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

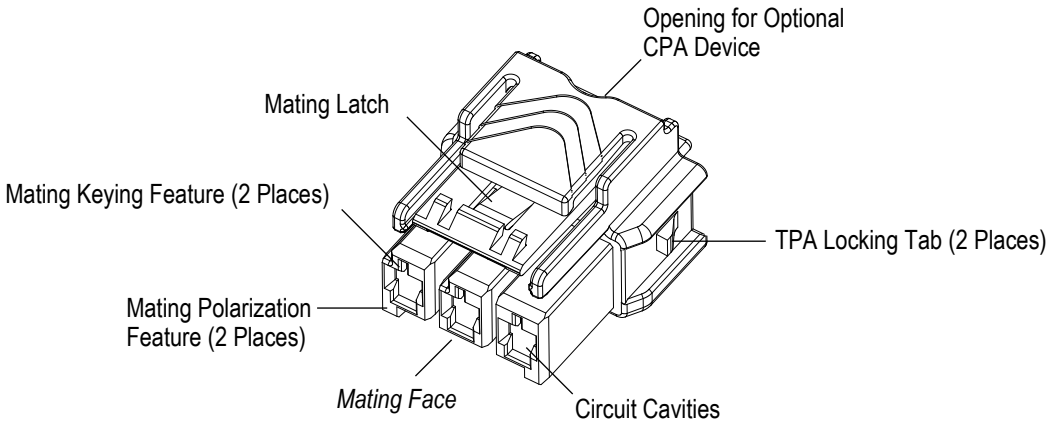
For an overview of the POWER TRIPLE LOCK connector system, view the video on www.te.com.*

1. INTRODUCTION

This specification covers the requirements for application of the POWER TRIPLE LOCK* connector system. The connector system consists of a plug housing that accepts receptacle contacts and a cap housing that accepts tab contacts. The housings are available in single, dual, and triple (matrix) rows with 2 to 15 positions having a centerline spacing of 6 and row-to-row spacing of 8.1 for panel mount applications.

When corresponding with personnel, use the terminology provided in this specification to facilitate inquiries for information. Basic terms and features of this product are provided in Figure 1.

Plug Housing (1 X 3 Shown)



Panel Mount Cap Housing (1 X 3 Shown)

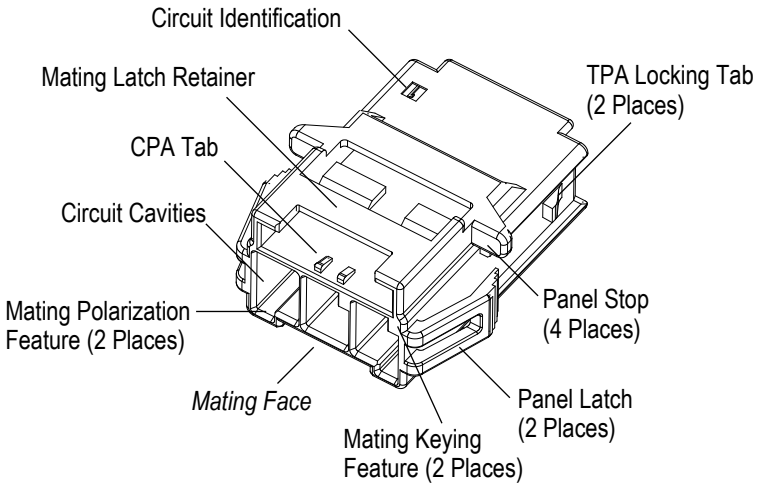


Figure 1 (Cont'd)

