



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 mm [$\pm .005$ in.] 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 AMPLIMITE HD-20 Series 318, 478, and 590 Right-Angle All Plastic Housing Connectors designed for pc boards. The series designator is the dimension from the center of the first row of solder tines to the front surface of the mounting flange. Connectors are available with mounting flanges that have through holes, threaded inserts, or non-removable screwlocks.

These connectors are made in five sizes: size 1 has 9 positions; size 2 has 15 positions; size 3 has 25 positions; size 4 has 37 positions; and size 5 has 50 positions.

Connector receptacles are available in sizes 1, 2, 3, and 4 in Series 318. Connector plugs and receptacles are available in sizes 1, 2, 3, and 4 in Series 478. Plugs and receptacles are available in sizes 1, 2, 3, 4, and 5 in series 590. Sizes 1, 2, 3, and 4 have round solder tines and size 5 has square solder tines. The plugs contain pin contacts and the receptacles contain socket contacts.

When corresponding with TE Connectivity Personnel, use the terminology provided in this specification to facilitate your inquiries for information. The connector illustrations present composites of mounting options and do not depict actual applications. Basic terms and features of this product are provided in Figure 1.

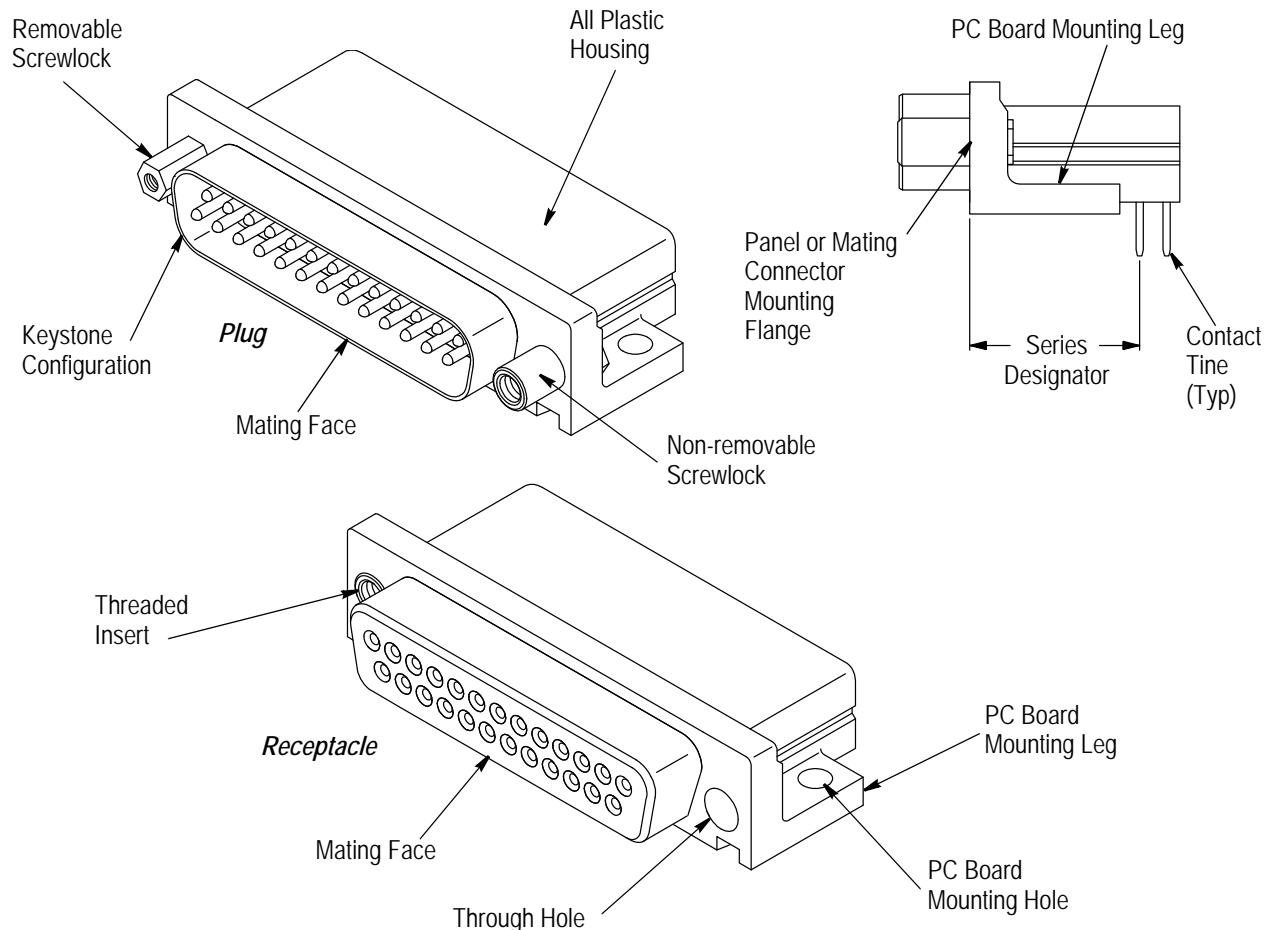


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Revisions to this instruction sheet include:

- Updated document to corporate requirements
- New logo
- Changed time in Figure 11
- Changed text in Paragraphs 2.2, 2.5, and 3.13

2.2. Customer Assistance

Reference Product Base Part Number 747460 and Product Code 5765 are representative of AMPLIMITE HD-20 Right-Angle All Plastic Connectors. 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 TE 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 page 1.

2.3. Drawings

Customer Drawings for each product part number 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 technical documentation supplied by TE.

2.4. Specifications

Product Specification 108-40025 provides product performance and test information.

2.5. 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.

3. REQUIREMENTS

3.1. Storage

A. Ultraviolet Light

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

B. Shelf Life

The connectors should remain in the shipping containers until ready for use to prevent damage. The products should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions.

