

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ± 0.13 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 requirement for application of the Z-PACK 12-Row Interconnection System. These connectors reduce signal crosstalk in high speed, nanosecond applications requiring very high pin count applications. The system consists of 50 ohm impedance connectors with 2.0 signal column spacing.

The Z-PACK Connectors are available in modular right-angle receptacles, and vertical pin headers. Both receptacles and pin headers are available with compliant pin only and are shipped in 72 and 144 signal position (12-row) modules which the customer joins together on the printed circuit (pc) board for the correct size.

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

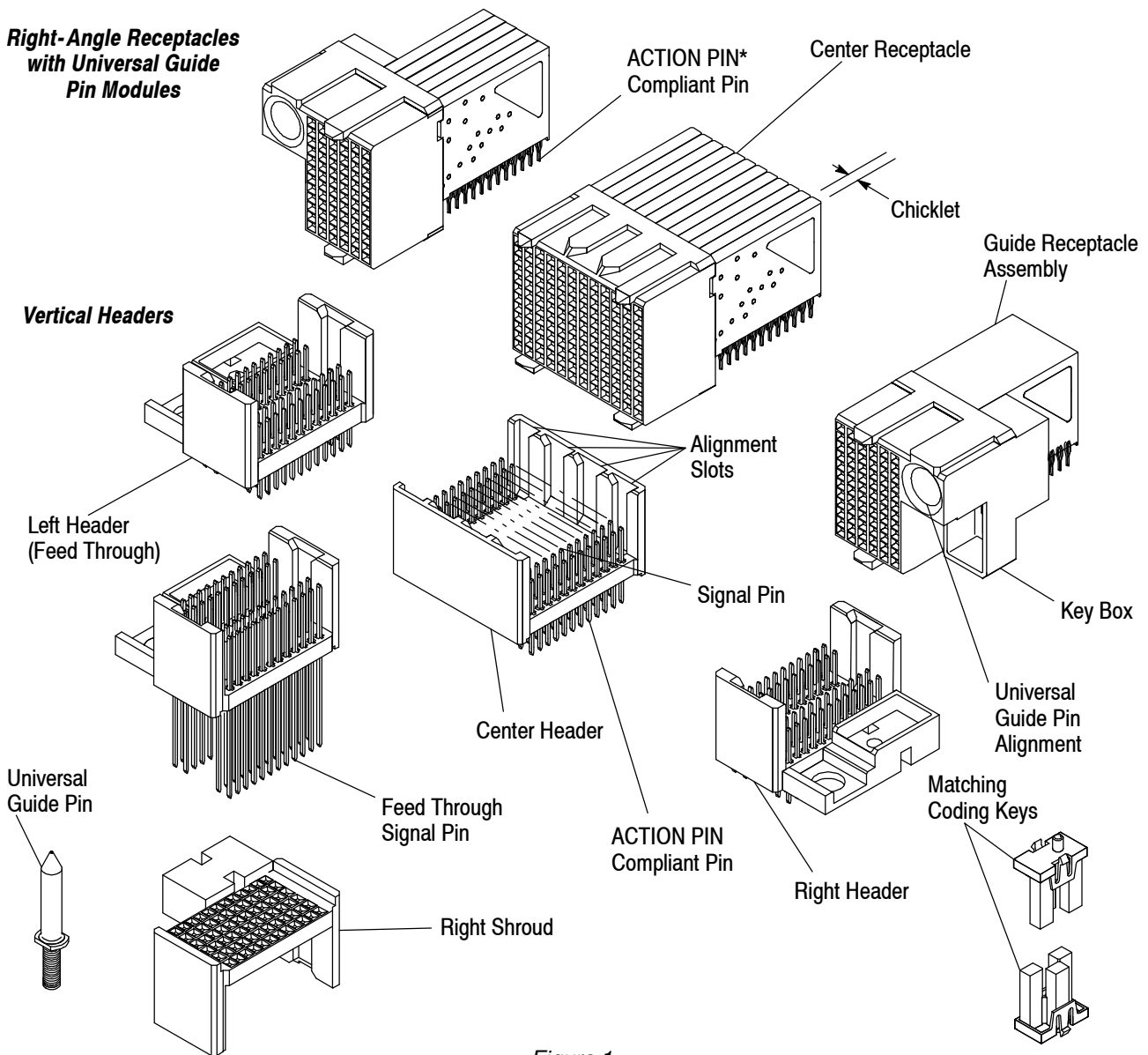


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

- Updated document to corporate requirements
- Deleted obsolete documentation in Paragraph 2.4
- Deleted obsolete tooling in Section 5, TOOLING
- New logo and format

2.2. Customer Assistance

Reference Part Number 120637 and Product Code A259 are representative numbers of Z-PACK 12-Row Backplane 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 Electronics Representative or, after purchase, by calling the Tooling Assistance Center or Product Information 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 Customer Drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by Tyco Electronics.

2.4. 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>
408-2636-1	CERTI-LOK* Insertion Tool 380392-8
408-4553	Seating Tools 91311-[] for Z-PACK 12-Row Backplane Headers
408-4568	Chicklet Extraction Tools 1320870-1
408-4571	Receptacle Seating Tools 91318-[], 91319-[], and 91320-[]
408-4572	Receptacle Housing Removal Tool 91323-[]
408-9979	Pin Repair Kits 354687-1, -2, and -3 for Z-PACK Signal Pin Contacts

3. REQUIREMENTS

3.1. Storage

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.

3.2. Product Materials and Selection Criteria

A. Material

All Z-PACK 12-Row Connector housings and chicklets are molded of UL 94V-O rated thermoplastic.

All contacts are copper alloy, plated at the contact interface with gold, with a nickel underplate, and tin-lead tines.

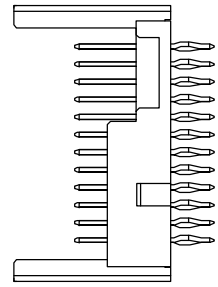
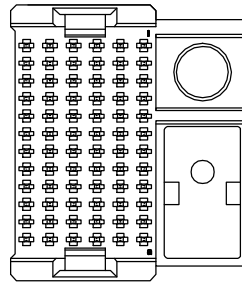
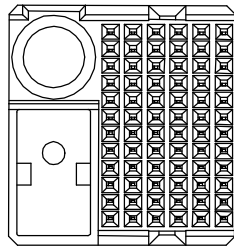
B. Size

Typical connector sizes and length of pins are shown in Figure 2.

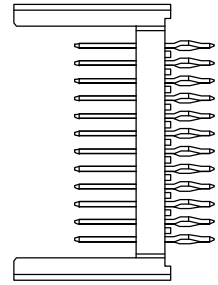
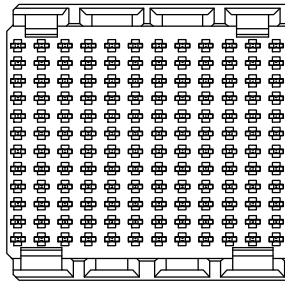
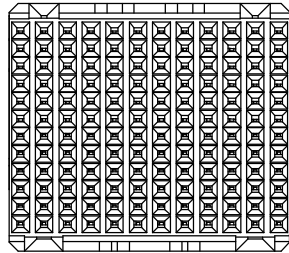
C. Guides

The pin headers have alignment slots with a guide-in feature that helps position the pin and receptacle contacts prior to engagement of the circuits. See Figure 1.

