



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  $\pm 0.13$  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 requirements for application of IMPACT 2-, 3-, 4-, 5-, and 6-pair standard connector systems. This connector system uses a modular concept and interconnects two printed circuit (pc) boards. These connectors are available in vertical press-fit pin headers, and right-angle press-fit receptacles available with two different compliant pin sizes. Column sizes 6, 8, 10, 12, 14, 16, 18, and 20 are available for all pair sizes. All connectors are offered in a left-guided, right-guided, or unguided form. The headers also have the option of an end-wall where a guide module is not located.

The pin header and receptacle have the same footprint to simplify pc board layout. Both pin header and receptacle connectors are designed to be seated onto the pc board via eye-of-needle compliant pin contacts. The pin header and receptacle have polarization/alignment slots and lugs that help to position the contacts prior to engagement of the circuits.

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.

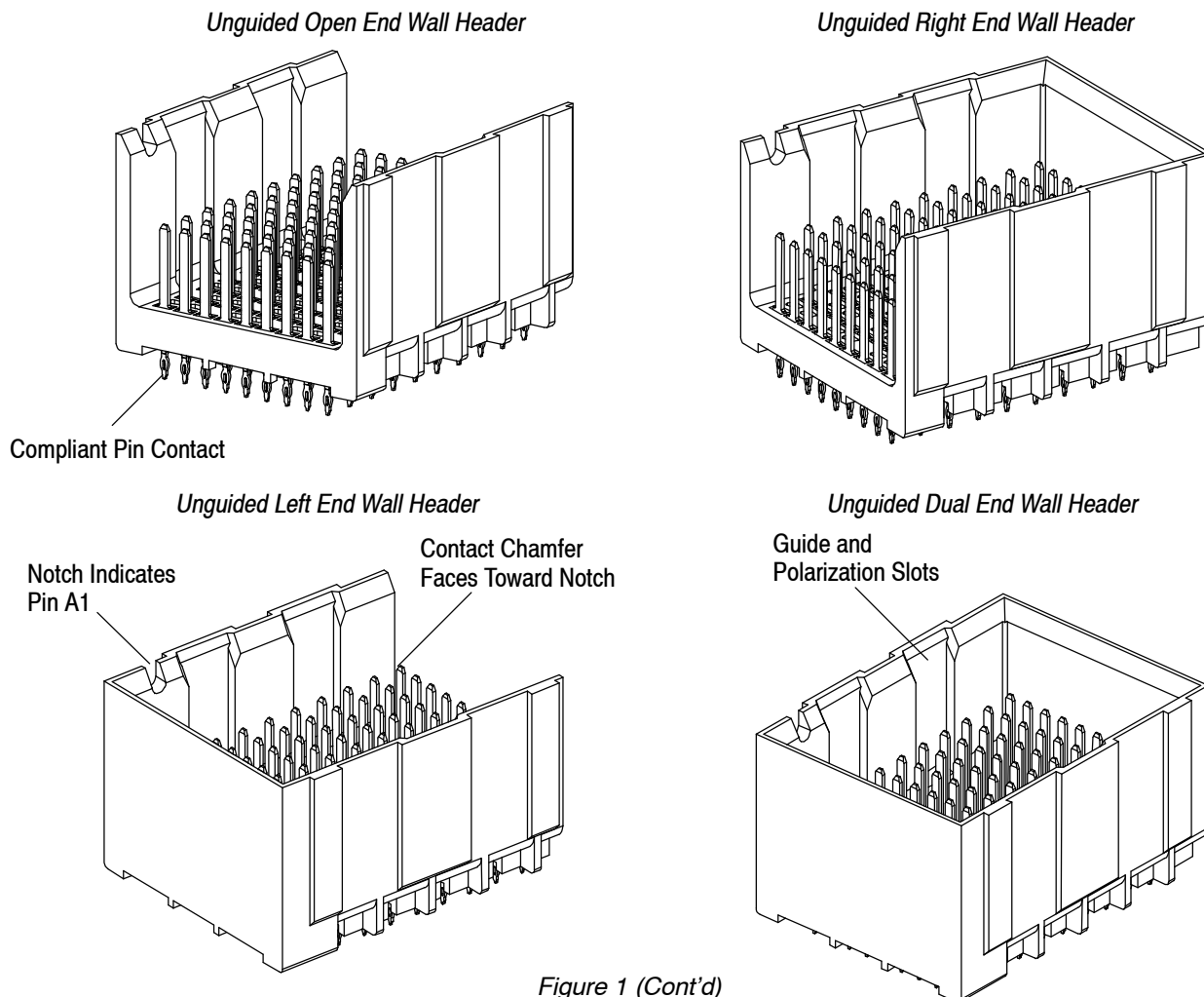


Figure 1 (Cont'd)