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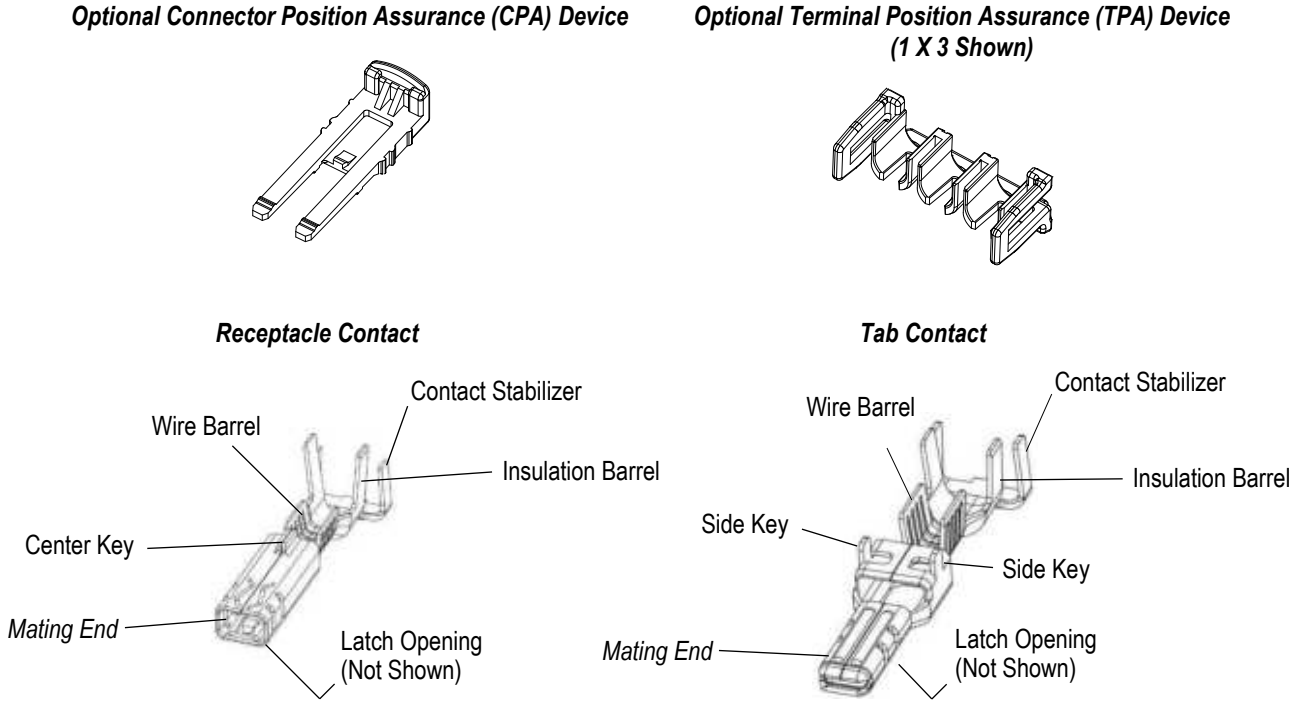


Figure 1 (End)

The housing features contact cavities each having a keying feature, mating polarization feature, a mating latch (plug) or mating latch retainer (cap) that provides positive mating. The ribs surrounding the mating latch prevent wires from becoming caught underneath the latch. The polarization feature prevents mating housings of different sizes and keying configuration. The housings have a mating keying feature available in 4 configurations (A, B, C, and D) to prevent mis-mating. The housings are also color coded for 4 available housing materials: standard, high temperature, glow wire, and hot wire. In addition, the panel mount cap housing features panel stops and flexible panel latches. In use, the panel latches secure the housing to a panel without the use of mounting hardware.

Optional connector position assurance (CPA) device and terminal position assurance (TPA) device (also called locking plate) are available to install onto the housing. These devices provide added security to ensure that the mated housings remain together and ensure proper contact insertion and retention in the circuit cavities. The CPA device prevents the plug housing mating latch from being accidentally depressed.

Each contact features a wire barrel, insulation barrel, contact stabilizer, and center key (plug) or side keys (tab). The underside at the mating end of the contact has a latch opening that engages the housing contact cavity latch and secures the contact to the housing. The key(s) only allow the contact to be inserted into the associated housing.

POWER TRIPLE LOCK* contacts are not intended as stand-alone products. Proper mating and performance is highly dependent on the housings. Prior to mating or evaluation, they must first be crimped to wire and then inserted into the appropriate cap or plug housing in compliance with this specification and the TE Connectivity product drawing.

2. REFERENCE MATERIAL

2.1. Revision Summary

- Add installation details to paragraph 3.8

2.2. Customer Assistance

Reference Product Base Part Number 1971779 (receptacle contact) and 1971238 (tab contact) and Product Code L755 are representative of POWER TRIPLE LOCK* connector system. Use of these numbers will identify the product line and help you to obtain product and tooling information, which can be obtained by visiting www.te.com or by calling the number at the bottom of page 1.

