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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 ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers requirements for the printed circuit (pc) board-to-board application of Eurocard Connectors Types B, C, M, Q, R, and Enhanced Type C. These two-piece, 2.54 mm [.100 in.] row-to-row and in-row centerline contact connectors are designed to mate with all DIN 41612 and IEC 603-2 connectors of similar type and contact arrangement. The two- and three-row connectors are available in 32, 64, and 96 positions, as well as half sizes and expanded sizes as mating pin and receptacle connectors.

The housings are available pre-loaded with ACTION PIN* thin stock and square stock contacts (0.64 mm [.025 in.]), solder tines and wrap-type contacts in various lengths. Type M housings have contact cavities at each end that will accept solder cup, coaxial crimp-type, and solder type contacts. Multiple pin heights for connectors with make first, break last (MFBL) contacts and selective contact loading are available.

When corresponding with TE Connectivity Personnel, use the terminology provided in this specification to facilitate your inquiries for information. Basic terms and features of these components are provided in Figure 1.

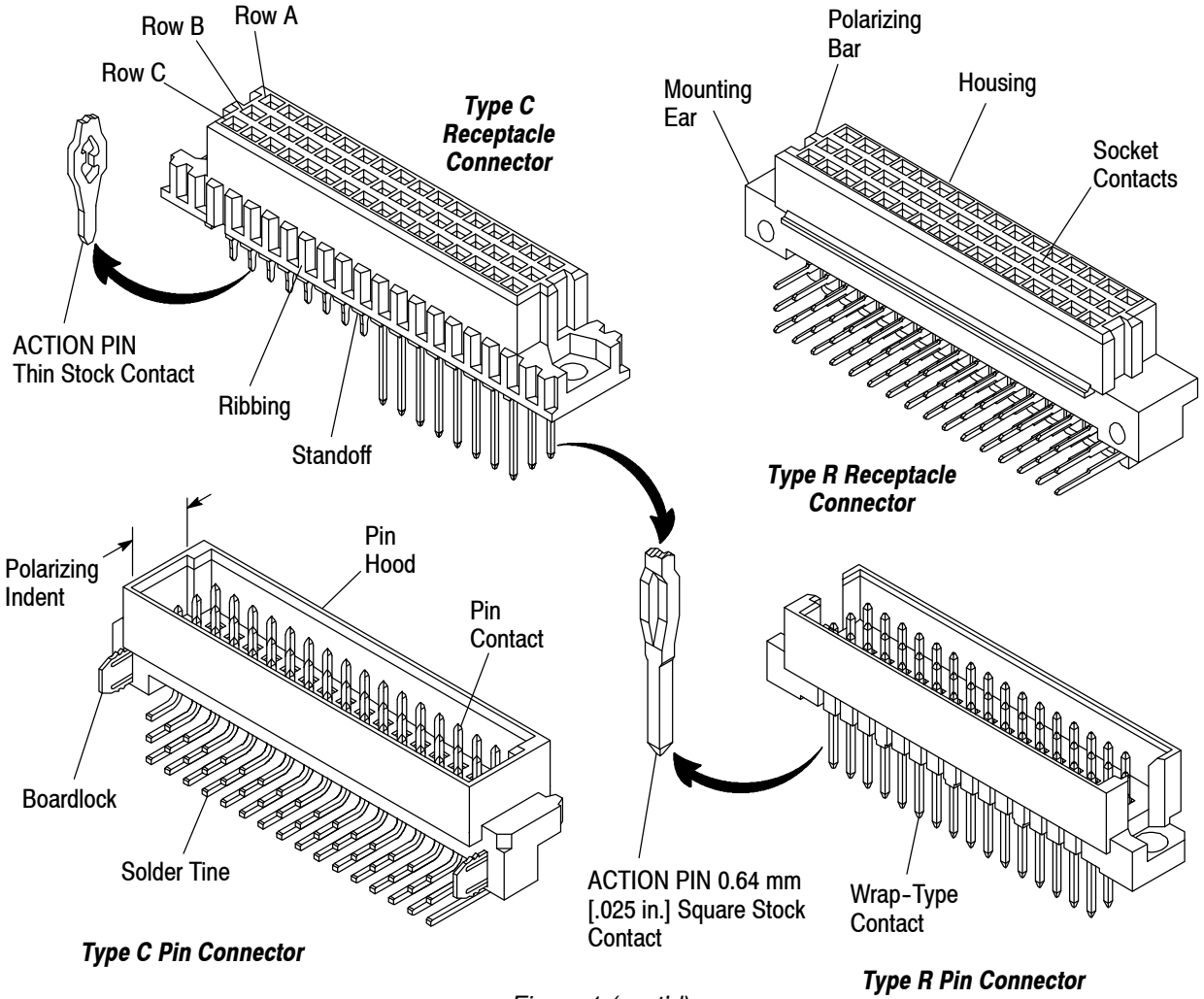


Figure 1 (cont'd)

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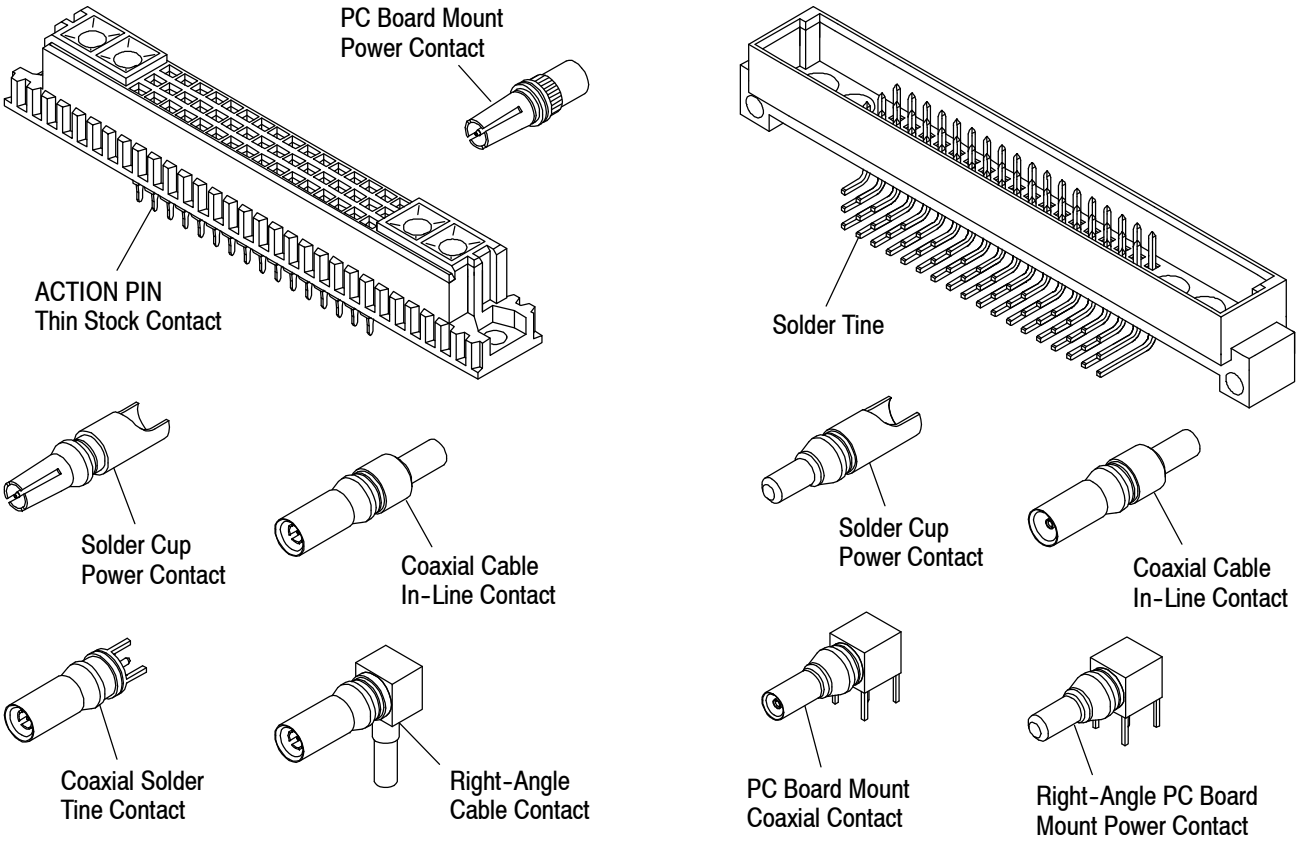


Figure 1 (end)

2. REFERENCE MATERIAL

2.1. Revision Summary

The following revision summary of changes and additions have been made to this specification for this revision.

- Updated document to corporate requirements
- Corrected dimension line in Figure 10

2.2. Customer Assistance

Product Base Part Number 535032 and Product Code 5607 are representative of Eurocard 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 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 TE.

2.4. Specifications

Product Specification 108-26003 provides information for ACTION PIN contacts. Product Specification 108-5299 contains information for ACTION PIN contacts and solder type contacts for Type Q connectors.

2.5. Instructional Material

Available instruction sheets (408-series) and customer manuals (409-series) contain detailed assembly instructions and repair procedures for product and tooling. Documents available which pertain to Eurocard connectors are:

408-9027	Adapter Kit for Greenerd Frame Assembly
408-9623	Seating Tool 535072-1 (for Type C Receptacle Connectors and Seating Tool 148090-[ ] for Type M Receptacle Connectors)
408-9740	Seating Tools 768211-[ ] (for Type R Connectors with ACTION PIN Contacts)
408-9894	Programmable Seating Tools 768216-[ ] (for Type R Connectors with MFBL Contacts)

2.6. 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.

