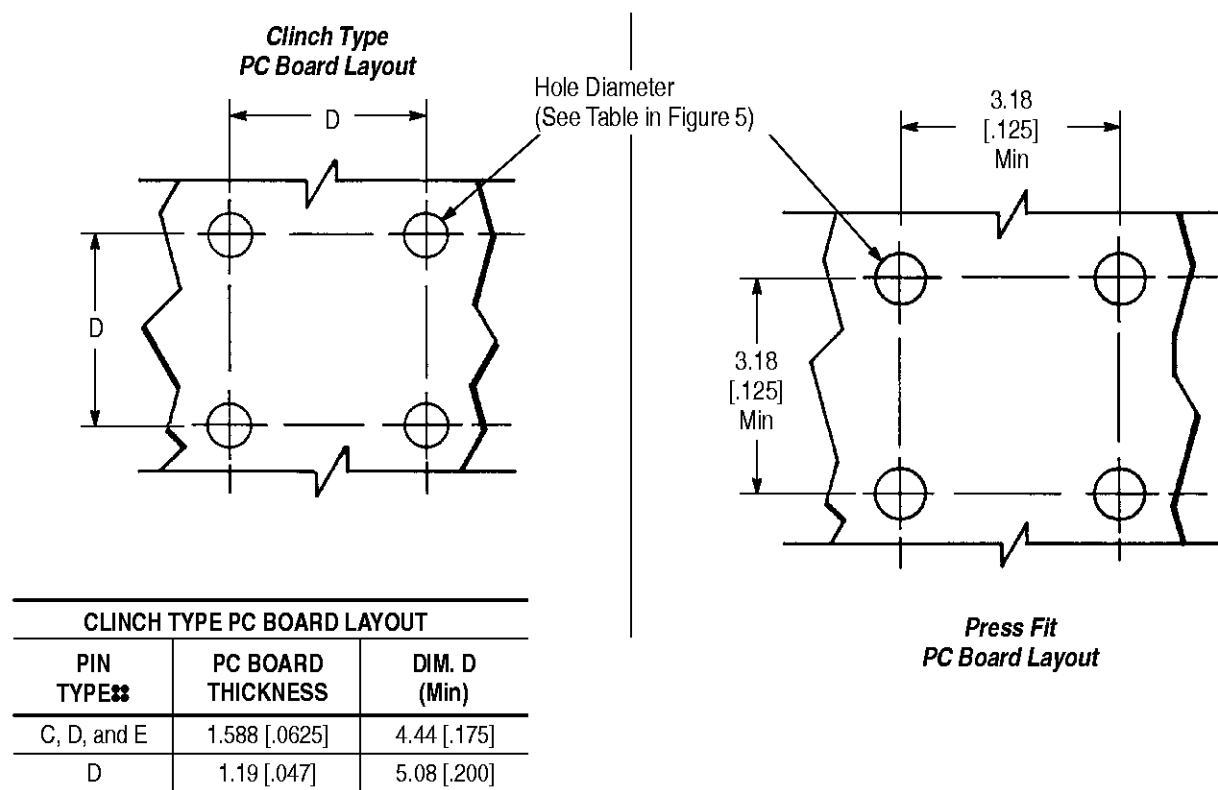


Figure 3

3.2. PC Board Pins**A. PC Board Layout**

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



**See Figure 5

Figure 4

B. Carrier Cutoff Tab

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

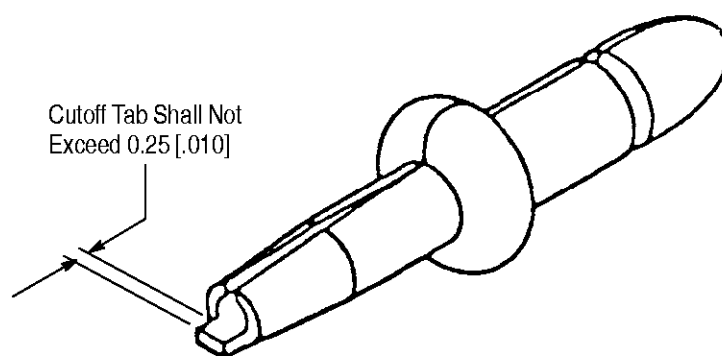
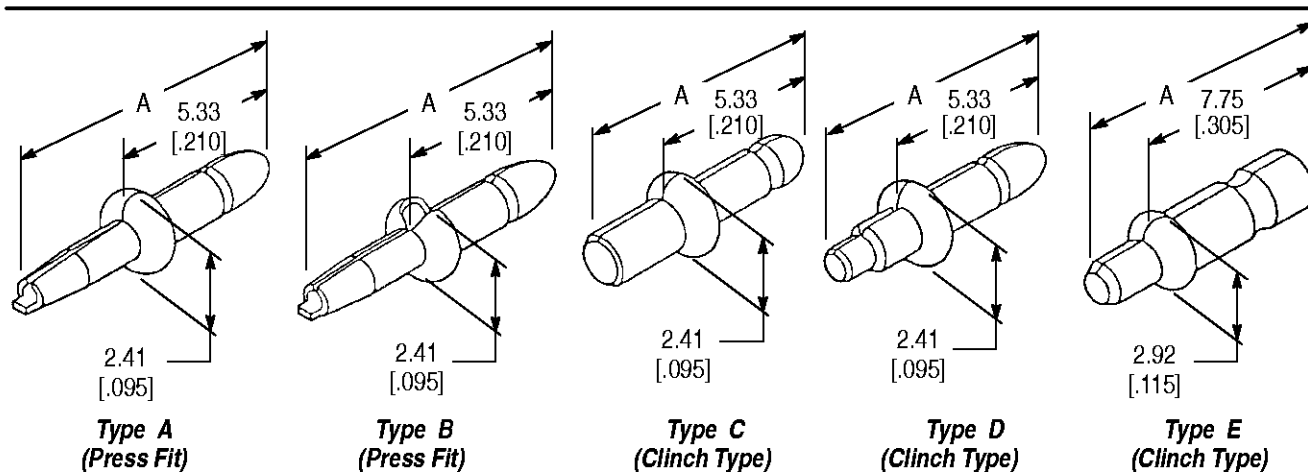


Figure 5

C. Pin Insertion Inspection

1. The pin shall be perpendicular to the pc board within 5° maximum.

2. An inserted pin shall not be able to rotate, nor shall it exhibit looseness when a torque is applied by finger force.
3. Bead of pin shall be in contact with top surface of pc board.
4. Pin dimensions shall be as shown in Figure 6.