C. Chemical Exposure

Do not store connectors near any chemicals listed below, as they may cause stress corrosion cracking in the components.

Alkalies	Ammonia	Citrates	Phosphates	Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites		Tartrates



NOTE

Where the above environmental conditions exist, phosphor-bronze contacts are recommended instead of brass if available.

3.2. Connector Shell Sizes

There are five industry standard shell sizes available for these connectors. A composite of the five receptacle sizes with the overall dimension for each is provided in Figure 2.

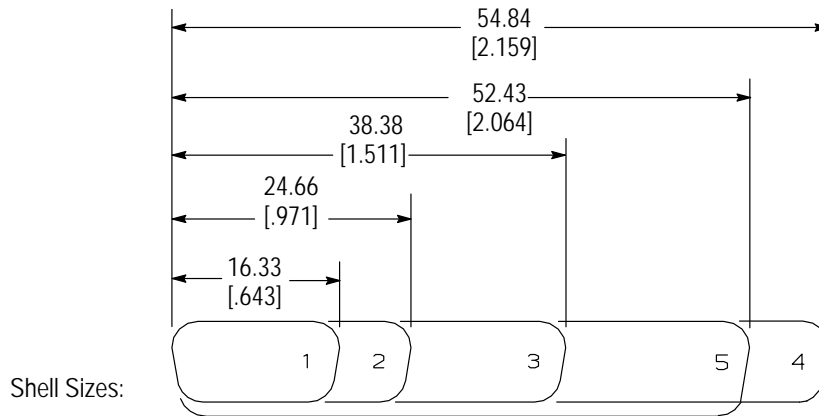
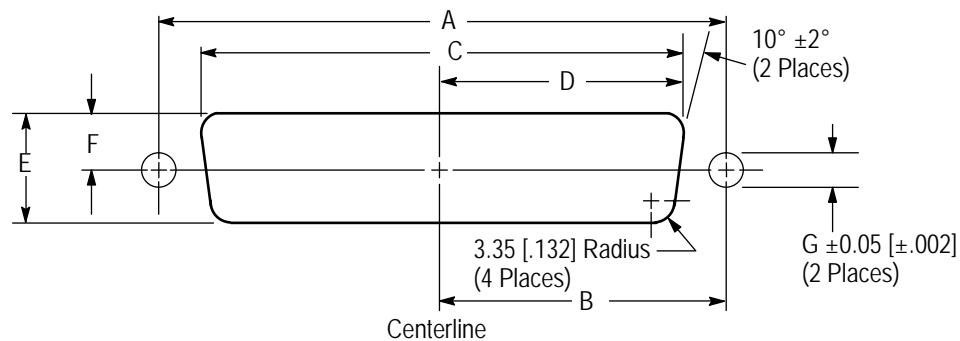


Figure 2

3.3. Panel Mounting Cutout

Panel mounting is optional for AMPLIMITE Right-Angle All Plastic Housing PC Board Connectors. It will provide additional support for the solder joints during mating and unmating of connectors. The pc board receptacles can ONLY be rear mounted. Either front or rear mounting is acceptable for the mating cable connector. Connectors that have mounting flanges with 4-40 threaded inserts will accept threaded screwlocks or panel mounting screws. Hardware attached to the connector mounting flange shall be tightened to 0.45 N•m (4 in.-lb) maximum. See Figure 3 for panel cutout dimensions.

Removable screwlocks are designed to secure a connector to a panel 1.58 mm [.062 in.] thick. They can be used with thinner panels; however, washers are recommended to make up the thickness difference and provide a bottoming surface for the mating connector flange. These screwlocks should be tightened to a torque of 0.45 N•m (4 in.-lb) maximum. The 4-40 internal threads in the screwlocks will accept commercially available 4-40 threaded screws and jackscrews.



SHELL SIZE	DIMENSIONS							
	A	B	C	D	E	F	G	
							WITHOUT SCREWLOCKS	WITH SCREWLOCKS
1	24.99 [0.984]	12.50 [0.492]	20.47 [0.806]	10.24 [0.403]	11.40 [0.449]	5.72 [0.225]	3.05 [0.120]	4.83 [0.190]
2	33.32 [1.312]	16.66 [0.656]	28.80 [1.134]	14.40 [0.567]				
3	47.04 [1.852]	23.52 [0.926]	42.52 [1.674]	21.26 [0.837]				
4	63.50 [2.500]	31.75 [1.250]	59.08 [2.326]	29.54 [1.163]				
5	61.11 [2.406]	30.56 [1.203]	56.34 [2.218]	28.17 [1.109]				

Figure 3

3.4. Mating Dimensions

The dimensions shown in Figure 4 must be considered when determining method of mounting and thickness of the panel when connectors are to be panel-mounted. This dimension assures full mating of connectors.

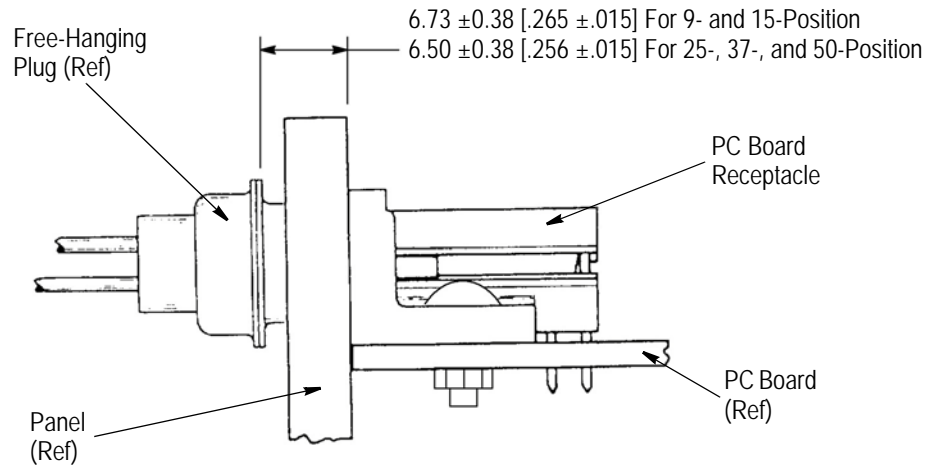


Figure 4

3.5. Connector Spacing

Care must be used to avoid interference between adjacent connectors and/or other components. The dimension is dependent on variable hardware used and the clearance required for mating connectors. The information provided in Figure 5 is to ensure proper mating for manual placement of connectors.

