

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 $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of AMP* AMPLIMITE Series 109 Straight and Right Angle Connectors with size 20 contact posts. These connectors are designed for printed circuit (pc) board and panel mounting applications. They are available with 9, 15, 25, 37, and 50 positions, with standard mounting holes that will accept removable screwlocks or commercially available hardware. The connectors are designed to be placed on the pc board manually.

Figure 1 provides terminology for connector features that will be used throughout this specification. Use of these terms will facilitate assistance when corresponding with Tyco Representatives.

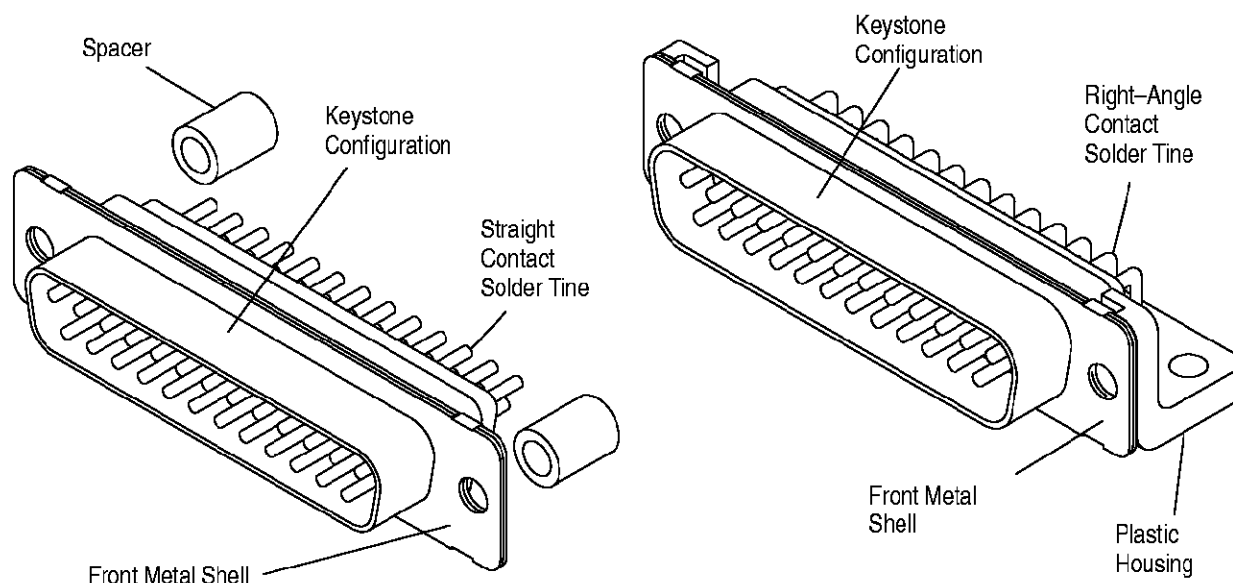


Figure 1

2. REFERENCE MATERIAL**2.1. Revision Summary**

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

Per EC 0990-1249-00:

- Updated document to corporate requirements
- Changed reference part number in Paragraph 2.2
- Changed and added new soldering information to Paragraph 2.5
- Added new soldering recommendation to Paragraph 3.8.A

2.2. Customer Assistance

Reference Part Number 448693 and Product Code 4791 are representative numbers of AMPLIMITE Series 109 PC Board Connectors. 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 (Sales Engineer, Applications Engineer, etc.) or, after purchase, by calling the Tooling Assistance Center or AMP FAX number at the bottom of page 1.

2.3. Drawings

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

2.4. Specification

This product meets the performance requirements of Military Specification MIL-C-24308.

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 attached to the manual as a guide for information on soldering problems.

3. REQUIREMENTS

3.1. Mating

To assure full mating of the connectors, the length between the mated connectors must be considered when determining the method of mounting and the panel thickness when the connector is to be mounted to it. This dimension is shown in Figure 2.