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]	1.588 [.0625]
	C	7.87 [.310]	1.70-1.85 [.067-.073]	
	D	7.87 [.310]	1.17-1.27 [.046-.050]	
		7.87 [.310]	1.40-1.55 [.055-.061]	
2.36 [.093]	C	7.87 [.310]	1.40-1.55 [.055-.061]	1.588 [.0625]
2.36 [.093]	E	10.41 [.410]	1.70-1.85 [.067-.073]	1.588 [.0625]

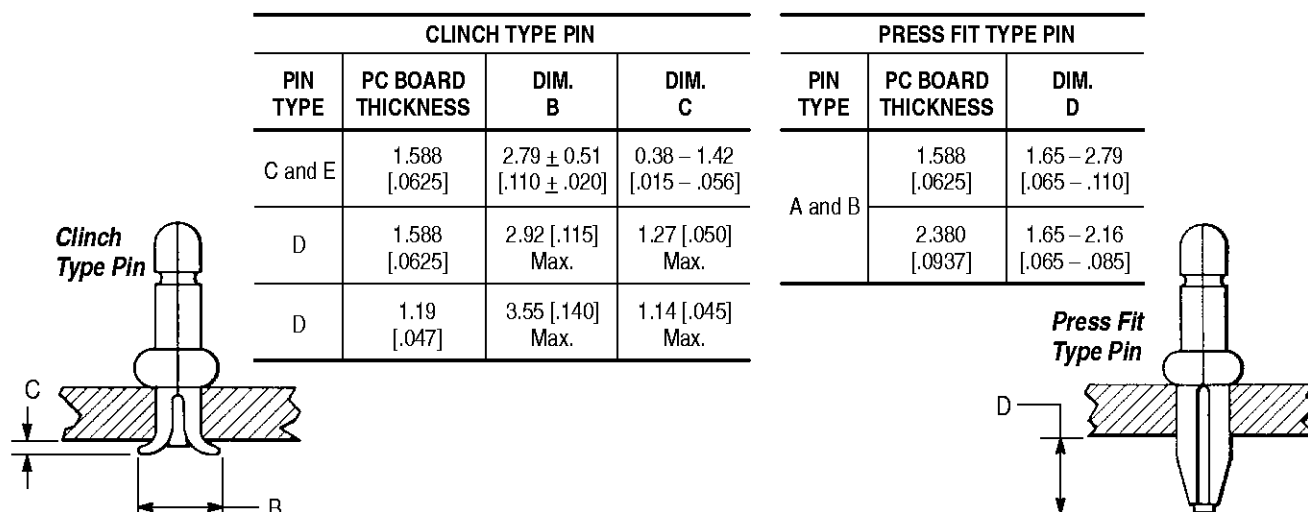


Figure 6

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 ⁸⁸	ALPHA [■]
Type RMA (Mildly Activated)	Mild	Noncorrosive	186	611

⁸⁸ Product of Kester Solder Co.

■ Product of Alphametals Inc.

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.

DANGER

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.

