

**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  $\pm 0.13$  [ $\pm .005$ ] 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 AMPLIMITE .050 Series cable end IDC and pc board connector. The connectors offer high-density “D” mating (keystone configuration) interfaces available in plug and receptacles with 20 through 120 positions (sizes) having  $1.27 \times 2.54$  [ $.050 \times .100$ ] contact centerlines. The connectors are available with a metal shell over a plastic housing for electromagnetic interference shielding (EMI) and electrostatic discharge (ESD) shielded applications.

The cable end connector contains insulation displacement contacts and is available with pre-assembled or unassembled termination covers. The cable end connector is available for free-hanging applications or panel-mount applications.

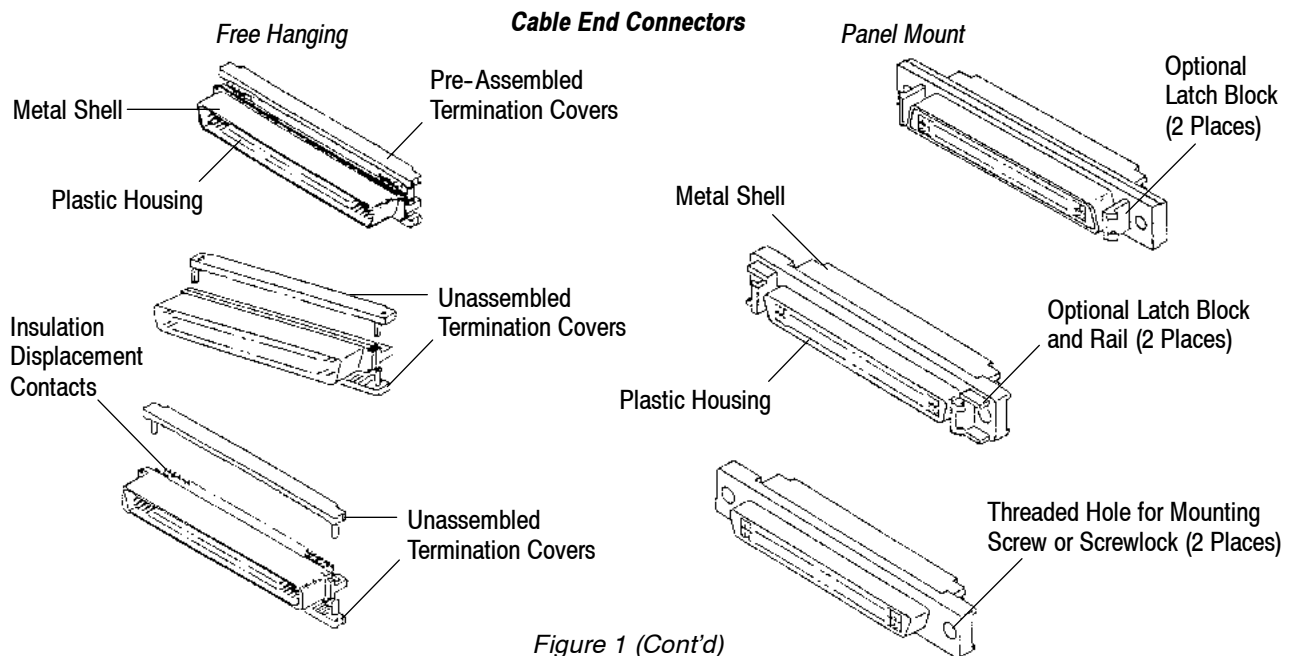
**NOTE**



Feed-through cable end connectors are also available and are covered in Application Specification 114-40049.

For free-hanging cable end connectors, a shielded metal backshell, available with a straight cable exit or angled cable exit, must be used to provide cable strain relief and prevent movement of the terminated wires in the insulation displacement contacts. The metal backshell consists of two intermating halves and a serrated strain-relief staple. The strain-relief staple is used to clamp the cable bundle to the lower half of the metal backshell, which reduces stress on the terminated wires. Straight cable exit and angled cable exit metal backshells are available in kits that include latches. Latches lock with a mating connector that has either latch blocks or latch block and rails. Straight cable exit metal backshells are available in kits that include jackscrews. Jackscrews secure the cable end connector with a mating connector that has screwlocks.

When corresponding with 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.



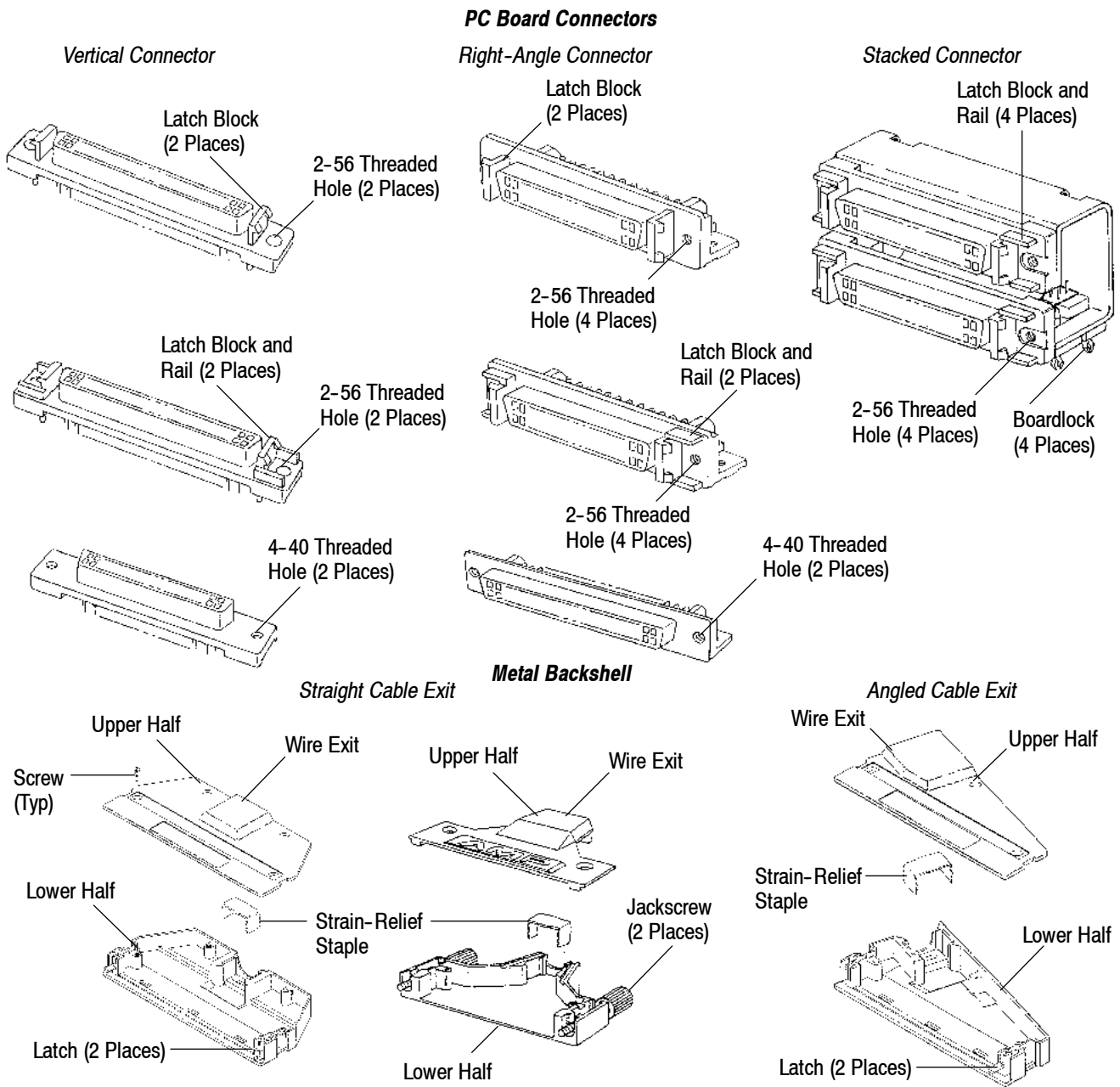


Figure 1 (End)

The panel-mount cable end connector features threaded holes in the mounting flange, which accept commercially-available hardware or screwlocks to secure the connector to a panel. Screwlocks are also used to lock with a mating connector having a metal backshell with jackscrews. The panel-mount cable end connector is available with latch blocks, latch blocks and rails, or without either. The latch blocks and latch blocks and rails are used to lock mating connectors together in cable-to-cable applications, when the mating connector has a backshell with latches.

The pc board connector is available in vertical, right-angle single, and right-angle stacked configurations with solder-type contacts or vertical configuration with ACTION PIN\* (solderless) contacts. The pc board connector features boardlocks or threaded holes that accept commercially-available hardware to secure the connector to the pc board. Threaded holes in the mounting flange accept commercially-available hardware or screwlocks to secure the pc board connector to a panel. Screwlocks are also used to lock with a mating connector having a metal backshell with jackscrews. The pc board connector is available with latch blocks, latch blocks and rails, or without either. The latch blocks and latch blocks and rails are used to lock with a cable end connector having a metal backshell with latches.

Panel-mount cable end connectors and pc board connectors having latch blocks and rails mating with cable end connectors having a metal backshell with latches only allow the connectors to unmate by pulling them straight apart. Unmating connectors using a rocking motion can cause damage to the contacts.