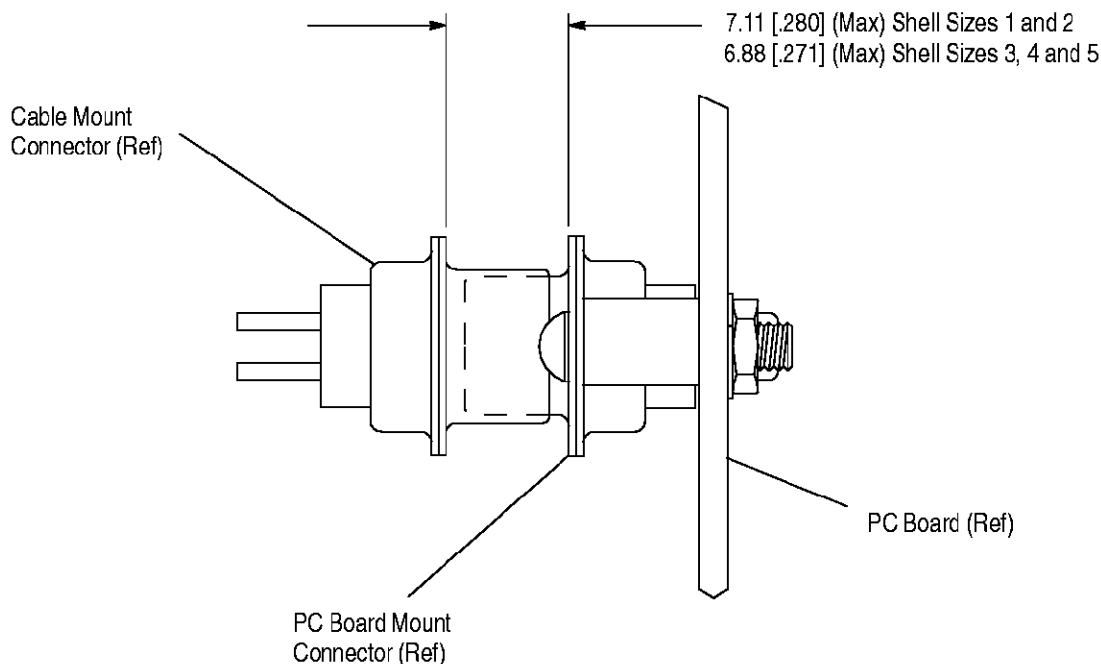


Figure 2

3.2. Connector Shell Sizes

There are five industry standard shell sizes available for these connectors. A composite of the five sizes with the overall dimension for each is provided in Figure 3.

3.3. Printed Circuit Board

A. Thickness

The connectors are designed for standard thickness pc boards of 1.57 [.062], 2.39 [.094], 3.18 [.125] thick. Those with solder tine lengths of 3.91–2.52 [.154–.099] are recommended for pc boards up to 1.57 [.062] thick. For pc board thickness up to 2.39 [.094] use solder tine lengths of 4.699–3.302 [.185–.130]. Those with tine lengths of 5.334–3.937 [.210–.155] are recommended for pc boards up to 3.18 [.125] thick.

