



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  $\pm 0.13$  [ $\pm 0.005$ ] 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-HDI 2.54 mm [.100 in.] Centerline Connectors and related items. The connectors are available in four types: vertical pin assemblies with ACTION PIN\* contacts or solder posts, right-angle receptacle assemblies with solder tails, right-angle pin assemblies with solder posts, and three-row assemblies designed to fit Eurocard footprints.

When corresponding with TE Connectivity 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.

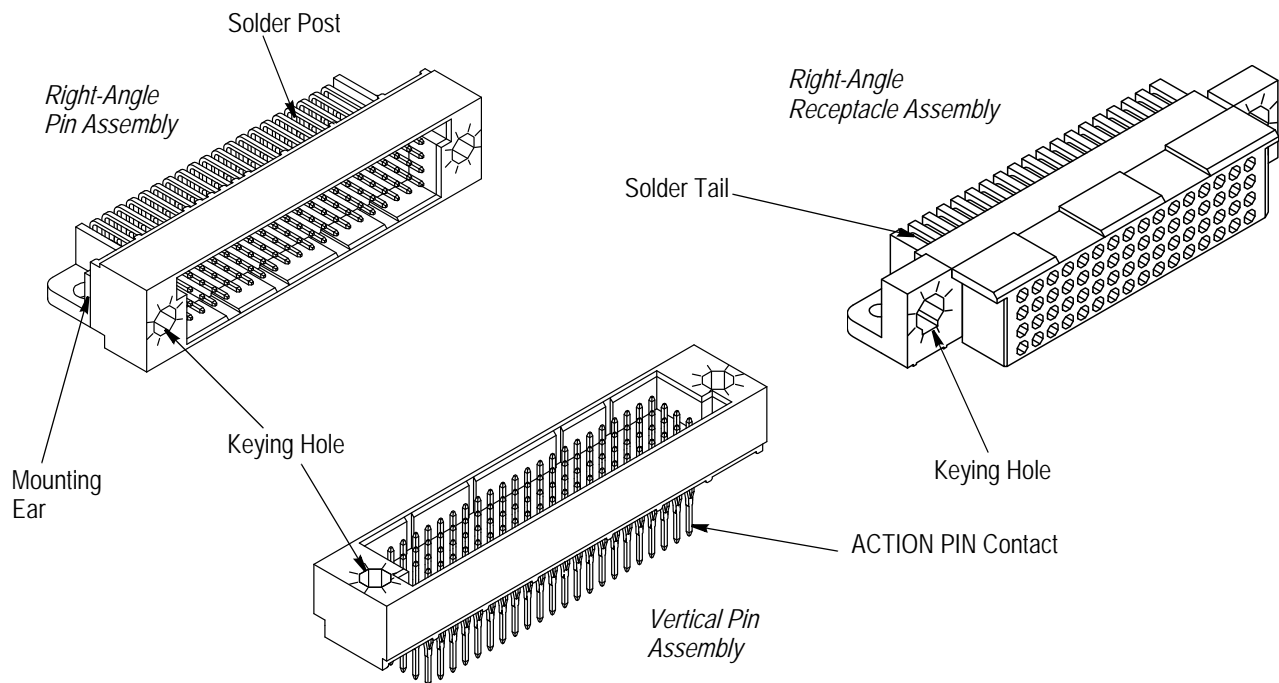


Figure 1

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

- Updated document to corporate requirements
- New format and new logo
- Added new text and renumbered text areas throughout document
- New artwork in Figures 1 and 11 and deleted artwork in Figure 11

### 2.2. Customer Assistance

Reference Part Number 533404 and Product Code 5248 are representative numbers of AMP-HDI 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 TE Representative or, after purchase, by calling the Tooling Assistance Center or Product Information number at the bottom of this page.

### 2.3. Drawings

Customer Drawings for specific products 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 TE.

### 2.4. Specifications

Product Specification 108-9063 is available to 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 instruction sheets (408-series) that provide assembly procedures for product, operation, maintenance and repair of tooling, as well as setup and operation procedures of applicators; and customer manuals (409-series) that provide setup, operation, and maintenance of machines.

<u>Document Number</u>	<u>Document Title</u>
408-2636	Contact Replacement Tool 265871-[ ] for ACTION PIN Contacts
408-6626	Clinching Tool 91117-3
408-6909	AMP-HDI Connector Jackscrew Hardware Kits, Guide Pins, and Guide Pin Kits
408-9007	AMP-HDI High Density Interconnection Printed Circuit (PC) Board Connectors
408-9038	Seating Tools 58172-[ ] for AMP-HDI Connectors
408-9141	Alignment Tools 532925-2, 58294-1, and 58302-[ ]
408-9178	Clinching Tool 91117-5 for Two-Row AMP-HDI Connectors

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the connector housing material.

#### B. Shelf Life

The connectors should remain in the shipping containers until ready for use to prevent deformation to the contacts. The connectors 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 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



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

### 3.2. PC Board Requirements

#### A. Material

The pc board material shall be glass epoxy (FR-4, G-10). Contact the Product Information Center number listed at the bottom of page 1 for suitability of other board materials and thicknesses.