## 2. REFERENCE MATERIAL

### 2.1. Revision Summary

Revisions to this application specification include:

- Removed trademark from Paragraph 3.3,A

### 2.2. Customer Assistance

Reference Product Base Part Number 5749621 and Product Code 4620 are representative of AMPLIMITE .050 Series cable end IDC and pc board 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 Representative or, after purchase, by calling PRODUCT INFORMATION at the number at the bottom of page 1.

### 2.3. Drawings

Customer Drawings for product part numbers are available from the service network. If there is a conflict between the information contained in the Customer Drawings and this specification or with any other technical documentation supplied, the information contained in the Customer Drawings takes priority.

### 2.4. 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 and flux removal procedures. A checklist is included in the manual as a guide for information on soldering problems.

### 2.5. Specifications

Application Specifications (114-series) provide product description and application requirements. Product Specifications (108-series) provide product performance and test information. Specifications that pertain to these connectors are:

- 114-40049 AMPLIMITE .050 Series Feed-Through Connectors for 0.64 [.025] Ribbon Cable
- 108-1228 AMPLIMITE Shielded .050 Series Connectors
- 108-1228-1 AMPLIMITE Stacked .050 Series Connectors
- 108-1359 AMPLIMITE .050 Series Connectors for 0.64 [.025] Ribbon Cable

### 2.6. Instructional Material

Instruction Sheets (408-series) provide product assembly instructions or tooling setup and operation procedures and Customer Manuals (409-series) provide machine setup and operating procedures. Documents available which pertain to these connectors are:

- 408-6923 Manual Arbor Frame Assembly 58024-1
- 408-9027 Adapter Kit for Greenerd Frame Assemblies 3A and 3B
- 408-9200 Repair Tool 58430-1 for AMPLIMITE .050 Series Connectors
- 408-9427 AMPLIMITE .050 Series Connectors (Round-to-Flat-Cable)
- 408-9663 Installation and Use of Mass Termination Tooling 91291-[ ]
- 408-9750 Cover Lacing Fixture 91293-1 for AMPLIMITE .050 Series Connectors
- 408-9757 Tooling Assembly 856371
- 408-9817 Manual Miniature Applicator Frame Assembly 91295-1
- 408-9820 Cover Closing and Staple Inserter Kits for AMPLIMITE .050 Series Connectors
- 408-9822 Tooling Kit 768900-1 for CHAMPOMATOR\* 2.5
- 409-5791 CHAMPOMATOR 2.5 Terminating Machine Control Module 852423-[ ]
- 409-5839 CHAMPOMATOR 2.5 Bench Terminating Machines 762734-3 and -4

## 2.7. Standards and Publications

Standards Developing Organizations provide engineering and technical information documents containing industry test and performance requirements. Documents available that pertain to these connectors are:

SCSI-2, "Small Computer System Interface-2"

EIA 232, Electronic Industries Alliance, "Interface Between Data Terminal Equipment and Data"

These connectors are compatible with IPI (Intelligent Peripheral Interface) and HIPPI (High-Performance Parallel Interface) technologies.

## 3. REQUIREMENTS

### 3.1. Storage

#### A. Ultraviolet Light

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

#### 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 the connectors near any chemical listed below as they may cause corrosion stress cracking in the contacts.

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.



### 3.2. Contact Position Assignment

These connectors are marked to indicate contact position 1 only. Pin contacts are numbered on plugs from left to right; top row first. Socket contacts are numbered on receptacles as a mirror image of the plugs from right to left; top row first. Typical assignments are shown in Figure 2.

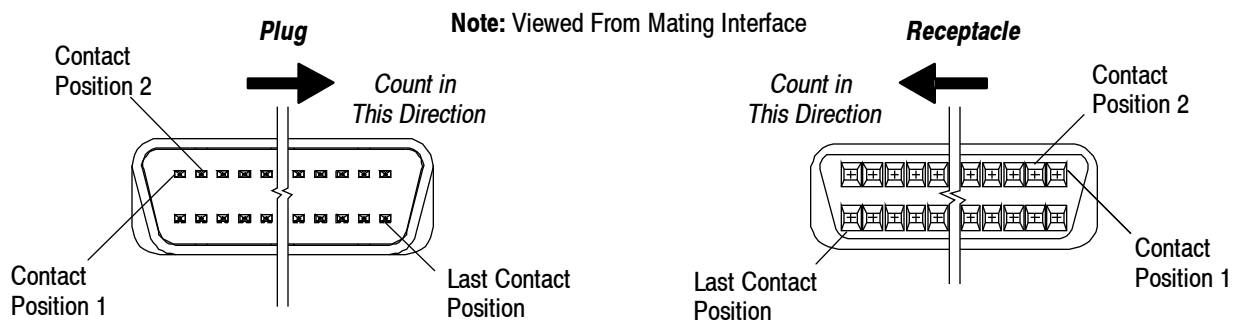


Figure 2

### 3.3. Cable End Connector

#### A. Cable Selection

These connectors are designed to terminate solid or 7-strand wire sizes 30 to 28 AWG having PVC insulation with an insulation diameter range of 0.74 to 0.91 [.029 to .036]. Connector size, maximum cable diameter, and backshell material and staple size are provided in Figure 3.

Wire not meeting these parameters should be fully evaluated in the application to verify that the connector consistently terminates the cable and provides stable electrical performance. Wire with PTFE insulation is not recommended for use with these connectors.

CONNECTOR SIZE	MAXIMUM CABLE DIAMETER (See Note)	METAL BACKSHELL STAPLE SIZE
20, 26	6.86 [.270]	SMALL
28	7.49 [.295]	
40	8.64 [.340]	
50	9.02 [.355]	MEDIUM
	10.16 [.400]	
	12.19 [.480]	
60	9.65 [.380]	MEDIUM
68	10.16 [.400]	MEDIUM
	11.18 [.440]	
	13.21 [.520]	LARGE
80	10.67 [.420]	LARGE
	12.70 [.500]	
100	12.70 [.500]	
	13.97 [.550]	
120	13.97 [.550]	

**Note:** Based on size of cable exit opening of metal backshell.

Figure 3

#### B. Cable Preparation

The strip length of jacketed cable will depend on the type of tooling used to terminate the wire. Refer to the instructions packaged with the application tooling for the proper cable jacket strip length.

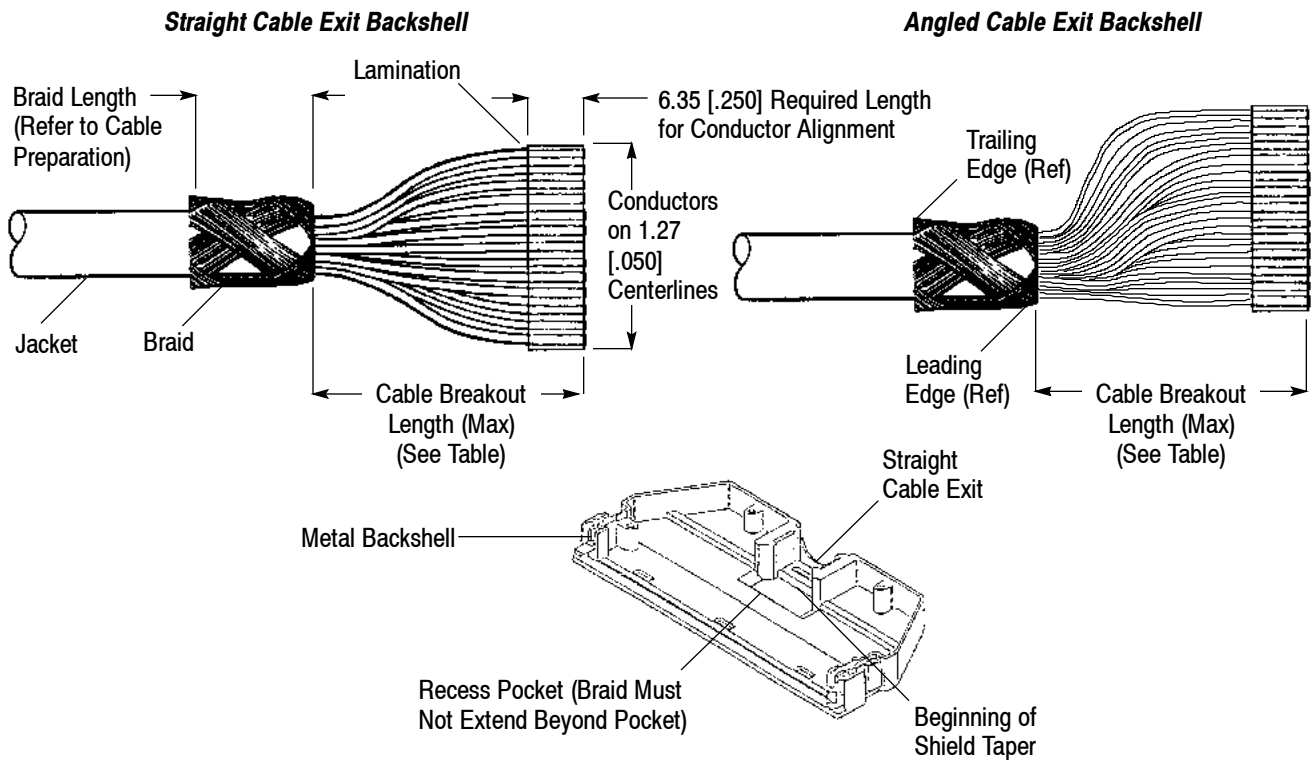
The braid length will vary depending on the backshell and the cable bundle size and slack needed to assure strain relief for all wires. Essential requirements are that the leading edge of the braid fold extends slightly beyond the beginning of the shield taper and the trailing ends of the braid be trimmed so they do not extend beyond the backshell cable exit. See Figure 4.