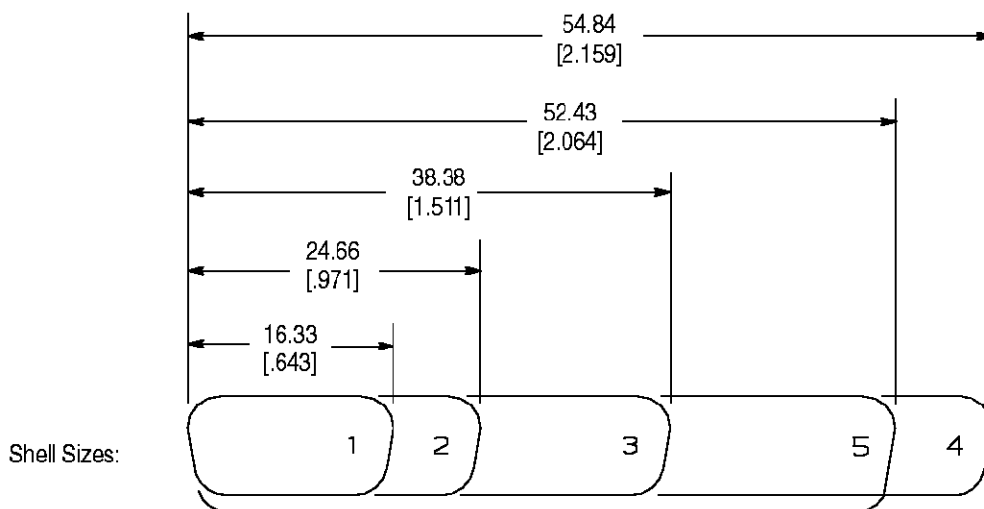
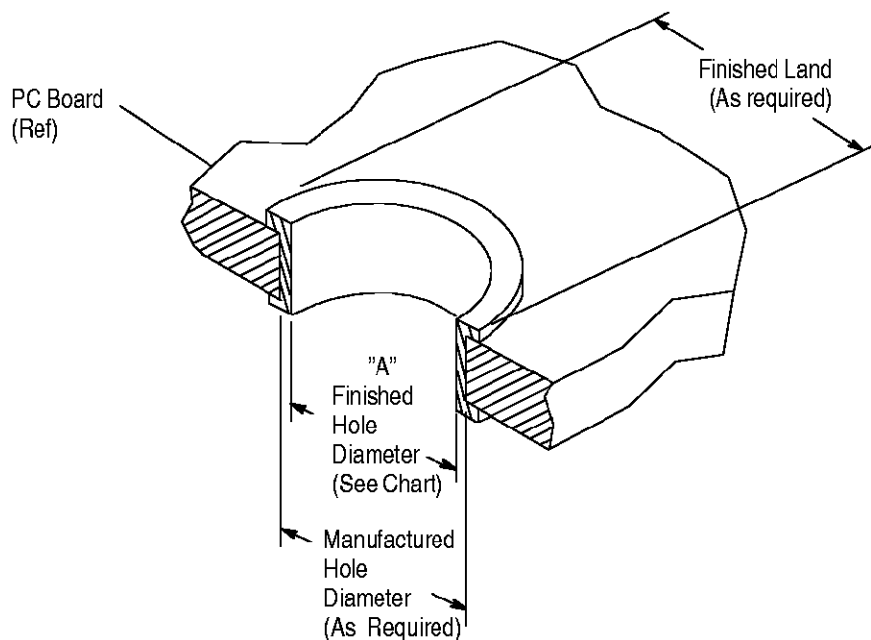


Figure 3

B. Solder Tine Hole Requirements

The method of making holes in the pc board, plating them, and the size of the finished land around the holes will depend on your own established standards. The finished hole diameter after plating for the two solder tine diameters must be within the range specified in Figure 4.



SOLDER TINE DIAMETER	"A" FINISHED HOLE DIAMETER (After Plating)
0.76 [.030]	1.02 – 1.27 [.040 – .050]
1.02 [.040]	1.27 – 1.52 [.050 – .060]

Figure 4

C. Layout

The overall pc board layout patterns for each connector shell size are provided in Figure 5.

NOTE

True position tolerance for all pc board layouts is 0.25 [.010] at maximum material condition.

