

**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  $\pm 0.13$  [.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 application of AMP\* AMPMODU Mod I and II PC Board Receptacle Contact applications. AMPMODU Mod I Receptacle Contacts will accept 0.79 x 1.57 [.031 x .062] posts while Mod II contacts will accept 0.64 x 0.64 [.025 x .025] square posts. These strip-fed machine applied contacts are for both vertical and horizontal application and are designed to be soldered to pc boards.

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

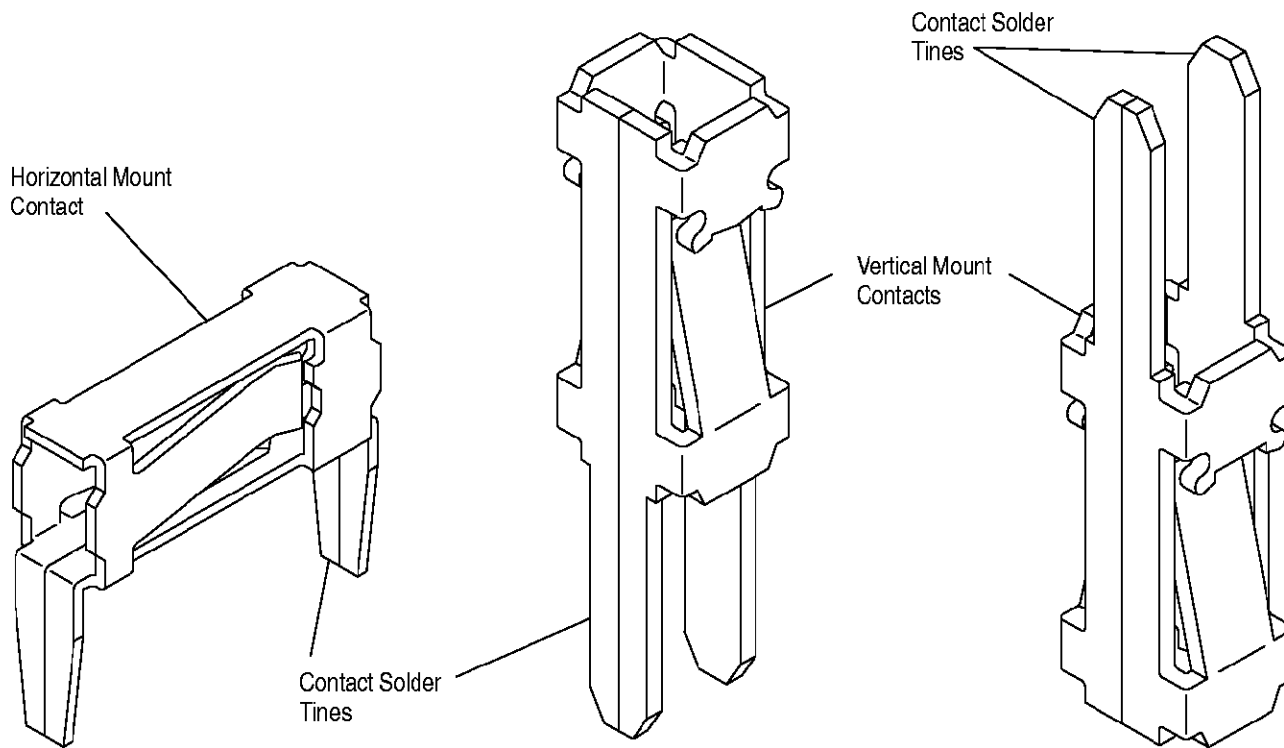


Figure 1

**2. REFERENCE MATERIAL**

**2.1. Revision Summary**

This paragraph is reserved for a revision summary of changes covering the most recent additions and changes made to this specification which include the following:

Per EC: 0990-0312-00

- Update specification to corporate requirements
- Changed "Bulletins" to "Manuals" in Paragraph 2.5
- Changed pc board layouts in Figure 2
- Changed text in Paragraph 3.7
- Deleted applicator text information in Section 5, TOOLING

**2.2. Customer Assistance**

Reference Part Number 87772 and Product Code 5440 are representative numbers of AMPMODU Mod I and II PC Board Receptacle Contacts. 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 Tyco Representative (Field Sales Engineer, Field Applications Engineer, etc.) or, after purchase, by calling Tooling Assistance Center or AMP FAX/Product Information number at the bottom of page 1.

**2.3. Drawings**

Customer Drawings for product part numbers are available from the service network. The information contained in Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by Tyco Electronics.

**2.4. Specifications**

Product Specifications 108-25016, 108-25025, and 108-25025-1 provide test and performance results.

**2.5. Manuals**

Manual 402-40 is available upon request and can be used as a guide in soldering. This manual provides information on various flux types and characteristics along with the commercial designation and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

**2.6. Instructional Material**

The following list includes available documents for safety and instructional information. The list includes instruction sheets (408-series) that provide assembly procedures for product, operation, maintenance and repair of tooling, and customer manuals (409-series) that provide setup, operation, and maintenance of machines.