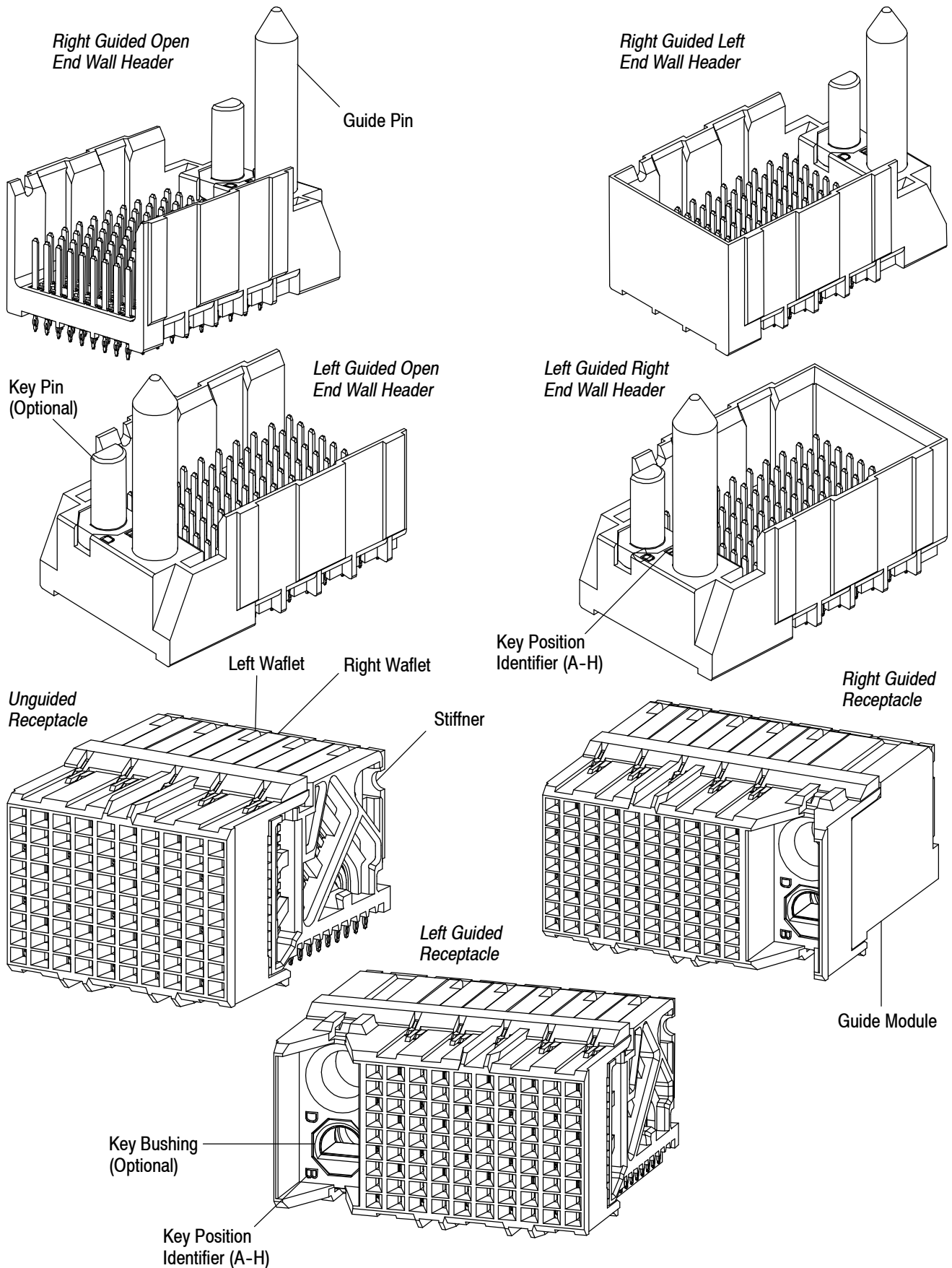


Figure 1 (End)

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## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Revisions to this application specification include:

- Updated document to corporate requirements
- Updated information in table in Figure 6

### 2.2. Customer Assistance

Reference Base Part Numbers 2007788 (header) and 2007705 (receptacle) and Product Code L346-L353 are representative numbers of the IMPACT standard connector system. 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 TE Representative or, after purchase, by calling the Tooling Assistance Center or Product Information at the 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 TE.

### 2.4. Specifications

Design Objective 108-2351 provides expected product performance and test results.

## 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 connector performance.

### 3.2. Product Materials and Selection Criteria

#### A. Material

All housings and waflets are molded of UL94V-0 rated polyesters.

The header and receptacle contacts are a high-performance copper alloy and plated at the contact interface with gold. All contacts have a nickel underplate and tin or tin-lead plated press-fit leads. Refer to the specific Customer Drawings for additional details.

#### B. End-to-End Placement

Connectors can be mounted end-to-end within the specified dimensions shown below. Component side of motherboards and daughterboards are shown. See Figures 2A and 2B.

2A

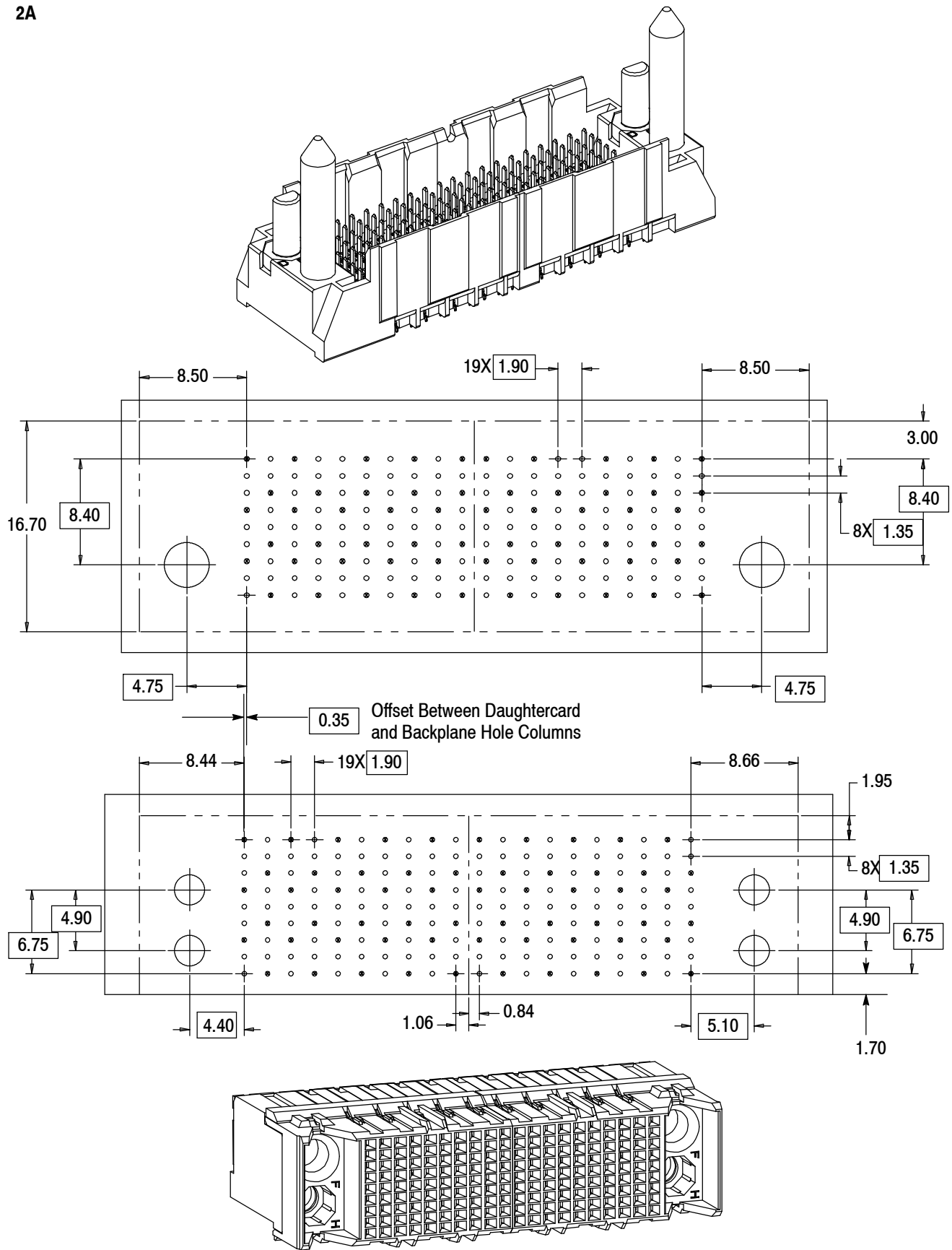


Figure 2A (Cont'd)