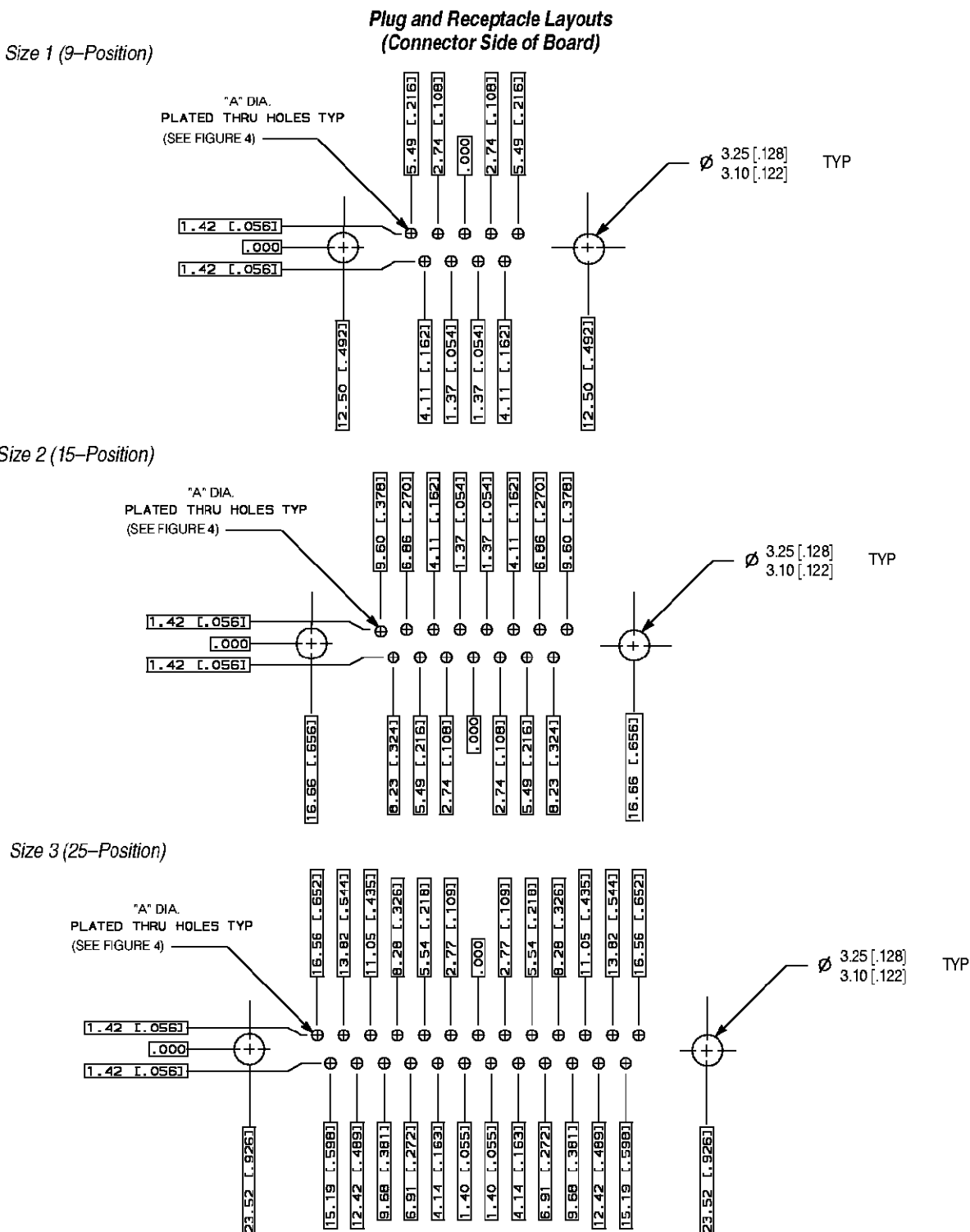
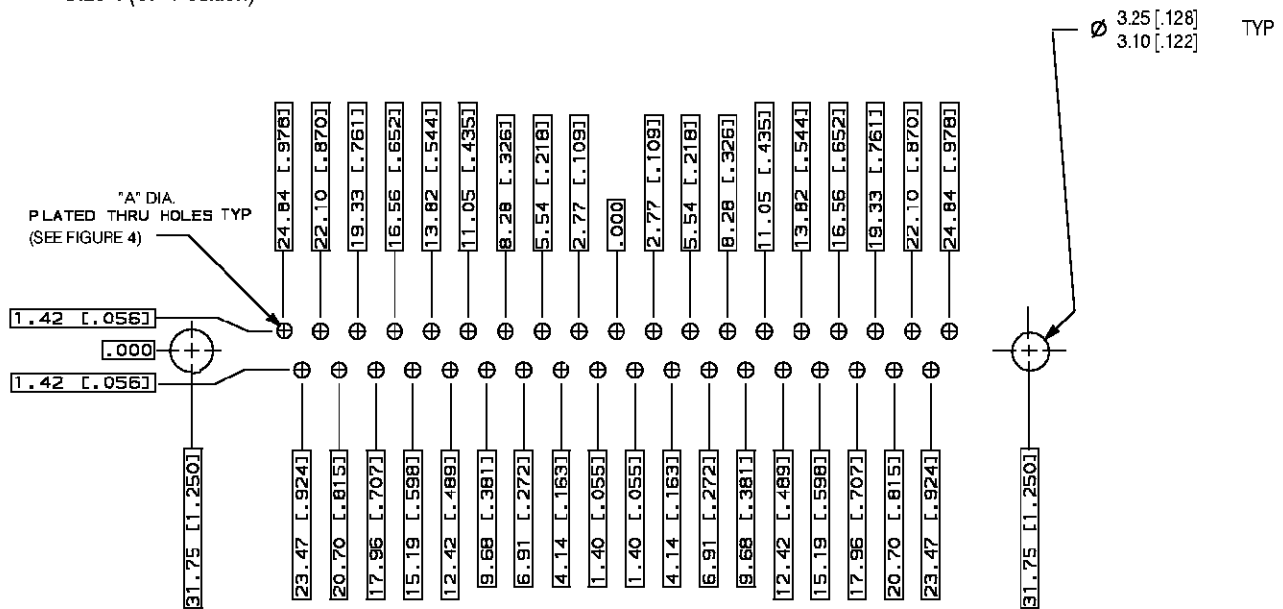