2.3. Drawings

Customer drawings for product part numbers are available from www.te.com. Information contained in the customer drawing takes priority. Also available for this product is:

1969744 POWER TRIPLE LOCK* Receptacle Contact Continuity Test Fixture Design Guidelines

1969745 POWER TRIPLE LOCK* Tab Contact Continuity Test Fixture Design Guidelines

2.4. Instructional Material

Instructional material that pertains to this product is:

408-10389 Ocean Side-Feed Applicators 2151741-1, 2151742-1, 2151743-1, 2151744-1, 2151745-1, and 2151746-1

408-32082 SDE-SA Commercial Hand Tools 2217266-1 and 2217267-1

408-32083 SDE-SA Commercial Hand Tool 2217268-1

408-32084 SDE-SA Commercial Hand Tool 2217208-1

408-32184 Guidelines for POWER TRIPLE LOCK* Receptacle Contact Continuity Test Fixture Design and Probing

408-32187 Guidelines for POWER TRIPLE LOCK* Tab Contact Continuity Test Fixture Design and Probing

408-32206 Re-Work Procedure for POWER TRIPLE LOCK* Connector System

408-143020 Procedure for Vertical Force Testing POWER TRIPLE LOCK* Cap Housings

409-5128 AMP-O-LECTRIC* Model “K” Terminator Machine 1-471273-2

409-5842 AMP-O-LECTRIC* Model “G” Terminating Machines 354500-[ ]

409-10047 AMP 3K* Terminating Machines 1725950-[ ] and AMP 5K* Terminating Machines 1725900-[ ]

409-10099 AMP 3K/40* Terminating Machines 2119683-[ ] and AMP 5K/40* Terminating Machines 2119684-[ ]

2.5. Specifications

Product Specification 108-106118 provides product performance requirements and test information. When mating single row caps with POWER TRIPLE LOCK* PC board headers refer to specifications 108-32090 and 114-32136.

3. REQUIREMENTS

3.1. Storage

A. Ultraviolet Light

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

B. Shelf Life

Contacts are shipped on continuous reels and housings are supplied in plastic bags in cartons. The product should remain in the shipping containers until ready for use to prevent deformation to components. The product should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

C. Reels

When using reeled contacts, store coil wound reels horizontally. When storing partial reeled contacts, the end of the strip should be secured to the flange using a wire tie or similar method.

D. Chemical Exposure

Product must not be stored near any chemical listed below as they may cause stress corrosion cracking in the material.

Alkalies	Ammonia	Citrates	Phosphates Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites	Tartrates

NOTE
Contacts that contain brass must not be stored or used in environments where these chemicals exist.

3.2. Wire Selection and Preparation

The contacts accept 1 stranded copper wire sizes 0.20 to 3.30 mm^2 [24 to 12 AWG] or 2 stranded copper wires sizes 0.34 to 0.89 mm^2 [22 to 18 AWG] with an insulation diameter range of 2.00 to 4.25.

Each wire must be stripped to the dimension given in Figure 2.

CAUTION
Care must be taken not to nick, scrape, or cut any part of the wire during the stripping operation.

Note: Not to Scale

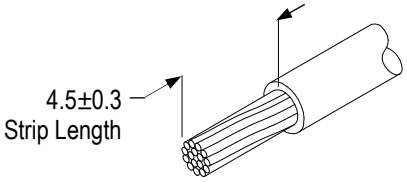


Figure 2

3.3. Contact Crimp

A. Cutoff Tab and Burr

The cutoff tab is the remaining portion of the carrier strip after the contact is cut from the strip, and the burr is the result from the cutoff tab shearing. The cutoff tab and burr must not exceed the dimension given in Figure 3.

B. Wire Barrel Crimp

The crimp applied to the wire barrel portion of the contact is the most compressed area and is most critical in ensuring optimum electrical and mechanical performance of the crimped contact. The crimp must be centered on the closed wire barrel. The crimp must result in an “F” crimp where the wire barrel forms a closed seam with no evidence of loose wire strands or wire strands visible in the seam. The crimp height and width must be within the dimensions provided in Figure 3.