**72-Position
(Left)**



**144-Position
(Center)**



**72-Position
(Right)**

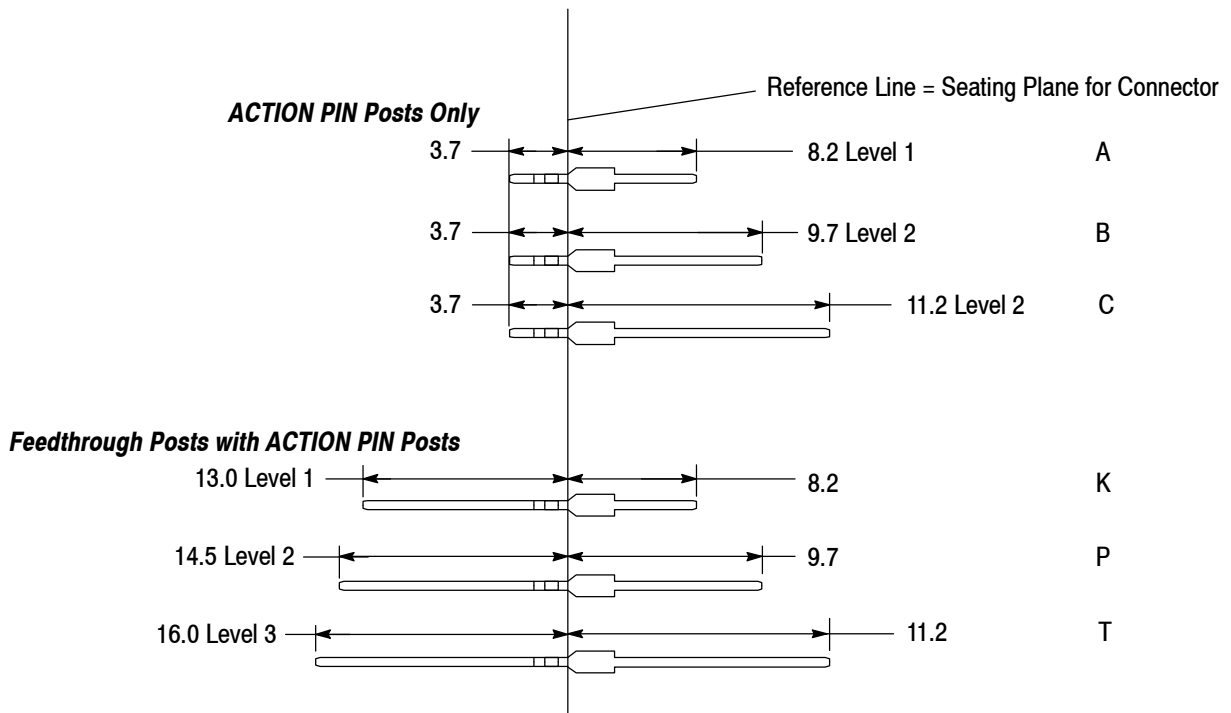
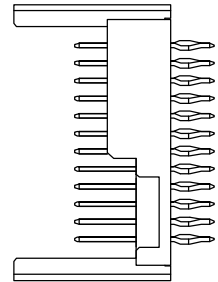
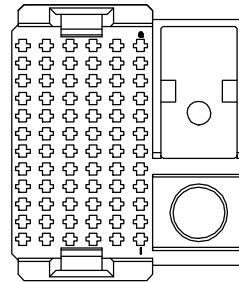
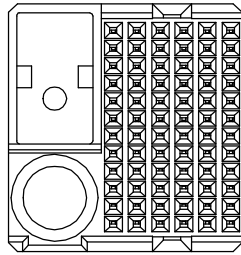


Figure 2

D. End-to-End Placement

The end contacts in the pin header and receptacle are one half the contact spacing distance from the ends of the housing. This design feature makes it possible to mount connectors end-to-end while maintaining the 2.0 mm column spacing. Connectors can be mounted end-to-end within the specified dimension. See Figure 3.

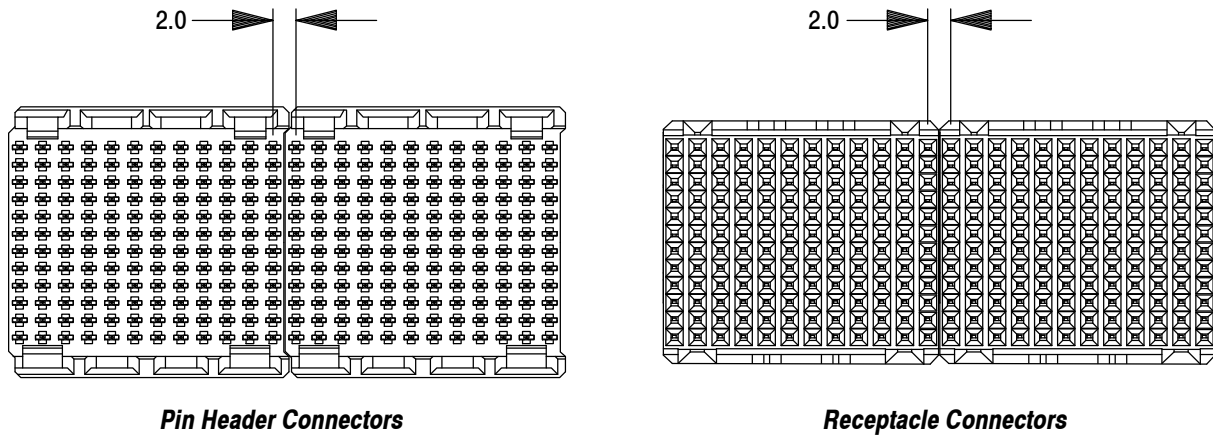


Figure 3

3.3. Alignment

Proper alignment is essential to ensure full engagement of mating connectors, and to ensure that contacts are not bent or otherwise damaged during mating and unmating. For tolerance limitations, see Figure 4.