**B. Thickness**

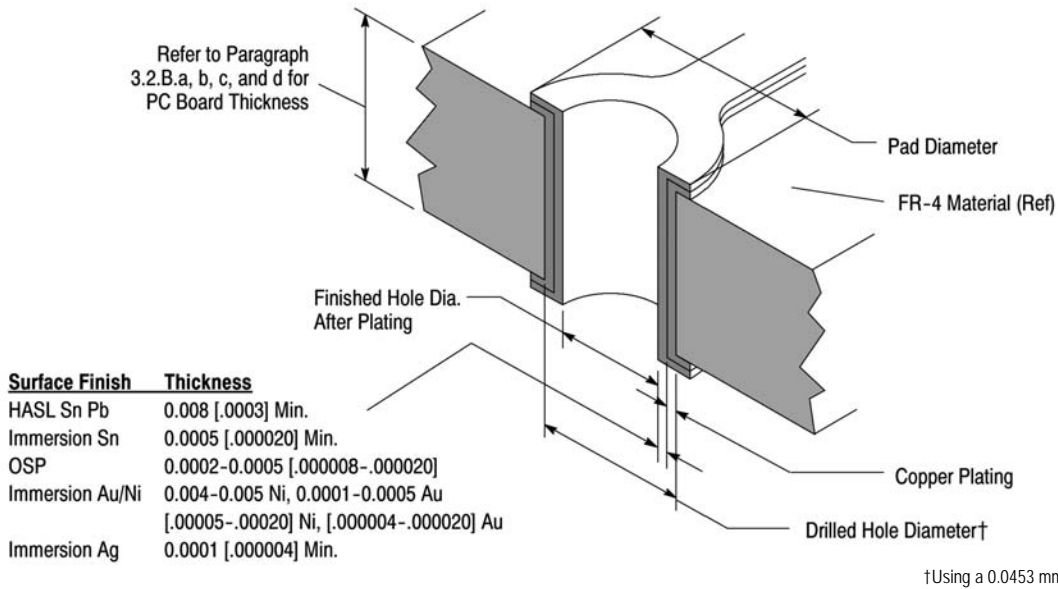
- a. Vertical pin assemblies with ACTION PIN contacts require a minimum pc board thickness of 2.13 mm [.084 in.].
- b. Vertical pin assemblies with solder posts require a pc board thickness of 1.57 to 3.18 mm [.062 to .125 in.].
- c. Receptacles and right-angle pin assemblies with solder tails or posts 3.05 mm [.120 in.] long require a pc board thickness of 1.57 mm [.062 in.].
- d. Receptacle and right-angle pin assemblies with solder tails or posts 4.57 mm [.180 in.] long require a pc board thickness of 2.36 to 3.18 mm [.093 to .125 in.].

**C. PC Board Layout**

For pc board layouts, contact PRODUCT INFORMATION at the bottom of page 1 for your specific customer assembly drawing.

**D. Hole Dimensions**

Values specified in Figure 2 must be complied with to ensure proper performance. The drilled hole diameter and the copper plating thickness are of major importance and must be adhered to.



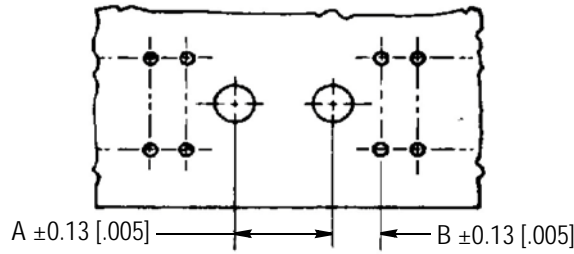
CONTACT TYPE	PC BOARD HOLE					PC BOARD PAD (MIN DIA)
	TYPE	DIAMETER		PLATING THICKNESS		
		DRILLED	AFTER PLATING	COPPER (KNOOP-150 MAX)	SURFACE FINISH	
ACTION PIN	Plated-Through	1.125-1.176 [.0443-.0463]	1.02 [.040] (Ref)	0.03-0.08 [.001-.003]	See Surface Finish/Thickness Callout in Above Illustration	1.57 [.062]
Solder Tine	Plated-Through	1.15 [.045]	0.94-1.09 [.037-.043]	0.03-0.08 [.001-.003]		Hole Dia Plus 0.51 [.020] Min

Figure 2

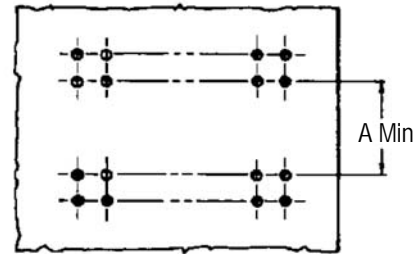
**E. Clearances**

End-to-end applicator tooling clearances are functions of the housing. Side-to-side clearances are functions of the housings, post or tail lengths, and heights of components mounted on daughter boards. Clearance envelope requirements shall be as indicated in Figure 3.

End-to-End Clearance



Side-to-Side Clearance



END-TO-END CLEARANCE

CONNECTOR TYPE	A	B
Vertical Pin	7.87 [.310]	6.98 [.275]
Vertical Pin with Eurocard Footprint	5.03 [.198]	5.61 [.221]
Receptacle and Right-Angle Pin	7.87 [.310]	6.98 [.275]
Receptacle and Right-Angle Pin with Eurocard Footprint	5.21 [.205]	5.08 [.200]

SIDE-TO-SIDE CLEARANCE

SOLDER POSTS	A	---
3.05 [.120]	7.37 [.290]	---
4.57 [.180]	8.89 [.350]	---

Figure 3

### 3.3. Ancillary Items

Ancillary items may be obtained from TE to expand the capabilities of a board system using AMP-HDI connectors.

#### A. External Keying

External keying provides 64 positions for connector polarization. Each connector keying area is number coded to aid in key positioning. Key application is illustrated in Figure 4; complete information on key part numbers, installation, and tooling is contained in Instruction Sheets 408-6626 and 408-9178.