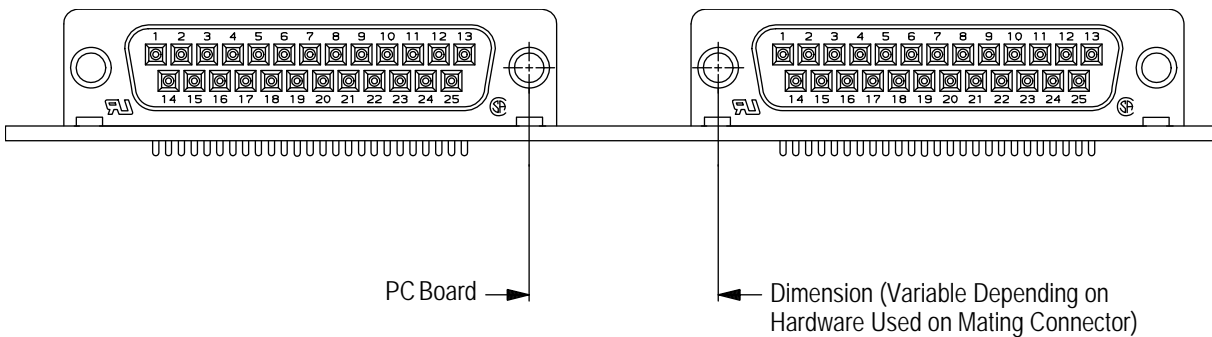


Figure 5

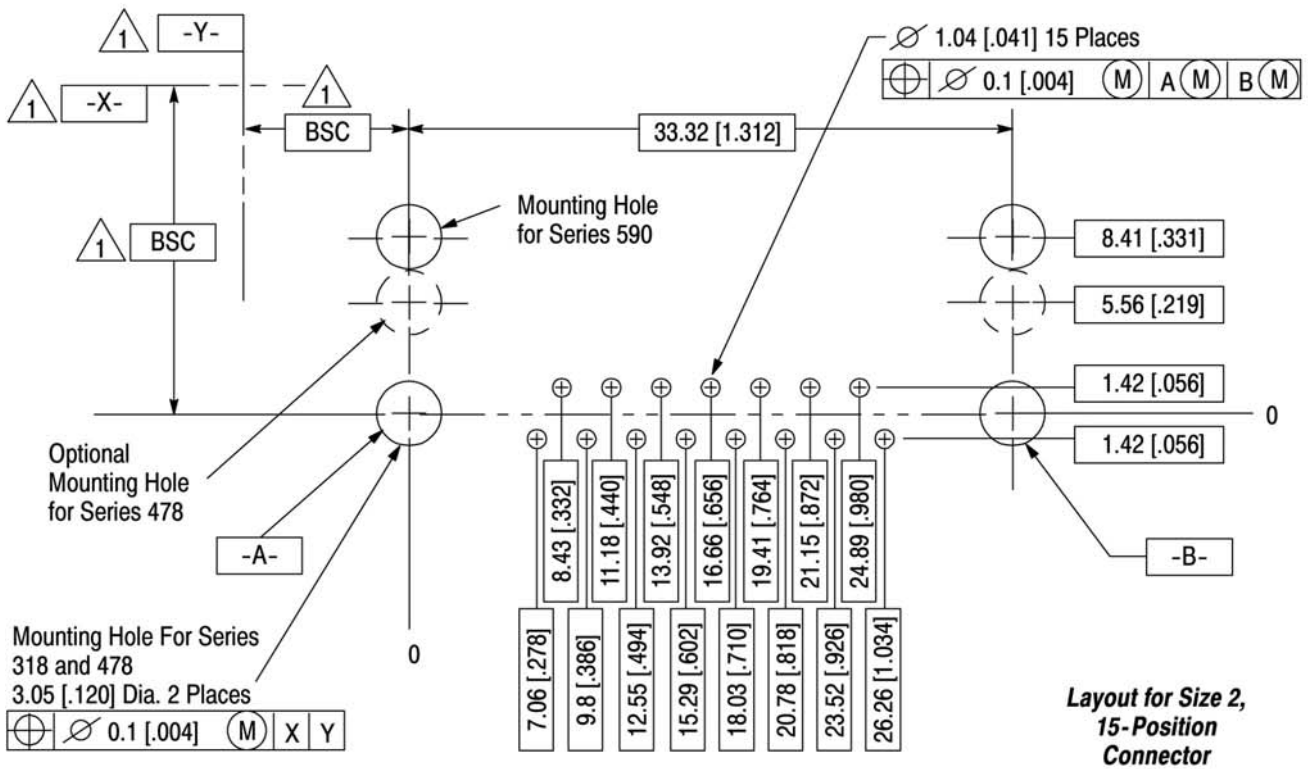
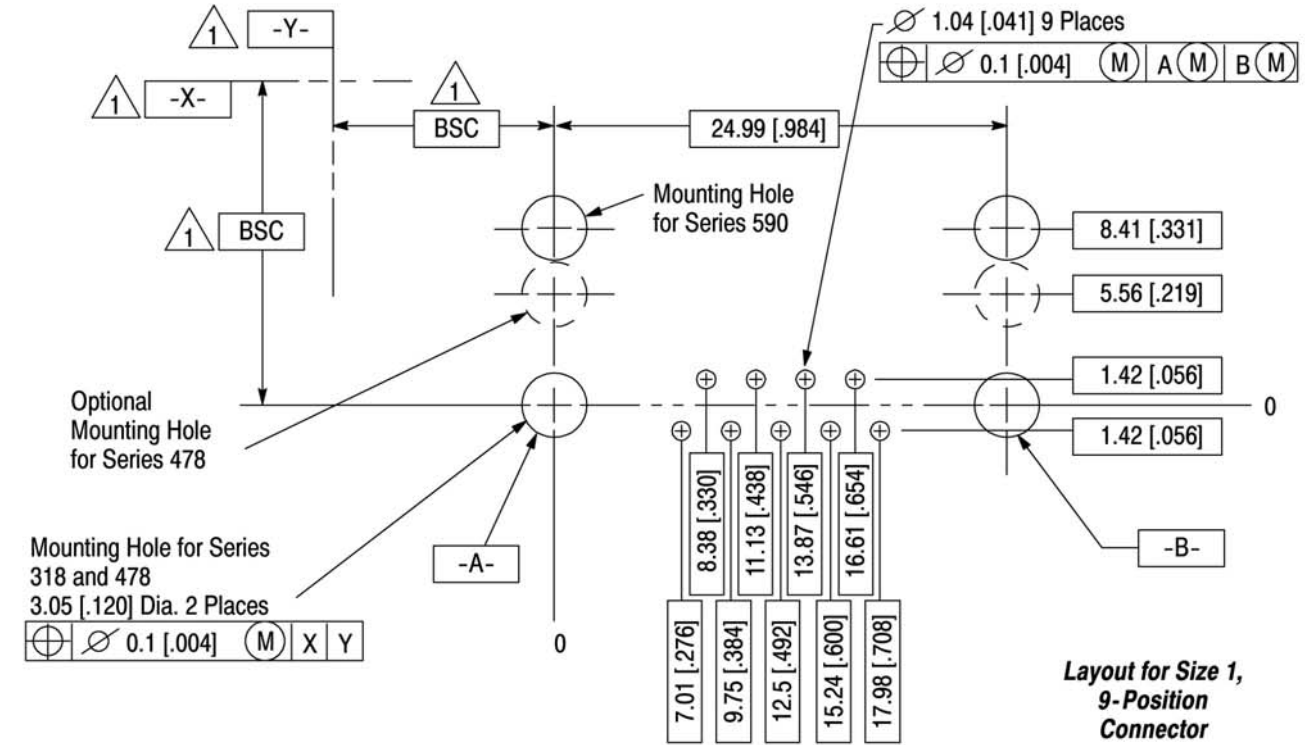
3.6. PC Board