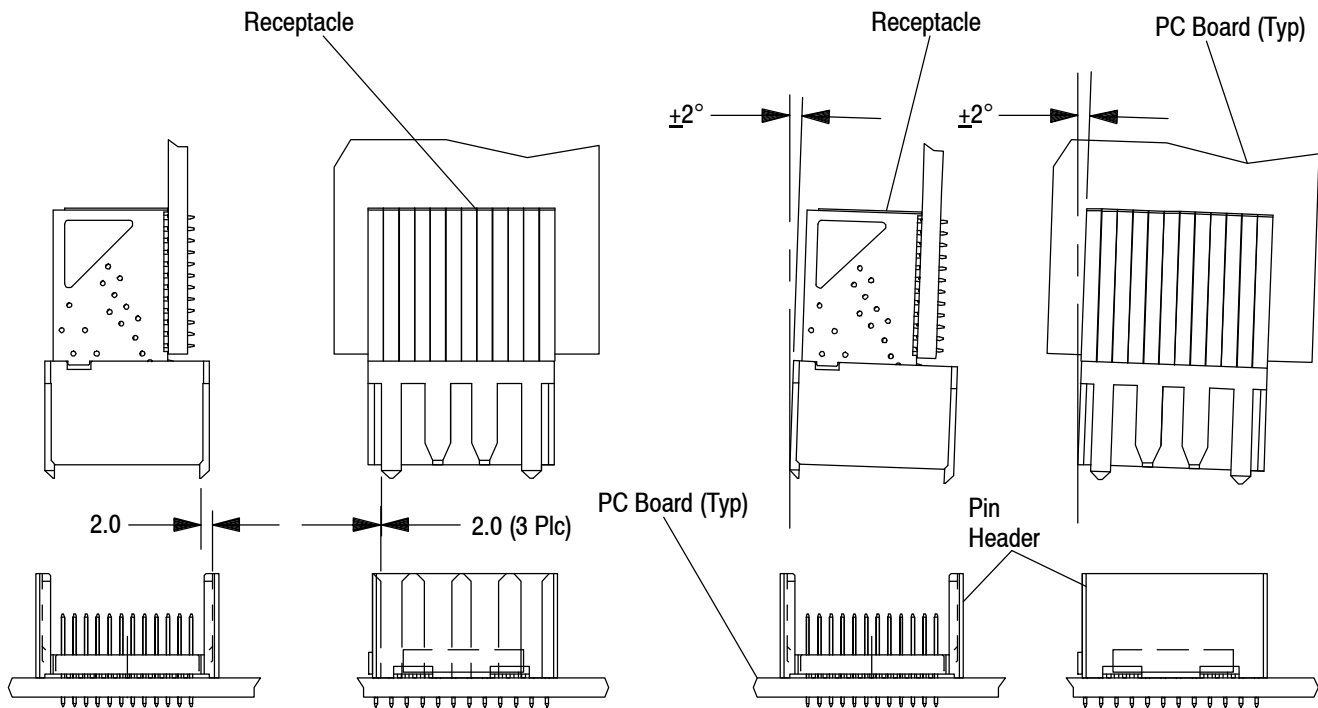


Figure 4

3.4. Mating Dimension

Full mating of connectors is necessary to ensure a good connection. The dimension from the surface of the pc board to which the pin header is mounted and the first row of contacts in the receptacle must be as shown in Figure 5.

Right-Angle-to-Vertical

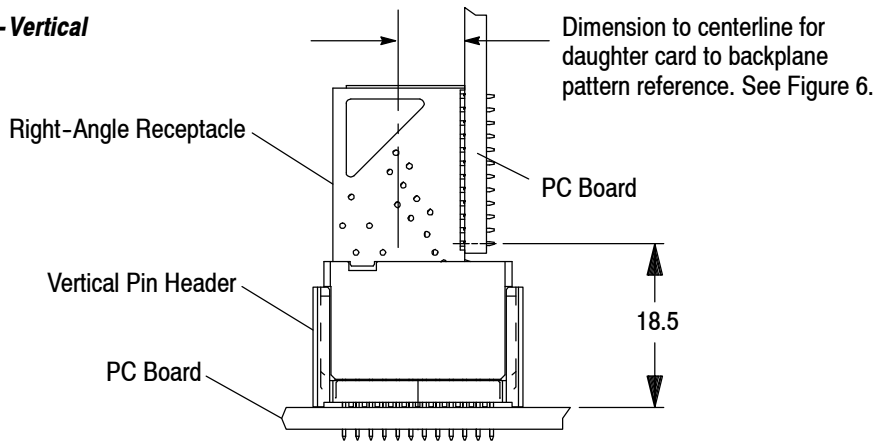


Figure 5

3.5. PC Board Requirements

A. PC Board Thickness

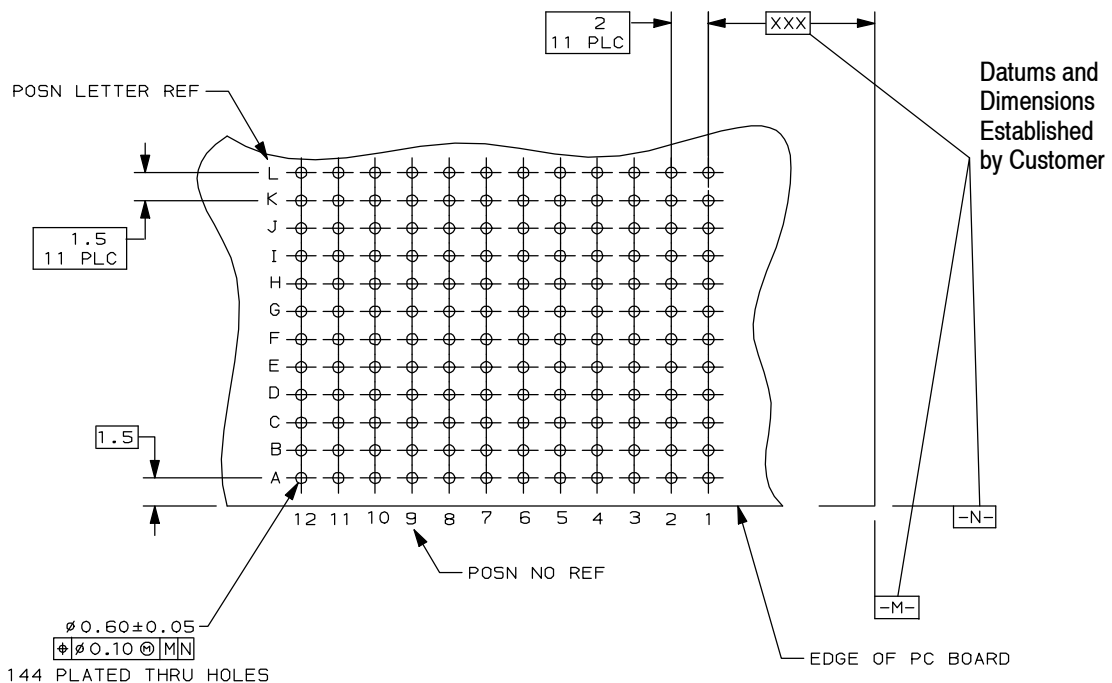
Right-angle receptacle connectors with compliant pin contacts require a pc board with a minimum thickness of 1.40 mm.

Vertical pin header connectors with compliant pin contacts also require a pc board with a minimum thickness of 1.40 mm.

B. PC Board Circuit Pattern Layout

The pc board layout patterns for the placement of Z-PACK 12-Row Pin Header and Receptacle Connectors are provided in Figure 6.