3. REQUIREMENTS

3.1. PC Board

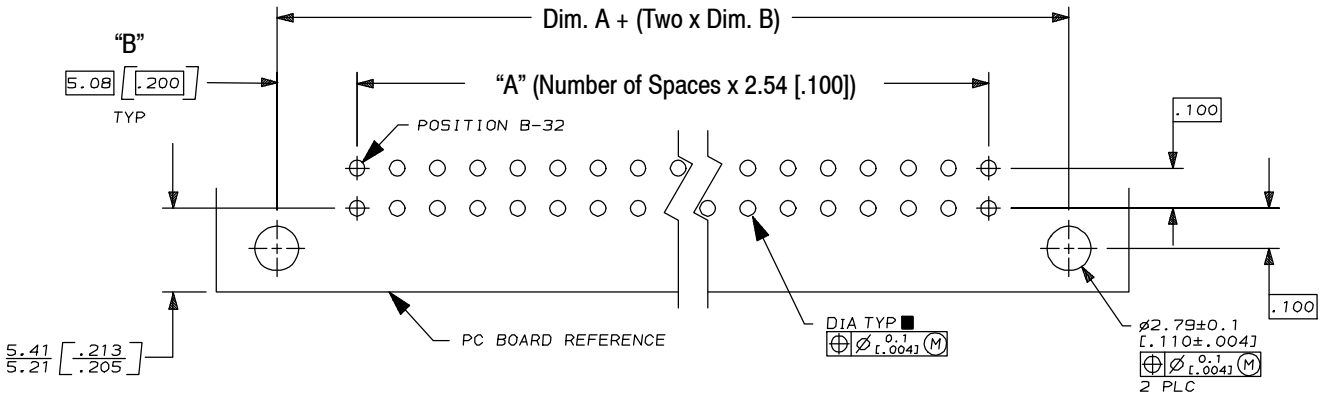
A. Thickness

1. Connectors with ACTION PIN contacts are available in two designs: one for pc boards with a minimum thickness of 1.57 mm [.062 in.] and one for pc boards with a minimum thickness 2.36 mm [.093 in.].

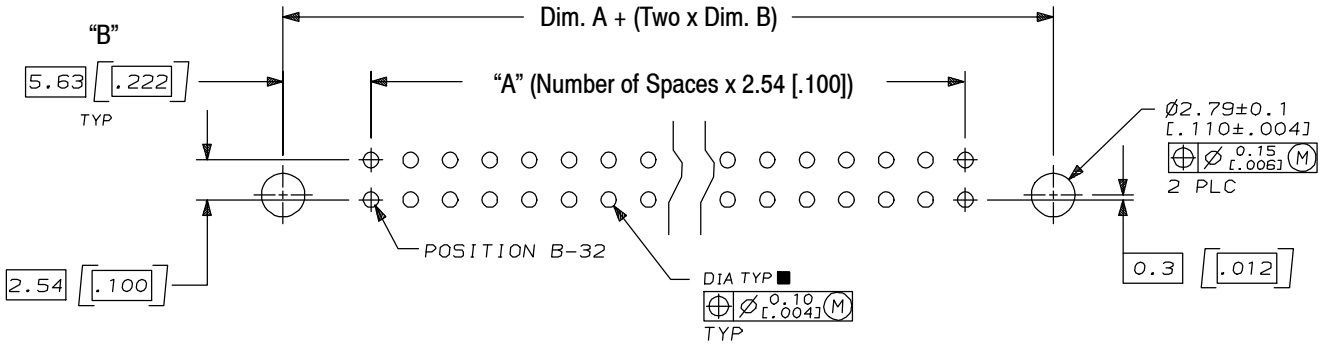
2. Connectors with solder tines or ACTION PIN thin stock contacts require a minimum pc board thickness of 1.57 mm [.062 in.].

B. Layout

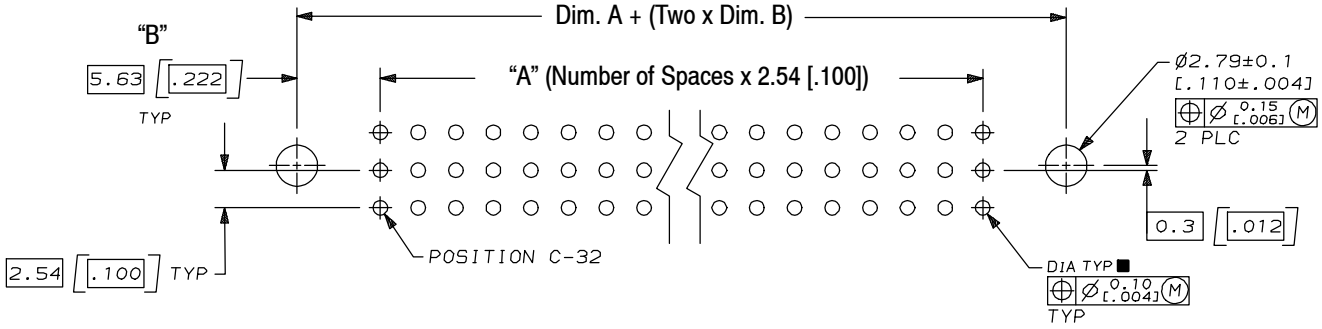
The suggested pc board layout should be as specified in Figure 2.



Type B Pin Connector and Type Q Receptacle Connector



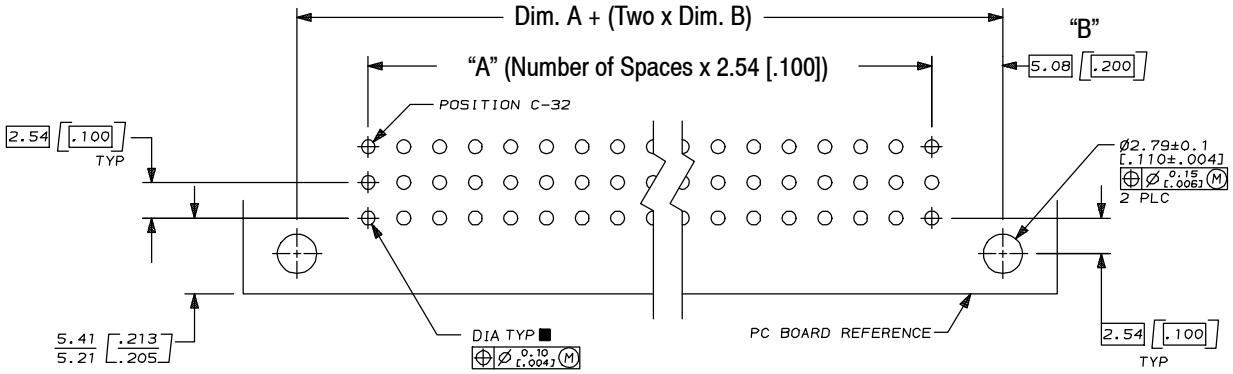
Type Q Pin Connector and Type B Receptacle Connector



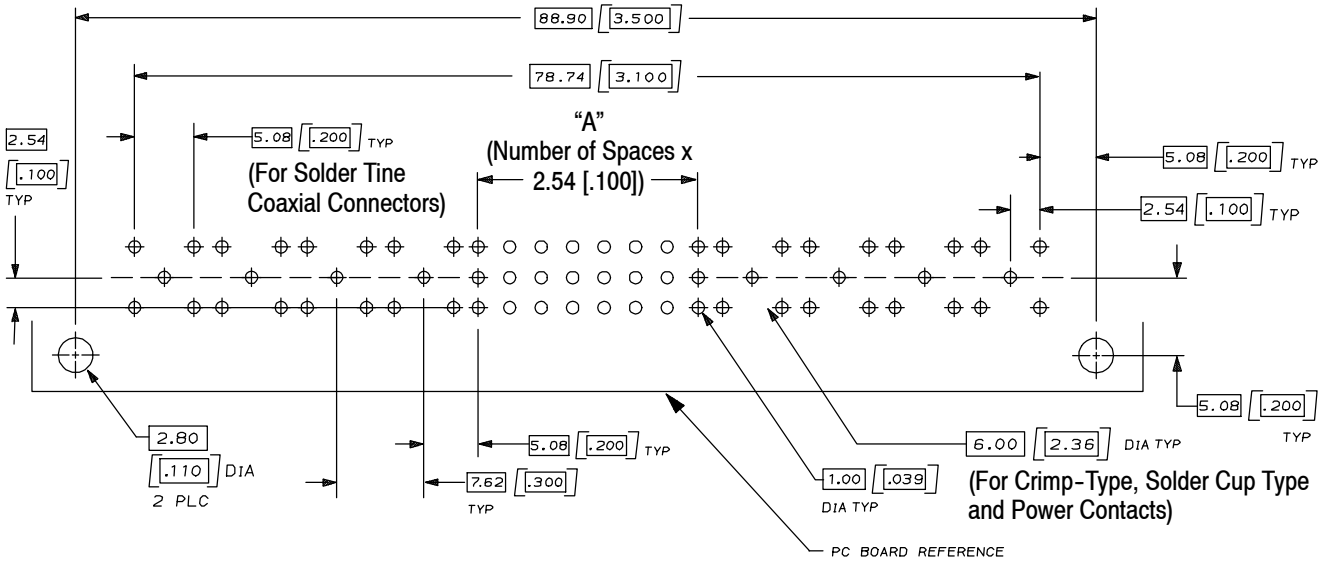
Type R Pin Connector and Type C Receptacle Connector