NOTE

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)	TEMPERATURES (Maximum)	
NAME	TYPE		CELSIUS	FAHRENHEIT
Alpha 2110 [■]	Aqueous	1	132	270
Bioact EC-7 [◆]	Solvent	5	100	212
Butyl Carbitol [●]	Solvent	1	Room Ambient	
Isopropyl Alcohol	Solvent	5	100	212
Kester 5778 [⌘]	Aqueous	5	100	212
Kester 5779 [⌘]	Aqueous	5	100	212
Loncoterger 520 [●]	Aqueous	5	100	212
Loncoterger 530 [●]	Aqueous	5	100	212
Terpene Solvent	Solvent	5	100	212

■ Product of Fry's Metals, Inc.

◆ Product of Petroferm, Inc.

● Product of Union Carbide Corp.

⌘ Product of Litton Systems, Inc.

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

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

SOLDERING PROCESS	TEMPERATURE		TIME (At Max Temperature)
	CELSIUS	FAHRENHEIT	
WAVE SOLDERING	260**	500**	5 Seconds

Figure 9

4. QUALIFICATIONS

AMP .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 (Figure 10)

AMP .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. PC Board Pins can be inserted by automatic machine 453973-3 or by Hand Insertion Tooling 689141-1.

NOTE

The Model "K" AMP-O-LECTRIC Terminating Machine PN 565435-5 has been superseded by the Model "G" Terminating Machine PN 354500-1 for new applications. For existing applications, the Model "K" is still recommended because of the large number of installed machines.

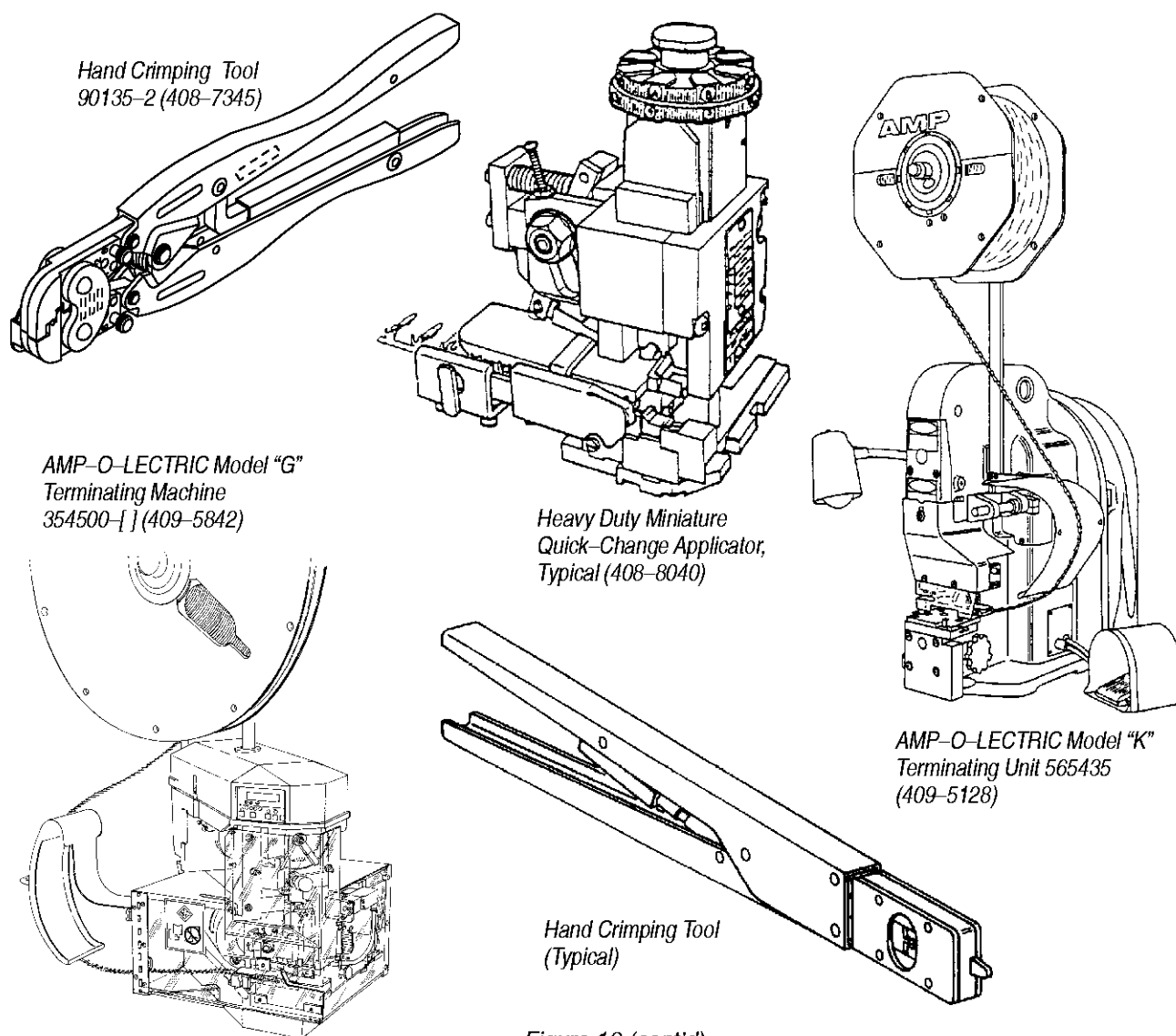


Figure 10 (cont'd)