Daughtercard



NOTE: Component Side View Shown

Figure 6 (cont'd)

NOTE: Component Side Views Shown

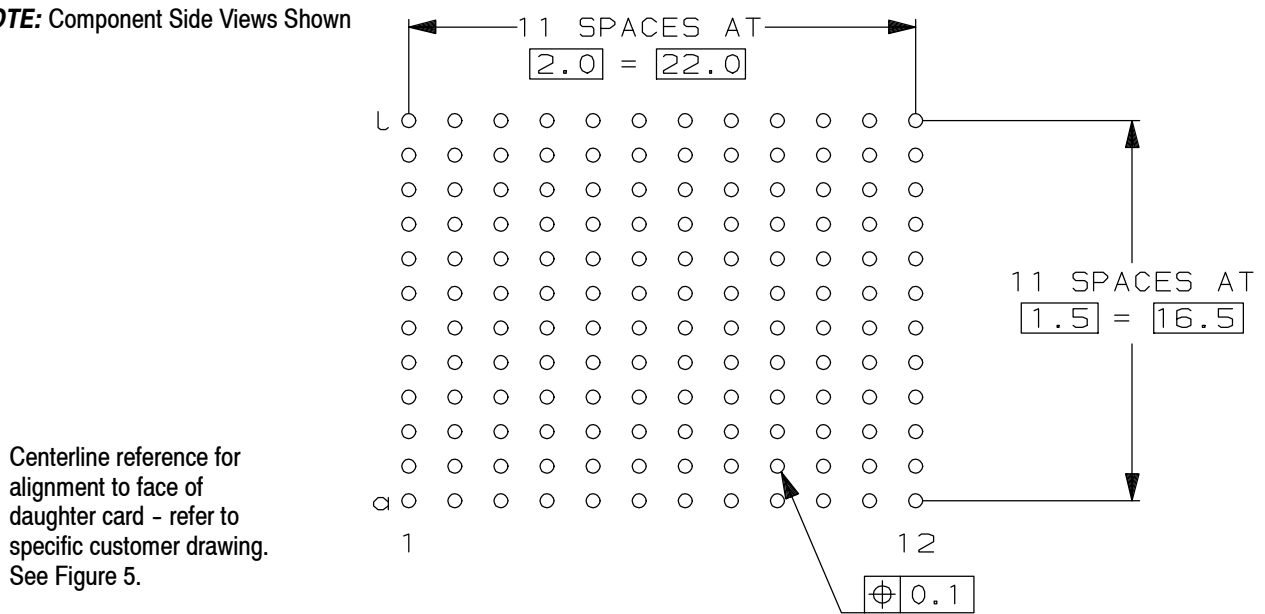


Figure 6 (end)

3.6. Contact Hole Configuration

The contact holes in the pc board for all contacts must be drilled and plated through to specific dimensions. See Figure 7.

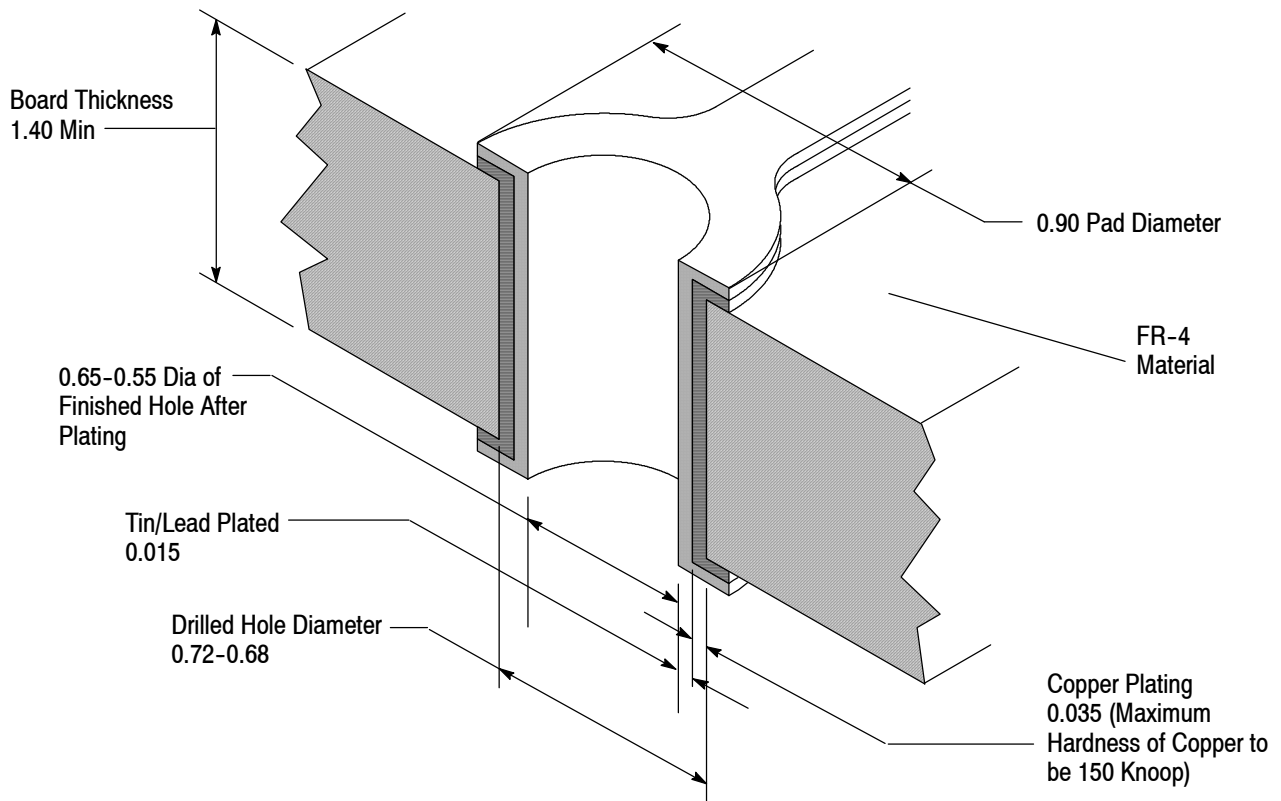


Figure 7

3.7. Connector Installation

A. Initial Positioning

Z-PACK 12-Row Vertical Pin Headers, and Right-Angle Receptacles must be pre-applied to a pc board by hand.

Connectors should be gripped by the housing only and not by the contacts. When placing a connector into a pc board, all contact tines should be aligned and inserted into the pc board simultaneously to prevent twisting or bending of the contacts.

B. Seating Connectors

Z-PACK 12-Row Headers and Receptacles with compliant pin contacts are seated with seating tools listed in Section 5, TOOLING. Seating force must be applied evenly on the connectors to prevent deformation or other damage to the contacts and housings. When installing header connectors, the insertion force must be simultaneously applied to the shoulders of each contact at the bottom of the slots. When installing right-angle receptacle connectors, the insertion force must be evenly applied to the assembly (top surface of the chicklets) as shown in Figure 8. Seating force will vary according to hole diameter and signal pin count. Approximate force to seat connectors will be 2668–4003 N [600–900 lb] per 100 signal pins.



Correct seating of connector is essential to interconnection performance. This includes correct seating height (see Figure 8) and force applied. Overdriving of product will deform parts critical to the quality of the connection. Maximum force occurs prior to seating the connectors on the pc board.