<u>Document Number</u>	<u>Document Title</u>
408-3295	Preparing Reel of Contacts for Application Tooling
408-7411	AMPMODU Mod I and Mod II Receptacle Wave Soldering Technique
408-9816	Handling of Reeled Products
408-9866	Terminal Reel Flange Removal Tool 354030-1
409-5863	Comp-U-Sertor* Machine 122300-1 and 122300-2
409-5890	Modular Insertion System (MIS) Pin-Barrel Terminal Insertion Head
409-5893	Modular Insertion System (MIS) Bench Machine 662820-[ ]

**3. REQUIREMENTS**

**3.1. Storage**

**A. Reeled Terminals**

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

**B. Shelf Life**

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

**C. Chemical Exposure**

Do not store contacts near any chemicals 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. Ultraviolet Light**

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the contacts.

**3.2. Material**

All contacts are made of phosphor bronze. They are available with tin plating or with gold over nickel.

**3.3. PC Boards**

**A. Material and Thickness**

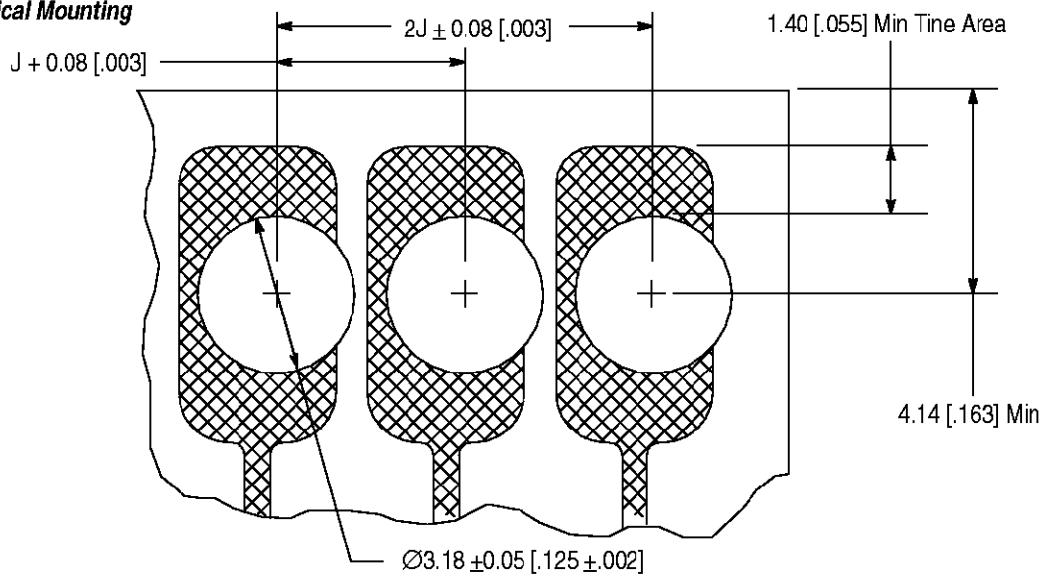
1. Board material will be glass epoxy (FR-4, G-10).
2. Board thickness shall be 2.38 [.094] maximum for Mod I contacts with a solder tine length of 3.68 [.145]. Mod I contacts that have a solder tine length of 2.84 [.112] or 3.05 [.120] shall be used with pc boards with a maximum thickness of 1.59 [.063]. Mod II contacts are placed on pc boards with a maximum thickness of 1.59 [.063].

Contact the Product Information number listed at the bottom of page 1 for suitability of other board materials or thicknesses.

**B. PC Board Layout**

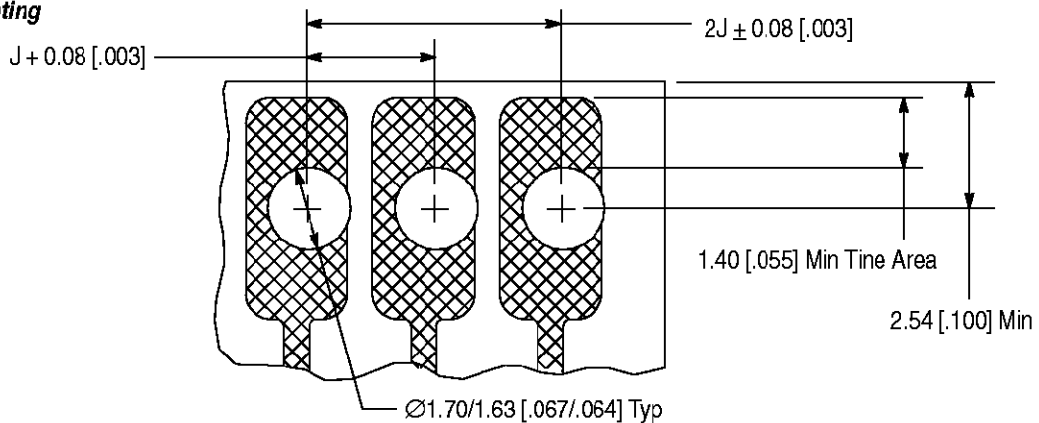
The contact holes in the pc board must be precisely located to ensure proper placement and optimum performance of the contact. The contacts can be placed on the pc board manually or by machine. The dimensions provided in Figure 2 must be observed when preparing a pc board for AMPMODU Mod I and II PC Board Receptacle Contacts.