Figure 5 (cont'd)

Size 4 (37-Position)



Size 5 (50-Position)

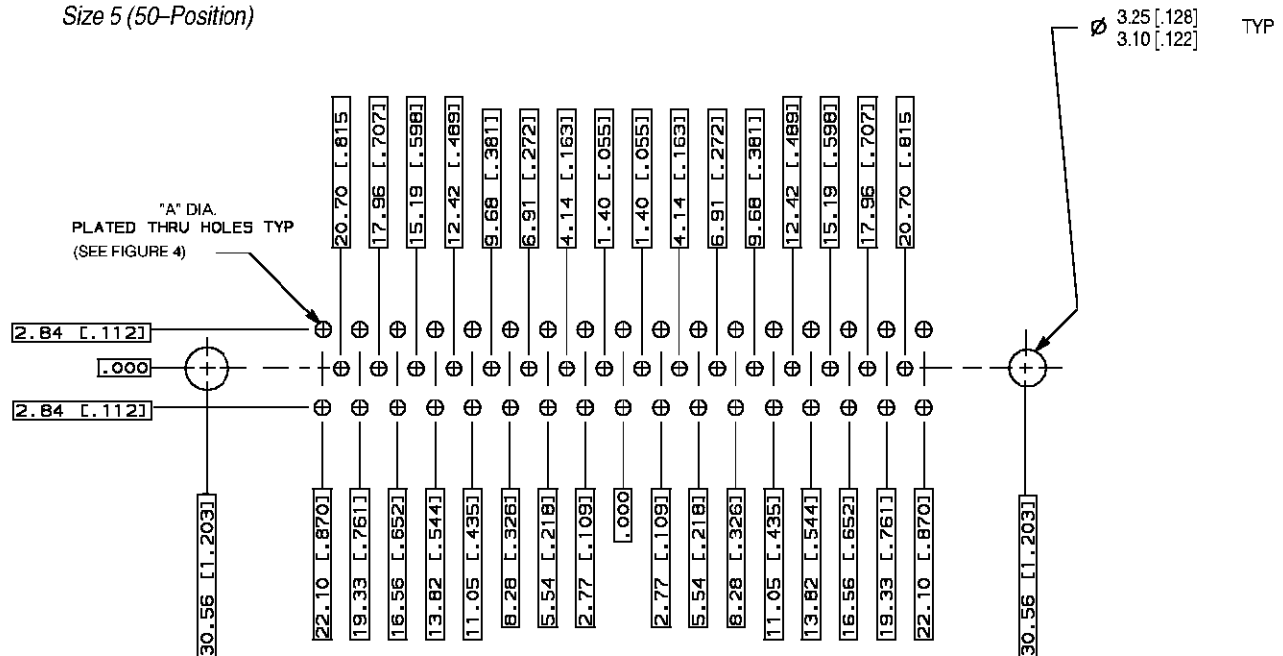
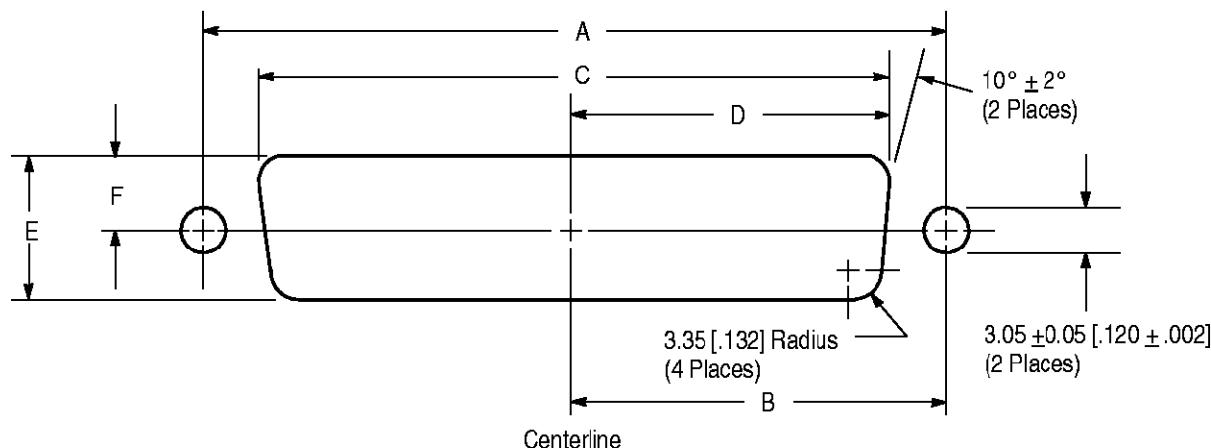