2B

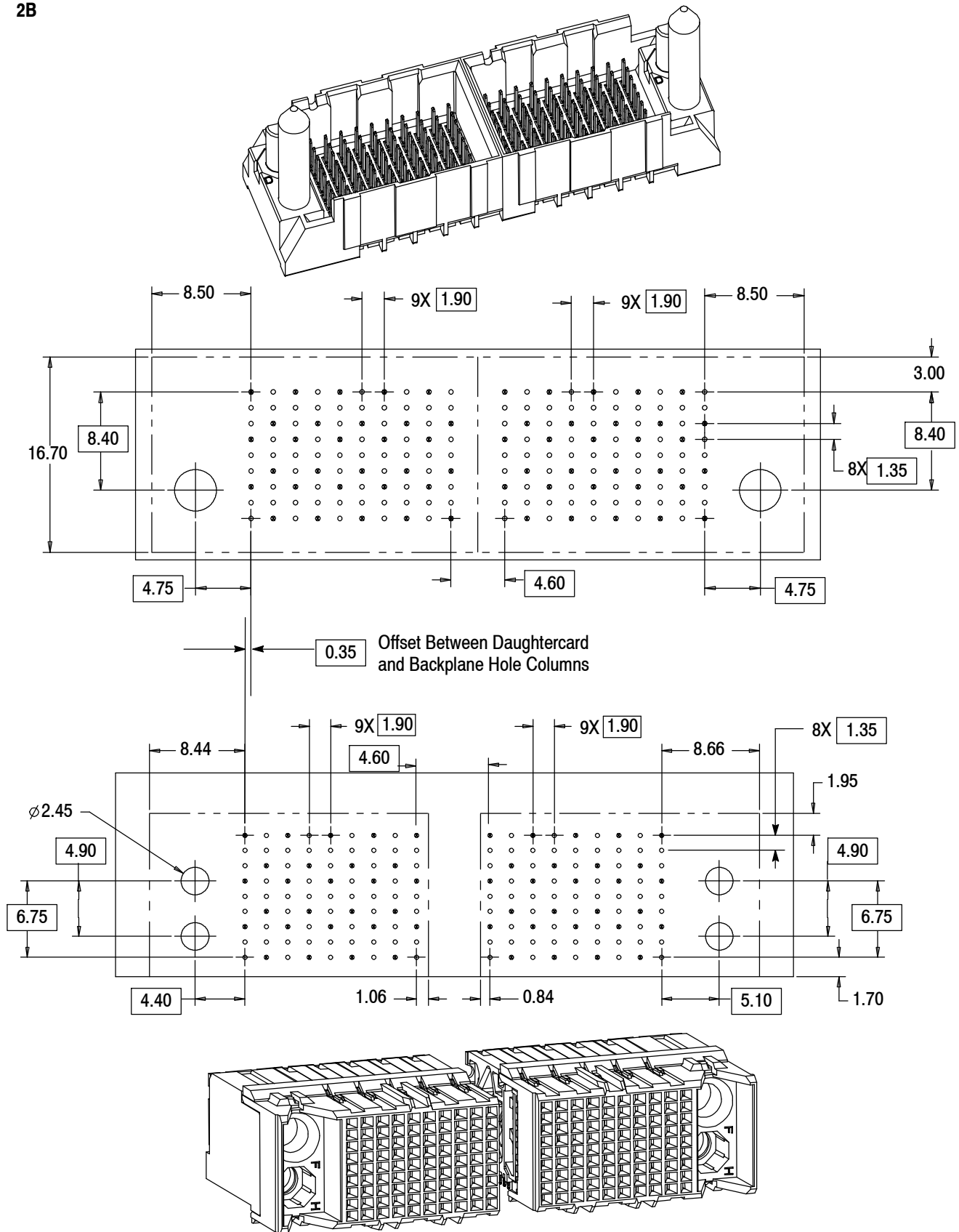


Figure 2B (End)

**C. Sizes**

Length of pins are shown in Figure 3.