**Mod I Vertical Mounting**



J=Receptacle centers may vary depending on requirements. For individual receptacles, minimum nominal centerline spacing between adjacent receptacles is 3.81 [.150]; for receptacle assemblies, nominal centerline spacing between adjacent receptacles is 3.96 [.156]. Tolerances are not to accumulate over the length of the pc board.

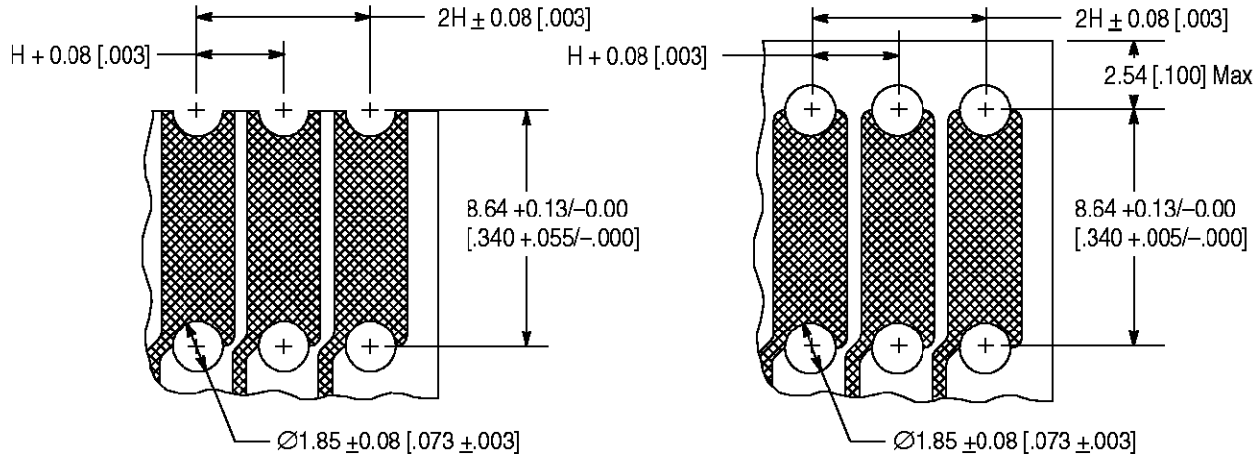
**Mod II Vertical Mounting**



J=Receptacle centers may vary depending on requirements. For individual receptacles, minimum nominal centerline spacing between adjacent receptacles is 2.54 [.100]. Tolerances are not to accumulate over the length of the pc board.

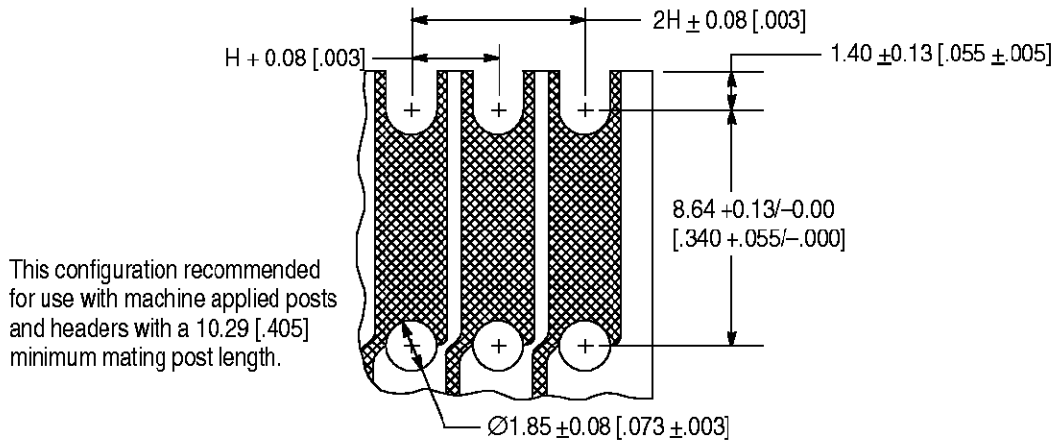
Figure 2 (cont'd)

**Mod I Horizontal Mounting**



This configuration recommended for use with machine applied posts and headers with a 8.76 [.345] minimum mating post length.