#### C. Lamination of Discrete Wires

Discrete wire cable can be laminated for mass termination by flattening the round bundle of wires and applying a thin lamination over the ends of the wire as shown in Figure 4.



*Individual wire insulation must not be cut during stripping of the cable insulation or when trimming the braid shield and foil from the wrapping.*



CONNECTOR SIZE	CABLE BREAKOUT LENGTH (MAX)	
	STRAIGHT CABLE EXIT BACKSHELL	ANGLED CABLE EXIT BACKSHELL
20, 26, 28	22.86 [.900]	22.86 [.900]
40	22.86 [.900]	27.94 [1.100]
50, 60, 68, 80	27.94 [1.100]	27.94 [1.100]
100, 120	27.94 [1.100]	38.10 [1.500]

Figure 4

**D. Termination Requirements**

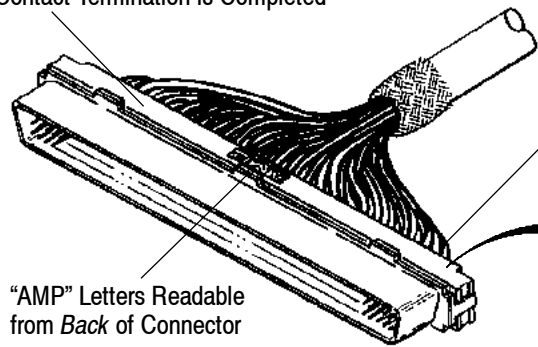
Prepared cable shall be located and terminated according to the procedure given in the applicable tooling instructions. Criteria for an acceptable termination is shown in Figure 5.



Reasonable care should be taken to provide undamaged terminations. An improper termination in any of the insulation displacement contacts will be reason to discard the entire connector. Contacts are designed for one-time termination, and cannot be replaced, repaired, or re-used.

### IDC Termination Requirements

For Discrete Wire, Termination Covers Must be Installed *Immediately After* Contact Termination is Completed

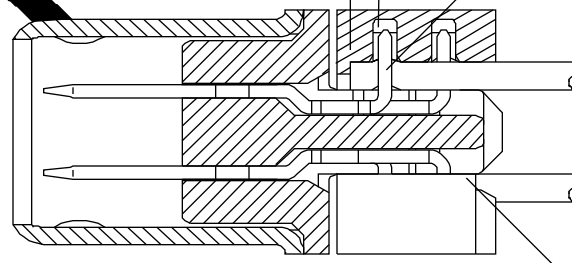


"AMP" Letters Readable from Back of Connector

Allow for Slack in Wires Between Termination Covers and Strain-Relief Staple Area (Front of Braid)

Contacts Are Not Bent After Termination and Fit Within Termination Cover Slots

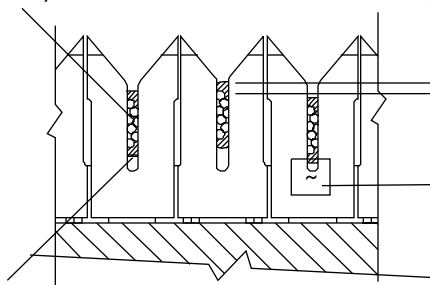
0.76 [.030] Min Wire Protrusion



For Destructive Testing, Remove Wire from Slot (Conductor Must Be Exposed and Deformed on Both Sides to be Considered Good Termination)

Strand Closest to Transition Minimum of One Full Strand Diameter to Maximum of Three Full Strand Diameters from Transition

Covers Fully Seated Against Connector Housing at Termination Cover Ends



Contact Base Metal Neither Exposed Nor Deformed During Termination

Insulation Intact Except in Area of Slot (Tooling Marks on Wire Insulation Acceptable)

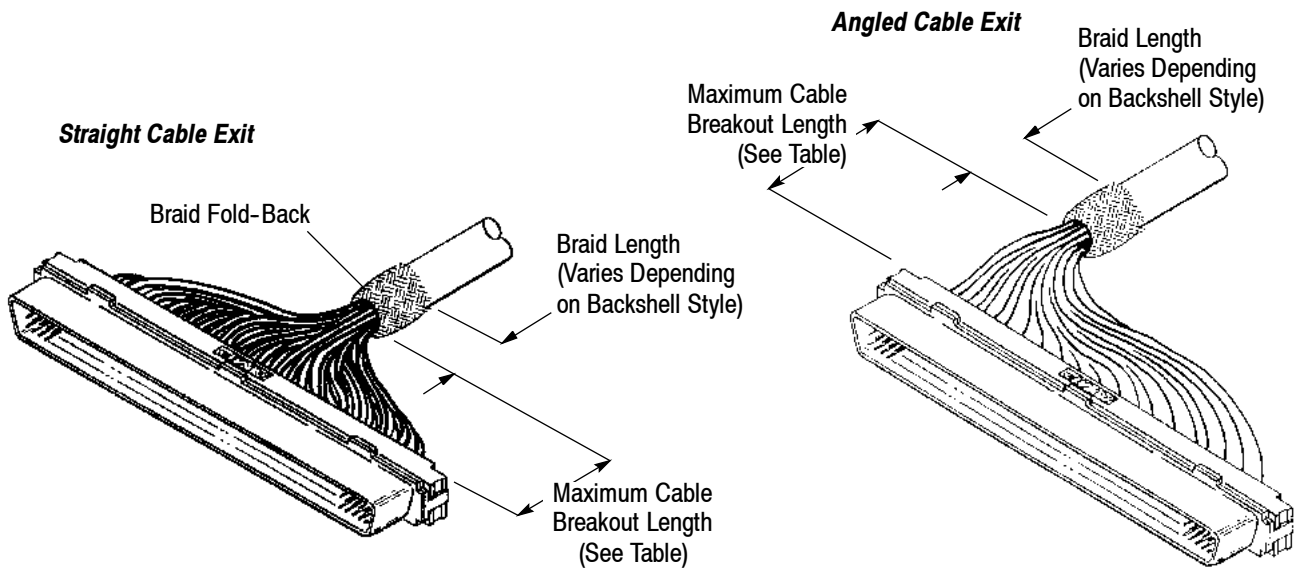
Figure 5

### E. Cable Breakout Length

Correct breakout length is required for proper assembly of the terminated connector and cable into the backshell. Breakout dimensions are measured from the front edge of the termination cover to the cable braid fold-back. The points for measurement and dimension for connector size and backshell combination is provided in Figure 6.

### 3.4. Backshell Installation

The terminated connector must be placed in the lower half of the backshell and the strain-relief staple installed onto the cable bundle. The insertion depth of the staple will depend on the insulation diameter of the individual wires and the effect they have on the overall cable bundle. If insertion is too shallow there will not be adequate strain relief on the cable bundle; if insertion is too deep, the wire conductors could be stretched or broken. If there is doubt about proper insertion depth, the strain-relief staple should be installed in increments. Each increment should be checked by holding the connector firmly and gently moving the cable bundle in a circular motion. If the wires between the termination point and strain-relief staple move, the staple must be inserted deeper. Recommended strain-relief staple insertion depth for most cable bundles is provided in Figure 7.



CONNECTOR SIZE	CABLE BREAKOUT LENGTH††	
	STRAIGHT CABLE EXIT BACKSHELL	ANGLED CABLE EXIT BACKSHELL
20, 26, 28	22.86 [.900]	22.86 [.900]
40	22.86 [.900]	27.94 [1.100]
50, 60, 68, 80	27.94 [1.100]	27.94 [1.100]
100, 120	27.94 [1.100]	38.10 [1.500]

†† Cable Breakout Length is based on standard application and may be adjusted for specific insulation diameter, wiring technique, and tooling.