■ See Figure 3

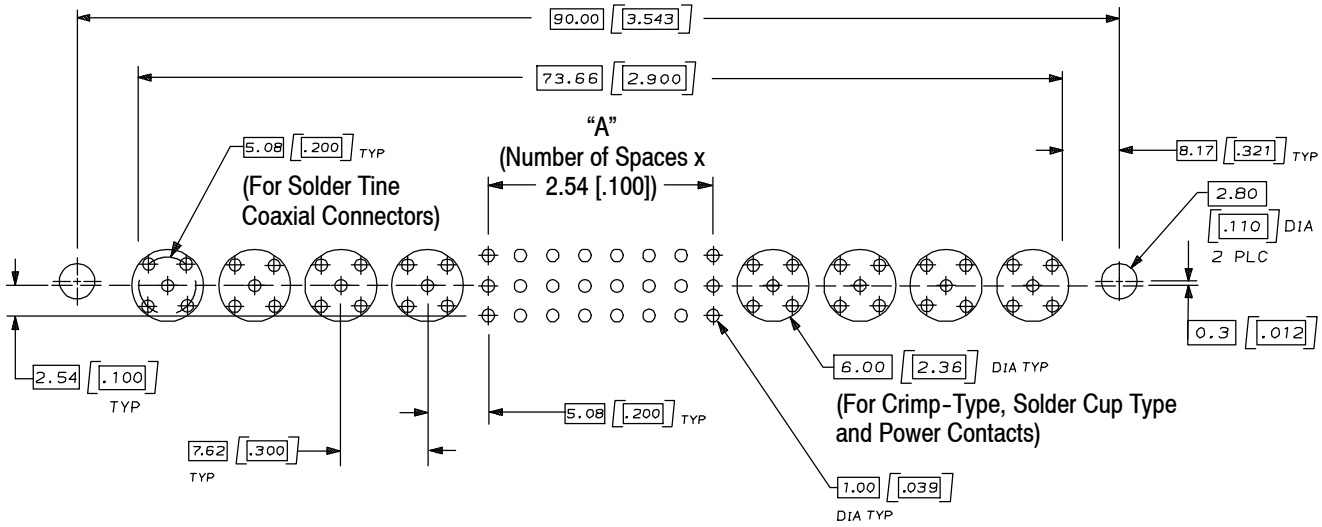
Figure 2 (cont'd)



Type C Pin Connector and Type R Receptacle Connector



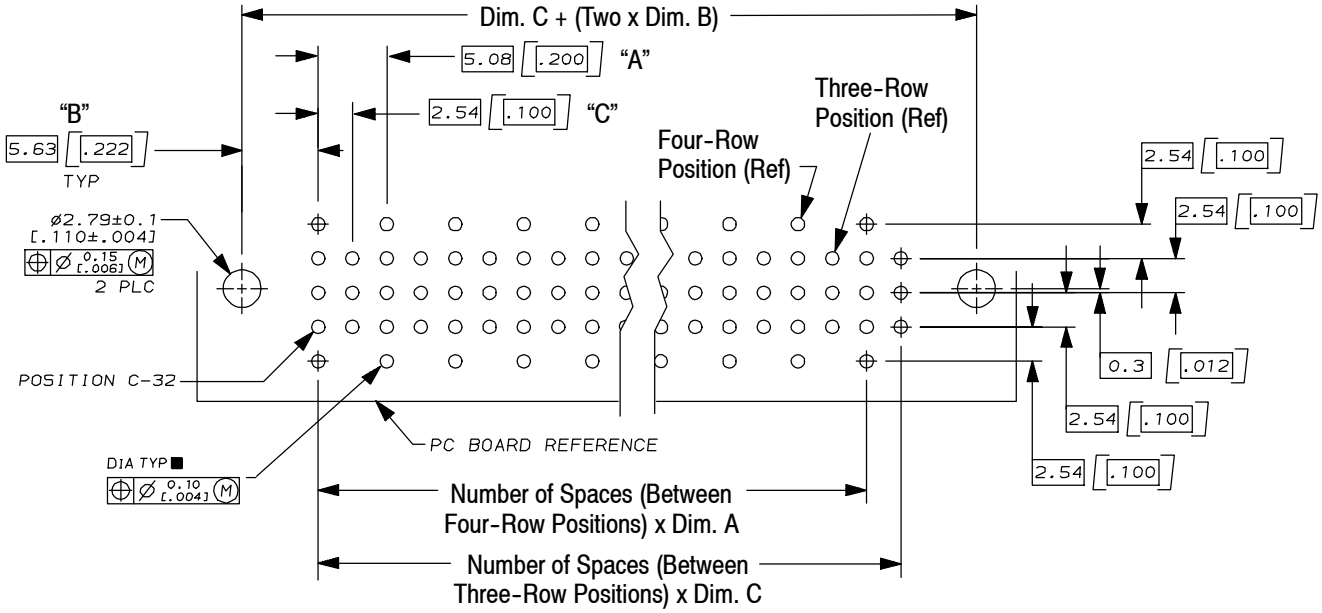
Type M Pin Connector



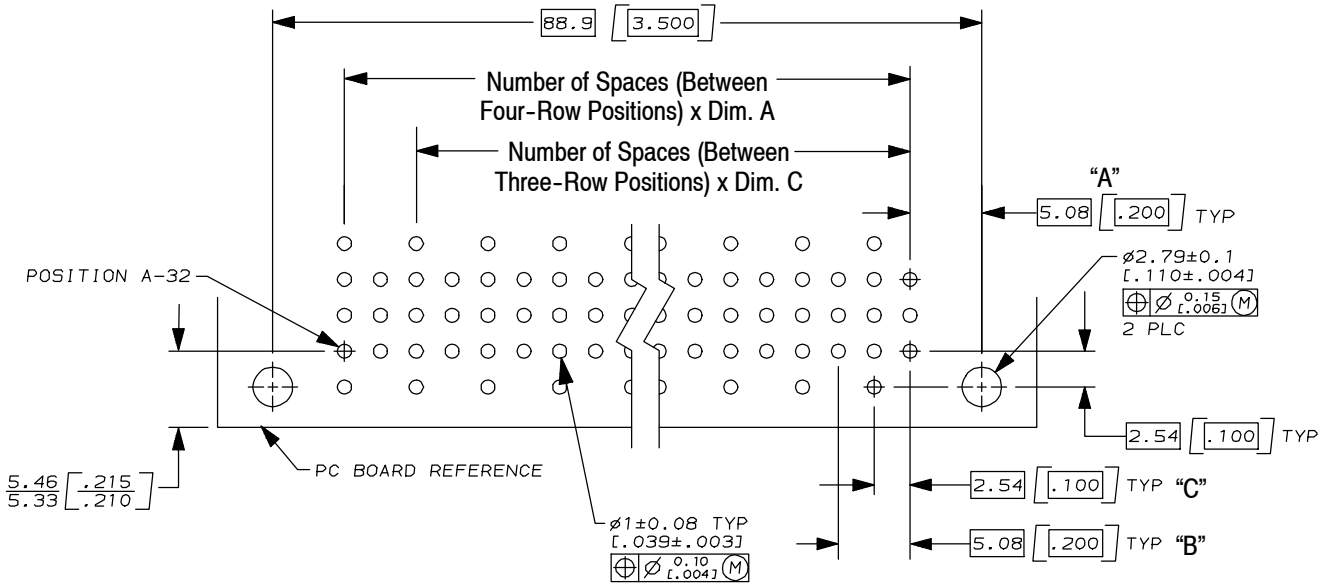
Type M Receptacle Connector

■ See Figure 3

Figure 2 (cont'd)



Enhanced Type C Receptacle Connector



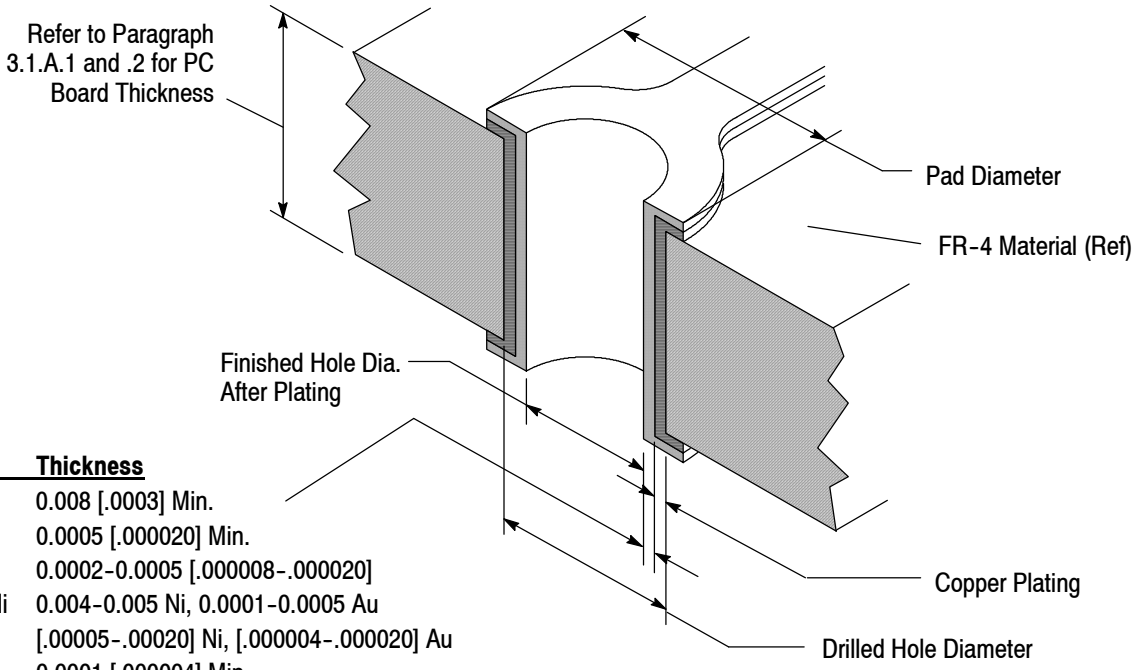
Enhanced Type C Pin Connector

■ See Figure 3

Figure 2 (end)

C. Hole Dimensions (Figure 3)

Values specified in the following 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.