Z-PACK
12-Row
Receptacle

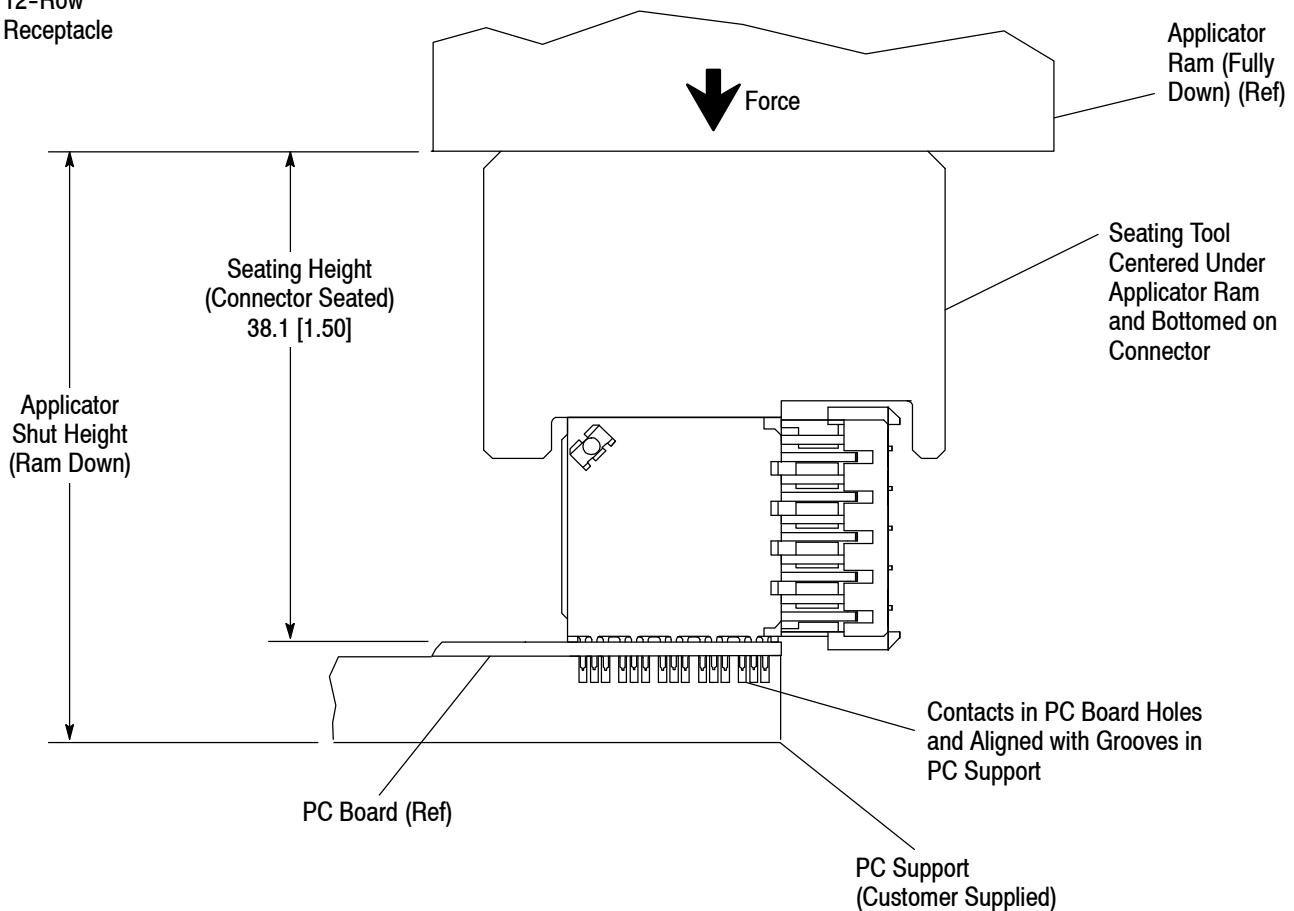


Figure 8 (cont'd)

Z-PACK 12-Row Pin Header With Compliant Pin Contacts

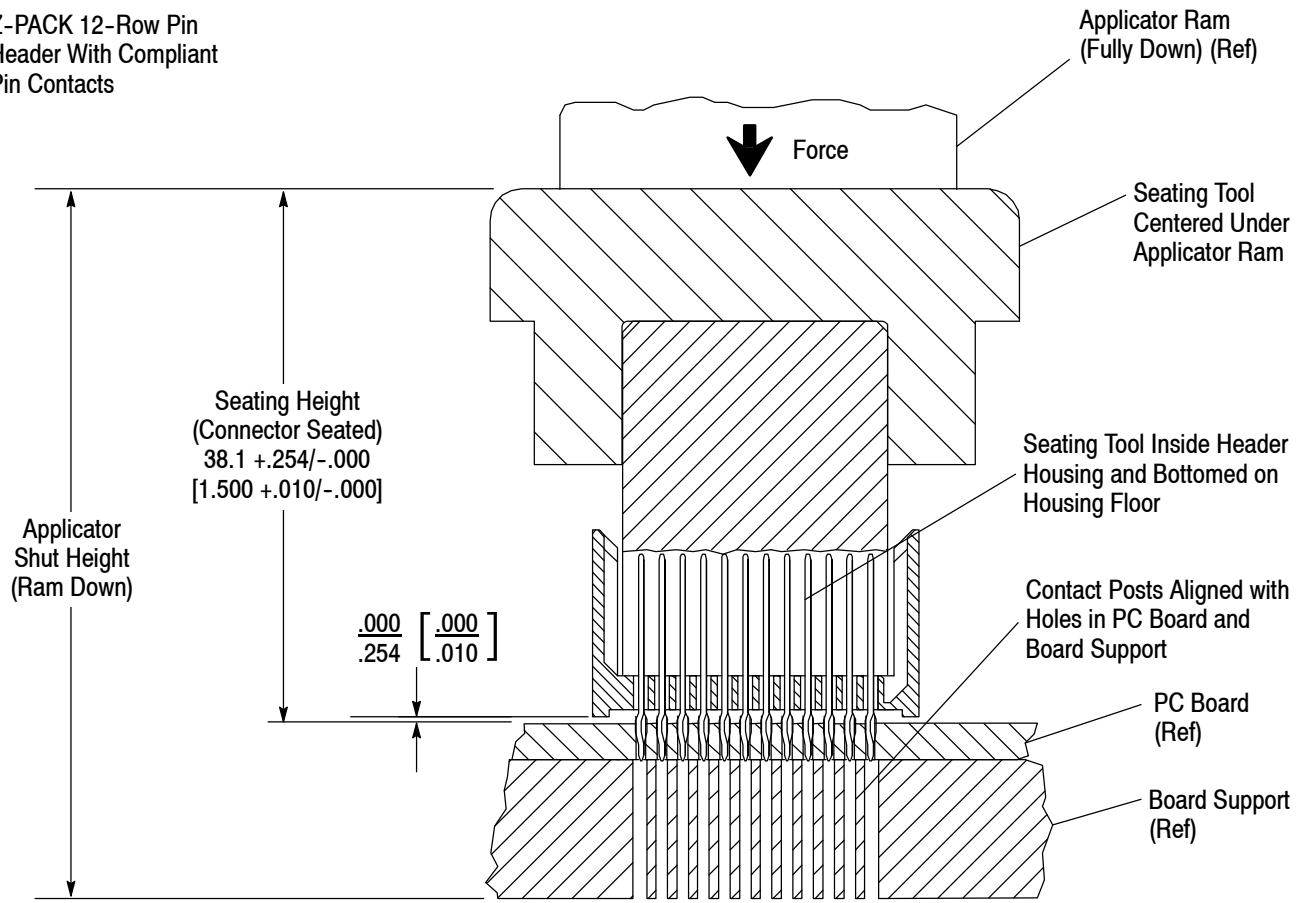


Figure 8 (end)

3.8. Solder Process Considerations

Since the Z-PACK 12-Row Backplane Connectors have a press-in compliant pin type of design, it does not require solder. But, when pc board repair or rework requires soldering after the connectors are already inserted in the pc board, the following applies.