Figure 6



*It is extremely important to ensure that all wire conductors extending from the strain relief area to the connector are positioned within the sides of the lower half of the backshell. Any wire conductors extending over the sides of the lower half of the backshell will be pinched and consequently shorted when the upper half of the backshell is secured to the lower half.*

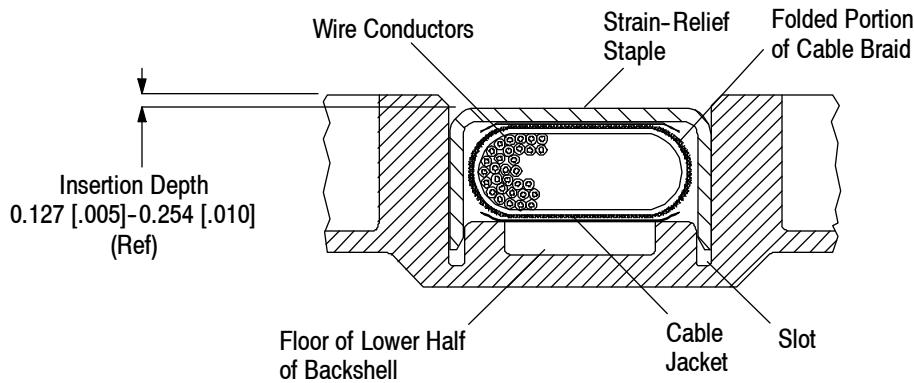


Figure 7

### 3.5. Panel

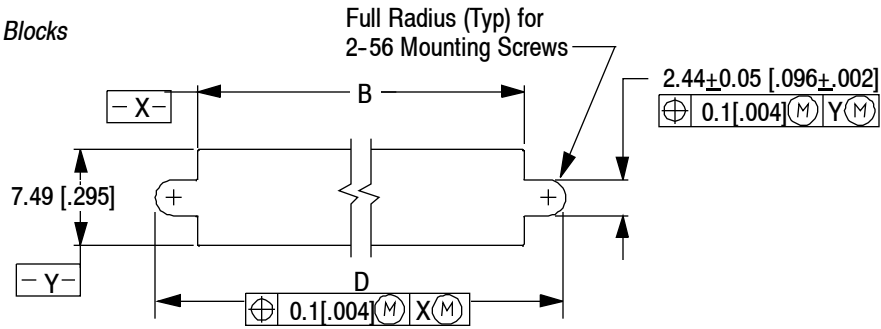
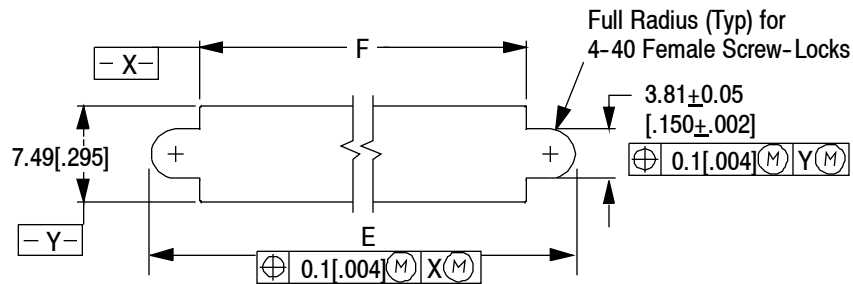
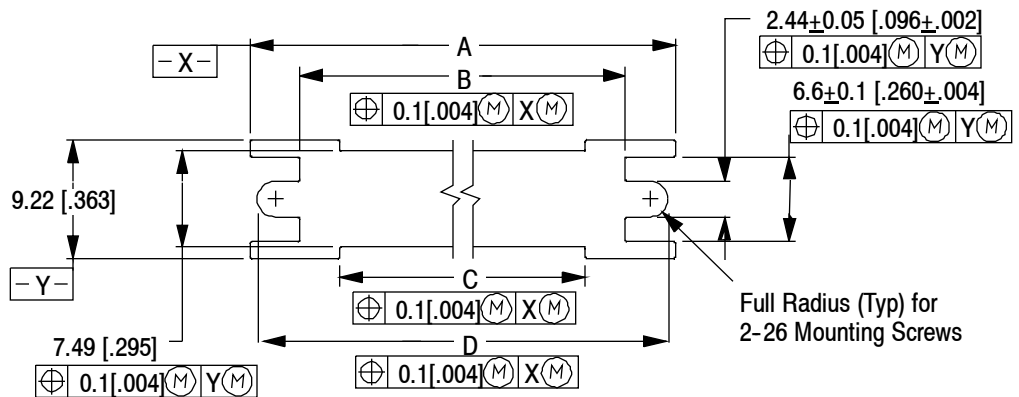
#### A. Thickness

The recommended panel thickness is 1.57 [.062].

#### B. Cutout

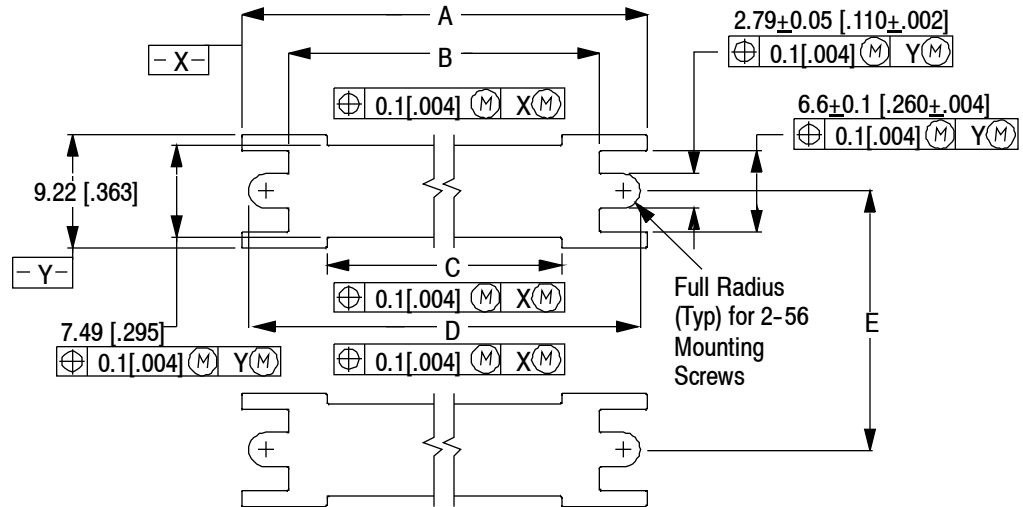
Panel cutout patterns and dimensions are provided in Figure 8.



**Panel Cutout for Single Connector**
**Connector With Latch Blocks**

**Connectors Without Latch Blocks and Rails**

**Connectors With Latch Blocks and Rails**


RIGHT-ANGLE SINGLE CONNECTOR SIZE	DIMENSION					
	A	B	C	D	E	F
20	31.50 [1.240]	23.75 [.935]	17.37 [.684]	29.87 [1.176]	31.24 [1.230]	18.64 [.734]
26	35.31 [1.390]	27.56 [1.085]	21.18 [.834]	33.68 [1.326]	35.05 [1.380]	22.45 [.884]
28	36.58 [1.440]	28.83 [1.135]	22.45 [.884]	34.95 [1.376]	36.32 [1.430]	23.72 [.934]
40	44.2 [1.740]	36.45 [1.435]	30.07 [1.184]	42.57 [1.676]	43.94 [1.730]	31.34 [1.234]
50	50.55 [1.990]	42.8 [1.685]	36.42 [1.434]	48.92 [1.926]	50.29 [1.980]	37.69 [1.484]
60	56.9 [2.240]	49.15 [1.935]	42.77 [1.684]	55.27 [2.176]	56.64 [2.230]	44.04 [1.734]
68	61.98 [2.440]	54.23 [2.135]	47.85 [1.884]	60.35 [2.376]	61.72 [2.430]	49.12 [1.934]
80	69.6 [2.740]	61.85 [2.435]	55.47 [2.184]	67.97 [2.676]	69.34 [2.730]	56.74 [2.234]
100	82.3 [3.240]	74.55 [2.935]	68.17 [2.684]	80.67 [3.176]	82.04 [3.230]	69.44 [2.734]
120	95 [3.740]	87.25 [3.435]	80.87 [3.184]	93.37 [3.676]	94.74 [3.730]	82.14 [3.234]

Figure 8 (Cont'd)

**Panel Cutout for Stackable Connector with Latch Blocks and Rails**


RIGHT-ANGLE STACKABLE CONNECTOR SIZE	DIMENSION				
	A	B	C	D	E
26	35.31 [1.390]	27.56 [1.085]	21.18 [0.834]	34.04 [1.340]	10.54 [0.415]
50	50.55 [1.990]	42.80 [1.685]	36.42 [1.434]	49.28 [1.940]	14.00 [0.551] or 12.70 [0.500]
68	61.98 [2.440]	54.23 [2.135]	47.85 [1.884]	60.71 [2.390]	19.05 [0.750]

Figure 8 (End)

**3.6. Accessories**
**A. Latches**

Latches are used to lock mating connectors together where the mating connector has latch blocks or latch blocks and rails. The latches must be installed in the latch slots of the lower half of the metal backshell. The locking tip of each latch must be turned inward. See Figure 9.

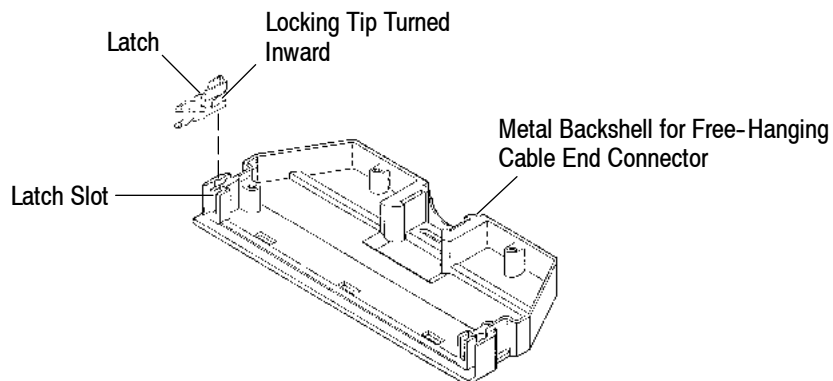


Figure 9

**B. Jackscrews and Screwlocks**

Jackscrews and screwlocks are used to secure mating connectors together. The jackscrews must be installed in the jackscrew slot of the lower half of the metal backshell of one of the mating connectors. The jackscrews can only be used in the straight cable exit metal backshell. The screwlocks must be installed in the threaded holes in the mounting flange of the mating pc board connector or panel mount cable end connector.