Surface Finish	Thickness
HASL Sn Pb	0.008 [.0003] Min.
Immersion Sn	0.0005 [.000020] Min.
OSP	0.0002-0.0005 [.000008-.000020]
Immersion Au/Ni	0.004-0.005 Ni, 0.0001-0.0005 Au [.00005-.00020] Ni, [.000004-.000020] Au
Immersion Ag	0.0001 [.000004] Min.

CONTACT TYPE	PC BOARD HOLE					PC BOARD PAD (MIN DIA)
	TYPE	DIAMETER		PLATING THICKNESS		
		DRILLED	AFTER PLATING (REF)	COPPER (KNOOP-150 Max)	SURFACE FINISH	
ACTION PIN	Plated-Through	1.125-1.176 [.0443-.0463]◆	1.02 [.040]▼	0.03-0.08 [.001-.003]	See Surface Finish/Thickness Callout in Above Illustration	1.57 [.062]
	Plated-Through (Type Q)	0.874-0.925 [.0344-.0364]	0.80 [.031]	0.03-0.08 [.001-.003]		1.57 [.062]
	Non-Plated-Through	1.125-1.176 [.0443-.0463]	---	---	---	1.65 [.065]
Solder Tine	Plated-Through	1.125-1.176 [.0443-.0463]	0.99 [.039]	0.03-0.08 [.001-.003]	See Surface Finish/Thickness Callout in Above Illustration	Hole Diameter Plus 0.51 [.020]

◆Drilled hole diameter for immersion Au holes to be 1.151-1.201 mm [.0453-.0473 in.].
▼Finished hole diameter for immersion Au holes to be 1.04 mm [.041 in.] ref.

Figure 3

3.2. Housing Features

A. Boardlocks

The solder tine connectors are available with boardlocks which help retain the connector onto the pc board. Special application tooling or equipment is not required for connectors with boardlocks.

B. Mounting Ears and Standoffs

These connectors are designed with mounting ears in different thicknesses and spacing between standoffs. Those with larger mounting ear height and closer standoff spacing do not require a seating tool to push the ACTION PIN contacts through the pc board holes to seat the connector. Those with smaller mounting ear height and greater standoff spacing require the use of a seating tool. See Figure 4.

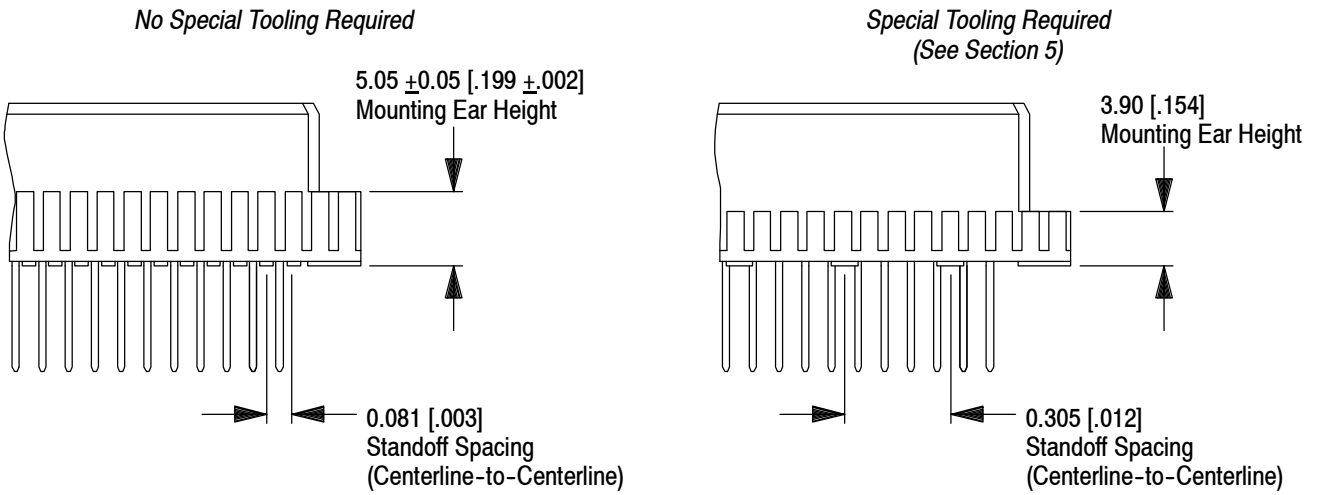


Figure 4

3.3. Mounting Hardware

Connectors are designed to be secured to the pc board with commercially available M2.5 mounting screws and nuts. See Figure 5.

3.4. Polarizing Feature and Keying

Each pin and receptacle connector has a polarizing bar and indent that ensures correct orientation for mating. When more than one pin and receptacle connector of the same configuration are used in an area, they can be keyed to prevent mis-mating. Keying strips and keying plugs are available. See Figure 5.

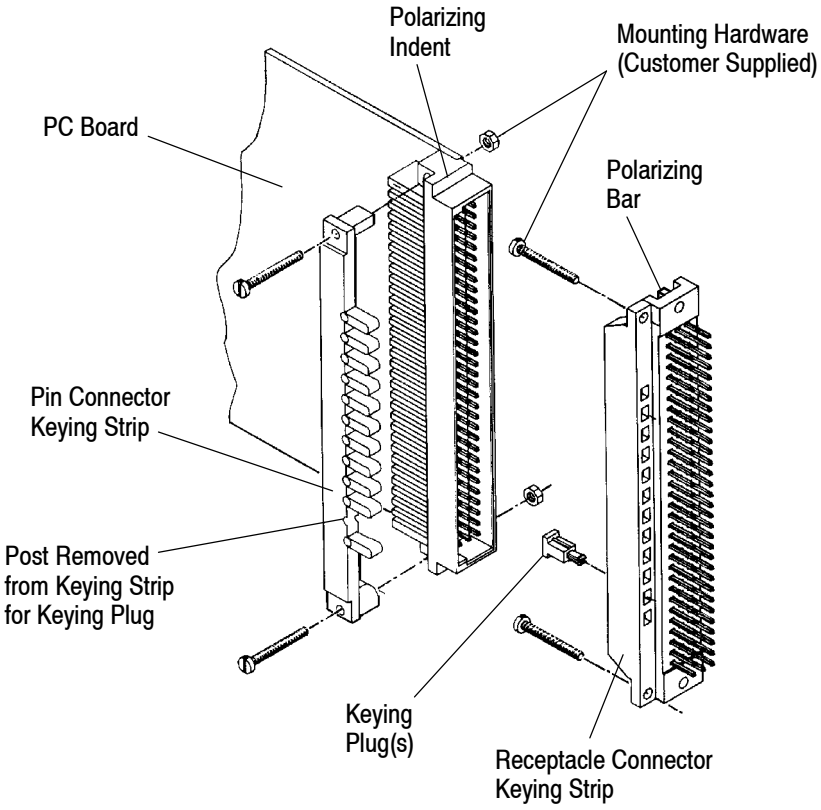


Figure 5

3.5. Wrap-Type Contacts

The wrap-type contacts available in these connectors will accommodate one or two wire wrap applications. It is recommended that 8 to 10 turns of solid wire be wrapped when using wire size 32 AWG, 7 to 9 turns when using wire size 30 or 28 AWG, and 6 to 7 turns when using wire size 26 AWG. The wire must be tightly wrapped to achieve reliable wrap-type terminations. See Figure 6.

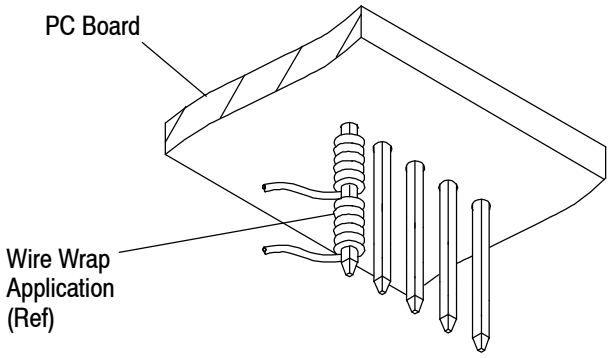


Figure 6

3.6. Ancillary Items

A. Guide Brackets

Various types of guide brackets have been designed for application to Type C connectors. The guide bracket is mounted onto the pc board to help properly guide the mating connector onto the pin or receptacle connector. The bracket is also designed to attach to the connector with the mounting screws and nuts supplied with the guide brackets to ensure a stable application. See Figure 7.