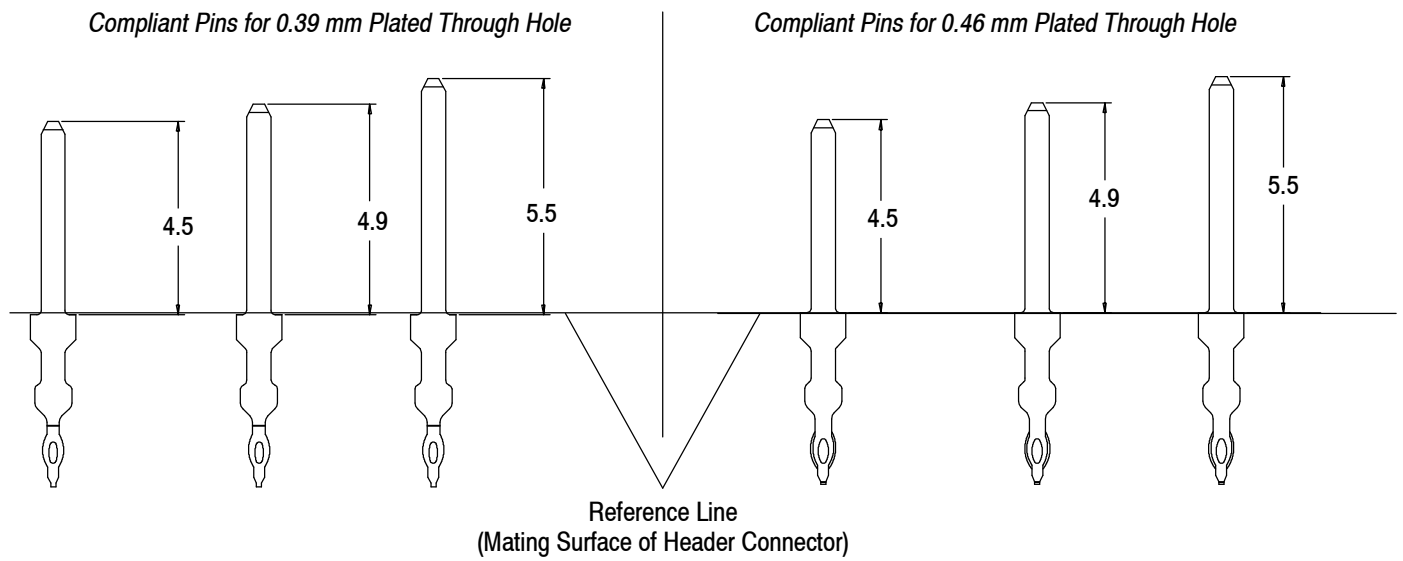


Figure 3

**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.

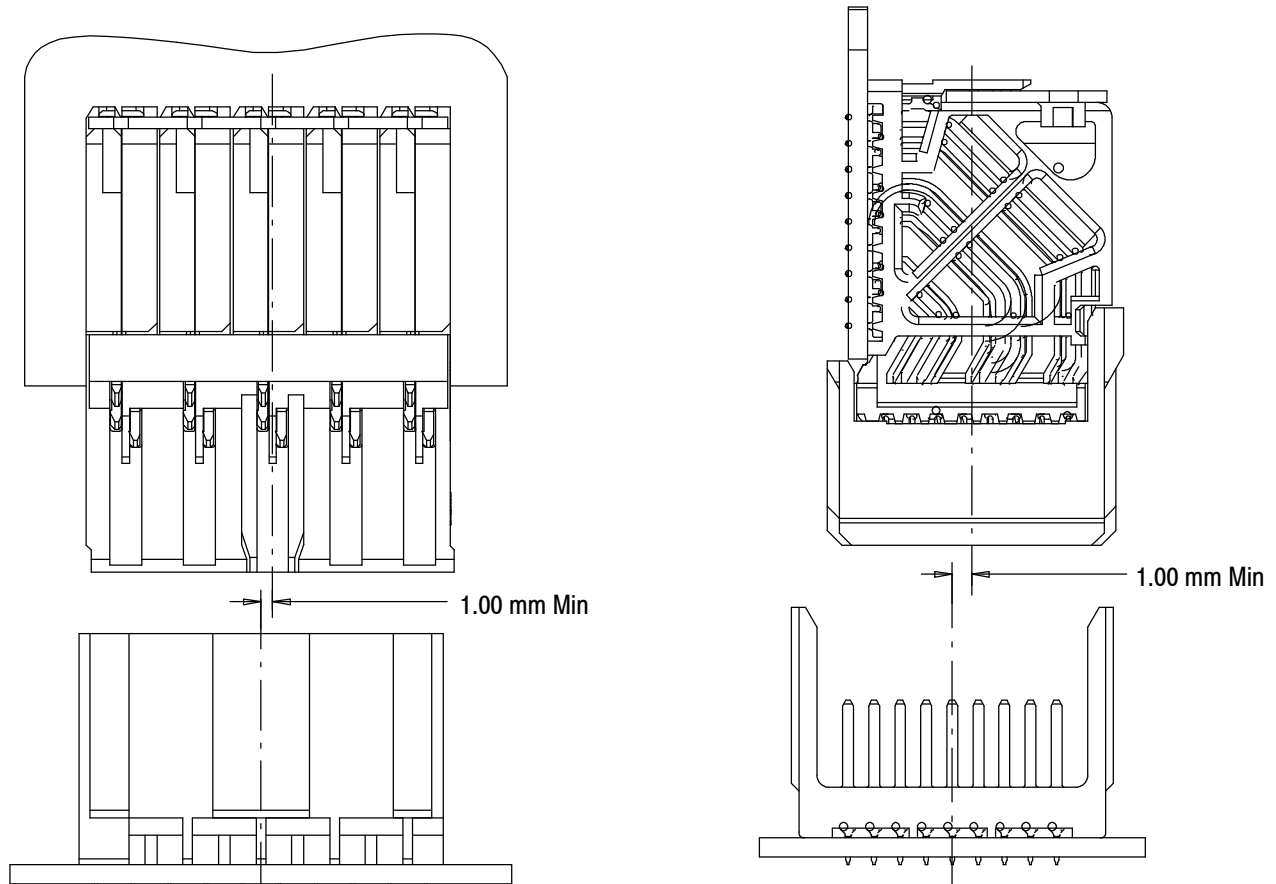


Figure 4 (Cont'd)