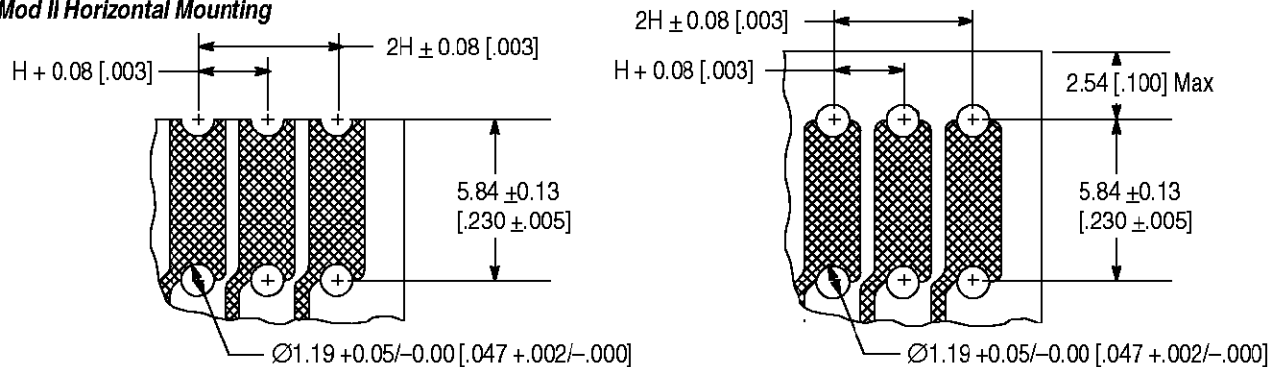
This configuration recommended for use with machine applied posts and headers with a 12.7 [.500] minimum mating post length.



This configuration recommended for use with machine applied posts and headers with a 10.29 [.405] minimum mating post length.

H=Receptacle centers may vary depending on requirements. For individual receptacles, minimum nominal centerline spacing between adjacent receptacles is 3.18 [.125]; for receptacle assemblies, nominal centerline spacing between adjacent receptacles is 3.96 [.156]. Tolerances are not to accumulate over the length of the pc board.

**Mod II Horizontal Mounting**



This configuration recommended for use with machine applied posts and headers with a 5.59 [.220] minimum mating post length.

This configuration recommended for use with machine applied posts and headers with a 8.13 [.320] minimum mating post length.

H=Receptacle centers may vary depending on requirements. For individual receptacles, minimum nominal centerline spacing between adjacent receptacles is 2.54 [.100]. Tolerances are not to accumulate over the length of the pc board.

Figure 2 (end)

### 3.4. Mounting PC Board Contacts

These contacts can be mounted either vertically or horizontally according to the directions provided with application tooling. Vertical mount contacts are mounted as Type A or Type B. Horizontal contacts are mounted as Type C. See Figure 3.

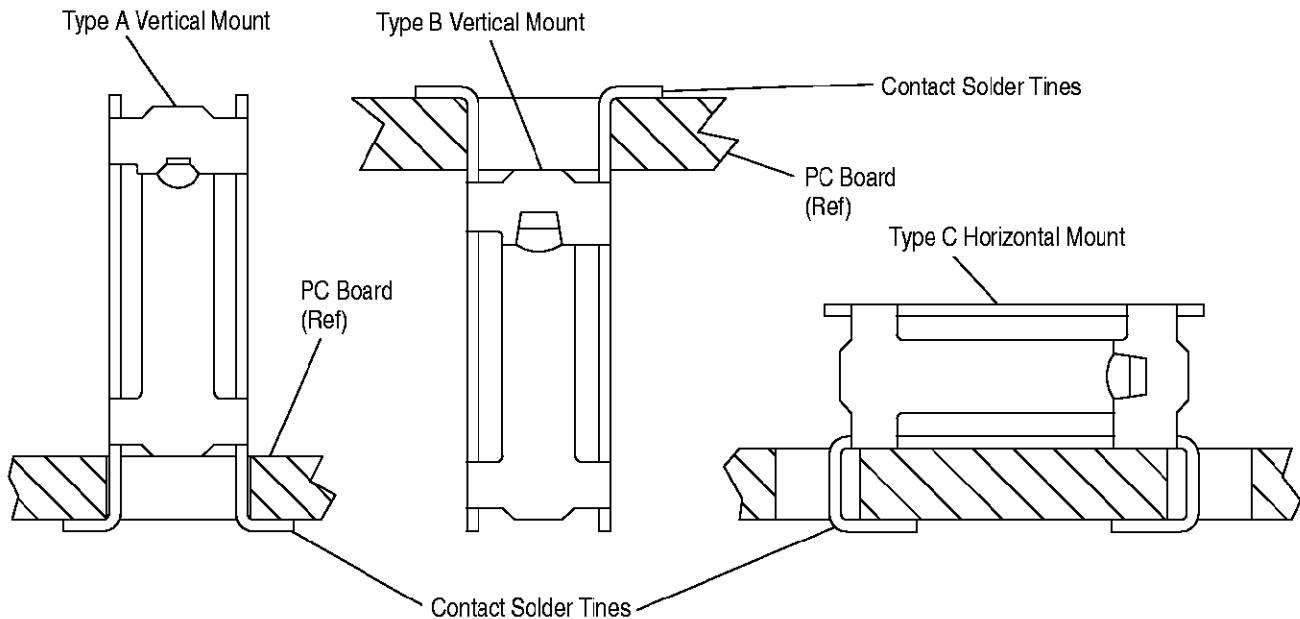


Figure 3

### 3.5. Requirements

#### A. Cutoff Tab and Burr

The cutoff tab and burr resulting from the contact being cut from the carrier strip must be within the limits provided in Figure 4.