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)		--
18-17	1.52-2.29 [.060-.090]	--	--	90314-1 (408-7698)

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 should be inspected using the information in the main body of this document.

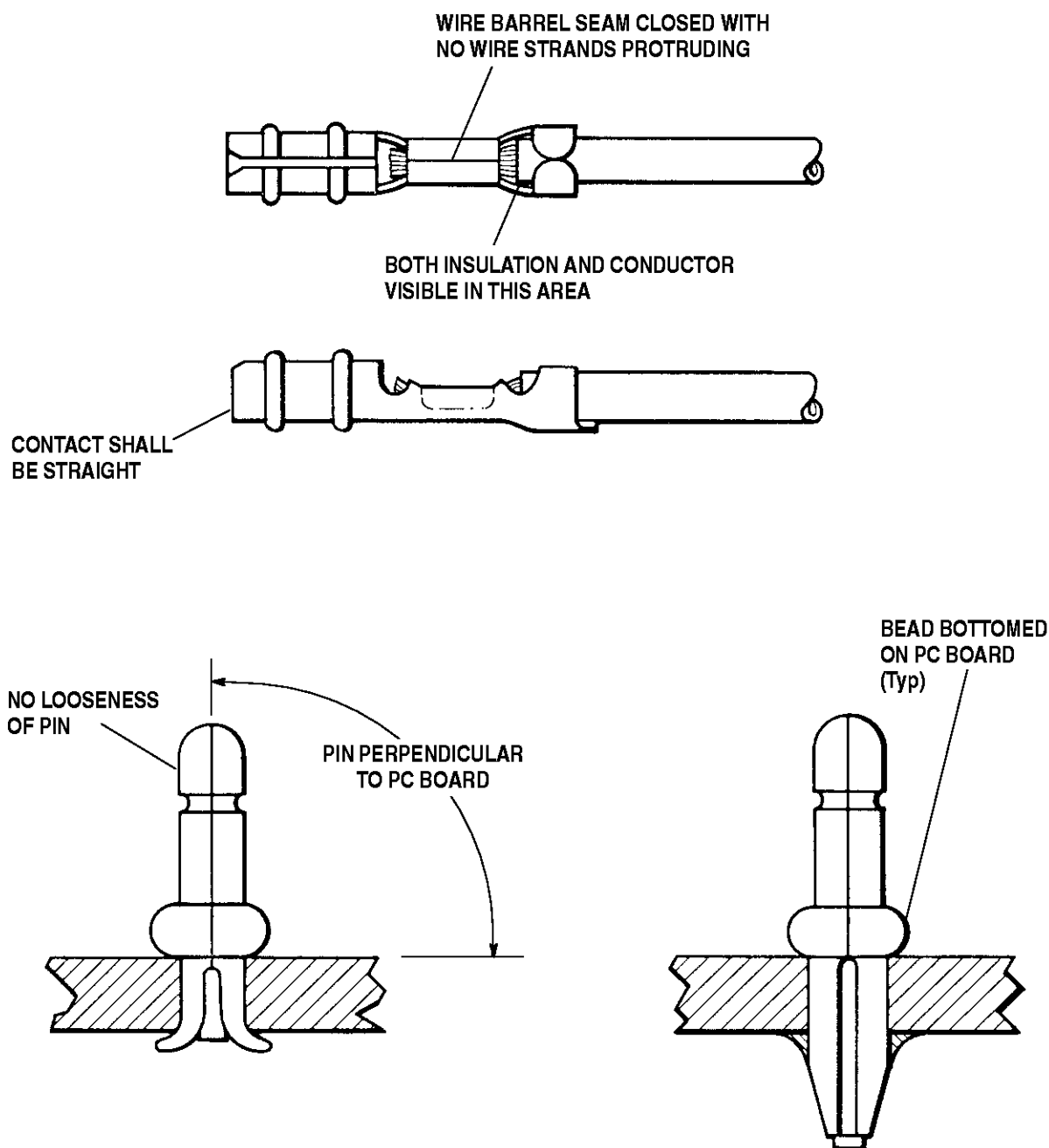


FIGURE 11. VISUAL AID