Male jackscrews and screwlocks have 2-56 external threads on the mating end and female jackscrews and screwlocks have 2-56 internal threads on the mating end. 2-56 threaded male and female jackscrews must be installed in the jackscrew slots of the metal backshell. Jackscrews with opposite threads (male/female) can be used with each other for cable-to-cable application or with threaded screwlocks for cable-to-pc board application.

Screwlocks can be used in mating pc board connectors without latch blocks or latch block and rails according to the following:

Male screwlocks with 2-56 threads on the mating end mate with cable end connectors having female jackscrews with 2-56 threads.

Female screwlocks with 2-56 threads mate with cable end connectors having male jackscrews with 2-56 threads.

Female screwlocks with slotted heads and 2-56 threads are designed to be used with pc board connectors or cable end panel-mount connectors having latch blocks and rails, which permit the metal backshell of the mating cable end connector to have latches or male jackscrews.

Screwlocks must be tightened to a maximum torque of 0.68 Nm [6 in.-lb]. See Figure 10.

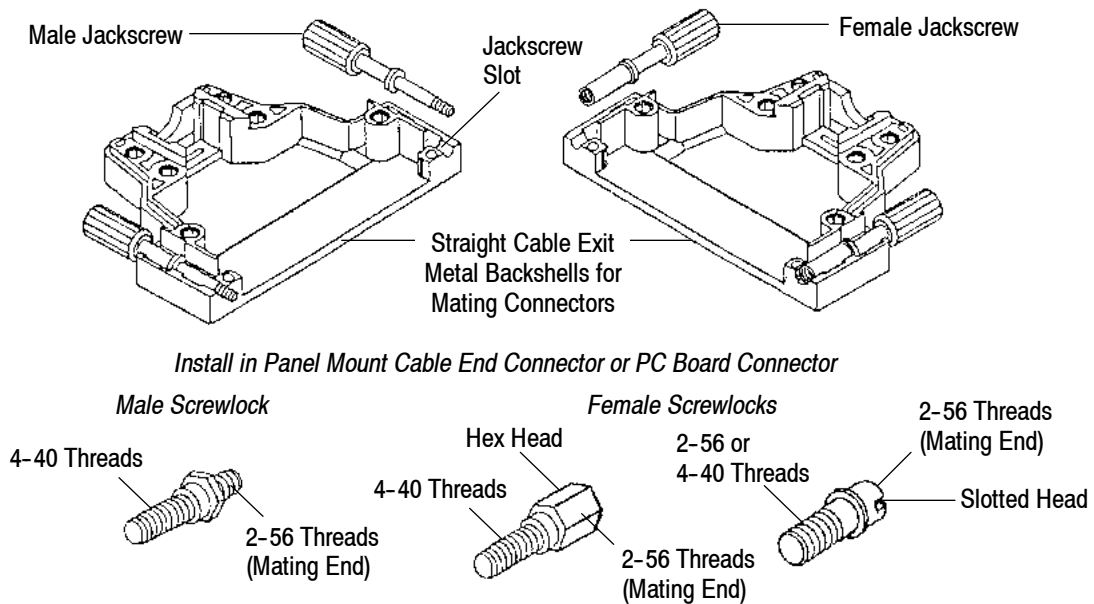


Figure 10

**C. Commercially-Available Hardware**

Pc board connectors with threaded holes can be secured to the pc board or panel or both using commercially-available hardware. Screw size will depend on the threaded hole size (2-56 or 4-40). The screws must be installed from the bottom of the pc board for securing the connector to the pc board and the front of the panel for securing the connector to the panel. See Figure 11.

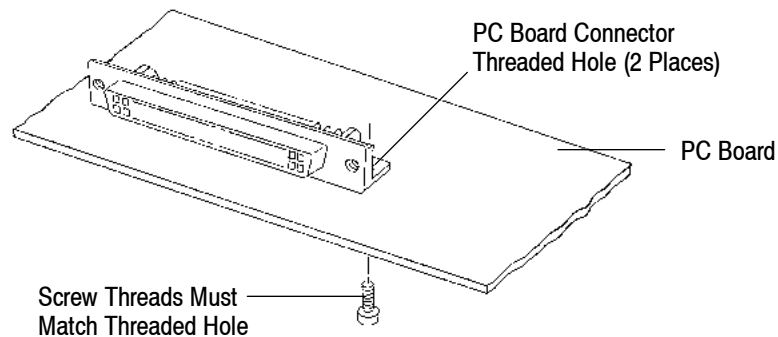


Figure 11

### 3.7. PC Board

#### A. Material and Thickness

##### — Stacked Connectors

The pc board thickness shall be  $1.57 \pm 0.18$  [.062 $\pm$ .007].

##### — Connectors with ACTION PIN Contacts

The pc board for connectors with ACTION pin contacts shall be made of FR-4 material.

Connectors with contact tail lengths of 4.39 [.173]: nominal pc board thickness of 1.57 [.062] and 2.36 [.093].

Connectors with contact tail lengths of 7.11 [.280]: nominal thickness of 3.18 [.125] and 5.08 [.200].

A minimum pc board thickness of 2.0 [079] is required when using connectors with tin-plated ACTION PIN contacts and pc board holes plated with immersion silver (refer to Paragraph 3.7, C).

##### — Connectors with Solder-Type Contacts

Vertical connectors with contact post lengths of 3.18 [.125] and all right-angle connectors: nominal thickness of 1.57 [.062].

Vertical connectors with contact post lengths of 4.78 [.188]: nominal thickness of 3.18 [.125].

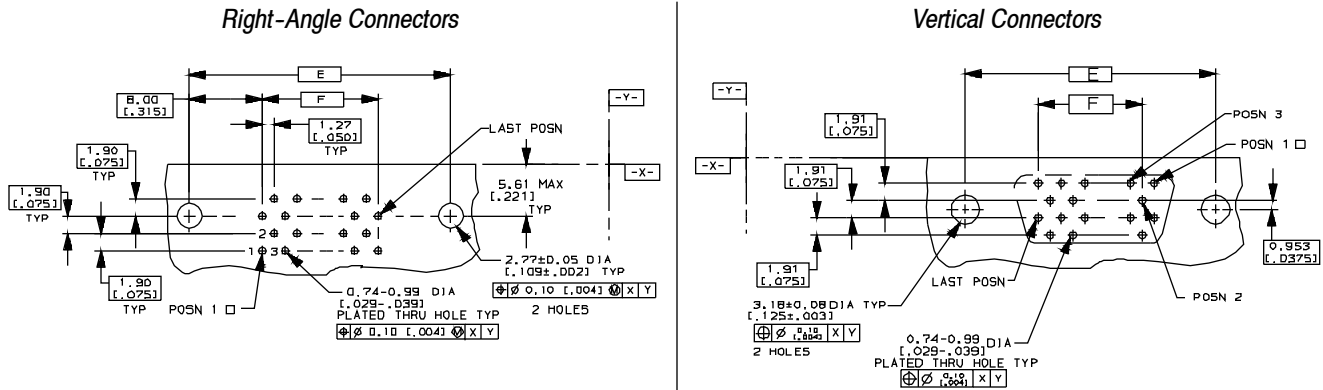
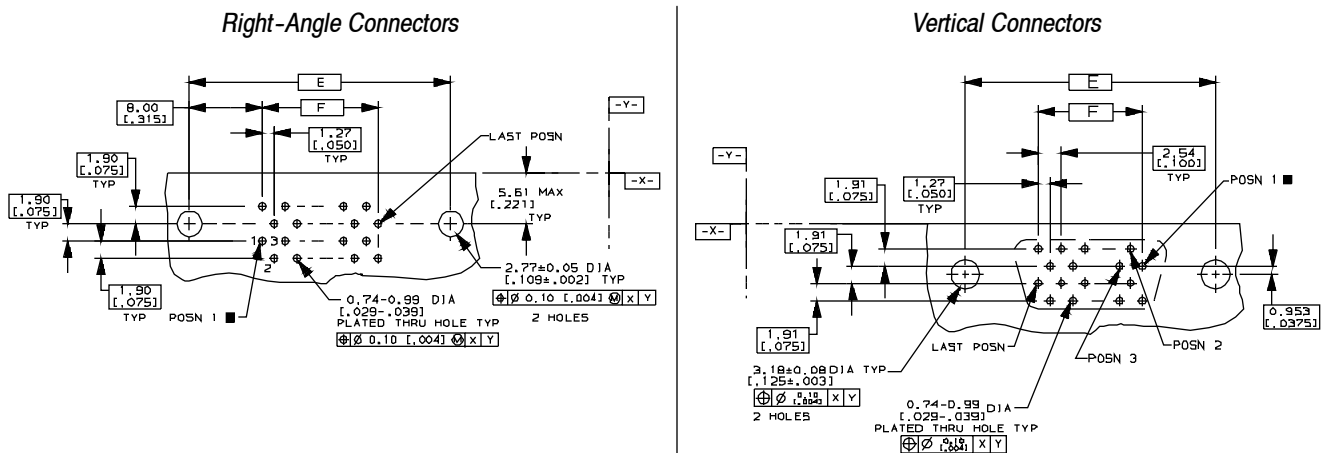
#### B. Layout

The contact holes and mounting holes must be precisely located on the pc board to assure proper connector placement and optimum performance of the connector. The pc board layout for connectors with solder-type contacts and connectors with ACTION PIN contacts is provided in Figure 12.