Even when using “no clean” solder paste, it is imperative that the contact interface be kept clean of flux and residue, since it acts as an insulator.



Consideration must be given to toxicity and other safety requirements recommended by the solvent manufacturer. Trichloroethylene and Methylene Chloride can be used with no harmful affect to the connectors; however, Tyco Electronics 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.

Air drying of cleaned connectors is recommended. Temperature for the connectors should not exceed -55 to 105°C [-67 to 221°F]. Degradation of the housings could result from extreme temperatures. Gold surfaces of contact tines must be relubricated with a Telcordia[®] approved lubricant if applications require it.

3.9. Accessories

Guide pins for additional pre-alignment, power pins and receptacles, and special keying inserts are available as shown in Figure 9. Other hardware options to meet specific needs may be available from, or designed by, Tyco Electronics Engineering at customers’ request.

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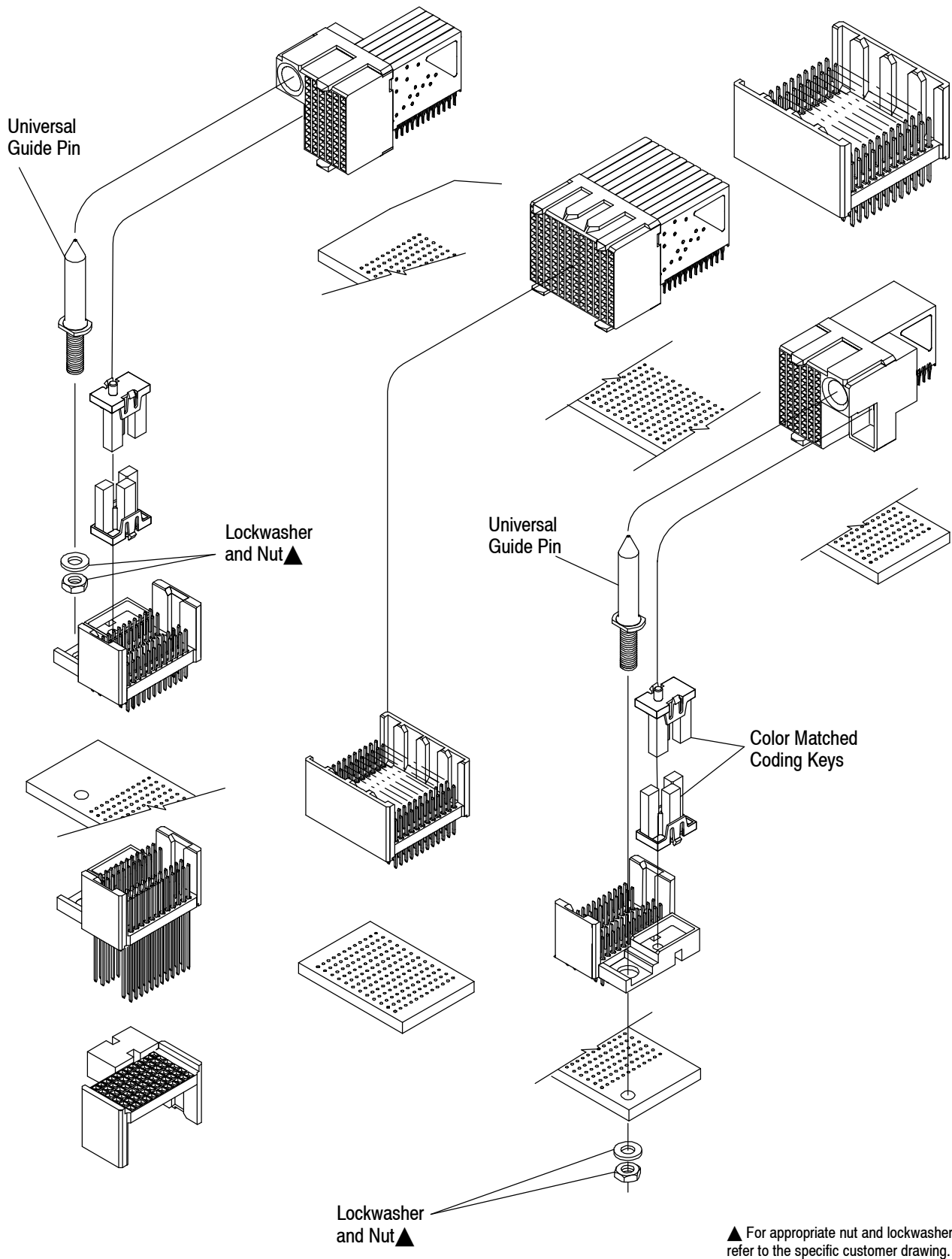


Figure 9

▲ For appropriate nut and lockwasher, refer to the specific customer drawing.

3.10. Repair/Replacement

A. Header Repair

Header assemblies can be repaired without removal from the pc board, in cases where only contacts are in need of replacement. For signal pin contacts, use replacement tool kit 354687-[] (Instruction Sheet 408-9979). This kit contains tips for removal and replacement of compliant pin contacts.

B. Receptacle Repair

Receptacle construction does not allow for replacement of individual contacts. Damaged integral receptacles generally must be completely replaced. Receptacles can be repaired by removing and replacing only the damaged connector module, as follows:

1. To remove the receptacle housing from the connector assembly, use receptacle housing removal tool 91323-1, (Instruction Sheet 408-4572).
2. Use chicklet removal tool 1320870-1 to remove the chicklet sub-assemblies. Refer to Instruction Sheet 408-4568.
3. Refer to Instruction Sheet 408-4571 to seat the new receptacle module in the proper position.

4. QUALIFICATIONS

The Z-PACK 12-Row Interconnection System have not yet been agency approved.

5. TOOLING

Figure 10 provides tool part numbers and instructional material related to Z-PACK 12-Row Backplane Connectors.

NOTE



Tyco Electronics Tool Engineers have designed machines for a variety of application requirements. For assistance in setting up prototype and production line equipment, contact Tyco Electronics Tool Engineering through your local Tyco Electronics Representative or call the Tooling Assistance Center number at the bottom of page 1.