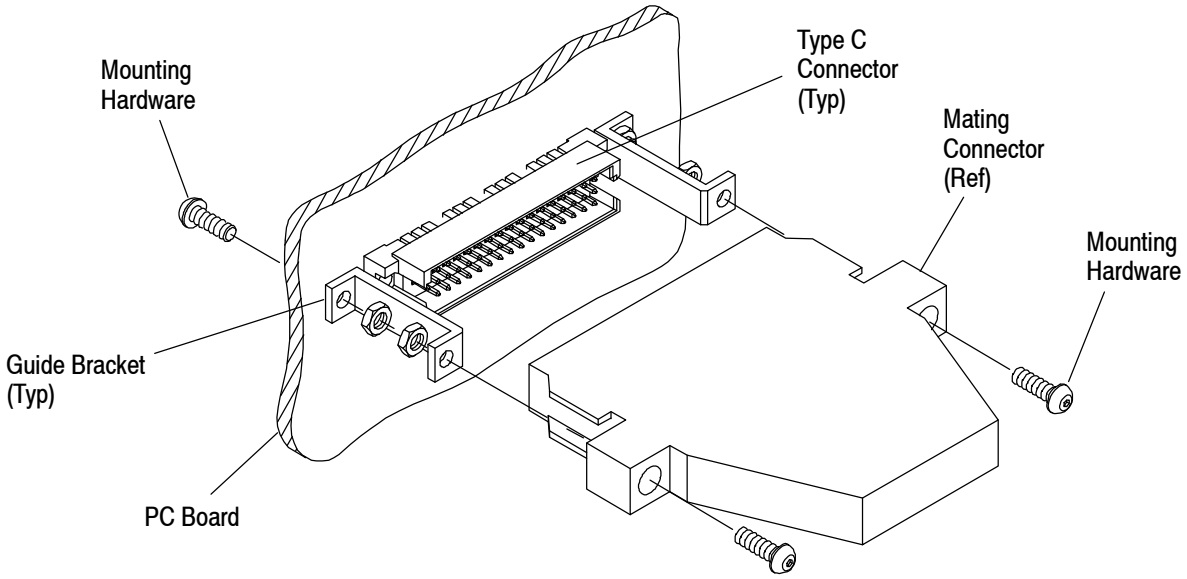


Figure 7

B. Dust Covers

Dust covers are used to protect the mating face of connectors that are not mated. The cover must be aligned with the mating face of the connector and pressed into position. The covers are available for Type C connectors 64- and 96-position. See Figure 8.

C. Shrouds

Mating capabilities may be expanded by stacking connectors with the use of a shroud. Shrouds are used with all 48- and 96-position, three-row, Type C connectors and all 48- and 96-position, Type R connectors with ACTION PIN contacts mounted in pc boards with a thickness of 3.18 mm [.125 in.], 2.36 mm [.093 in.], and 1.57 mm [.062 in.]. Shrouds must be selected according to size (contact positions) and height (contact length) and are applied manually. Refer to Figure 8.

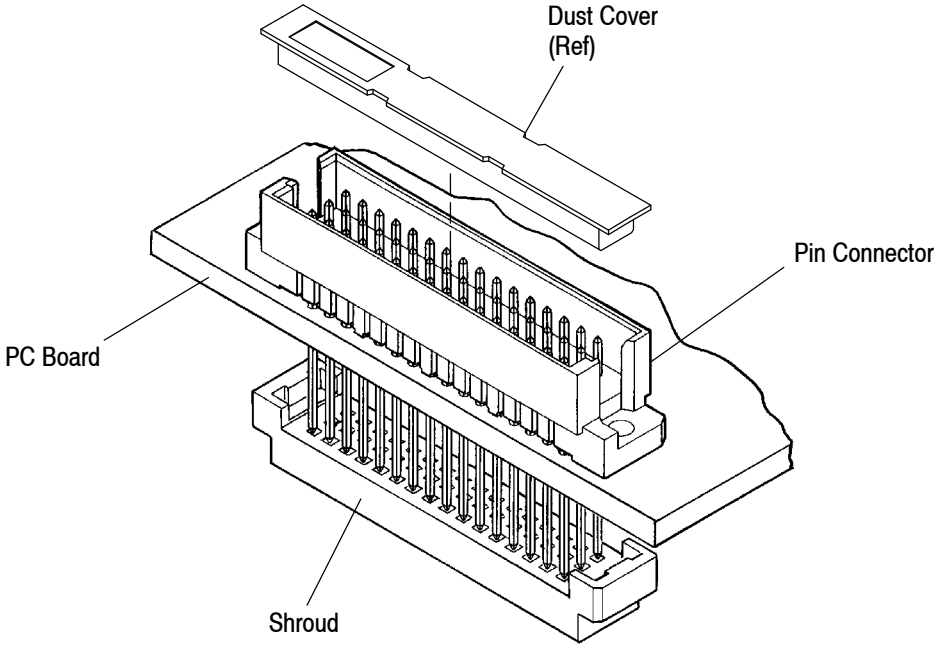


Figure 8

3.7. Mating and Alignment

A. Connector Seating

Seated connectors must be bottomed on the pc board, measured from the top of the connector standoffs to the pc board, to within the dimension shown in Figure 9.

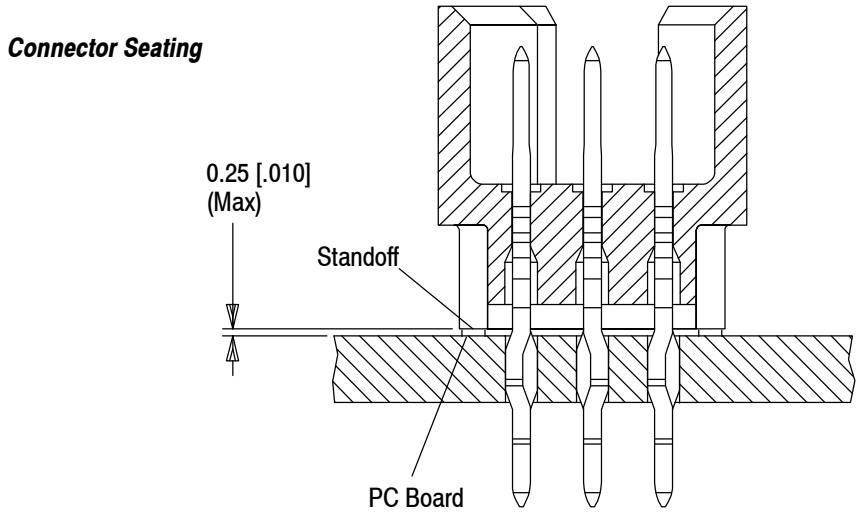


Figure 9

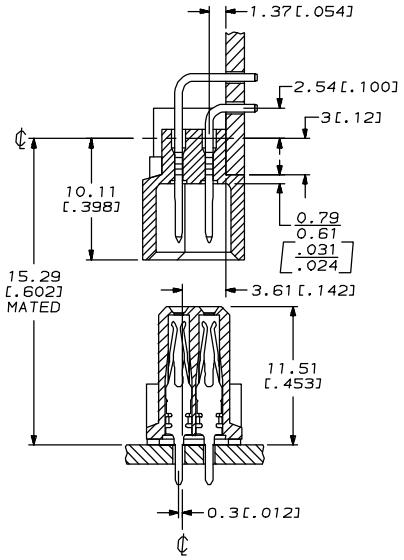
B. Mating Dimensions

Possible mating configurations are illustrated in Figure 10.

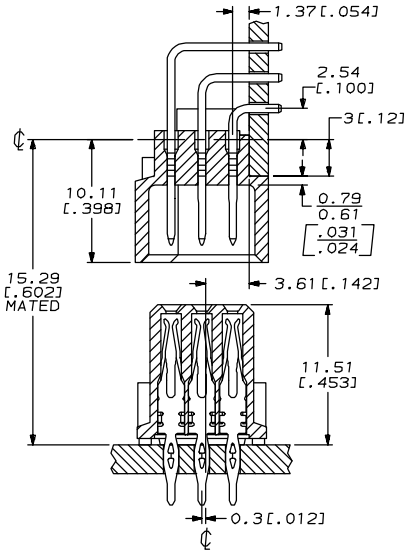
NOTE

The dimensions shown are for reference only when designing systems. Designated centerlines indicate mounting hole location. Refer to the applicable TE customer drawing for connector dimensions.

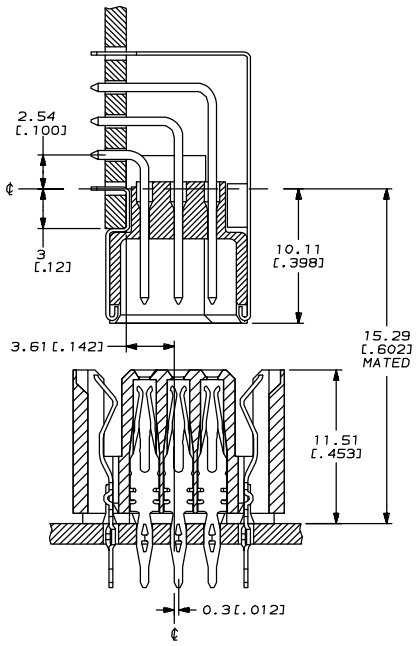
Type B Pin and Receptacle Connector



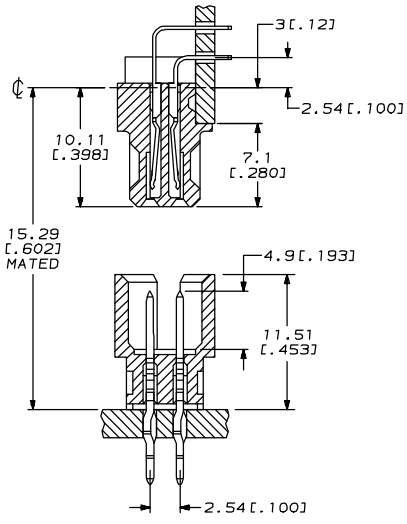
Type C Pin and Receptacle Connector



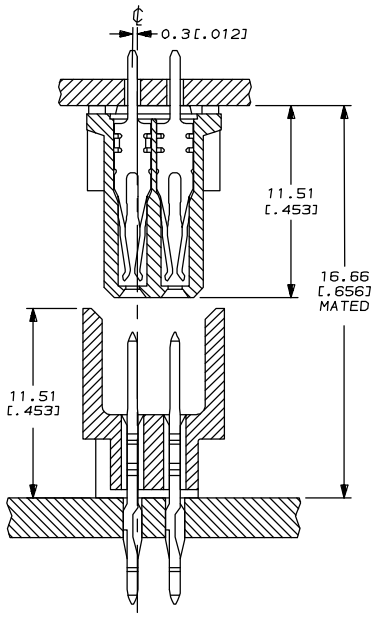
Type M and Enhanced Type C Pin and Receptacle Connector