C. Insulation Barrel Crimp

The crimp applied to the insulation barrel of the contact must result in either an “F” crimp where the insulation barrel forms a closed seam with no evidence of wire insulation in the seam or an overlap crimp where the tips of the insulation barrel wraps overlap each other and wrap firmly around the wire insulation without cutting into the wire insulation. The crimp height and width must be within the dimensions provided in Figure 3.

D. Contact Stabilizer

The contact stabilizer must not be crimped or deformed in any way. The width of the stabilizer must be within the dimension given in Figure 3. Otherwise, in addition to reducing the function of the stabilizer, a deformed stabilizer will cause the TPA to be ineffective.

E. Wire Barrel Flash

Wire barrel flash is the formation that may appear on both sides of the wire barrel as the result of the crimping process. It must not exceed the dimension provided in Figure 3.

F. Twist and Roll

There should be no twist or roll of the wire barrel or mating portion of the crimped contact that would cause overstress or impair usage. See Figure 3.

G. Wire End Extrusion

The wire conductor ends must extend beyond the end of the wire barrel within the dimensions given in Figure 3.

H. Bellmouths

The front bellmouth and rear bellmouth shall be evident and conform to the dimensions given in Figure 3.

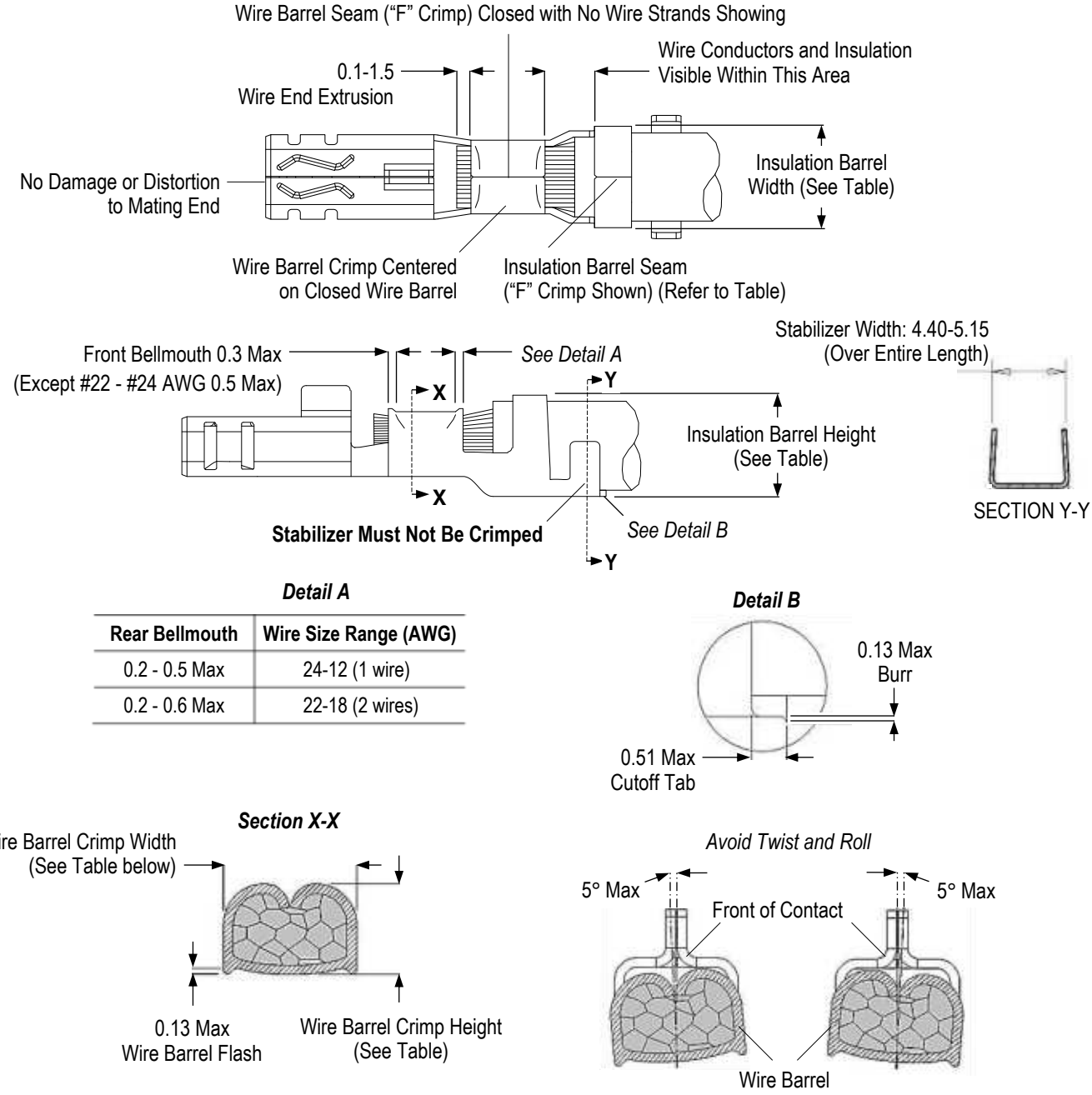


Figure 3 (Cont’d)

WIRE			CONTACT CRIMP ("F" Crimp Except Where Indicated OV—Overlap Crimp)							
			USING HAND TOOL				USING APPLICATOR			
			Wire Barrel		Insulation Barrel		Wire Barrel		Insulation Barrel	
NO. OF CONDUCTORS	SIZE mm² [AWG]	INSULATION DIAMETER RANGE	Width	Height	Width	Height (Ref)	Width	Height	Width	Height (Ref)
1	0.20 [24]	1.43-2.70	—	—	—	—	1.40	0.91±0.03	2.79 OV	2.0
	0.34 [22]	1.43-2.70▲ □	1.40	0.98 +0.03/-0.06	2.79	2.2	1.40	0.98±0.03	2.79	2.2