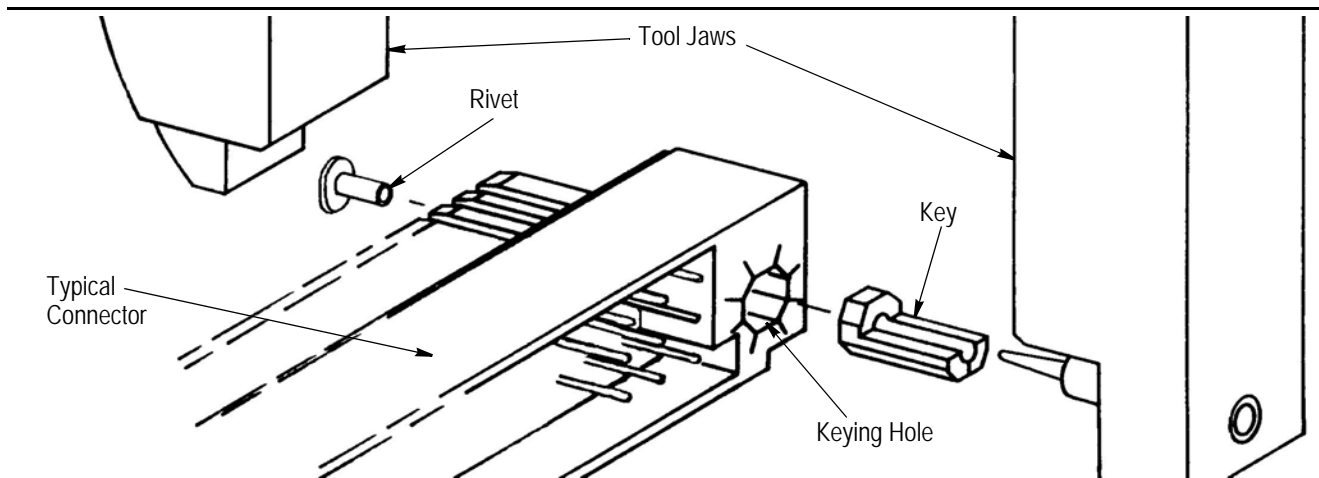


Figure 4

#### B. Polarization and Quick-Mate/Unmate

Polarization with a positive, quick-mate/unmate feature can be achieved through the use of jackscrew hardware kits. Jackscrews are available in male and female versions; fixed for use with receptacles and turnable for use with pin assemblies. Figure 5 illustrates the kits and shows special assembly requirements for turnable jackscrews. For complete information pertaining to jackscrew hardware kits, see Instruction Sheet 408-6909.

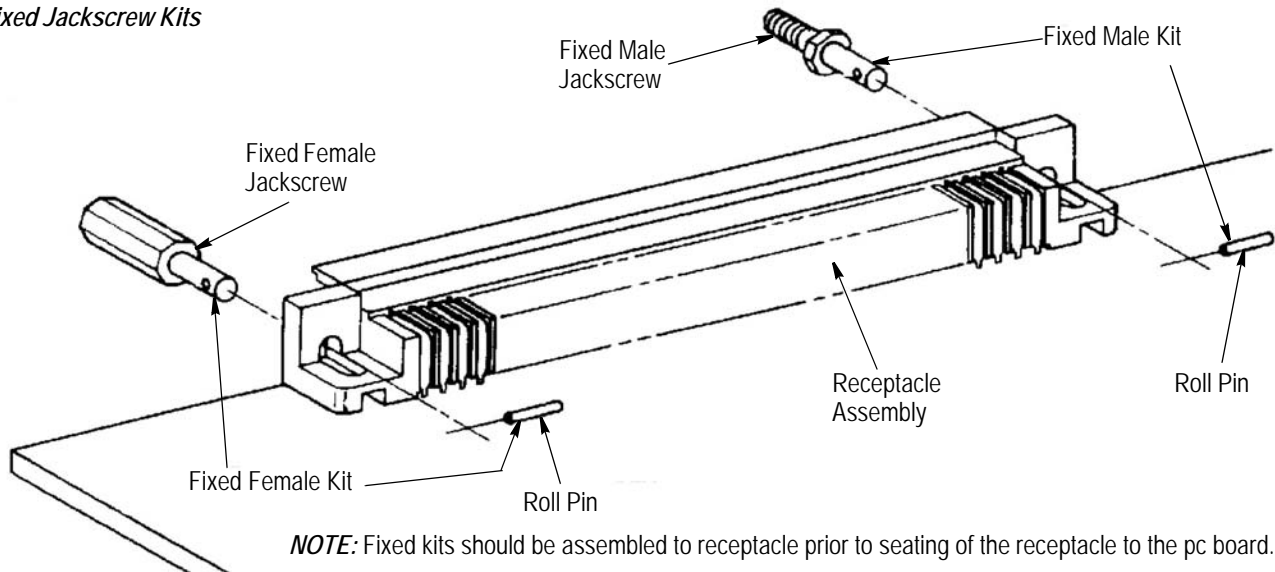


Jackscrews and external keys are mutually exclusive. If a large number of same-size connectors is to be used, the keys offer the greatest polarization advantage.

**C. Guide Pins**

Instruction Sheet 408-6909 also contains information pertaining to the use of guide pins. Guide pins help with the alignment of large-size connectors, allowing reliable mating with as much as 2.03 mm [.080 in.] total misalignment. The guide pins are available separately or in kits which include attaching hardware (see Figure 5).