#### NOTE



*The "X" and "Y" symbols in Figure 12 represent customer-established datums for locating hole centers. They are the points of reference from which all positions must be located. The dimensions from these datums to the first mounting hole and contact hole represent the basic dimensions from which permissible tolerances and variations are established.*

**PC Board Layouts for Single Connector (Shown from Component Side of PC Board)**
**Circuit Patterns for 26- and 50-Position Connectors**

**Circuit Patterns for 20-, 28-, 40-, 60-, 68-, 80-, 100-, and 120-Position Connectors**


74.93 [2.950]	90.93 [3.580]	120
62.23 [2.450]	78.23 [3.080]	100
49.53 [1.950]	65.53 [2.580]	80
41.91 [1.650]	57.91 [2.280]	68
36.83 [1.450]	52.83 [2.080]	60
30.48 [1.200]	46.48 [1.830]	50
24.13 [.950]	40.13 [1.580]	40
16.51 [.650]	32.51 [1.280]	28
15.24 [.600]	31.24 [1.230]	26
11.43 [.450]	27.43 [1.080]	20
F	E	NO OF POSN

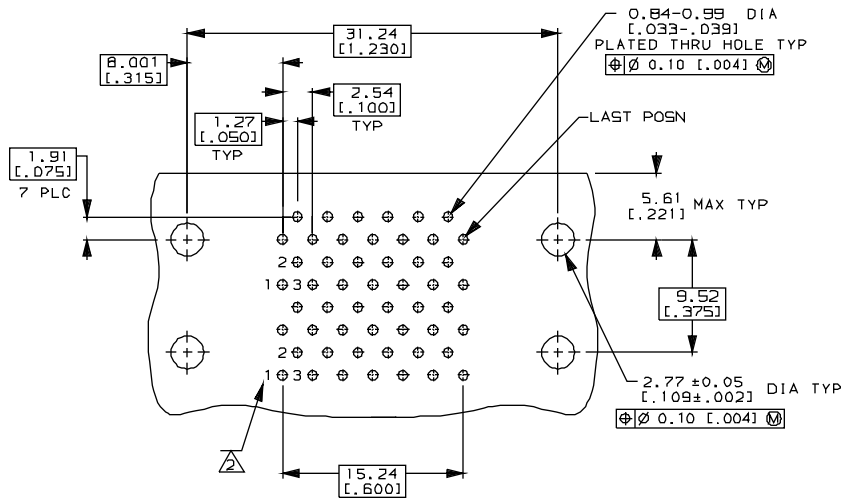
**Note:** A range has been provided for the contact hole diameter. The actual diameter will depend on trace routing requirements between holes and the technique for placing the connector on the pc board.

**Note:** ACTION PIN contact hole requirements are shown in Figure 13.

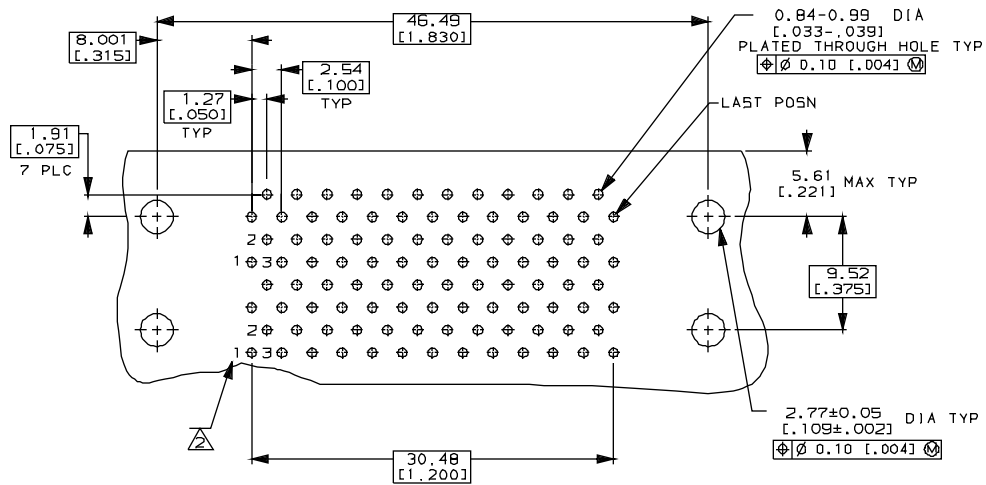
Figure 12 (Cont'd)

**PC Board Layouts for Stacked Connectors (Shown from Component Side of PC Board)**

**26/26 Stacked Connectors**



**50/50 Stacked Connectors**



**For 68/68 Stacked Connectors**

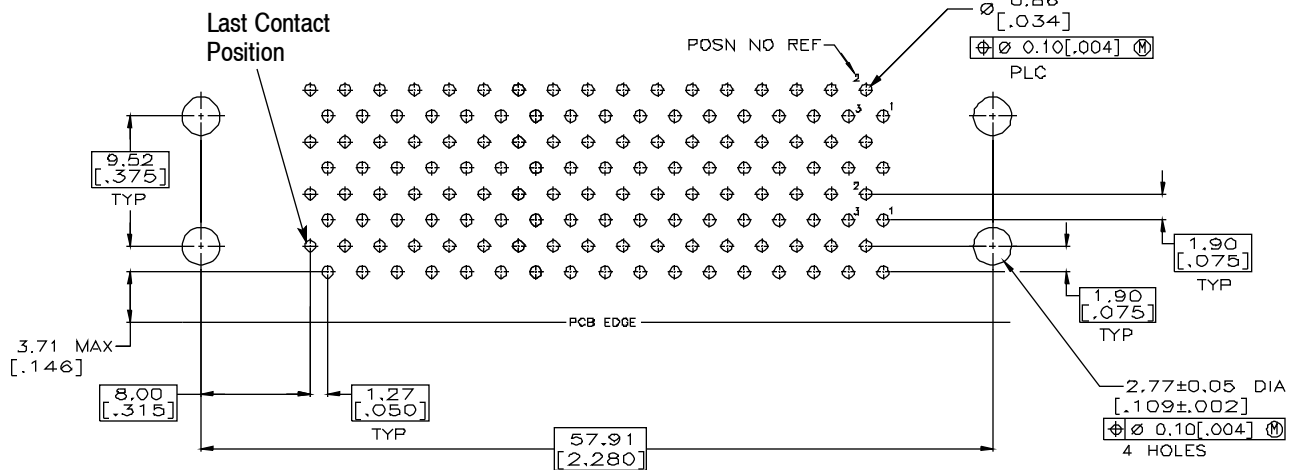
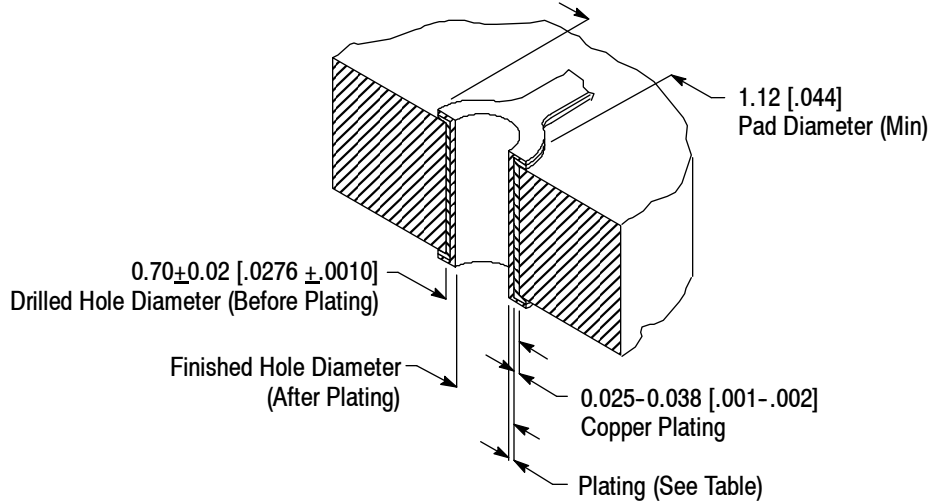


Figure 12 (End)

**C. Holes**

Pc board holes for connectors with ACTION PIN contacts must be drilled and plated-through to the dimensions given in Figure 13.

**PC Board Hole Dimensions for ACTION PIN Contacts**



PLATING	THICKNESS
Hot Air Solder Leveling (HASL) Tin-Lead (Sn Pb)	0.004-0.010 [.0002- .0004]
Immersion Tin (Sn)	0.0005-0.004 [.00002- .0002]
Organic Solderability Preservative (OSP)	0.0002-0.0005 [.00001- .00002]
Immersion Gold (Au) Over Nickel (Ni) (ENIG)	0.0001-0.0005 [.000004- .00002] (Au) 0.00127-0.0076 [.000050- .00030] (Ni)
Immersion Silver (Ag) ♦	0.0001-0.0005 [.000004- .00002]

♦ Refer to Paragraph 3.7, B for pc board thickness requirements when using tin-plated ACTION PIN contacts in holes with this plating.