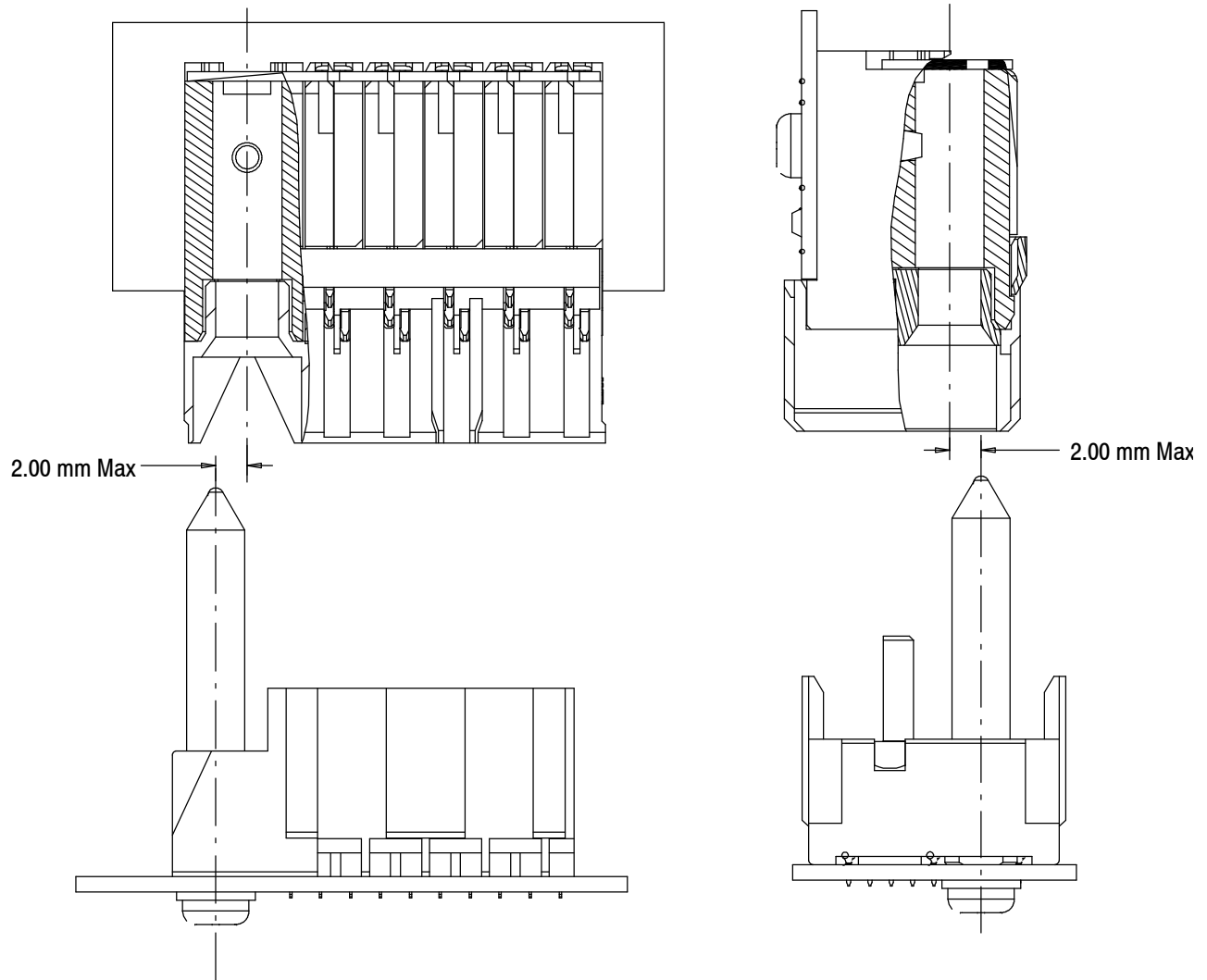


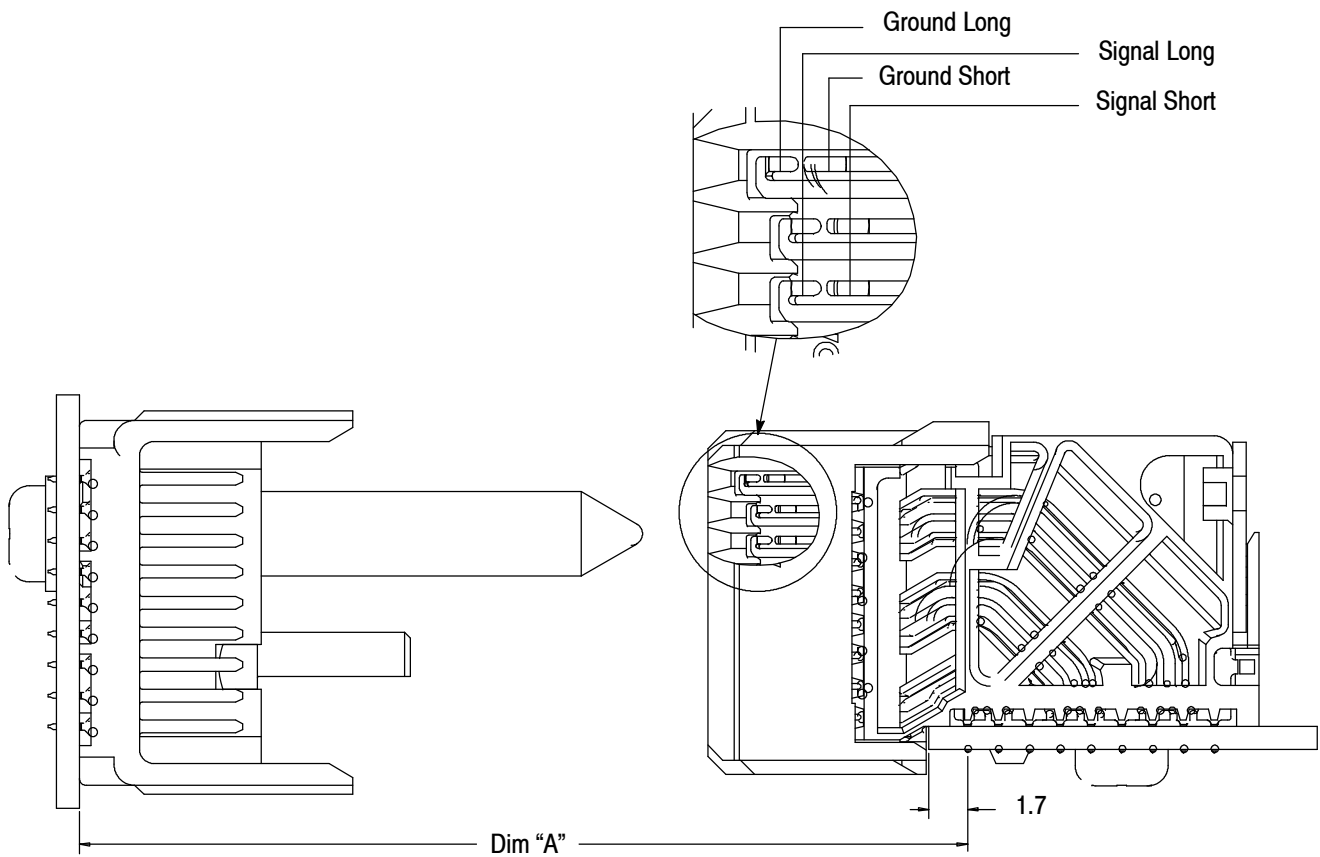
Figure 4 (End)

### 3.4. Mating Sequences and Wipe Length

The IMPACT standard connector system has two basic levels of sequencing during mating. The order of mating is as shown below. Figure 6 shows the relative distances between sequencing events as a function of the distance between the surface of the backplane and the centerline of Row A of the daughtercard connector.

Full mating of connectors is necessary to ensure a good connection and to obtain the maximum signal transmission performance. The dimension shown for the fully mated condition from the surface of the backplane, and the first row of contacts in the daughtercard connector is recommended. Refer to Figure 5.

Connector wipe dimensions are shown in Figure 6. Wipe lengths are calculated by subtracting the fully mated connector condition from the reliable mating point data (Dim A in table) as shown in Figure 5.



Note: Dim "A" is 14 mm for a fully mated connector.