*Fixed Jackscrew Kits*



*Turnable Jackscrew Kits*

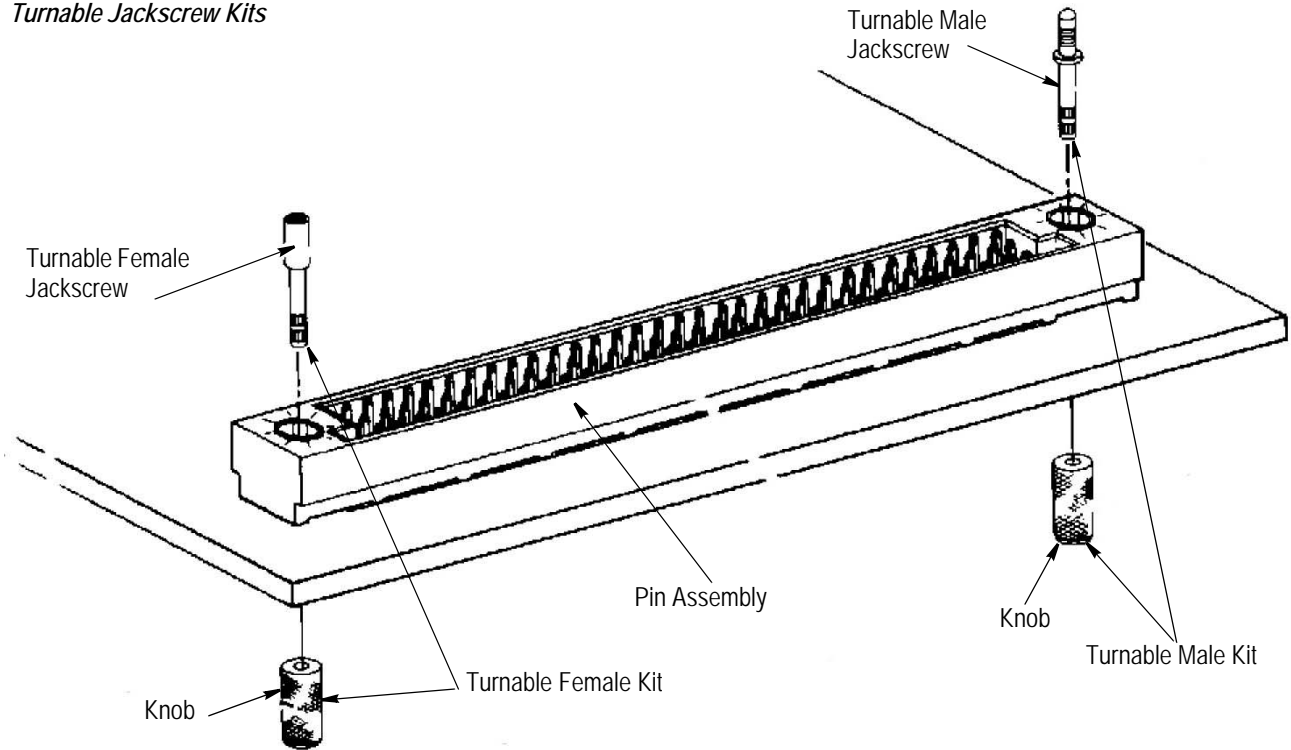
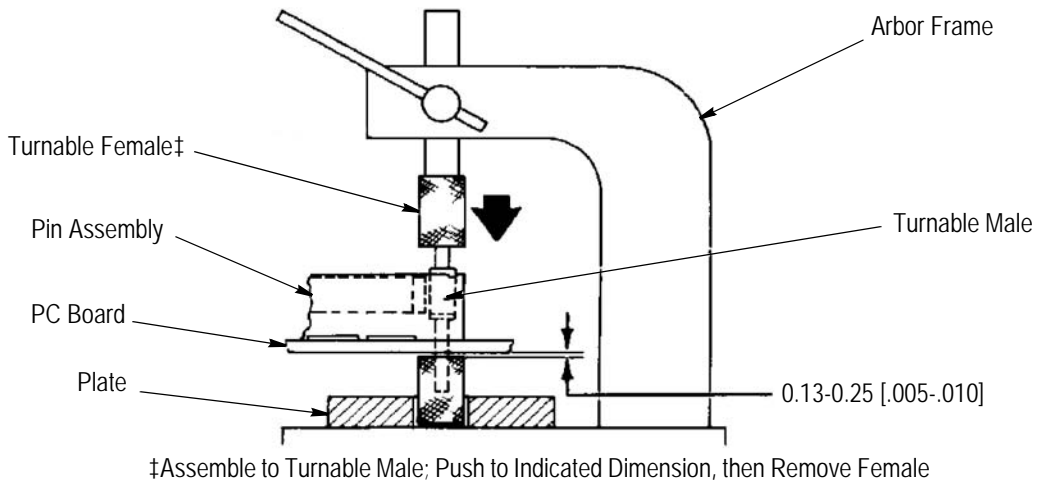


Figure 5 (Cont'd)