Figure 13

**3.8. PC Board Connector Placement**

All pc board connectors shall be fully seated and securely attached by the boardlocks, or screwlocks or commercially available screws (refer to Paragraph 3.6, C, Commercially-Available Hardware). The connector must be seated on the pc board to within the dimension given in Figure 14.

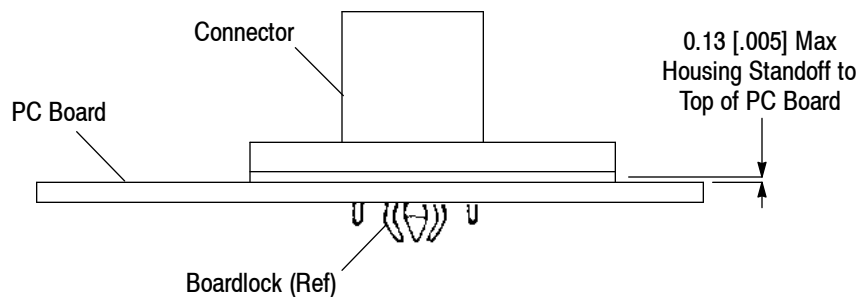


Figure 14

### 3.9. Soldering

Soldering, cleaning, and drying of pc board assemblies shall be according to the following guidelines.

#### A. Guidelines

Manual 402-40 is available for establishing soldering guidelines.

#### B. Flux

Solder-type contact posts and, if applicable, attaching hardware 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 pc board. Additionally, the flux must be compatible with the wave solder line, manufacturing, health, and safety requirements. Call PRODUCT INFORMATION at the number at the bottom of page 1 for consideration of other types of flux. Flux that is compatible with these connectors are provided in Figure 15.

FLUX TYPE	ACTIVITY	RESIDUE	COMMERCIAL DESIGNATION	
			KESTER	ALPHA
RMA	Mild	Noncorrosive	186	611

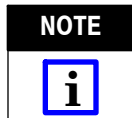
Figure 15

#### C. Cleaning

After soldering, removal of fluxes and activators is necessary. Cleaners must be free of dissolved flux and other contaminants. If using an organic solvent, it is recommended using vapor phase cleaning 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. Consult the supplier of the solder and flux for recommended cleaners. Common cleaning solvents with times and temperatures that will not affect these connectors is specified Figure 16.



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).



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

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 16

#### D. Drying

When drying cleaned assemblies, DO NOT exceed operating temperature limits stated in the Product Specification given in Paragraph 2.5. Excessive temperatures may cause degradation of the connector housing.

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



### 3.10. Replacement and Repair

Damaged or defective connectors or accessories must not be used.

## 4. QUALIFICATIONS

AMPLIMITE .050 Series cable end IDCs and pc board connectors are Recognized by Underwriters Laboratories Inc. (UL) Component Recognition Program in Electrical File E28476 and Certified by CSA International in File LR 7189A-207.

## 5. TOOLING

Hand tools for manual application and semi-automatic and automatic machines for power assist application of these connectors is available. Modified designs and additional tooling concepts may be available to meet other application requirements. For additional information, contact PRODUCT INFORMATION at the number at the bottom of page 1. Tooling part numbers and instructional material packaged with the tooling are shown in Figure 17.

### 5.1. Wire Insertion Tooling

#### A. CHAMPOMATOR 2.5 Bench Terminating Machine Tool Kit

This machine tool kit (which includes the bench terminating machine) used in conjunction with the control module and tie bar can meet medium- to high-volume production of discrete wire termination for the connectors with ACTION PIN contacts. The machine is a pneumatically- and electrically-powered, microprocessor-controlled unit. The appropriate tie bar used is based on connector size.

#### B. Termination Cover Closing Tooling

Manual miniature applicator frame assembly equipped with the cover closing tooling terminates ribbon cable, round-to-flat laminated cable, and wire lacing covers. This tooling can also be used to close connector termination covers after terminating.

#### C. Lacing Termination Cover Tooling

A manual arbor frame can be equipped with cover lacing tooling for lacing, inserting, and trimming discrete wire into wire lacing covers.

#### D. Mass Termination Tooling for Discrete Wires

A manual arbor frame can be equipped with mass termination tooling for terminating loose-strand discrete wire.

#### E. Repair Tool

The single-wire insertion tool terminates individual wires to contacts left unterminated after a termination process.

### 5.2. Strain-Relief Staple Tooling

The manual miniature applicator frame equipped with strain-relief staple insertion tooling is available to install cable strain relief staples onto the lower half of the backshell.

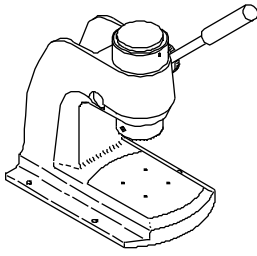
### 5.3. Seating Tool

A seating tool and pc board support made to accommodate the solder-type contact posts and other components of the system are recommended for installing connectors with ACTION PIN contacts onto the pc board. For low-volume applications, it is recommended using the adapter kit with Greenerd Arbor Frame Assemblies 3A and 3B.

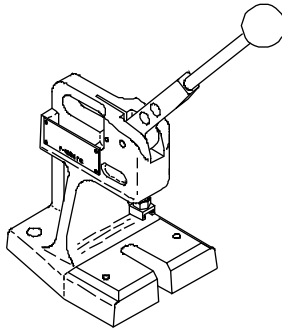
The adapter kits are designed to be installed onto Greenerd Manual Frame Assemblies 3A and 3B and used to adapt the frame assembly for seating connectors with ACTION PIN contacts onto the pc board.

### 5.4. Removal Tooling

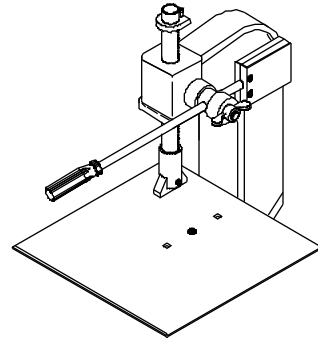
The housing support tool is designed to remove a connector with ACTION PIN contacts from a pc board. The tool supports the pc board while pressure is applied evenly to the contact tails using a flat bar and a press capable of producing 222 N [50 lb-force] per contact.



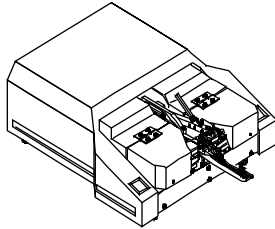
Manual Arbor Frame Assembly 58024-1 (408-6923)



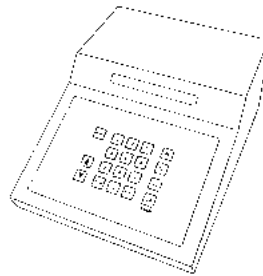
Manual Miniature Applicator Frame Assembly 91295-1 (408-9817)



Adapter Kits (Counterbalance Kit 58176-1, Ram Adapter Assembly Kit 58177-1 or 58177-2, and Board Support Plate Kit 58175-1) for Greenerd Manual Frame Assemblies 3A and 3B (408-9027)



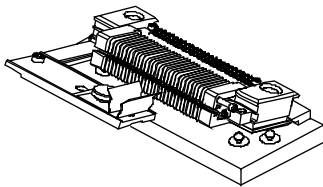
CHAMPOMATOR 2.5 Terminating Machine Tool Kit 354786-1 (Includes Terminating Machine) (409-5839)



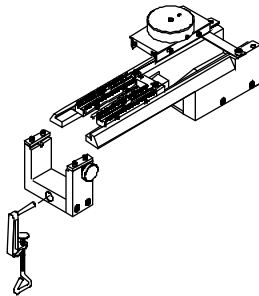
CHAMPOMATOR 2.5 Terminating Machine Control Module 852423-1 (409-5791)



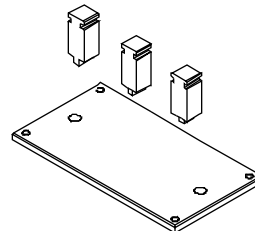
Tie Bar 762637-[]



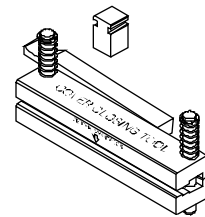
Discrete Wire Mass Termination Tooling 91291-[] (408-9663)



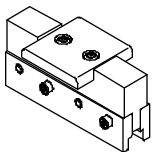
Lacing Terminating Cover Tooling 91293-1 (408-9750)



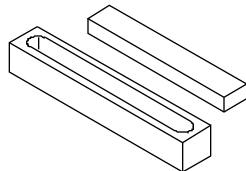
Strain Relief Staple Insertion Tooling 543515-1 (408-9820)



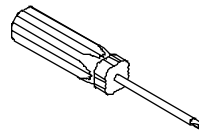
Termination Cover Closing Tooling 543508-1 (408-9820)



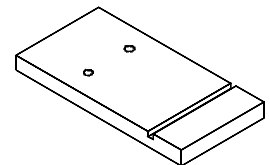
Seating Tool 856371-[] For Connectors with ACTION PIN Contacts (408-9757)



Aluminum Push Bar (Standard Stock Material) and Housing Support 856090-1



Single-Wire Insertion Tool 58430-1 (408-9200)



PC Board Support (Must Be Custom-Made)

Figure 17

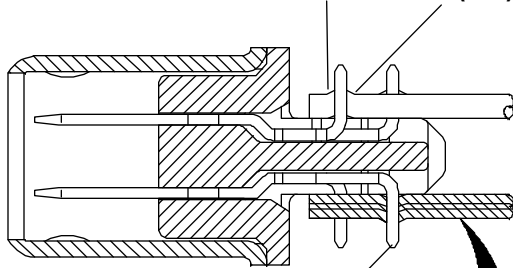
**6. VISUAL AID**

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.