A. Thickness

These connectors are designed to accommodate a range of applications. Standard connectors are designed for up to 2.36 mm [.093 in.] maximum thick pc boards.

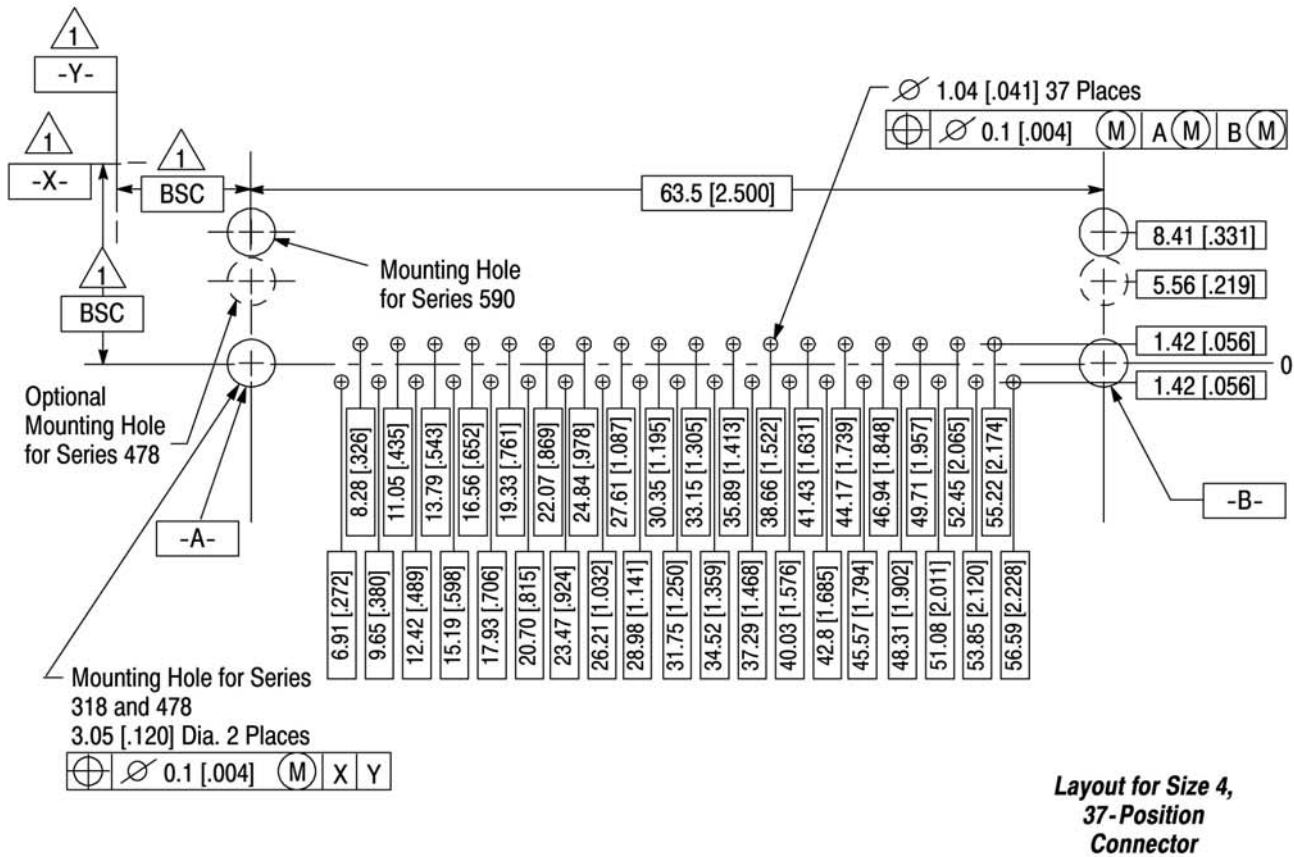
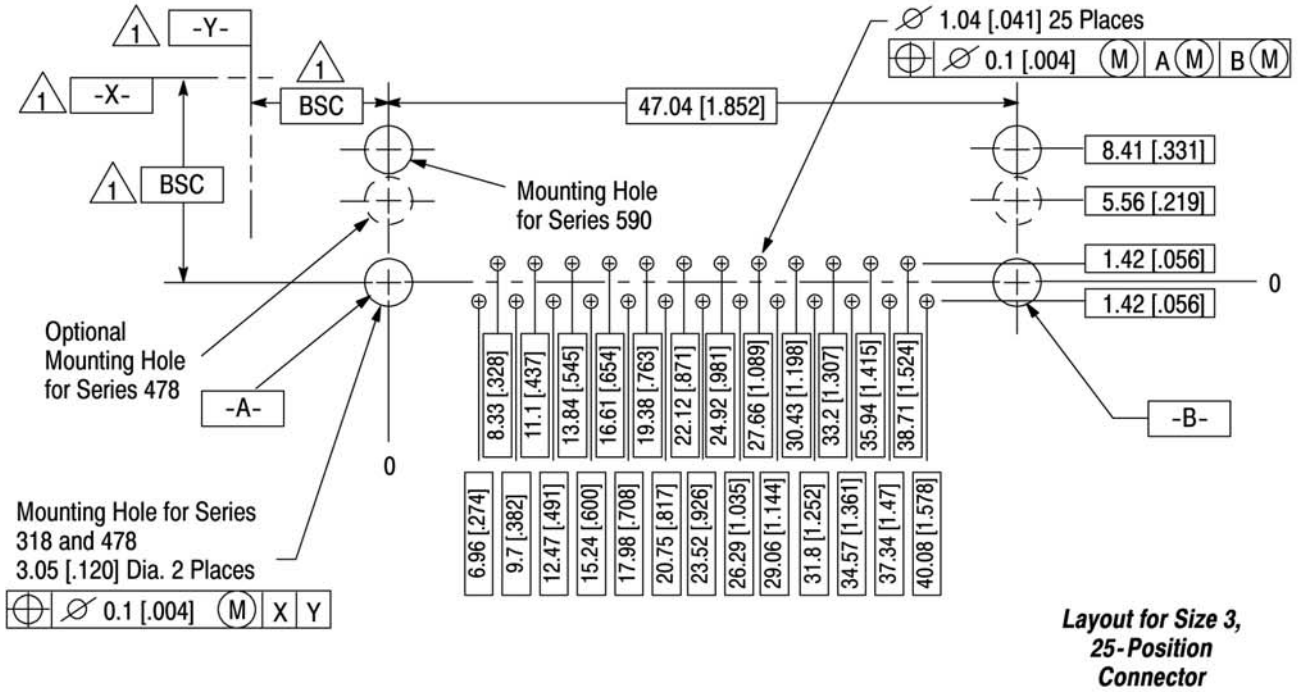
B. Layout

Solder tines require precisely drilled holes. See Figure 6 for dimensions.



Datums and Basic Dimensions Established by Customer

Figure 6 (Cont'd)



Datums and Basic Dimensions
 Established by Customer

Figure 6 (Cont'd)