#### B. Staking

A tight fit should be attained when the contact is staked to the pc board, but it is not mandatory. The allowable limits of looseness are indicated in Figure 4.

#### C. Springback

Springback of the holding contact tines shall not exceed the limits indicated in Figure 4.

#### D. Alignment

Maximum misalignment shall not exceed the limits indicated in Figure 4.

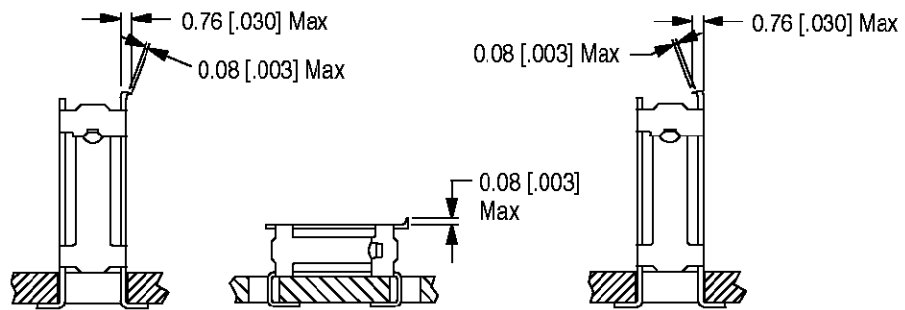
#### E. Seam Opening

After application, the contact seam opening shall not exceed the limits indicated in Figure 4.

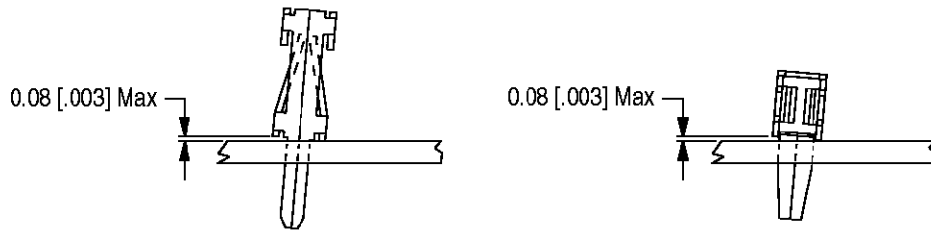
#### F. Clinching

The solder tines must be clinched to within the dimension specified in Figure 4. The clinching operation must not deform or mar the contact in any way.