- **PC Board Support**

A pc board support must be used to prevent bowing of the pc board during the insertion of a connector into the board. It should have flat surfaces with holes or a channel wide and deep enough to receive the contact compliant pins and other attaching hardware during installation of the connector on the pc board.

- **Seating Tools**

Seating tools have been designed to push on the contact and seat the connector on the pc board. The tool will prevent contacts from backing out of the housing and prevent damage to the housing. The seating tools may be used with the power units listed or arbor frame assembly.

- **Impact Repair Tools**

Impact repair tools are designed to remove damaged contacts from housings without damaging the housing. The tools must be used with a support that is deep enough to allow full extraction of the contact.

- **Power Units**

Power units are automatic or semi-automatic machines used to assist in the application of a product. A power unit supplies the force to seat the connector onto the pc board using seating tools.

- **Arbor Frame Assembly**

Manual arbor frame assemblies are used to exert a downward force used to apply connectors to a pc board using seating tools.

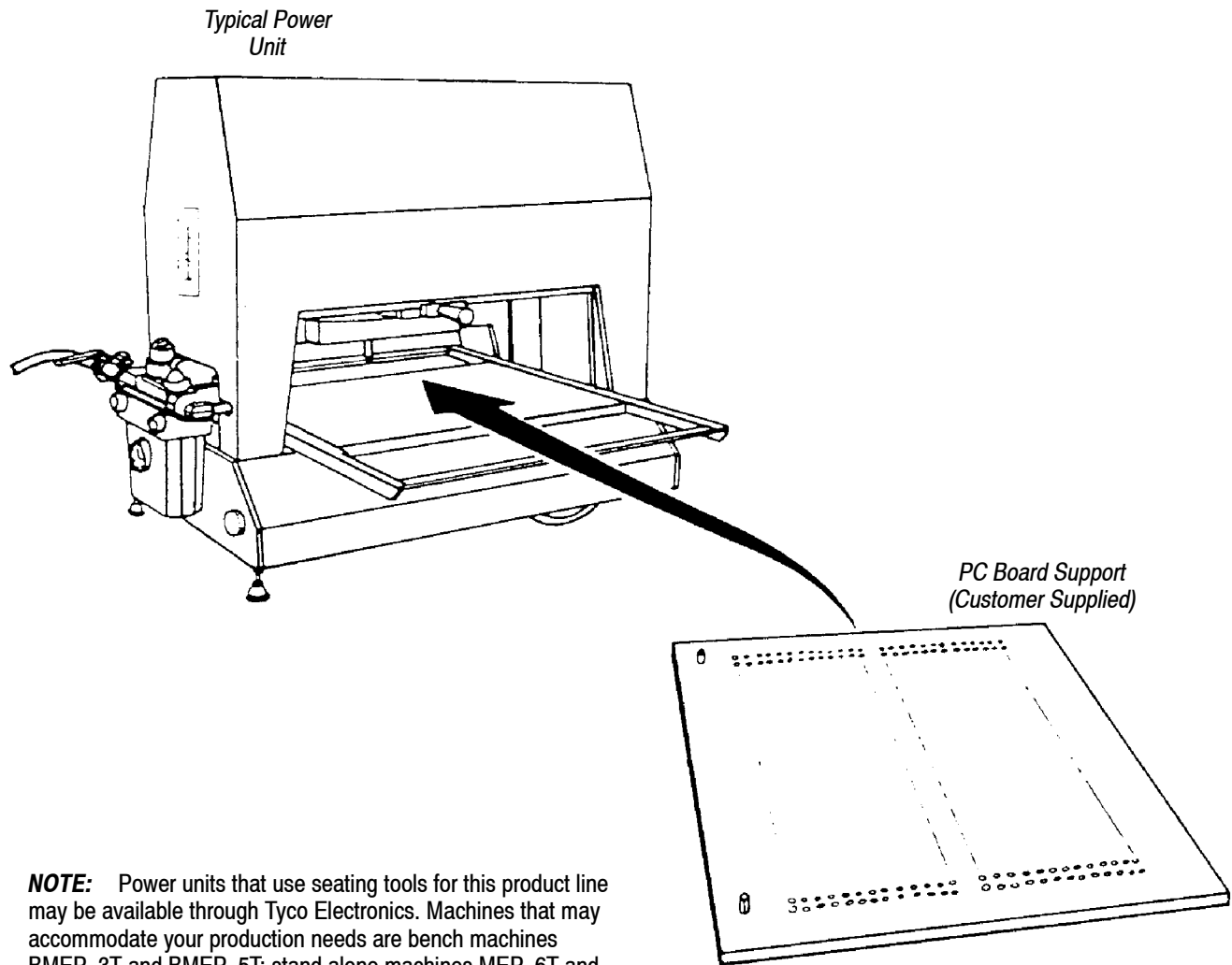
- **Extraction Tools**

Extraction Tools are designed to remove contacts or housings without damaging any parts of the connector.

- **Insertion Tools**

Insertion Tools are designed for inserting individual contacts or connector assemblies into areas without damaging or touching other component parts.

PRODUCT		TOOLING	
TYPE	DESCRIPTION	PART NUMBER (DOCUMENT)	DESCRIPTION
HEADER	72-POSITION-RIGHT 72-POSITION-LEFT 72-POSITION-THRU 144-POSITION-THRU	91311-[] (408-4553)	SEATING TOOL
		354687-3 (408-9979)	PIN REPAIR KIT
		380392-8 (408-2636-1)	INSERTION TOOL
RECEPTACLE	72-POSITION-RIGHT 72-POSITION-LEFT 72-POSITION-THRU 144-POSITION-THRU	91318-[] (408-4571)	SEATING TOOL
		91323-2 (408-4572)	REMOVAL TOOL
		1320870-1 (408-4568)	CHICKLET EXTRACTION TOOL



NOTE: Power units that use seating tools for this product line may be available through Tyco Electronics. Machines that may accommodate your production needs are bench machines BMEP-3T and BMEP-5T; stand alone machines MEP-6T and MEP-12T; and a fully automated machine available, AEP-12T. Contact the Tooling Assistance Center (TAC) phone number at the bottom of page 1 for information on these Automation Services Group (ASG) machines.