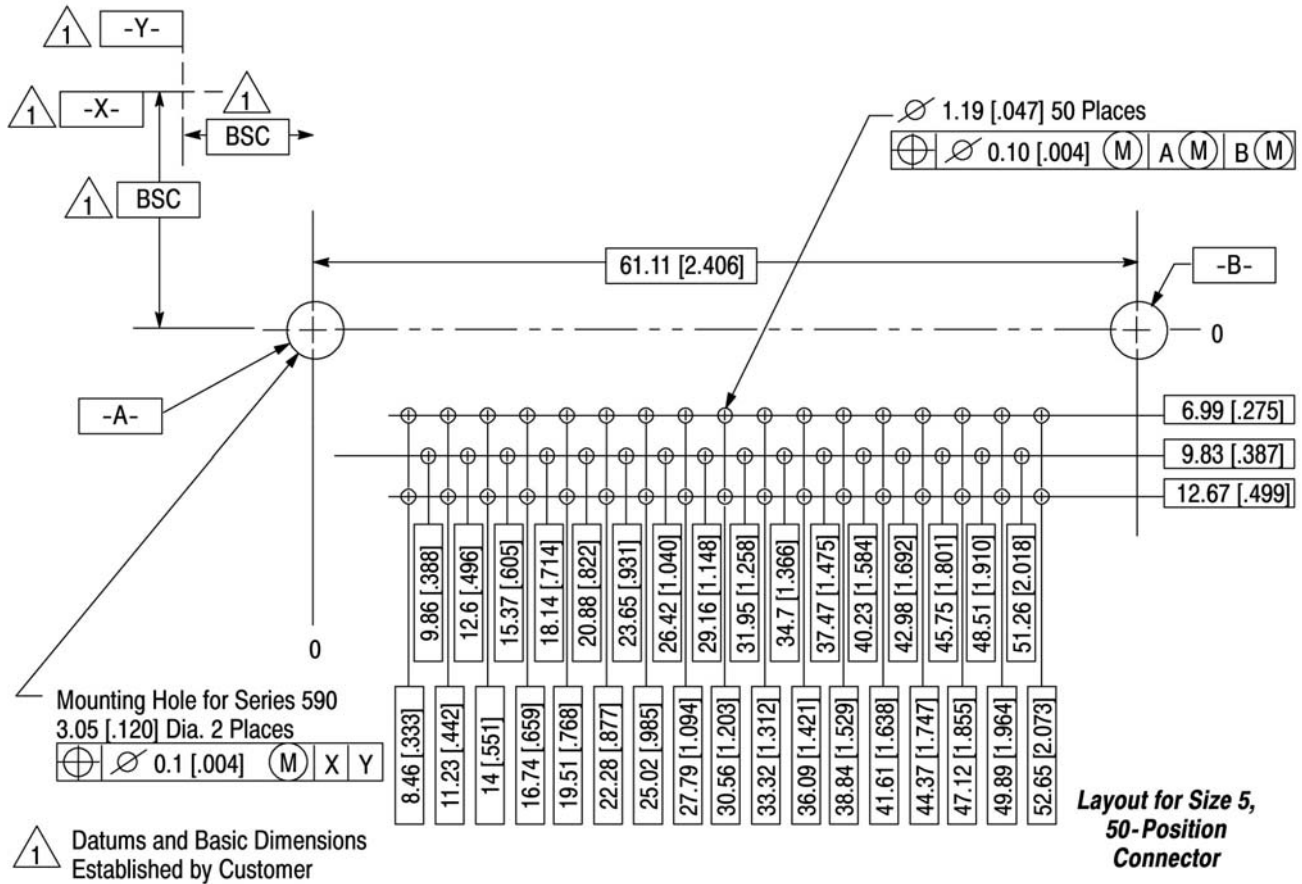


Figure 6 (End)

3.7. PC Board Contact Tine Holes

These connectors may be used with or without plated through holes. If plated, the drilled hole size, plating types, and plating thickness are dependent on your application requirements. The finished hole size must be as stated to provide unrestricted insertion and ensure adequate application of solder to the tines. See Figure 7.

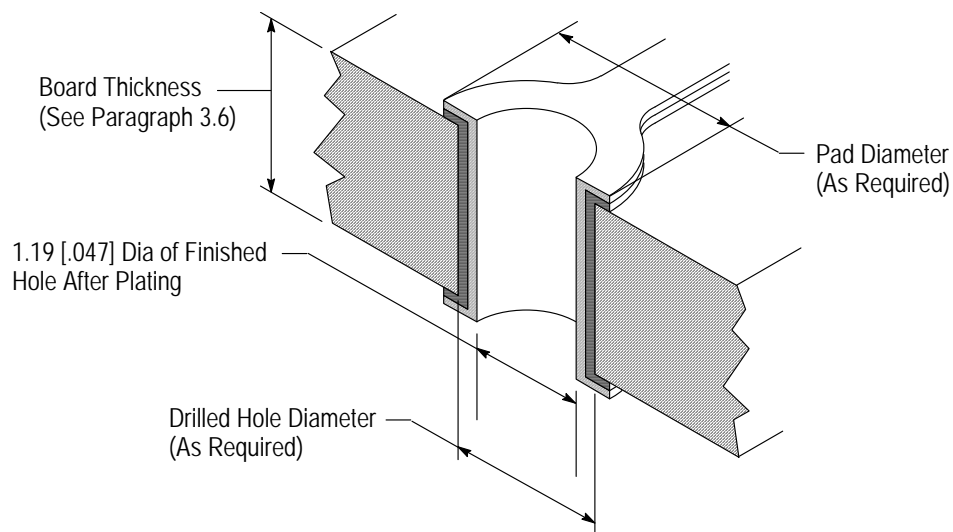


Figure 7

3.8. Limitations

Use the product specification referenced in Paragraph 2.4. for testing procedures and limitations regarding these connectors.

3.9. Polarizing and Keying