HEADER CONTACT LENGTH	RECEPTACLE CONTACT		DIM "A" FIRST MATE-LAST BREAK	FULLY MATED FUNCTIONAL NORMAL FORCE WIPE LENGTH
4.50	Ground	Long	16.60	2.52
		Short	15.60	1.52
	Signal	Long	16.10	2.02
		Short	15.10	1.02
4.90	Ground	Long	17.00	2.92
		Short	16.00	1.92
	Signal	Long	16.50	2.42
		Short	15.50	1.42
5.50	Ground	Long	17.60	3.52
		Short	16.60	2.52
	Signal	Long	17.10	3.02
		Short	16.10	2.02

Figure 5

### 3.5. PC Board

#### A. Thickness

Vertical pin header connectors and right-angle receptacle connectors with compliant pin contacts require a minimum backplane and daughtercard thickness of 1.00 mm to allow for positive retention of the compliant pin contact. Thicker backplanes will not effect the retention of the compliant pin contact.



**NOTE** For circuit routing concerns, contact Product Information at the number at the bottom of page 1.



**B. PC Board Hole Pattern Layout**

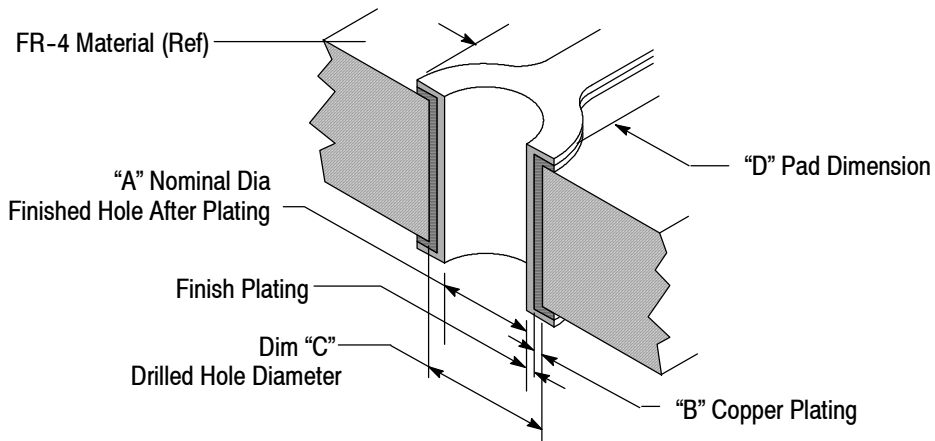
The pc board hole patterns for the placement of these connectors are provided on the applicable Customer Drawing.

**3.6. Contact Hole Configuration**

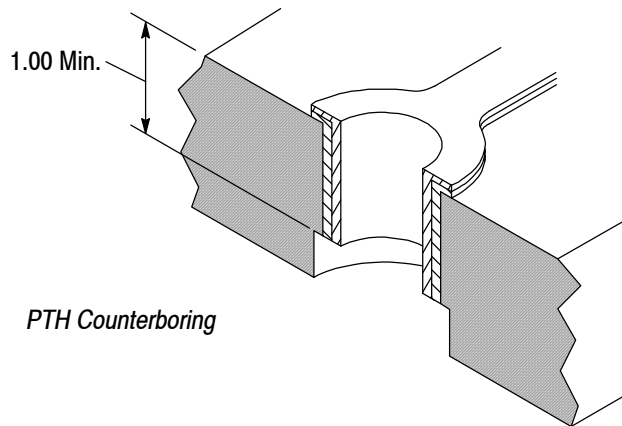
The holes in the pc board for all contacts must be drilled and plated through to the dimensions shown in Figure 6. Contact Product Information for additional plating options.

If pc boards are to be back-drilled (counterbored) for signal integrity performance, refer to the dimensions provided in Figure 6B.

6A



6B



DIMENSION	FINISHED PTH	
	"A" Dimension (Finished PTH)	0.39 ±0.05
"B" Dimension (Copper)	0.025 Min to 0.050 Max	
"C" Dimension (Drill Hole)	0.48 ±0.013	0.55 ±0.013
"D" Dimension (Top Layer Pad Diameter)	0.80	0.80
"D" Dimension (Bottom Layer Pad Diameter)	0.71	0.80

Figure 6

### 3.7. Connector Installation

#### A. Initial Positioning

Vertical pin headers, and right-angle receptacles typically are pre-applied to a pc board by hand.

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

When placing a right-angle receptacle on a pc board, align the row of contact leads closest to the pc board edge first, and continue aligning the remainder of the rows by rolling the receptacle from front to back.

**NOTE**



*Vertical pin header connectors must be placed on the pc board so that pin 1 to pin 1 orientation is maintained. For contact 1 indicators, see Figure 7.*

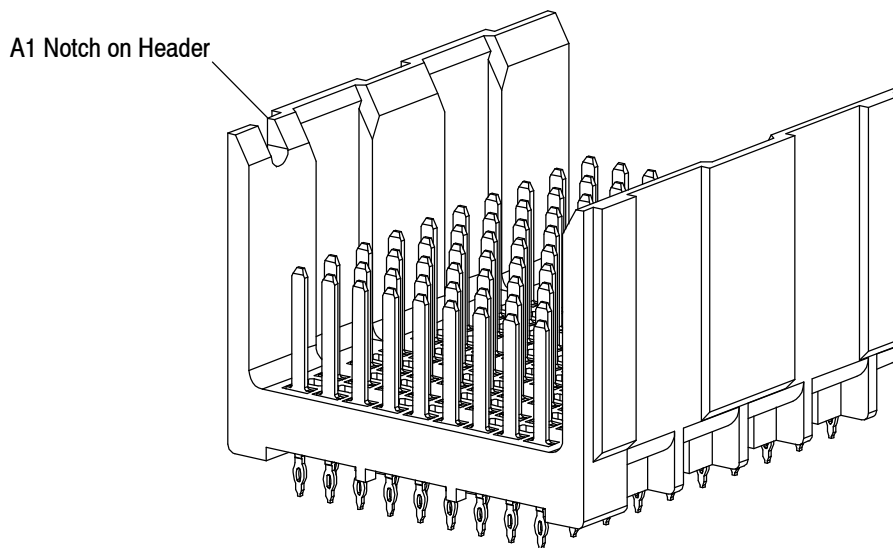


Figure 7

#### B. Seating Connectors

Seating force must be applied evenly on the connectors to prevent deformation or other damage to the contacts and housings. When installing vertical header connectors, the insertion force must be evenly applied to the assembly using the appropriate seating tool. When installing right-angle receptacle connectors, the insertion force must be evenly applied to the assembly (as shown in Figure 10). Refer to Paragraph 3.8 for seating force information. Seating force will vary according to pc board variations and signal pin count. Tooling recommendations are covered in Section 5.