Type Q Pin and Receptacle Connector



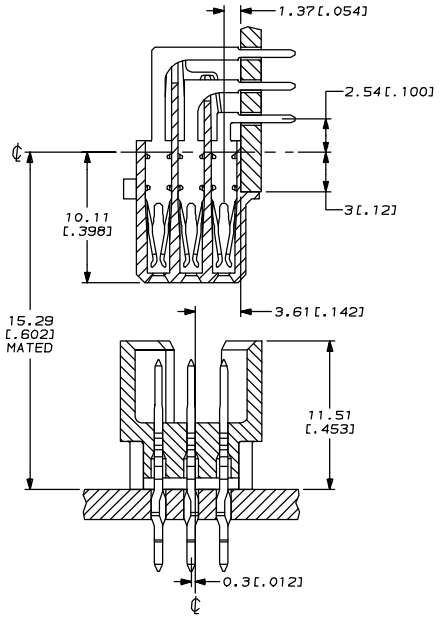
Type Q Pin and Type B Receptacle Connector ●



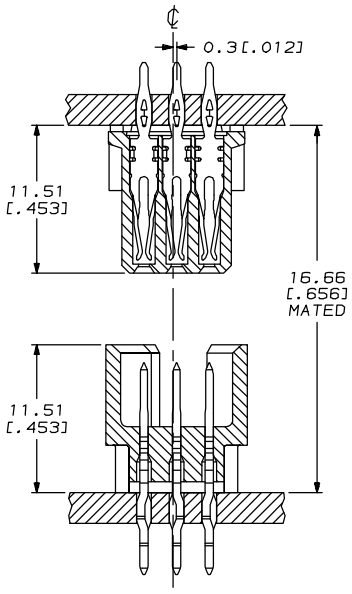
- When connector types are mixed (for example, C and R), the connector circuit numbers will not match; for example, Position A1 of the pin connector will mate with Position A32 of the receptacle connector.

Figure 10 (cont'd)

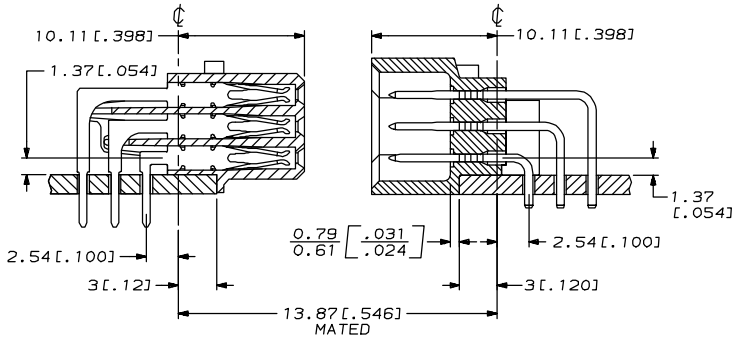
Type R Pin and Receptacle Connector



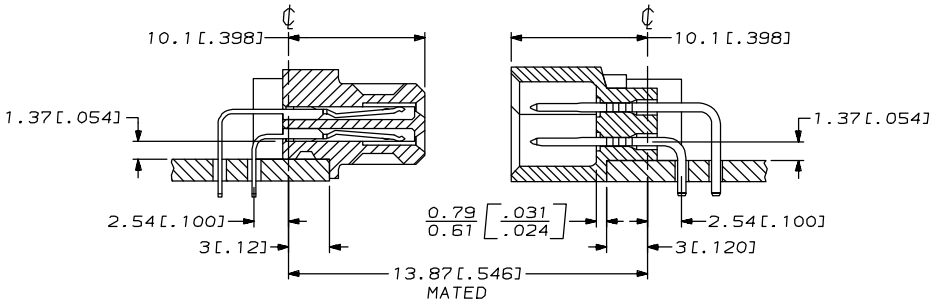
Type R Pin and Type C Receptacle Connector



Type C Pin and Type R Receptacle Connector ●



Type B Pin and Type Q Receptacle Connector ●



- When connector types are mixed (for example, C and R), the connector circuit numbers will not match; for example, Position A1 of the pin connector will mate with Position A32 of the receptacle connector.

Figure 10 (end)

C. Mating Conditions

To ensure reliable connections and prevent unnecessary damage to connectors, refer to the recommended vertical alignment and offset tolerances shown in Figure 11.

CAUTION

DISCONNECT electrical current before mating or unmating connectors.

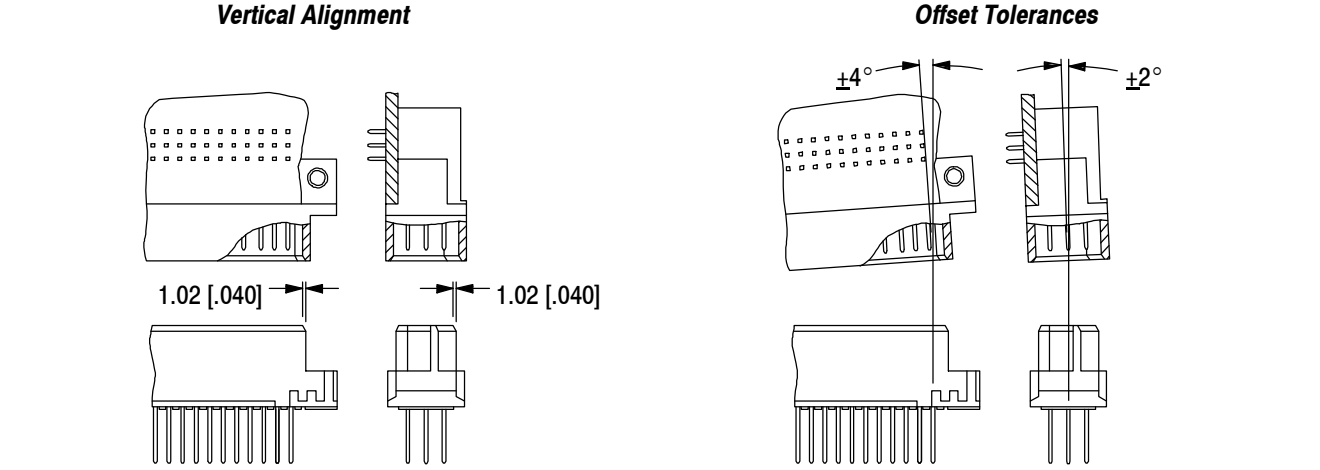


Figure 11

3.8. Soldering

Connectors with solder contacts can be mounted on and secured to a pc board by hand soldering or wave soldering techniques.

A. Flux Selection

Solder tines and pc board attaching hardware must be fluxed prior to soldering. Selection of the flux will depend on the type of pc board used and other components that may be mounted on the board. Also, the choice will have to be compatible with the wave solder line, manufacturing, and safety requirements.

B. Cleaning

Fluxes, residues, and activators must be removed. Cleaning procedures depend on the type of flux used on the solder line. The following cleaning compounds and chemicals may be used to clean the connectors without adverse affect on the housings and contacts. See Figure 12.

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	5	100°C [212°F]
KESTER 5779	Aqueous	5	100°C [212°F]
LONCOTERGE 520	Aqueous	5	100°C [212°F]
LONCOTERGE 530	Aqueous	5	100°C [212°F]
Terpene Solvent	Solvent	5	100°C [212°F]

Figure 12

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

DANGER

Consideration must be given to toxicity and safety requirements recommended on the Material Safety Data Sheet furnished by the solvent manufacturer.

NOTE

If you have a particular solvent that is not listed, consult an TE Representative before using it on these connectors.

C. Drying

When drying cleaned components and pc boards, make certain the temperature limitations of -55° to 125°C [-70° to 260°F] are not exceeded.

D. Soldering Guidelines

Refer to Paragraph 2.6 of this specification for instructional material that is available for establishing soldering guidelines.

CAUTION

Protect lower shroud (vertical connectors) or lower ground plane (enhanced connector) when soldering right-angle pin connectors.

3.9. Repair

In the event of damaged contacts or connector, the entire connector must be replaced with a new one, with the exception of the coaxial contacts in Type M connectors which are removable (refer to Paragraph 5.6).

4. QUALIFICATIONS

Eurocard Connectors meet DIN 41612 and IEC 603-2 specifications. The connectors are also Certified by CSA International in File LR7189 and Recognized under the Component Program of Underwriters Laboratories Inc. (UL) in File E28476.

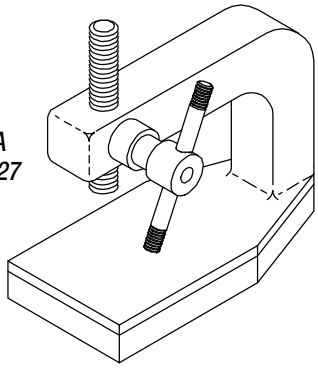
5. TOOLING

5.1. Application Tooling

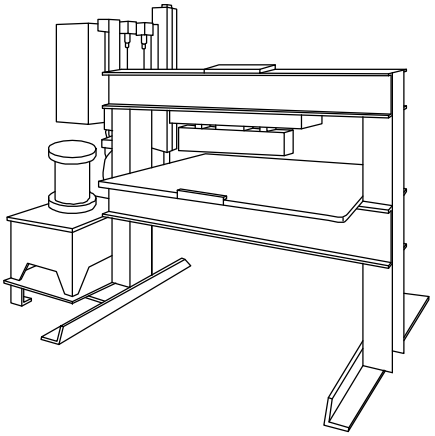
For low-volume manufacturing, an arbor frame type applicator may be used; for high-volume manufacturing, machine application is recommended. See Figure 13.