	0.56 [20]	1.43-2.70▲ □	1.40	1.05±0.03	2.79	2.5	1.40	1.05±0.03	2.79	2.5
	0.70 [19■]	1.80-3.30	—	—	—	—	2.03	1.08±0.04	3.56 OV	2.5
	0.80 [18]	1.80-3.30	2.03	1.21 +0.04/-0.08	3.56 OV	2.7	2.03	1.21±0.04	3.56 OV	3.2
									3.56	2.7
			—	—	—	—	2.03 ‡	0.99±0.03 ‡	3.56 OV ‡	2.7 ‡
	1.27 [16]	1.80-3.30	2.03	1.37 +0.04/-0.08	3.56 OV	3.2	2.03	1.37±0.04	3.56 OV	3.2
									3.56	3.6
	2.10 [14]	3.40-3.70	2.29	1.52 +0.05/-0.1	4.06	3.3	2.29	1.63±0.05	4.06	3.3
	3.30 [12]	3.85-4.25	3.05	1.87 +0.05/-0.1	4.83	4.2	3.05	1.87±0.05	4.83	4.2
2	0.34 [22]	2.03† Max	—	—	—	—	2.03	1.07±0.04	3.56 OV	4.0
	0.56 [20]	2.30-2.80†	2.03	1.28 +0.04/-0.08	3.05	4.7	2.03	1.28±0.04	3.05	4.7
	0.80 [18]	2.65-2.95†	2.29	1.40±0.10	3.3	4.9	2.29	1.48±0.05	3.3	4.9
	0.80 [18] + 0.34 [22]	2.30-2.80†	—	—	—	—	2.03	1.30±0.05	3.05	5.1

■ For contacts 1971783 and 1971784. Refer to product customer drawing for minimum cross-sectional area (CMA).

‡ For contacts 2238066 and 2238067. Crimp Height shown applies to all wire types except #18 UL3071, UL3173 and UL3252 which are to have a Crimp Height =1.07+/-0.05.

▲ Refer to hand tool drawing for insulation diameter restrictions.

□ For insulation smaller than 1.76 mm, applicator 2837163-1 or 2-2837163-1 should be used.

† For contacts with 2 wires, the insulation diameter range shown is for each wire. If one wire has a smaller insulation diameter, it is to be placed underneath the wire with the larger insulation diameter.

Figure 3 (End)

I. Mating End

There must be no damage or distortion to the mating end of the contact. See Figure 3.

J. Wire Location

All conductors must be held firmly inside the wire barrel. No strands can be folded back over the wire insulation. The wire insulation must be inside the insulation barrel, but must not enter the wire barrel. The wire conductors and insulation must be visible within the area between the wire barrel and insulation barrel as shown in Figure 3.