*Assembly of Turnable Male*



*Assembly of Turnable Female*

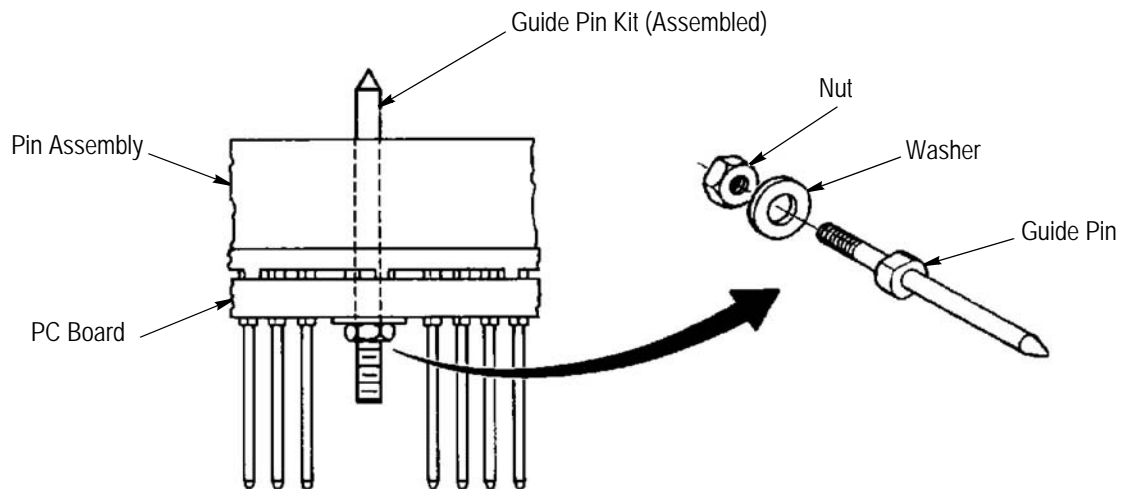
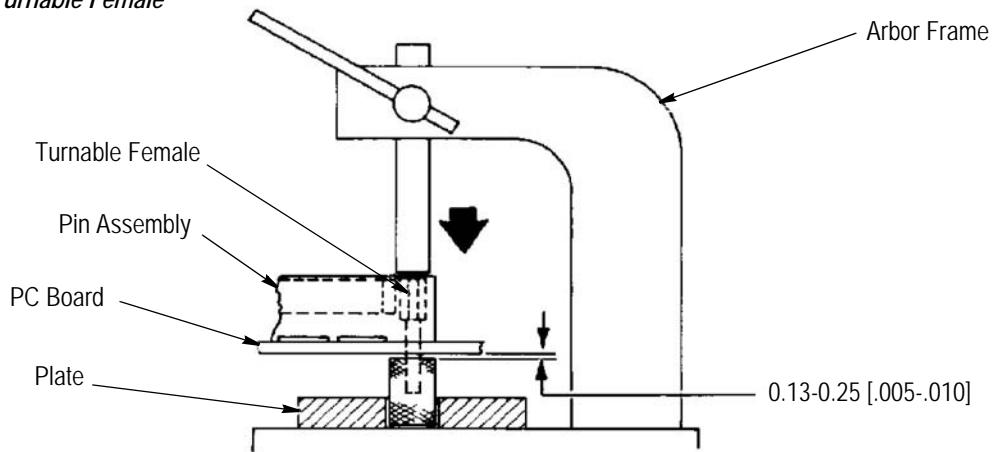


Figure 5 (End)

### D. Shrouds for Feed-Through Applications

Mating capabilities may be expanded through use of a shroud. When a shroud is used, the operator shall ensure that the proper size is selected and that the shroud is applied in correct polarization to its mating connector. The shroud shall be manually pressed over the pins until it bottoms evenly on the mother board as shown in Figure 6.

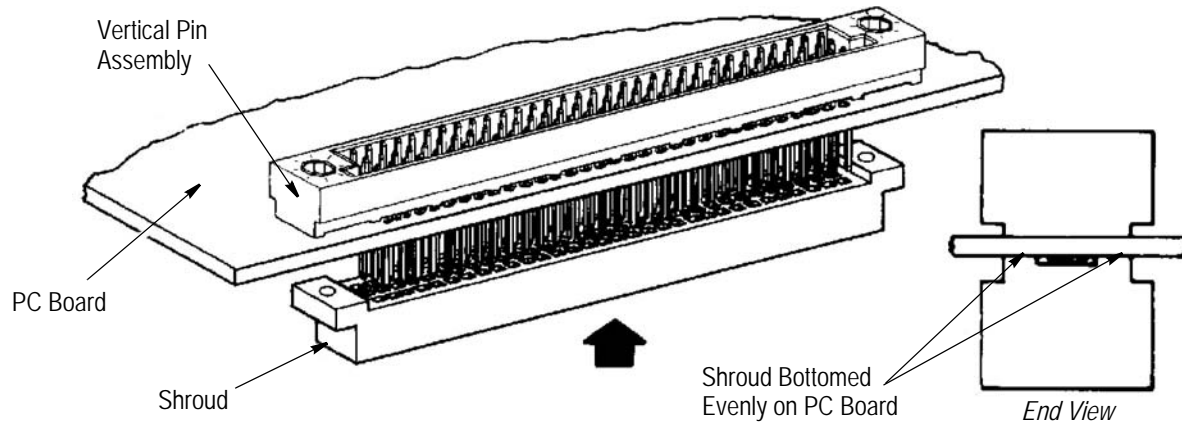


Figure 6

### E. Mounting Ear Kit

The right-angle pin assemblies contain 0.64 mm [.025 in.] square solder posts, but no method of attachment to the pc board. It is recommended that TE Mounting Ear Kits 533050-1 for three- and four-row right-angle pin assemblies, and 533069-1 for two-row pin assemblies be used to secure the products to the pc board.

The kits are purchased as separate items from the pin assembly. A typical application is shown in Figure 7.