**CAUTION**

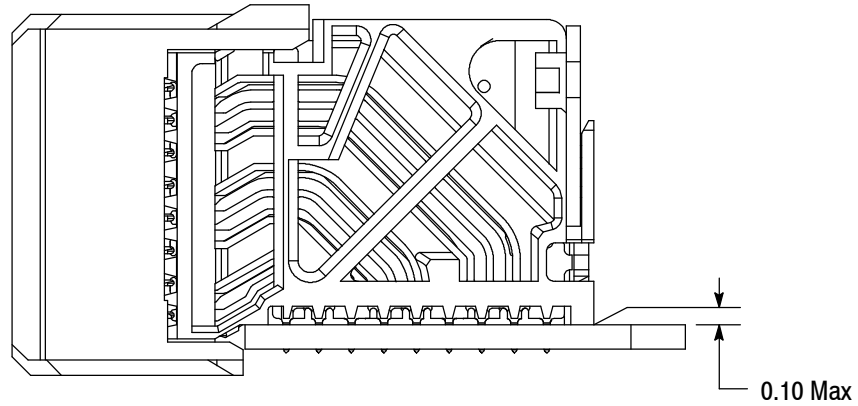


*Correct seating of connector is essential to interconnection performance. This includes correct seating height (see Figure 8) and force applied. Over-seating of product will deform parts critical to the quality of the connector. Maximum force occurs prior to the connector bottoming on the pc board.*

### 3.8. Connector Seating Height

The connectors with compliant pin contacts are seated using seating tools. See Figure 9. These tools may be used in the application machines listed in Section 5, TOOLING, or with a suitable machine capable of supplying a minimum controllable downward force per compliant pin contact of 66 N [15 lbs]. Pin headers and receptacles must be seated to the dimensions shown in Figure 8.

8A



8B

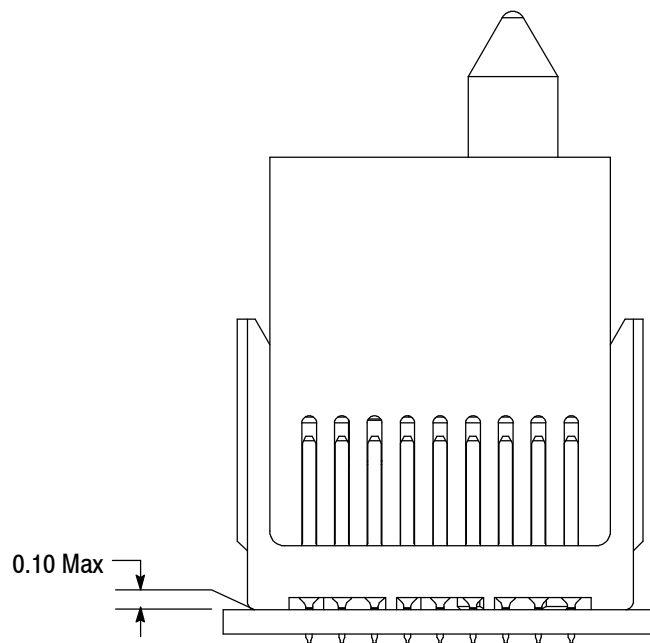


Figure 8

### 3.9. Repair and Replacement

#### A. Header

In cases where only individual pin contacts are in need of replacement, header assemblies can be repaired without removal from the pc board.

#### B. Receptacle

Receptacle construction does not allow for replacement of individual contacts. Damaged receptacles must be completely replaced.

### 4. QUALIFICATIONS

IMPACT standard connectors have not yet been sent for evaluation and testing.

### 5. TOOLING

Figure 9 provides tooling part numbers related to the IMPACT standard connector system.

### 5.1. 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 any contact compliant pins that may protrude below the pc board surface during installation of the connector.

### 5.2. Seating Tools

Seating tools for vertical headers 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.

### 5.3. Power Units

Power for seating tools must be provided by an application tool (with a ram) capable of supplying a downward force of 66 N [15 lbs] per pin. Manual Electric Servo Press (MEP 6T) 2-1399500-5 and Bench Top Electric Servo Presses (BMEP 3T) 1-1399400-5 and (BMEP 5T) 2-1399401-4 are available for this seating tool. For information on the presses, visit the press-fit assembly equipment website at <http://tooling.te.com/pressfit.asp>.