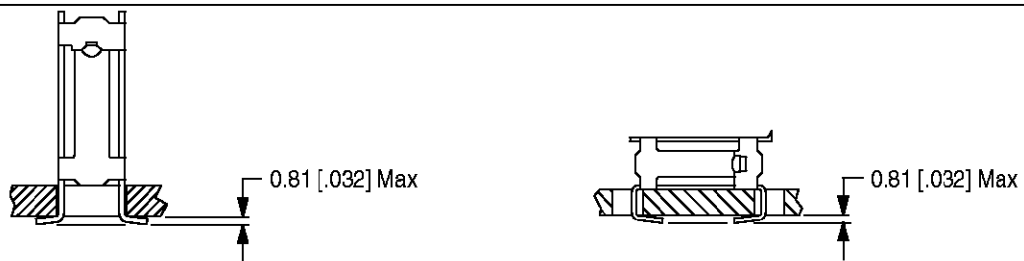
Cutoff Tab and Burr



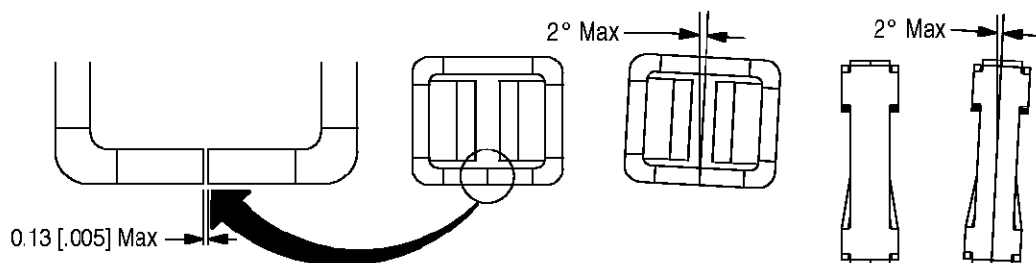
Staking



Springback and Clinching



Alignment and Seam Opening



Workmanship

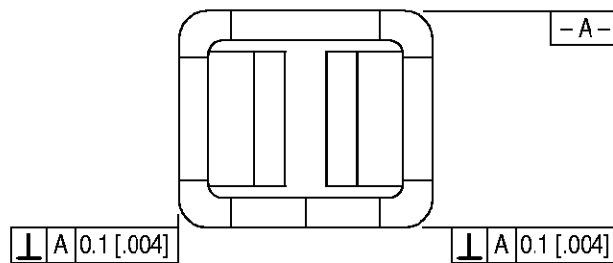


Figure 4

3.6. Soldering

A. Flux Selection

Contact solder tines 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 5.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER <sup>⊞</sup>	ALPHA <sup>■</sup>
Type RMA (Mildly Activated)	Mild	Noncorrosive	186	611

⊞ Product of Kester Solder Co.    ■ Product of Alphametals Inc.

Figure 5

**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 6.

**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 Tyco 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 <sup>■</sup>	Aqueous	1	132	270
Bioact EC-7 <sup>◆</sup>	Solvent	5	100	212
Butyl Carbitol <sup>●</sup>	Solvent	1	Room Ambience	
Isopropyl Alcohol	Solvent	5	100	212
Kester 5778 <sup>⊞</sup>	Aqueous	5	100	212
Kester 5779 <sup>⊞</sup>	Aqueous	5	100	212
Loncoterge 520 <sup>●</sup>	Aqueous	5	100	212
Loncoterge 530 <sup>●</sup>	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 6

**C. Drying**

Since housings or header assemblies are not used with these contacts, reasonable drying temperatures are not a major factor. However, make certain that reasonable temperatures are not exceeded or stress and cracking in the pc boards may occur.

**D. Soldering Guidelines**

AMPMODU Mod I and Mod II PC Board Connectors can be soldered using wave, vapor phase (VPR), double sided non-focused infrared reflow processes (IR) or equivalent soldering techniques. The temperatures and exposure time shall be within the ranges specified in Figure 7. We recommend using SN60 or SN62 solder for these connectors.

**NOTE** Manual 402–40 provides some guidelines for establishing soldering practices. Refer to Paragraph 2.5, Manuals.

SOLDERING PROCESS	TEMPERATURE		TIME (At Max Temperature)
	CELSIUS	FAHRENHEIT	
WAVE SOLDERING	260 <sup>⊞</sup>	500 <sup>⊞</sup>	5 Seconds
VAPOR PHASE SOLDERING	215	419	5 Minutes
INFRARED REFLOW SOLDERING	230	446	5 Minutes

⊞ Wave Temperature

Figure 7

### 3.7. Lubrication

For tin plated contacts, Tyco Electronics recommends customers apply the contact lubricant manufactured by Nye® Lubricants‡ listed below after soldering and cleaning.

<u>Part Number</u>	<u>Container</u>
NYEACT 502C-20-UV	2 Oz. Brush Cap Bottle
NYEACT 502C-20-UV	4 Oz. Aerosol Can

Small Volume Orders:

TAI Lubricants (Nye Authorized Distributor)

Phone: (302) 326-0200  
 Fax: (302) 326-0400  
 Website: [www.lubekits.com](http://www.lubekits.com)  
 E-mail: [nyeoil@aol.com](mailto:nyeoil@aol.com)

Large Volume Orders and Technical Support

Nye Lubricants, Inc.  
 Phone: (508) 996-6721  
 Fax: (508) 997-5285  
 Website: [www.nyelubricants.com](http://www.nyelubricants.com)  
 E-mail: [techhelp@nyelubricants.com](mailto:techhelp@nyelubricants.com)

### 3.8. Checking Installed Contacts

The contact should be soldered to the pc board as shown in Figure 8.

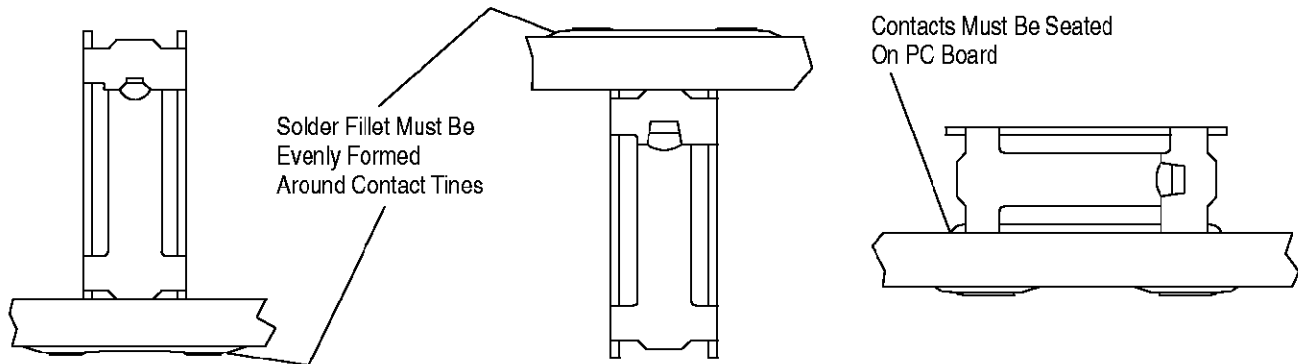


Figure 8

### 3.9. Repair/Replacement

A damaged contact must be removed and replaced with a new one. Solder must be removed from soldered tines and clinched tines must be straightened before removal. Care must be used to prevent damage to the mounting surface and surrounding components.