Figure 5 (end)

3.4. Panel Mounting Cutout

When panel mounting is required, it is recommended that these connectors be mounted to the rear of the panel. Dimensions for proper placement in a panel are provided in Figure 6.



SHELL SIZE	CONTACT POSITIONS	DIMENSIONS					
		A	B	C	D	E	F
1	9	24.99 [0.984]	12.50 [0.492]	20.47 [0.806]	10.24 [0.403]	11.40 [0.449]	5.72 [0.225]
2	15	33.32 [1.312]	16.66 [0.656]	28.80 [1.134]	14.40 [0.567]		
3	25	47.04 [1.852]	23.52 [0.926]	42.52 [1.674]	21.26 [0.837]		
4	37	63.50 [2.500]	31.75 [1.250]	59.08 [2.326]	29.54 [1.163]	14.10 [0.555]	7.06 [0.278]
5	50	61.11 [2.406]	30.56 [1.203]	56.34 [2.218]	28.17 [1.109]		

Figure 6

3.5. Polarization and Keying

The keystone configuration of the mating face prohibits the accidental inversion of mating connectors.

3.6. Shielding

The connectors shells are available with either tin-plate or cadmium over steel, or cadmium or gold over brass which provide electromagnetic compatibility (EMC). When mated with another metal shell connector, both shielding and grounding continuity are achieved. Use of metallic hardware provides additional reinforcement of electrical continuity.

3.7. Mounting Hardware

There are connectors with standard mounting holes which can be attached to the pc board with screwlock kits or commercially available hardware. The recommended application for each type of hardware is shown in Figure 7.