### 5.4. 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. Commercially made arbor frame assemblies are available.

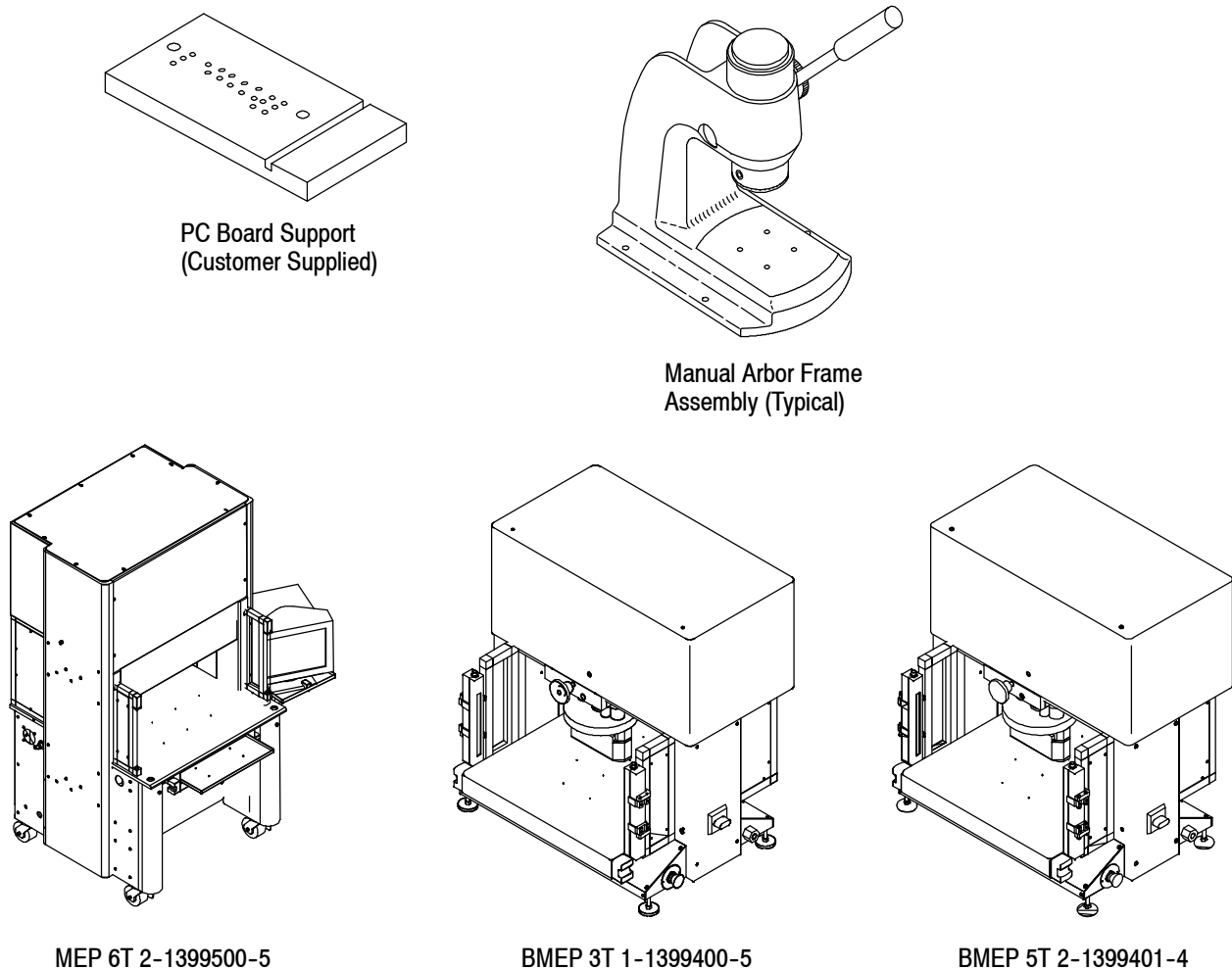


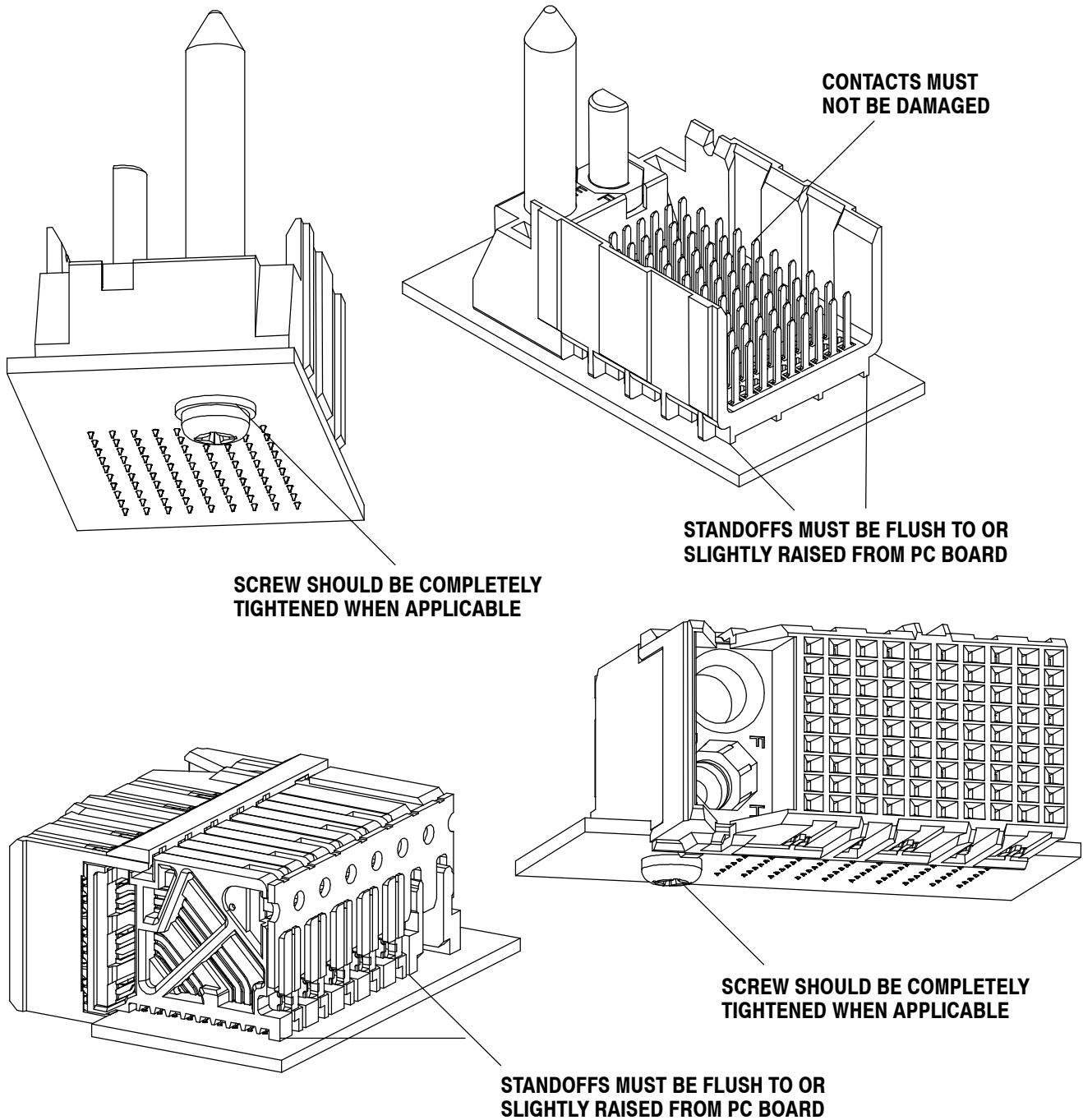
Figure 9 (Cont'd)

CONNECTOR			TOOLING		
TYPE	PAIR	COLUMN	SEATING TOOL	POWER UNIT	
Backplane	2	10	2018536-1	BMEP-3T, BMEP-5T, or MEP-6T	
		16	2018537-1		
	3	8	2018376-1		
		10	2018377-1		
		16	2018378-1		
	4	8	2018523-1		
		10	2018524-1		
		16	2018513-1		
	5	10	2018446-1		
		12	2018447-1		
		16	2018525-1		
	6	10	2018526-1		
		14	2018527-1		
		16	2018528-1		
	Daughtercard	2	10		2018538-1
			16		2018539-1
		3	8		2018379-1
			10		2018380-1
16			2018381-1		
4		8	2018529-1		
		10	2018530-1		
		16	2018531-1		
5		10	2018448-1		
		12	2018449-1		
		16	2018532-1		
6		10	2018533-1		
		14	2018534-1		
		16	2018535-1		

Figure 9 (End)

## 6. VISUAL AID

Figure 10 shows a typical application of the IMPACT standard connector 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 10. VISUAL AID**