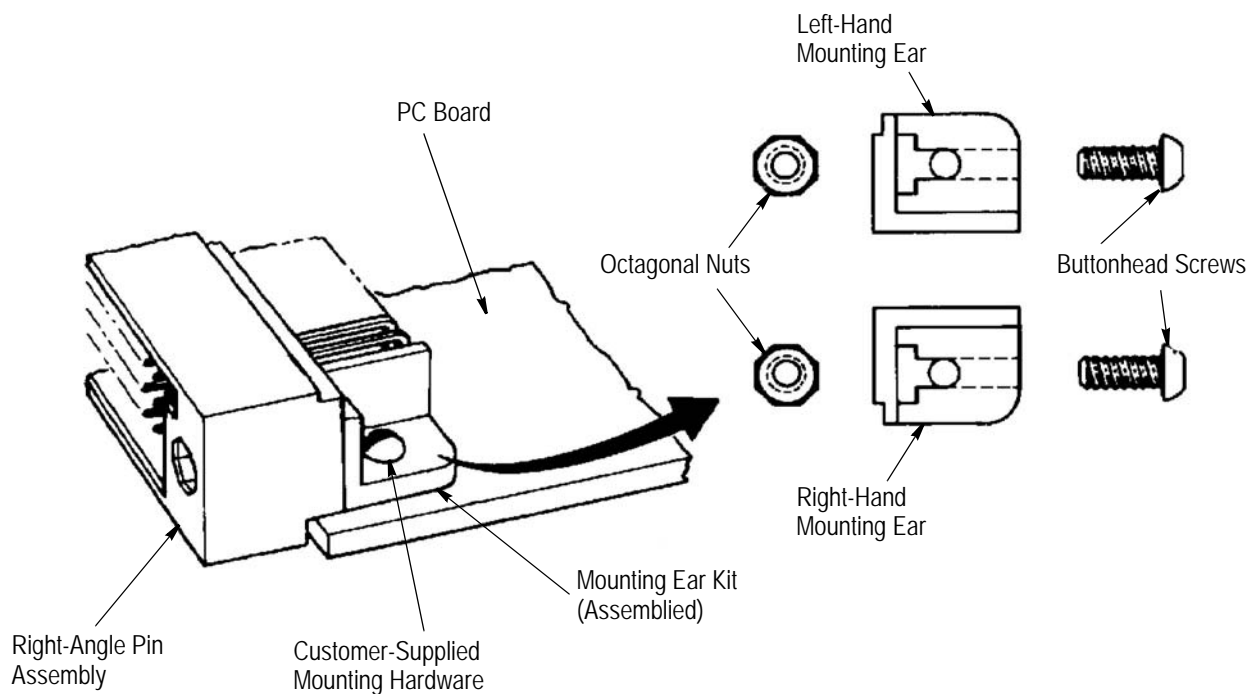


Figure 7

### 3.4. Alignment Tooling

The alignment tool shown in Figure 8 is used to align solder tails of receptacle assemblies, facilitating a smooth seating process. For complete information on proper tool selection and use, refer to Instruction Sheet 408-9141.

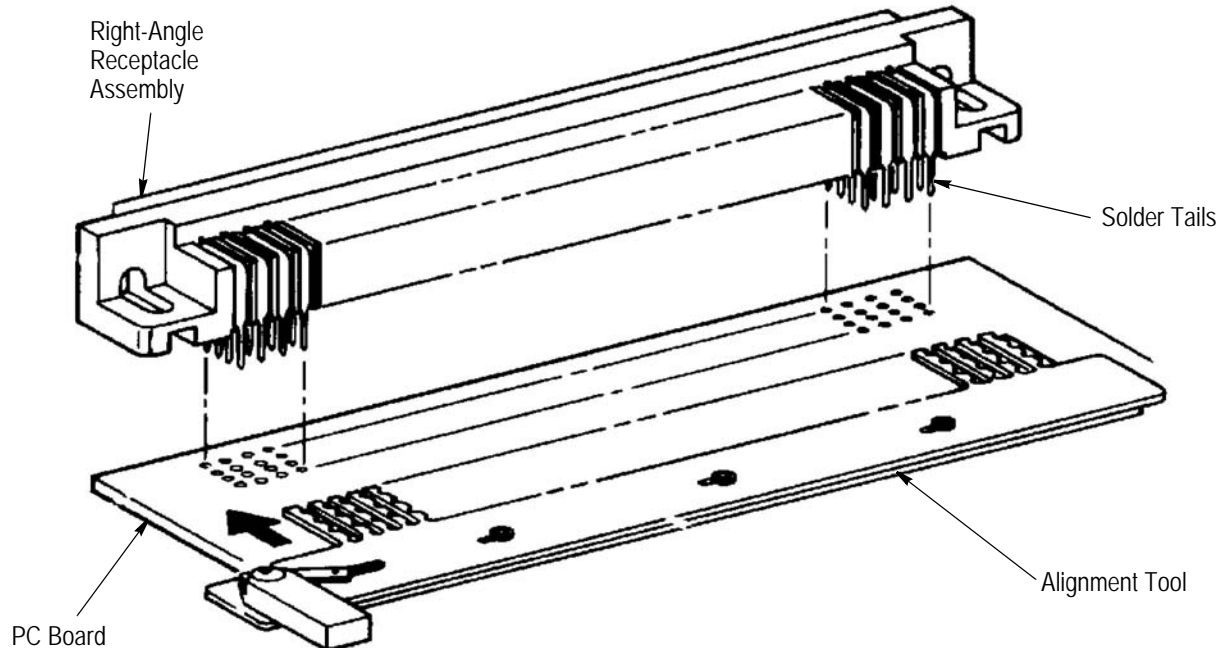


Figure 8

### 3.5. Cleaning and Soldering

Cleaning and soldering shall be according to the following guidelines:

#### A. Fluxing

Solder tails and posts shall be fluxed prior to soldering using a medium active rosin or a medium to highly active organic flux. Proper flux selection depends on the type of pc board and any components already mounted. Flux must also be compatible with customer's flow solder line and with manufacturing and safety requirements.

#### B. Flux Removal

Removal of fluxes, residues, and activators is mandatory. Cleaning procedures are chosen by the customer and depend on the type of flux used on the solder line.

#### C. Soldering Guidelines

Refer to Paragraph 2.5 for information on soldering provided in Manual 402-40.

### 3.6. Connector Seating

Vertical pin assemblies with ACTION PIN contacts shall be seated with the assistance of the following tools as shown in Figure 9.

- A pc board support shall be supplied by the customer which provides sufficient clearance for posts during seating of the connector.
- Seating Tool 58172-[ ] shall be used to seat the connector. See Instruction Sheet 408-9038 for tool selection and use.