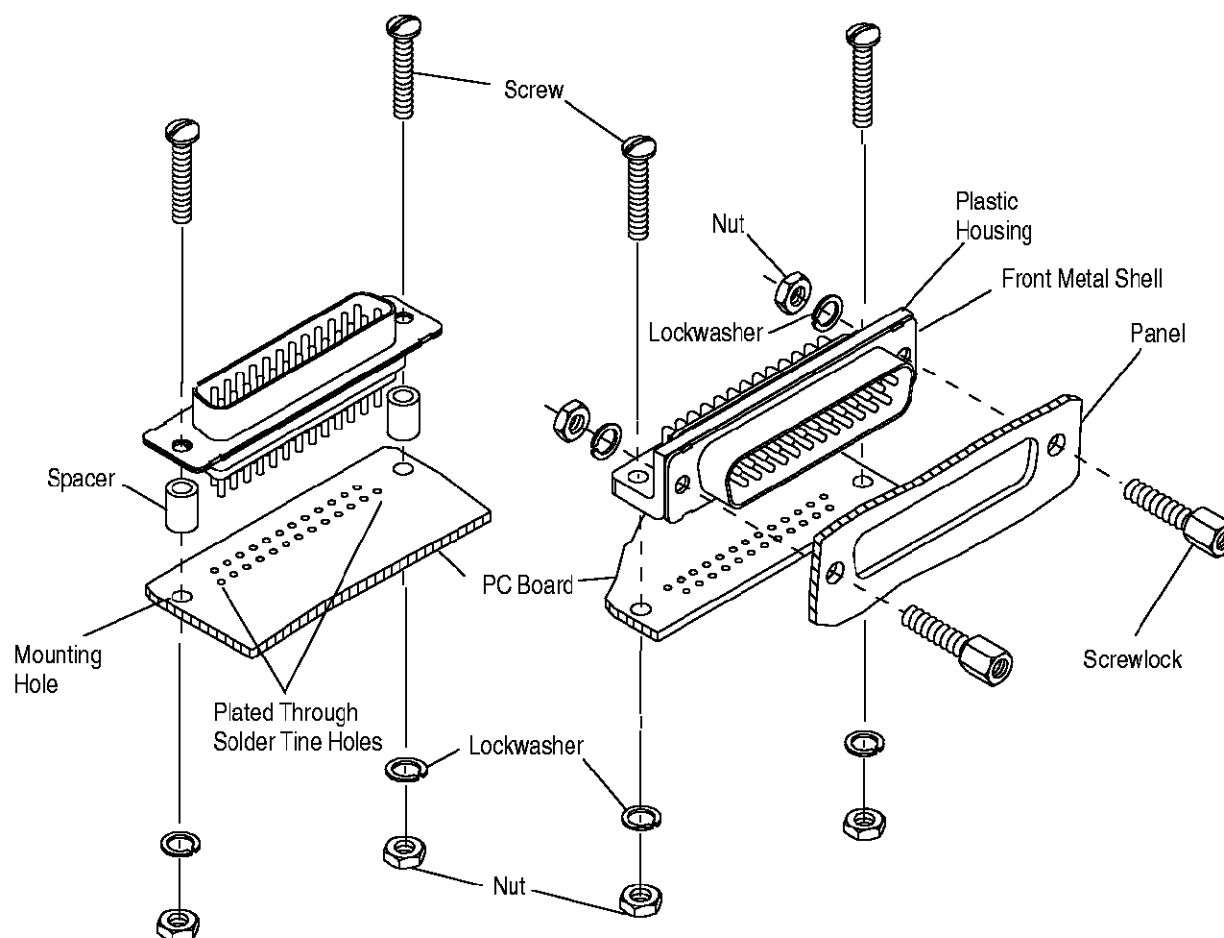


Figure 7

3.8. Soldering Connectors

It is recommended that connectors be soldered using wave solder or equivalent soldering technique. The connectors will withstand operating temperatures of -55°C to 125°C [-67°F to 257°F].

A. Soldering Guidelines

When soldering board-to-board applications, it is recommended the connector mating face be masked or shrouded during soldering and subsequent cleaning. This minimizes any effect this process has on the lubricity of the contact finish and therefore mating and unmating forces. Hand soldering and cleaning may be used to control this effect.

B. Flux Selection

If the contact tines and mounting hardware are used on the trace side of the pc board, they must be fluxed prior to soldering with a rosin base flux. Selection of the proper flux will depend on the type of pc board and other components that may be mounted to the pc board, compatibility with the wave solder line, and safety requirements.

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. Common cleaning solvents and exposure limits that should not have any adverse affect on the connectors are provided in Figure 8.

CAUTION

Due to the many variables involved with soldering processes (eg, component density, orientation, fluxes, cleaners, etc), we recommend conducting trial runs under actual manufacturing conditions to ensure product and process compatibility.

DANGER

Consideration must be given to toxicity and other safety requirements recommended in the Material Safety Data Sheet (MSDS) supplied by the manufacturer.

CLEANER		TIME (Minutes)	TEMPERATURES (Maximum)	
NAME	TYPE		CELSIUS	FAHRENHEIT
Alpha 2110■	Aqueous	1	125	257
Kester 5778⚡	Aqueous	5	100	212
Kester 5779⚡	Aqueous	5	100	212
Loncoterger 520●	Aqueous	5	100	212
Loncoterger 530●	Aqueous	5	100	212

■ Product of Fry's Metals, Inc.

⚡ Product of Litton Systems, Inc..

● Product of Union Carbide Corp.

Figure 8

D. Drying

When drying components, make sure the temperatures are within the limitations of -55°C to 125°C [-67°F to 257°F], otherwise housing degradation could occur.

3.9. Repair

Damaged connectors must be removed, discarded, and replaced.

4. QUALIFICATIONS

AMPLIMITE Series 109 Connectors are Underwriters' Laboratories, Inc. (UL) recognized, File No. E28476 and Canadian Standards Association (CSA) certified, File No. LR7189.