## 4. QUALIFICATIONS

The AMPMODU Mod I and Mod II PC Board Receptacle Contacts are recognized by Underwriters Laboratories Inc. (UL) under File No. E28476, and certified to the Canadian Standards Association (CSA) under File No. LR16455.

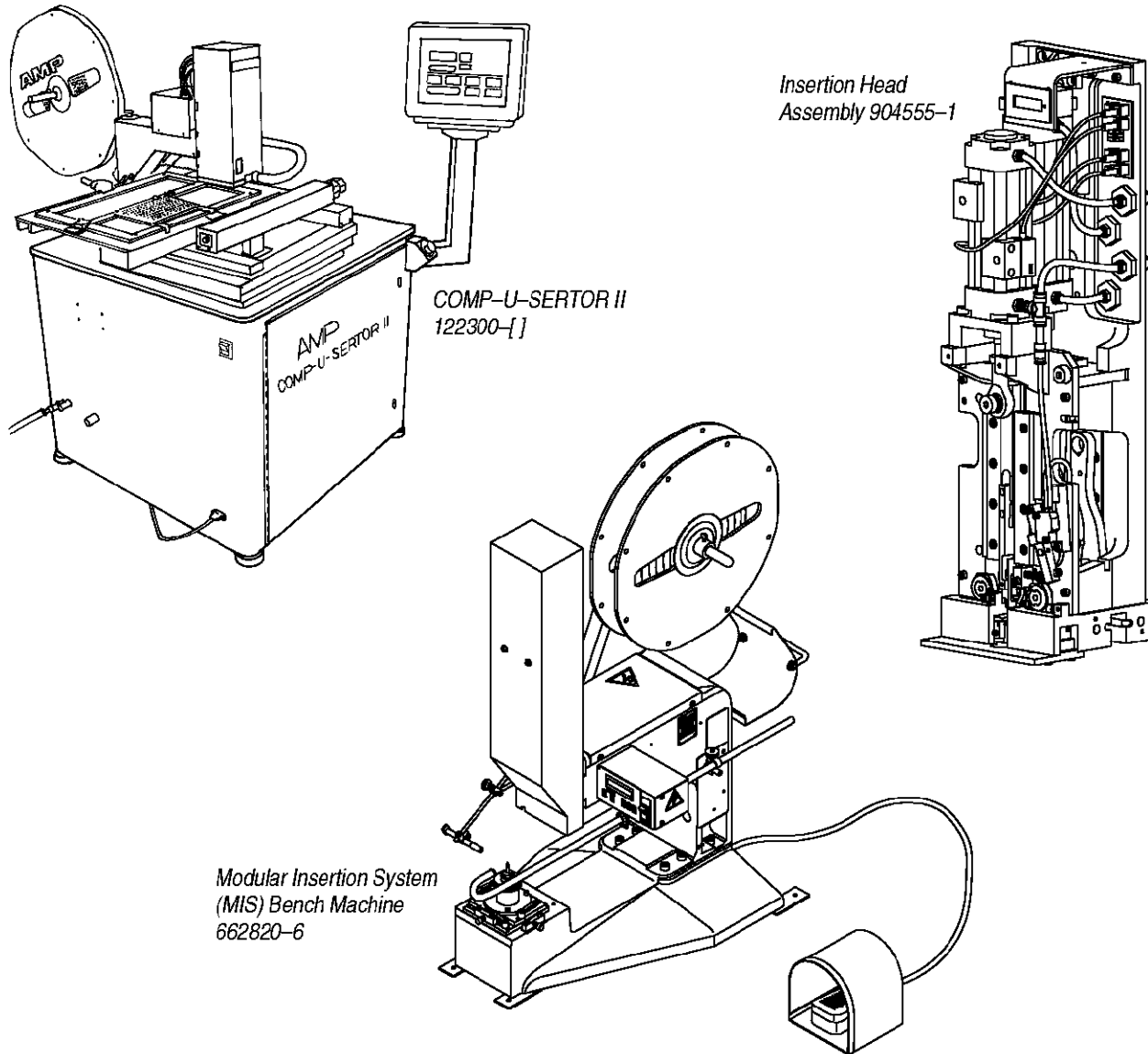
## 5. TOOLING

This section provides a selection of tools for various application requirements. They include semi-automatic and automatic machines for power assist application of strip form contacts. Modified designs and additional tooling concepts may be available to meet other application requirements. For additional information, contact one of the service groups at the bottom of page 1. A listing of tooling recommendations is provided in Figure 9.