Figure 10 (cont'd)

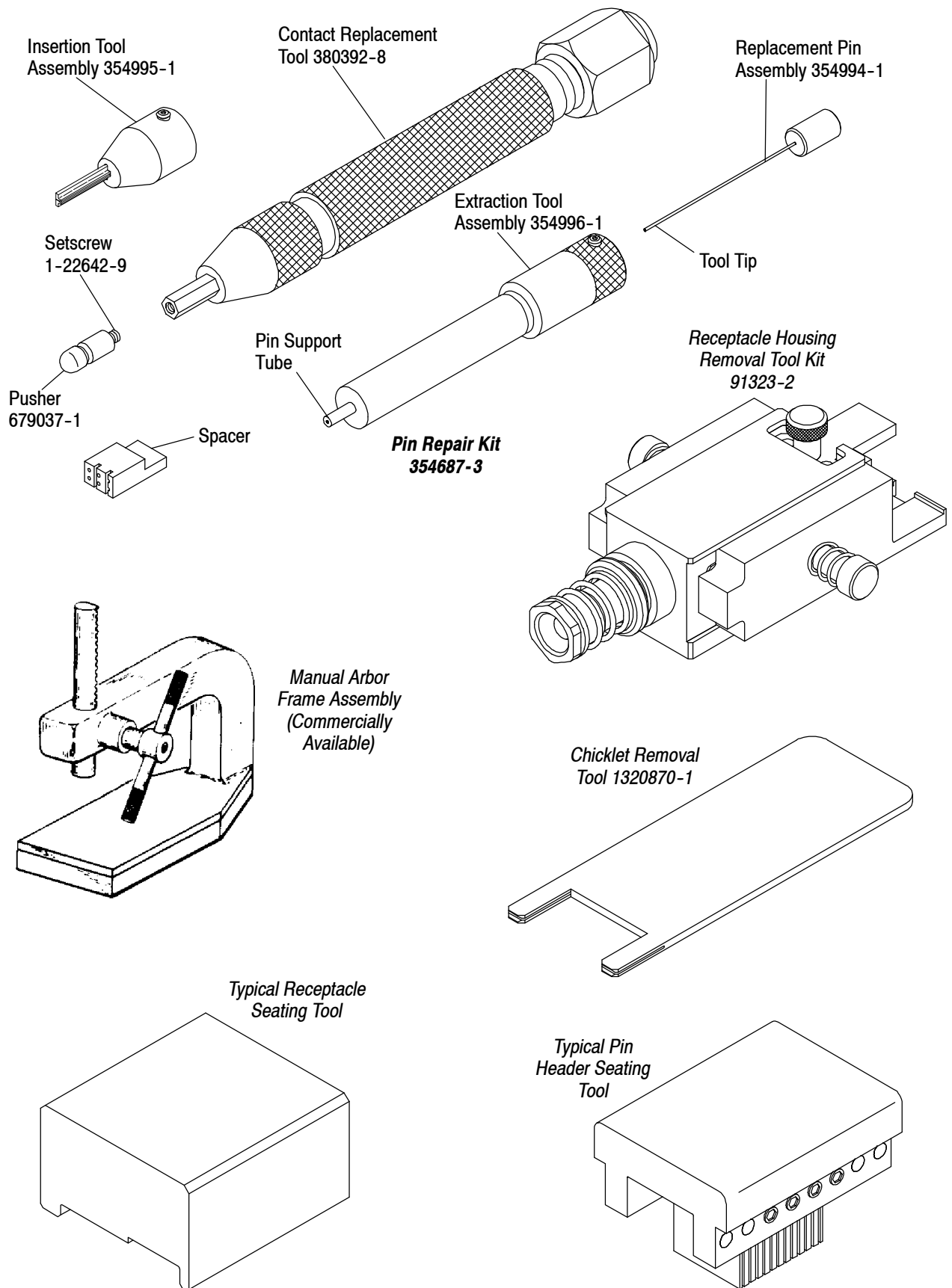


Figure 10 (end)

6. VISUAL AID

Figure 11 shows a typical application of an Z-PACK 12-Row Interconnection System. 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.

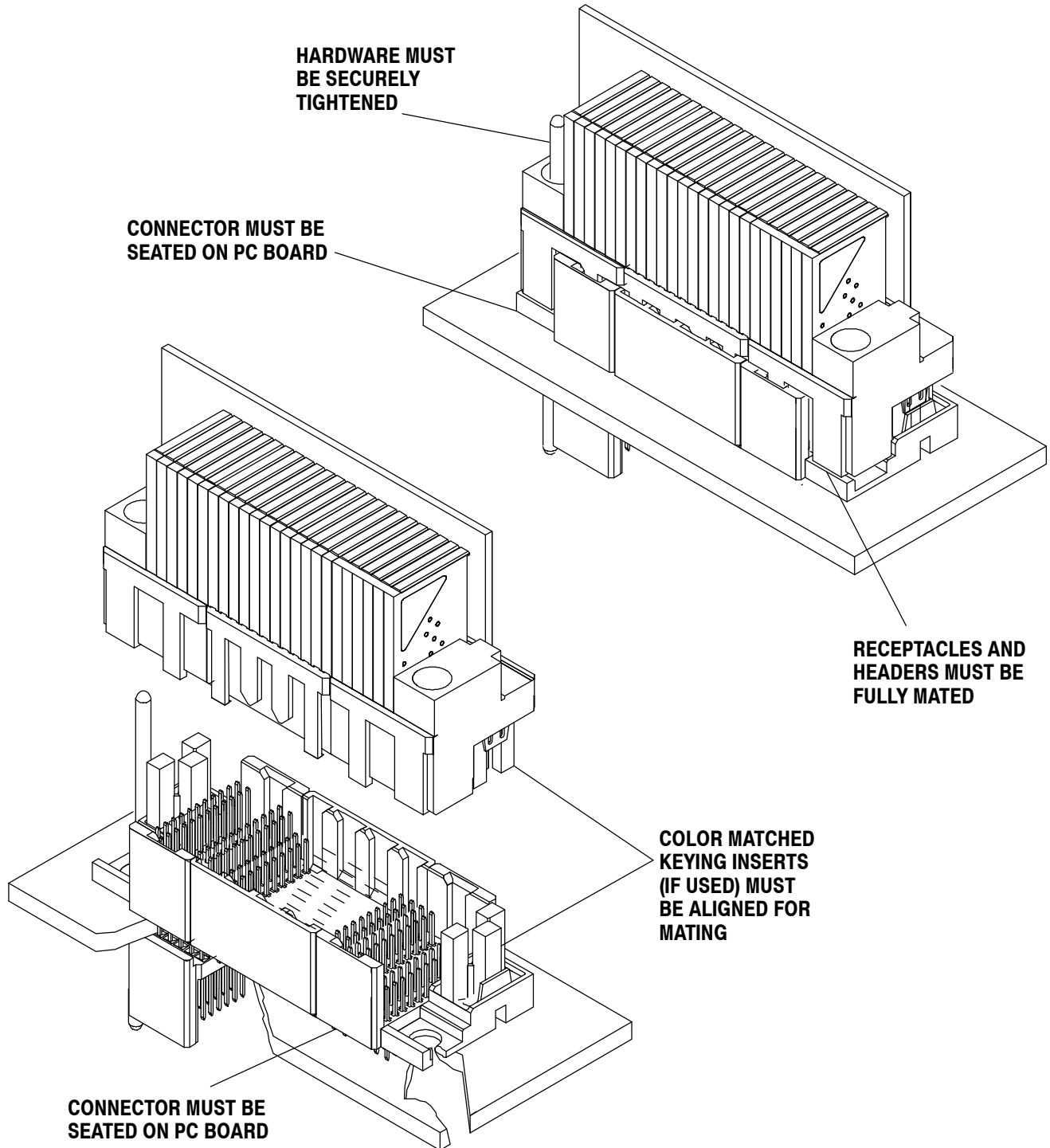


FIGURE 11. VISUAL AID