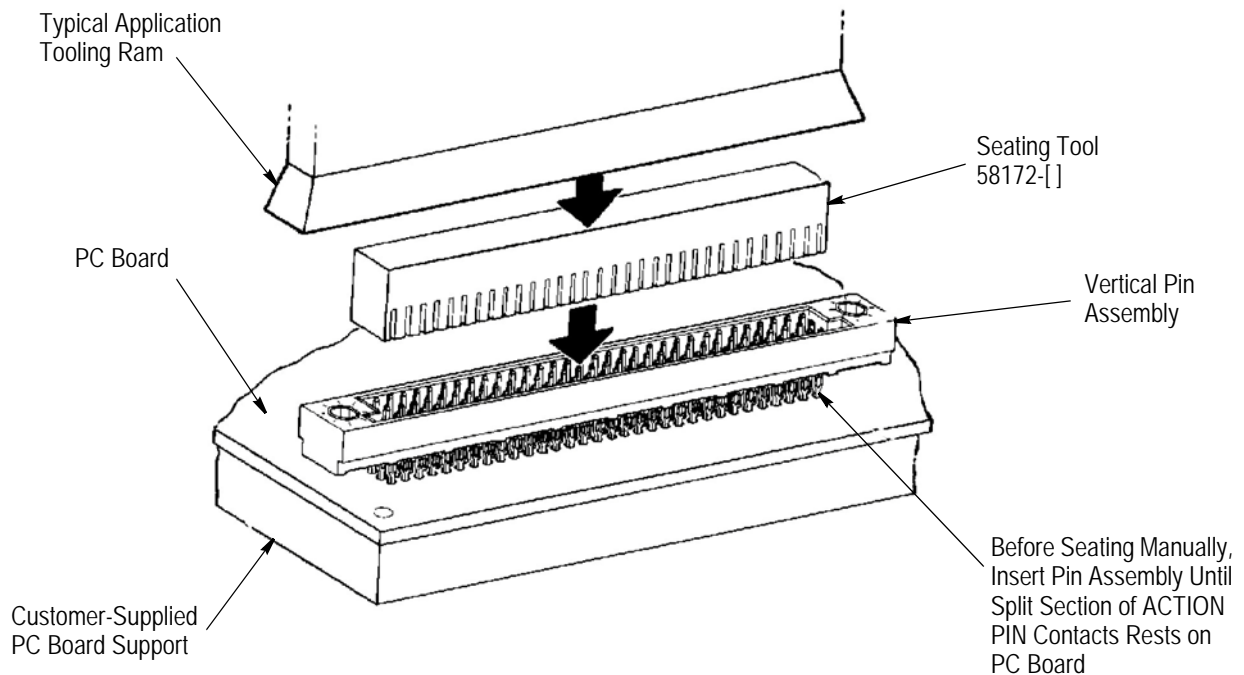


Figure 9

### 3.7. Seating Requirements

Seated AMP-HDI connectors shall meet the requirements of Figure 10.

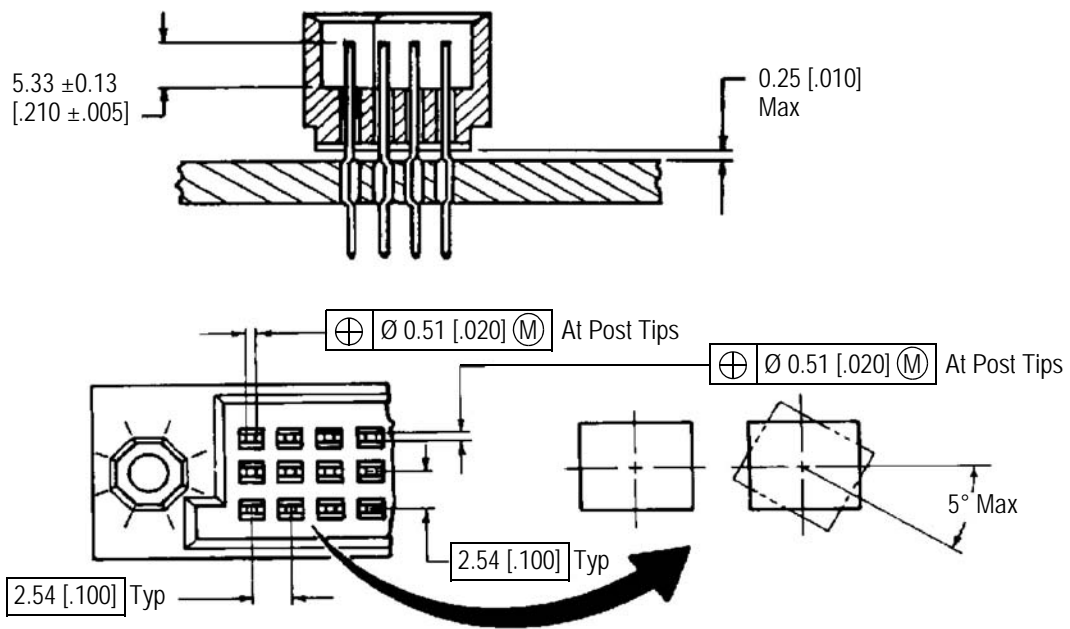


Figure 10

### 3.8. Inspection



*When using an electrical test probe to inspect a connector, probe the solder side and NOT the mating face side of the contacts. This should ensure that damage will not occur to the connector housing.*