Power Units

Typical Arbor Frame Press (Such as Greenerd 3A or 3B Manual Frame Assembly—refer to 408-9027 for Adapter Kit when using this type press)



"H" Frame Power Unit Machine 803880-6



SM-3 Machine 814700-2

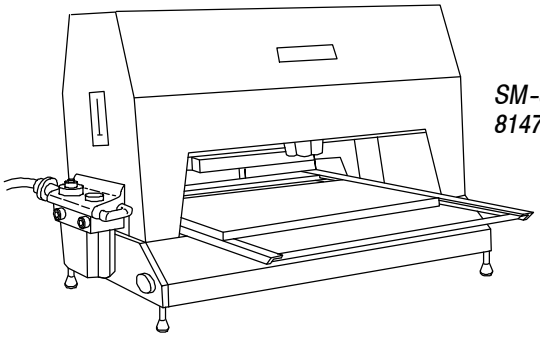


Figure 13

5.2. PC Board Support

A pc board support (customer supplied) must be used for the seating of connectors. While many materials can be used for this, steel or cast aluminum is recommended.

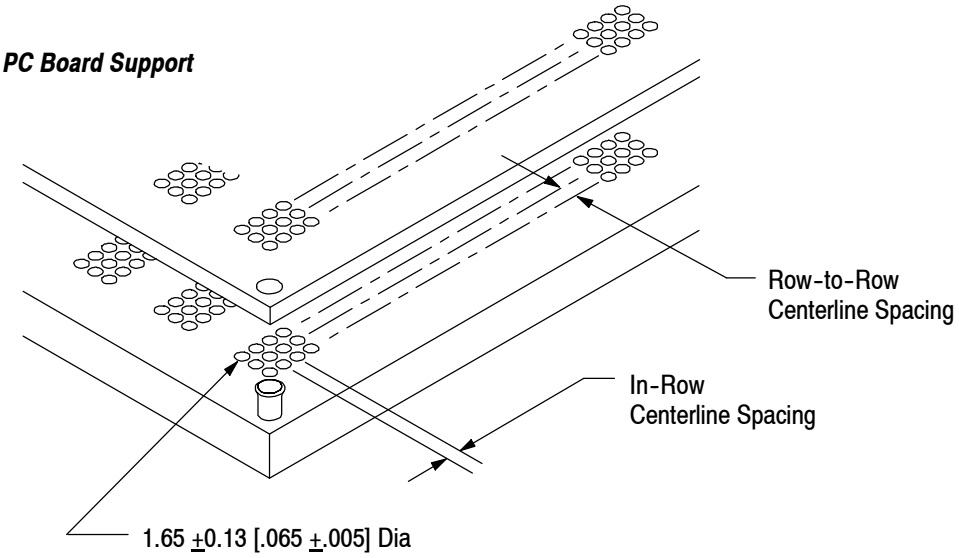
A. Multi-Layered PC Board Support

A flat-plate type support should be used with multi-layered pc boards having internal circuitry. For details, see Figure 14.

B. Single-Layered PC Board Support

An anvil type support may be for use with single-layered pc boards. See Figure 14.

Multi-Layered PC Board Support



Single-Layered PC Board Support

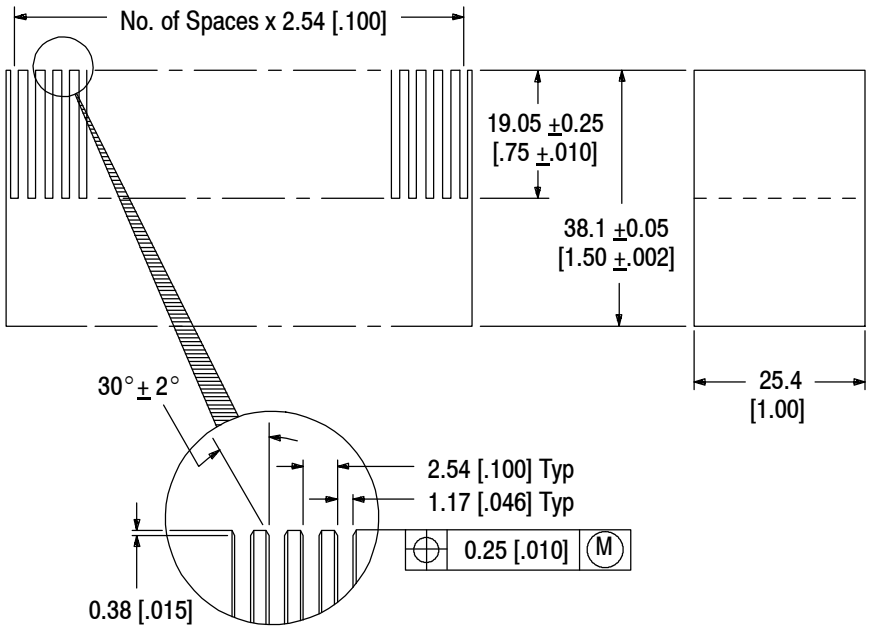


Figure 14

5.3. Seating Tool

Seating tools must be used in manual or power assist units with sufficient ram surface and the capability of applying insertion force per contact. The seating tools align the components for proper seating and are specifically designed for the different types of Eurocard connectors. Seating tools, connector types, and instruction sheets are shown in Figure 15.

5.4. Pushing Plate

A pushing plate (customer supplied) must be used to seat vertical receptacles with ACTION PIN thin stock contacts and square stock contacts in connectors that do not require special tooling. The pushing plate must be of minimum length and width equal to full top dimensions of the receptacle. The larger the pushing plate, the less critical the alignment during seating. When seating connector, the pushing plate must move in a straight, vertical line, and its bottom surface must be parallel to the top of the pc board support or template when force is applied. See Figure 15.

NOTE

The force used to seat Eurocard connectors with square stock contacts shall not exceed 177.93 N [40 lbs] per contact. Seating force for connectors with ACTION PIN thin stock contacts shall not exceed 88.96 N [20 lbs] per contact.

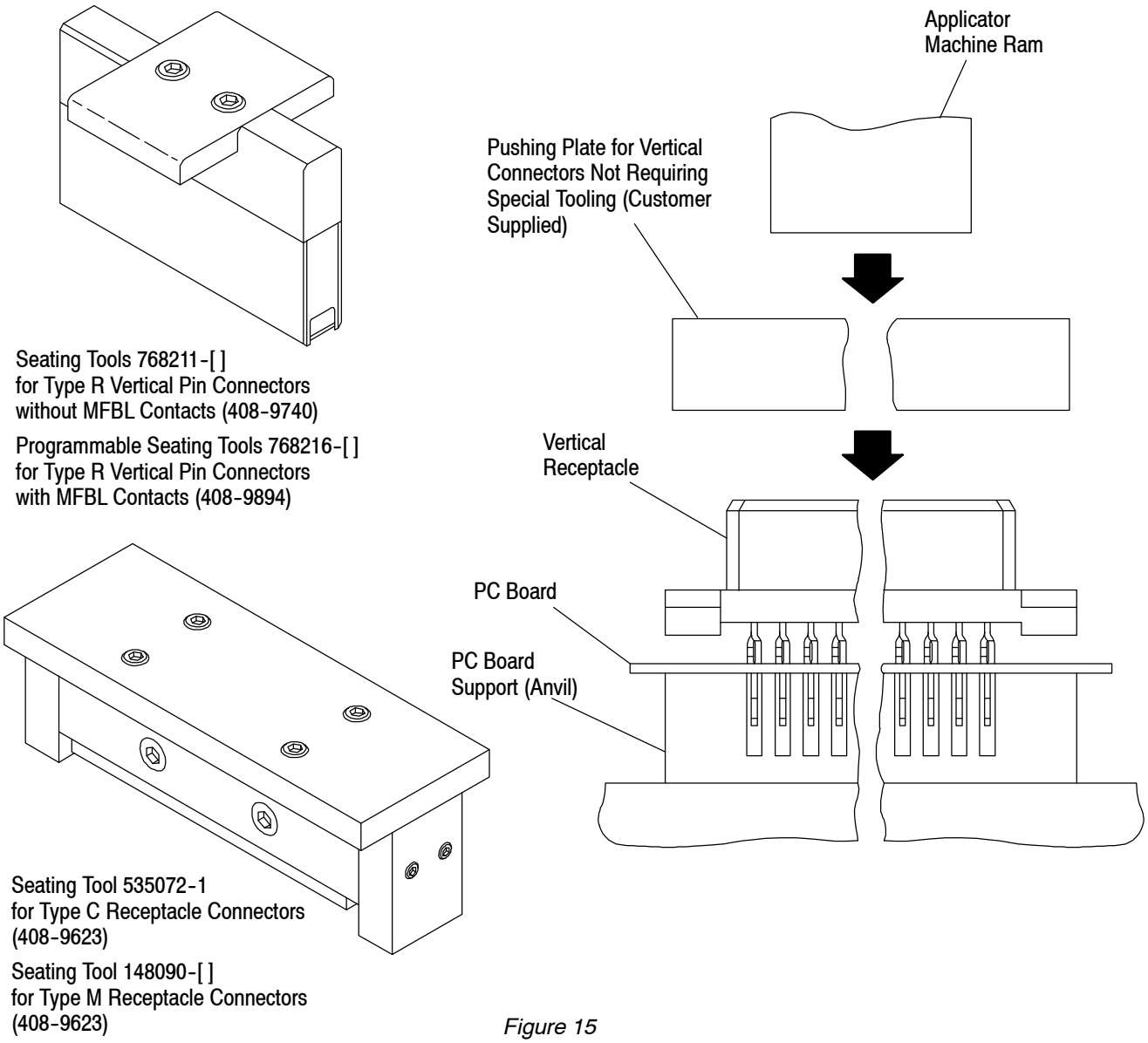


Figure 15

5.5. Connector Replacement Tooling

When entire Type C receptacle connectors and Type R pin connectors must be replaced, Eurocard Connector Removal Tool Kit 534611-1 should be used. Refer to Figure 16 and proceed as follows:

CAUTION

DO NOT use this tool in a power assist unit. This procedure should be done with a manually operated unit only.