The keystone configuration of the connector mating face prevents the accidental inversion of mating connectors. To prevent mismatching of same size connectors, keying plugs may be placed in the receptacle connector. See Figure 8.

i **NOTE**
If keying plug is used, the corresponding pin cavity in the mating plug connector **MUST BE EMPTY**.

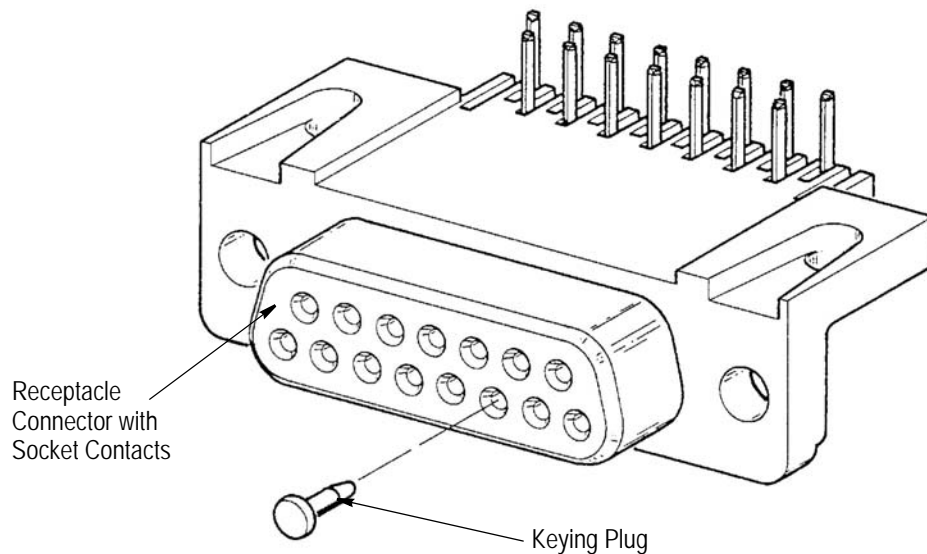


Figure 8

3.10. Integral Mounting Hardware

The connector may be affixed to the pc board using hardware such as screws, washers, and nuts; rivets; or similar devices. The hardware may be purchased from TE or through a commercial supplier.