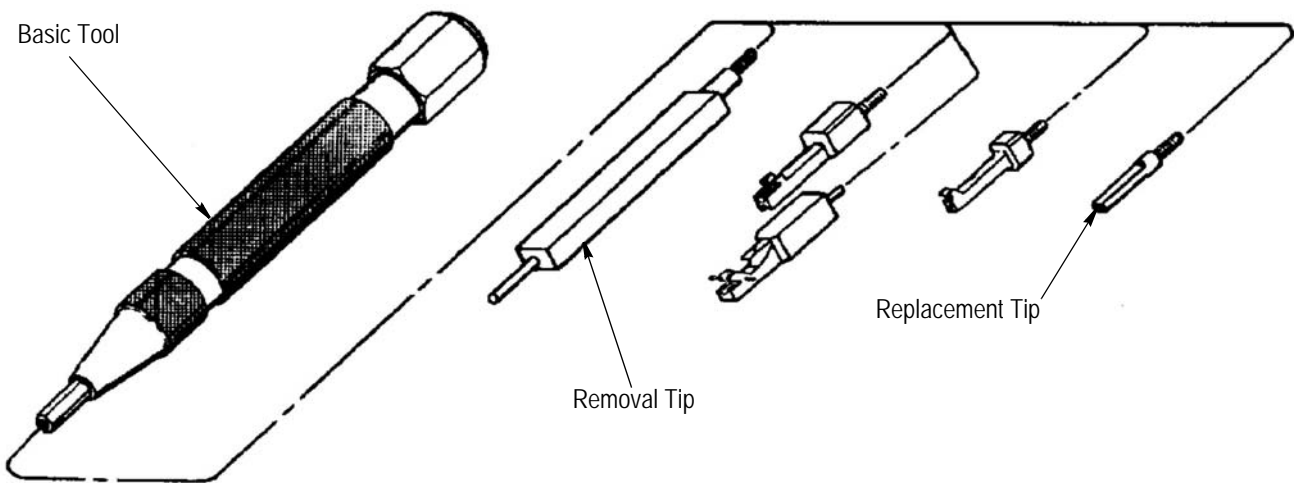
### 3.9. Damaged Contacts

Damaged individual ACTION PIN contacts can be removed and replaced using the Pin and Contact Replacement Tool Kit 265871-1 (refer to Instruction Sheet 408-2636). This tool is illustrated in Figure 11.



*If the damaged contact is soldered to the pc board, a hot soldering iron tip held against the contact will allow removal using the above-mentioned tooling. DO NOT hold soldering iron against the pc board or panel. To clean and size the hole for contact replacement, use a [.038-in.] drill bit. DO NOT re-sue damaged contacts.*

*Pin and Contact Replacement Tool Kit 265871-1*



*Figure 11*

## 4. QUALIFICATIONS

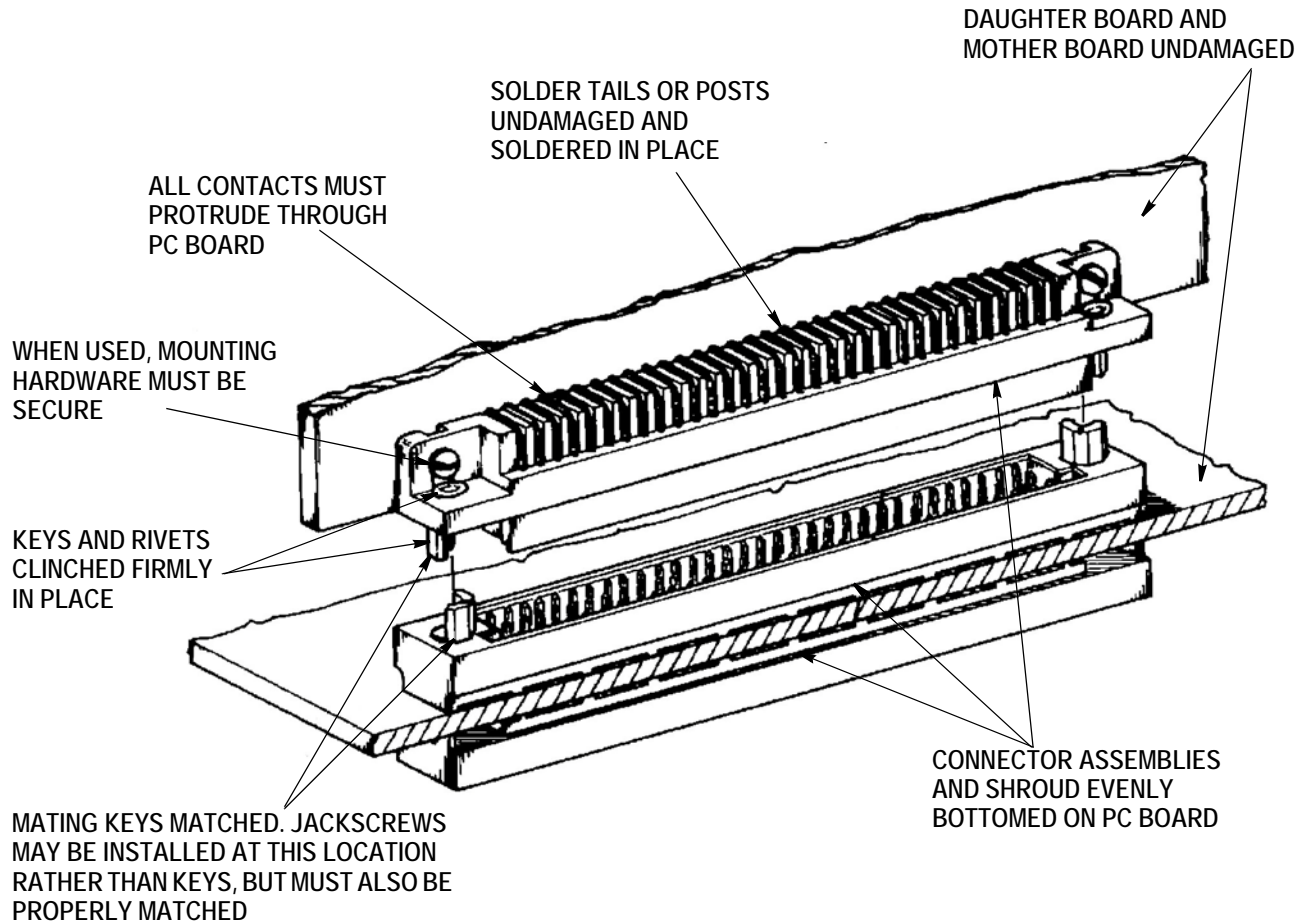
AMP-HDI Connectors are Recognized by Underwriters Laboratories Inc. in File E28476 and Certified to CSA International in File LR7189.

## 5. TOOLING

Connectors with solder tails or posts shall be applied manually and soldered in place in compliance with the requirements of this specification.

## 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.



**FIGURE 12. VISUAL AID**