1. Place support block with slot up on the arbor frame support base.
2. Place housing down on support block with pins extending up through pc board.
3. Slide guide block over wire-wrap tails. Be sure the "T" stamp on end of guide block is away from pc board.
4. Start push-out assembly into guide block, using care not to damage pins.
5. Lower the arbor ram onto the center of push-out assembly and apply force until it is seated on guide block.
6. Raise the arbor ram and remove push-out assembly and guide block. When the board, the connector, and the support block are removed, the connector will fall away with pins removed from the pc board and housing.

5.6. Contact Extraction Tooling

Extraction tooling is available for withdrawal of individual power contacts and coaxial contacts from Type M connectors. The tip of the tool is inserted into the contact cavity from the mating side of the housing. The contact is forced out of the rear of the housing by pushing the tool handle. See Figure 16.

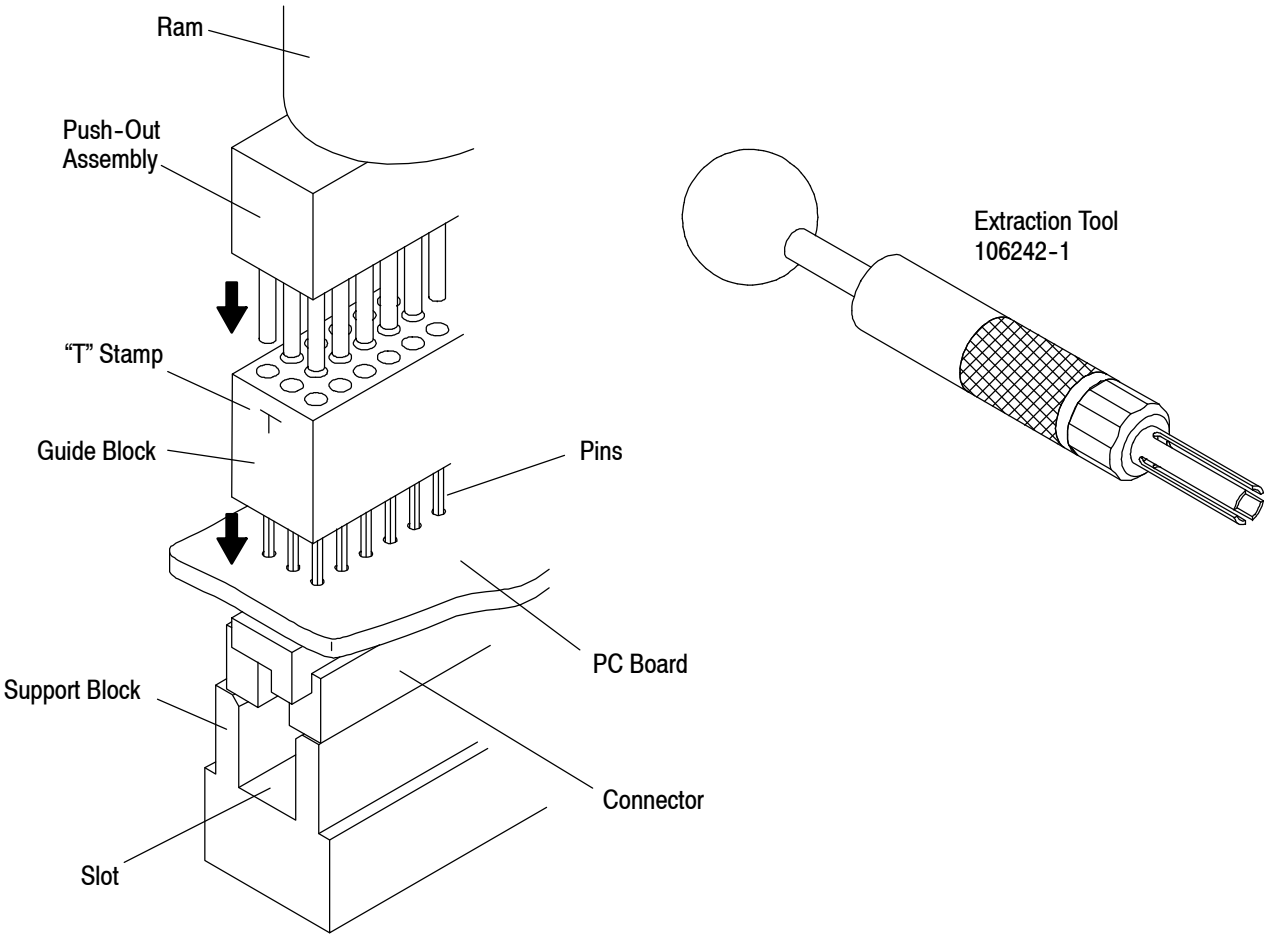


Figure 16

6. VISUAL AID

Figure 17 shows a typical application of a Eurocard Connector. 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.

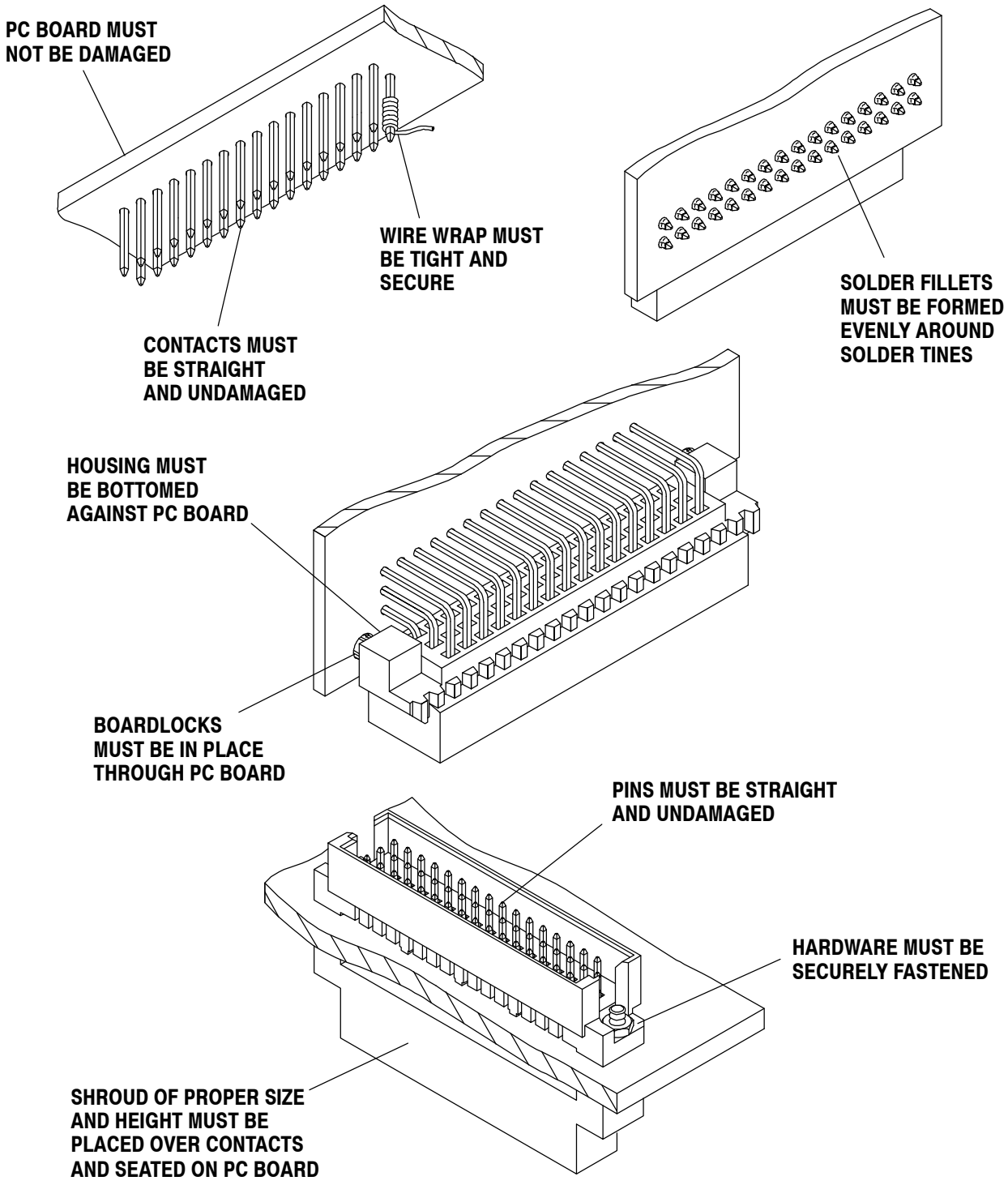


FIGURE 17. VISUAL AID

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