‡Trademark of Nye Lubricants, Inc.



- **Insertion Head**  
Insertion heads are designed to insert the contacts to a pre-determined depth and can be used in a variety of power sources.
- **Power Units**  
A power unit is an automatic or semi-automatic device used to assist in the application of a product. Power unit includes the power source used to supply the force or power to an applicator.

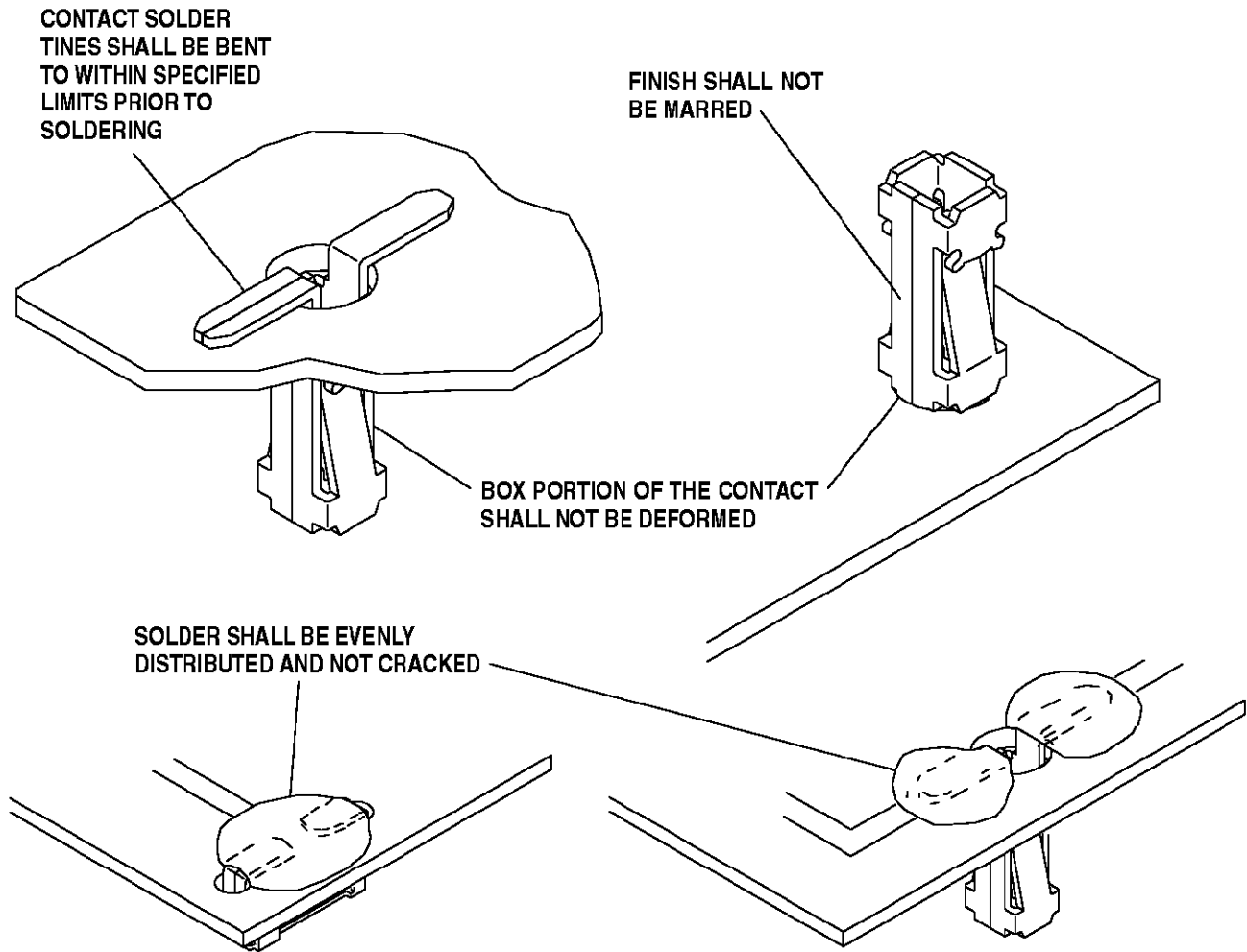


AMPMODU CONNECTOR	CONNECTOR STYLE	INSERTION HEAD (DOCUMENT)	POWER UNIT (DOCUMENT)
Mod I	Vertical	904555-1 (409-5890)	122300-[] (409-5863) 662820-6 (409-5893)
	Horizontal	Manufactured on Request	—
Mod II	Vertical	Manufactured on Request	—
	Horizontal		

Figure 9

**6. VISUAL AID**

Figure 10 shows a typical application of AMPMODU Mod I and Mod II PC Board Receptacle 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.



**FIGURE 10. VISUAL AID**