If designing a connector into a system with commercially available hardware, contact the Product Information number at the bottom of page 1 for design assistance.

3.11. Ancillary Items (See Figure 9)

A. Screwlocks

Removable or non-removable screwlocks provide a means of securing mating connectors with commercially available 4-40 threaded hardware. The torque limit is 0.23 N•m [2 in-lb] applied from the mating face side. The maximum pushout force is 89 N [20 lb-force] applied from the mating face side.

B. Inserts

Connectors with non-removable 4-40 threaded inserts in the mounting flange allow the connector to be mounted to a panel with commercially available 4-40 hardware. The torque limit is 0.45 N•m [4 in-lb] applied from the mating face side. The maximum pushout force is 89 N [20 lb], applied from the mating face side.

i **NOTE**
Figure 9 shows a combination of different types of hardware. In an actual application, identical hardware should be used on both mounting flanges.

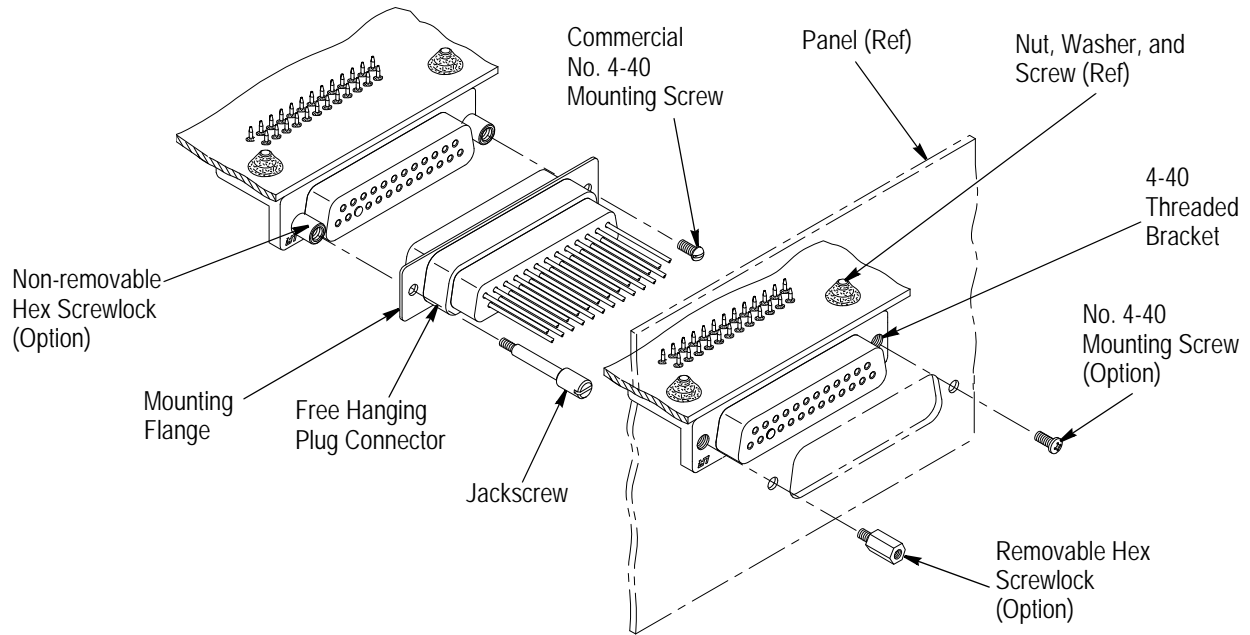


Figure 9

3.12. Connector Placement



CAUTION

The connector should be handled only by the housing to avoid deformation, contamination, or other damage to the contact solder tines.

Determine which hole in the pc board is to receive the number one contact solder tine, then orient the connector so the number one tine is aligned with the hole. Start all tines into the board; then, press evenly on the connector until the flange seats on the pc board.

3.13. Soldering

Observe guidelines and procedures when soldering contacts. Solder, clean, and dry all wire leads to contacts according to the following:

A. Flux Selection

Contact solder tails 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.

B. Process

The connectors can be soldered using wave soldering or equivalent soldering techniques. Manual 402-40 provides guidelines for establishing soldering practices. The temperatures and exposure time shall be as specified in Figure 10.

SOLDERING PROCESS	WAVE TEMPERATURE	TIME (At Max Temperature)
Wave	265 ±5° C [509 ±9° F]	12 Seconds (Max)

Figure 10

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. Common cleaning solvents with times and temperatures that will not affect these connectors is specified in Figure 11.

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 an automatic in-line machine.



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 is not recommended because of harmful occupational and environmental effects. Both are carcinogenic (cancer-causing).

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 11



NOTE

If a particular cleaning solvent is not listed, contact PRODUCT INFORMATION at the number at the bottom of page 1.

D. Drying

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

3.14. Checking Installed Connector

The AMPLIMITE Right-Angle All Plastic Housing PC Board Connector must be seated on the pc board to the dimensions shown in Figure 12.