**CABLE END IDC APPLICATION**

**WIRE TERMINATION**

TOOLING MARKS ON WIRE INSULATION PERMISSIBLE IN THIS AREA (TYP)



CONTACTS MUST BE STRAIGHT AND UNDAMAGED

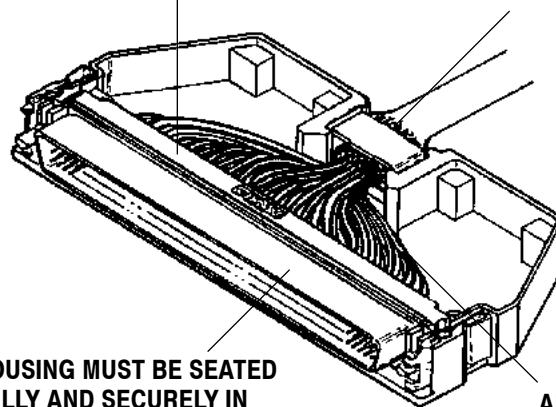
CONTACT BASE METAL MUST NOT BE EXPOSED OR DEFORMED

INSULATION MUST BE INTACT EXCEPT IN AREA OF CONTACT SLOT

**TERMINATION COVERS INSTALLATION**

TERMINATION COVERS MUST BE FULLY SEATED

CABLE MUST NOT BE CUT AND BRAID MUST BE UNDER STAPLE

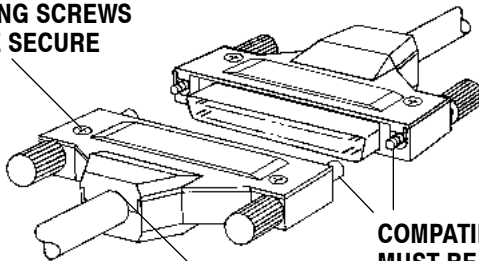


HOUSING MUST BE SEATED FULLY AND SECURELY IN LOWER HALF OF BACKSHELL

ALL WIRES MUST HAVE SLACK

**MATING CONNECTORS**

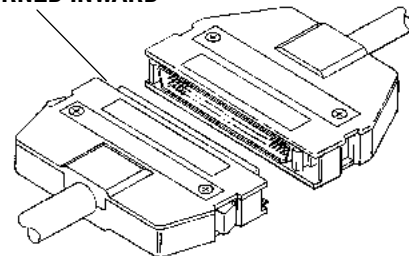
ATTACHING SCREWS MUST BE SECURE



THERE MUST BE NO VISIBLE BRAID STRANDS

COMPATIBLE JACKSCREWS MUST BE INSTALLED IN MATING CONNECTORS

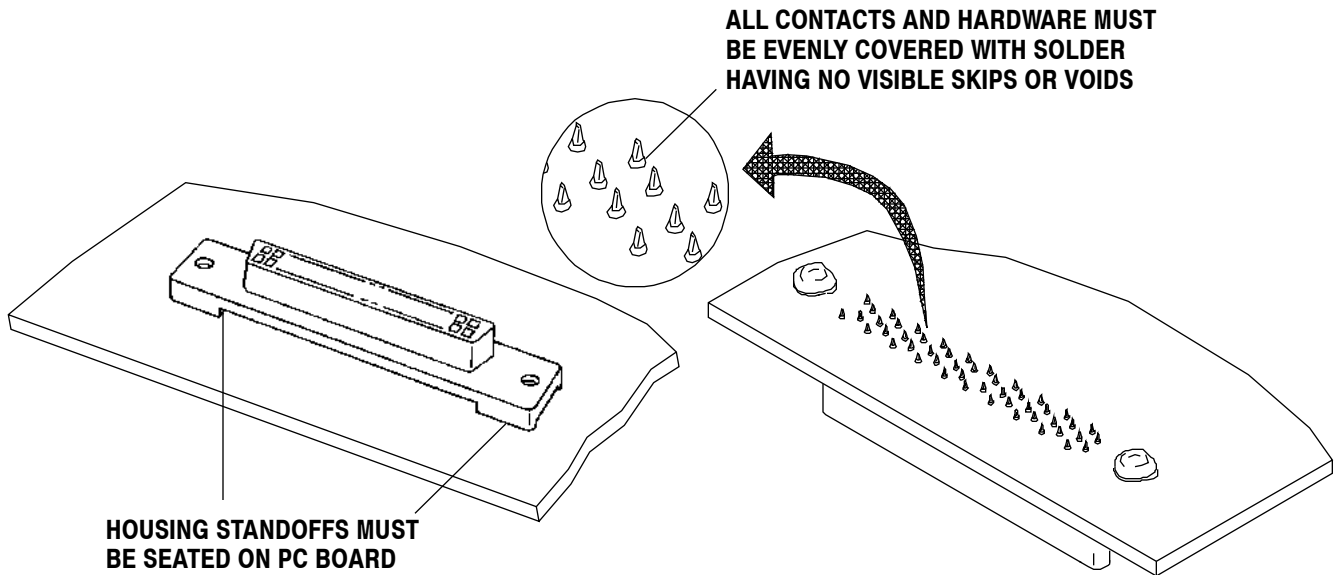
LATCH LOCKING TIPS MUST BE TURNED INWARD



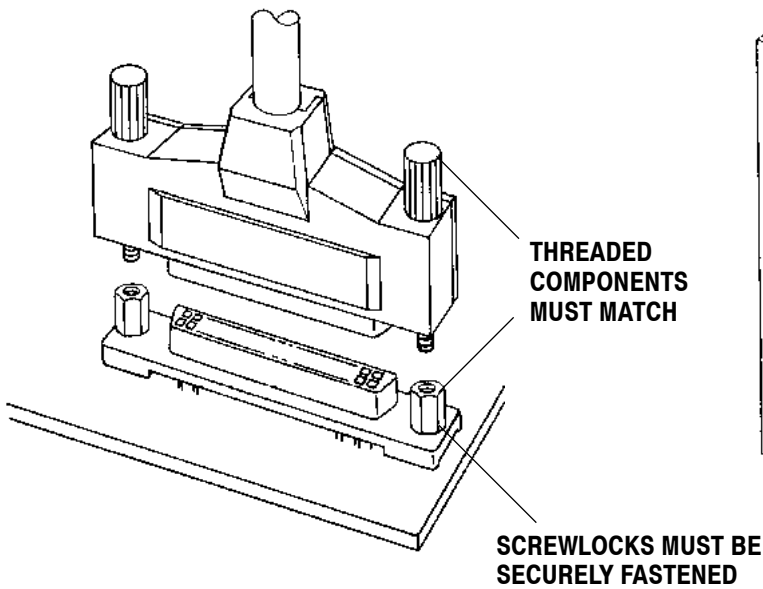
**FIGURE 18. VISUAL AID (Cont'd)**

**PC BOARD CONNECTOR APPLICATION**

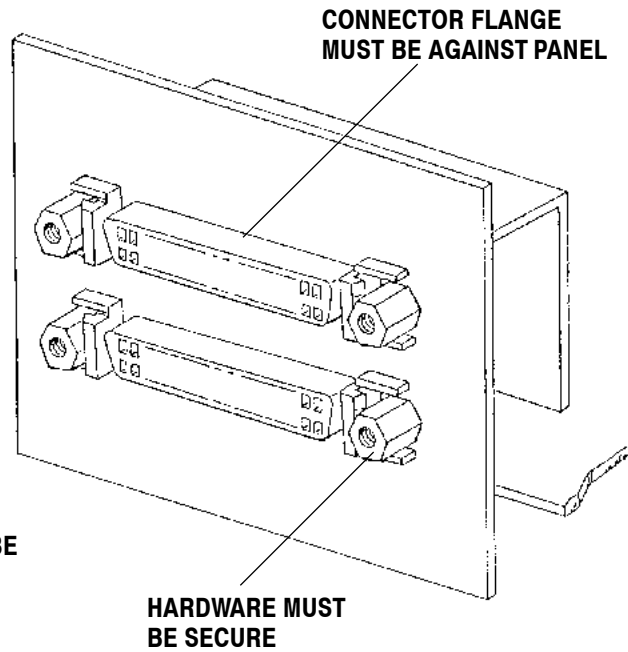
**PC BOARD INSTALLATION**



**MATING CONNECTORS**



**PANEL MOUNTING**



**FIGURE 18. VISUAL AID (End)**