5. TOOLING

No tooling is required for the placement of these connectors onto the pc board.

6. VISUAL AID

Figure 9 shows a typical AMPLIMITE 109 PC Board Straight and Right Angle Connectors after they have been installed. The illustrations are used by production personnel to visually ensure a suitable installation. Installations which appear visually incorrect should be dimensionally inspected using the information given in the preceding pages of this application specification.

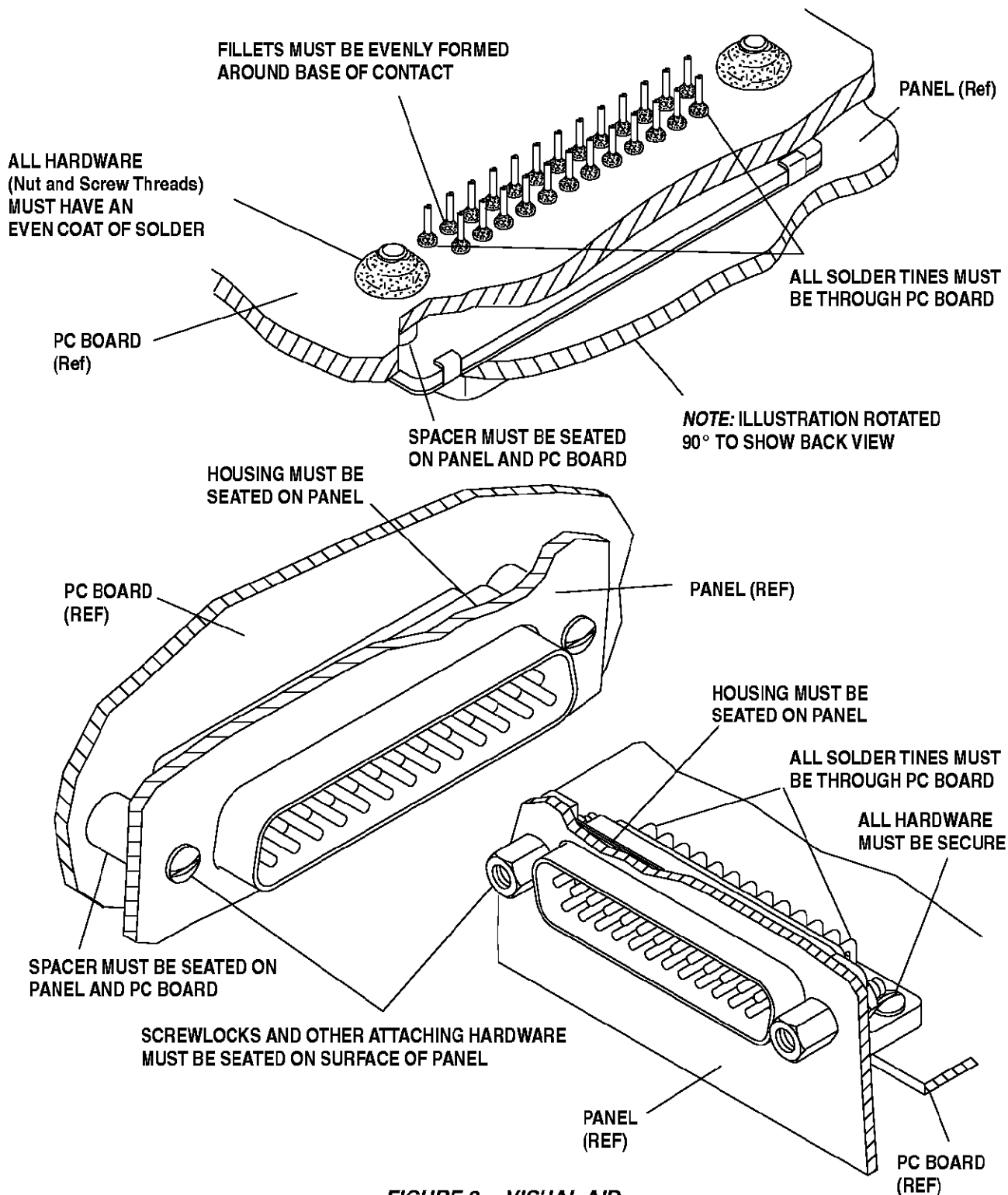


FIGURE 9. VISUAL AID