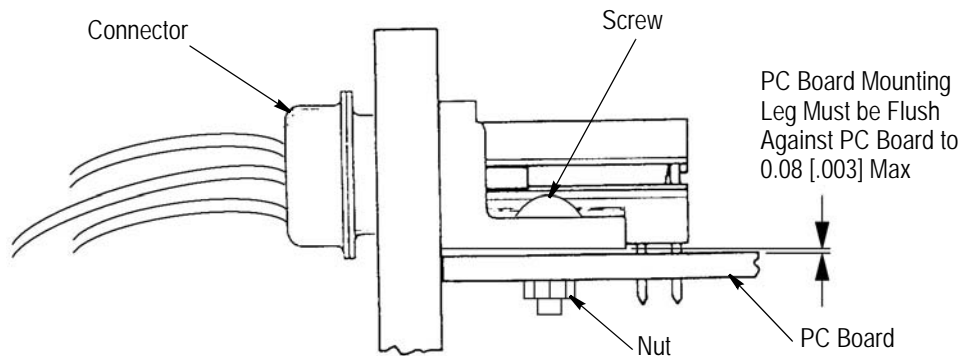


Figure 12

3.15. Repair/Removal

If the connector should become damaged, it must be replaced. The connector may be removed from the pc board by normal desoldering methods and replaced with a new connector.



CAUTION

When repairing or replacing AMPLIMITE Right-Angle All Plastic Housing PC Board Connectors, be careful not to damage other pc board components during the desoldering process.

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

4. QUALIFICATIONS

AMPLIMITE HD-20 Right-Angle All Plastic Housing PC Board Connectors are Recognized by the Component Program of Underwriters Laboratories Inc.(UL), File No. E28476; and are Certified by CSA International in File No. LR 7189.

5. TOOLING

These connectors are designed for hand placement on the pc board and require no special tool when handling them. The only concerns are to handle the connector by the flange only to avoid touching the solder tines which could deform or contaminate the tines, and to provide a backup support that will allow the contact tines to pass through the pc board without deforming them.

6. VISUAL AID

The illustration below shows a typical application of this product. 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.



NOTE

A composite of various types of hardware used illustrates available options. In an actual application, hardware used to mount connector will be identical, as will the hardware used for connector mating.

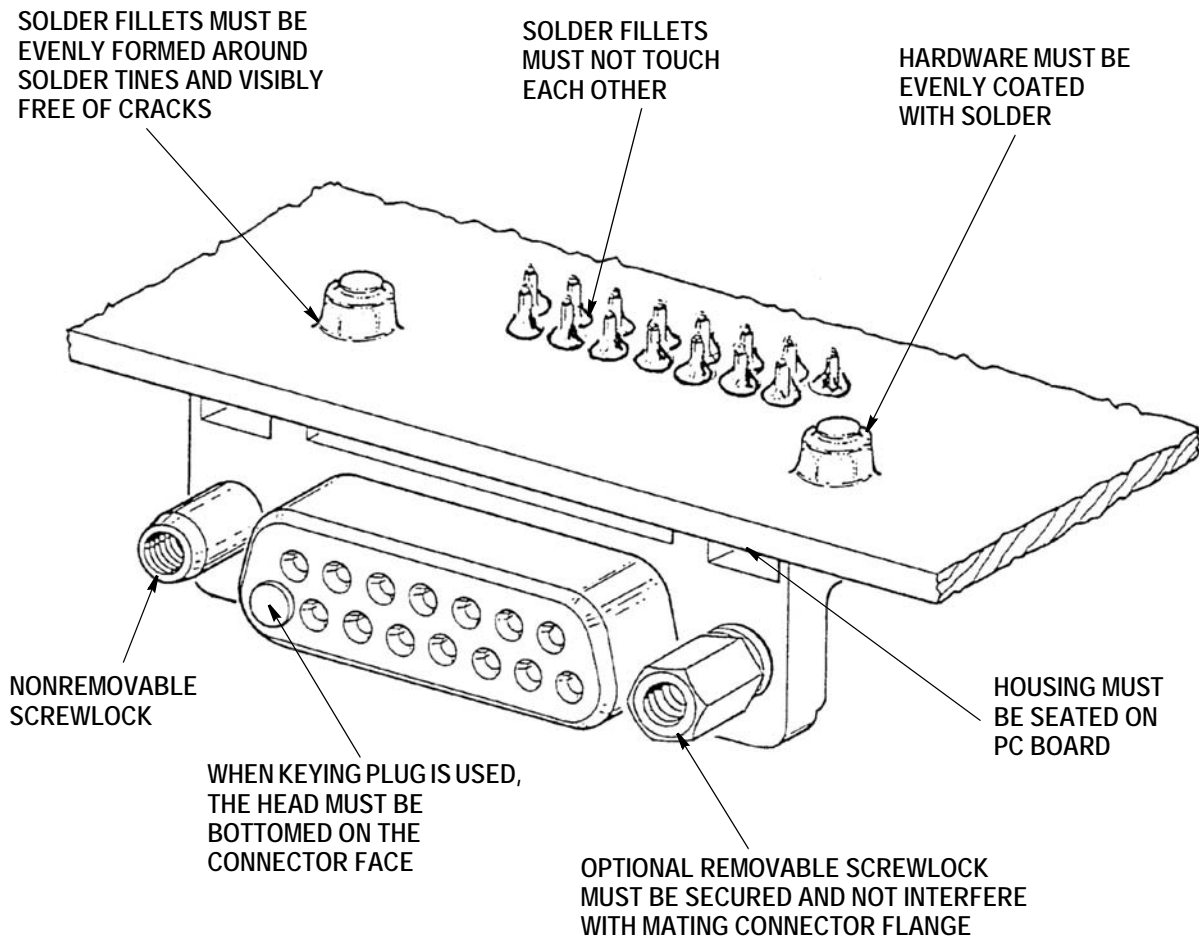


FIGURE 13. VISUAL AID