K. Contact Length

The contact length measured from the front of mating end to the back of the contact stabilizer (not including the carrier strip cutoff tab) must be within the dimensions given in Figure 4.

NOTE
Exceeding the contact length given may prevent the TPA from engaging the housing.

Contact Length (After Crimping)

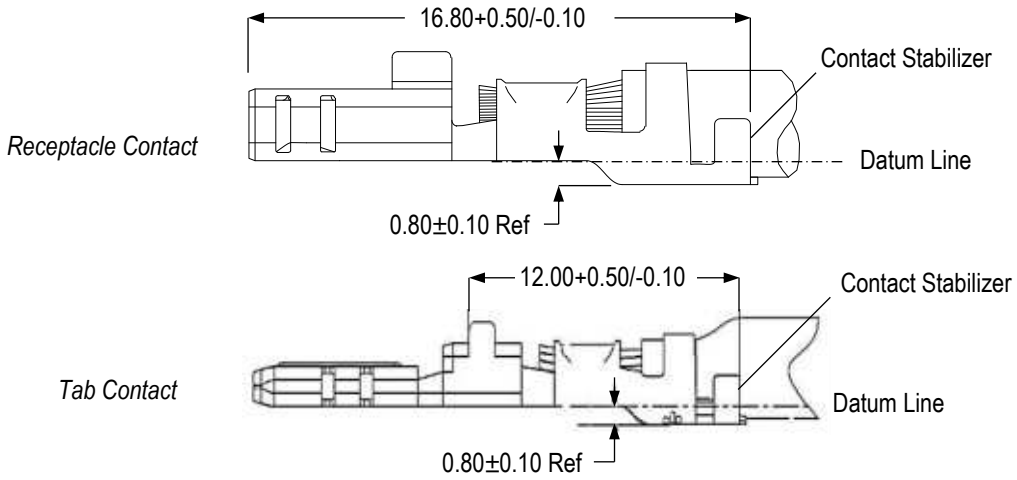
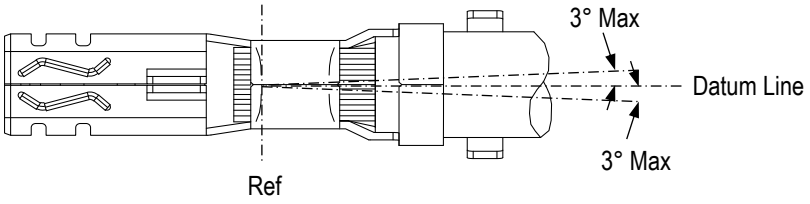


Figure 4

L. Bend Allowance

The bend allowance between the wire barrel and cable is acceptable within the limits given in Figure 5.

Side-to-Side Bend Allowance



Up-and-Down Bend Allowance

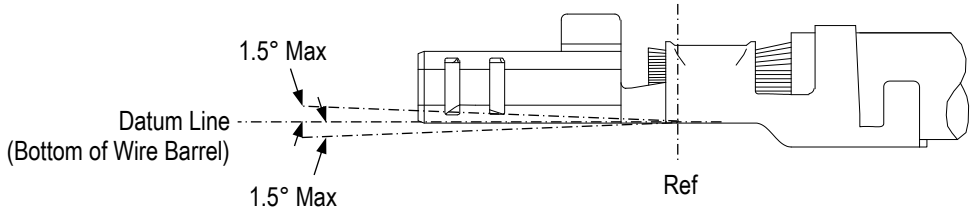


Figure 5

3.4. Keying

A. Contact Keying

The key(s) of the contact must match the contact keying feature of the circuit cavity to allow insertion into the associated housing.

B. Housing Mating Keying Feature

Only plug housings and cap housings with identical keying configuration will mate; for example, key A will only mate with key A, etc. The TE Connectivity customer drawing provides keying configurations.

3.5. Contact Insertion and Extraction

A. Insertion

Each contact must be aligned with the appropriate circuit cavity from the wire end of the housing so that the contact key(s) faces the housing mating latch (plug housing) or latch retainer (cap housing) for the first and third rows, and for the second row, the contacts must be inverted. The orientation of the contacts must alternate from row to row. Refer to Figure 6.

The contact must be inserted into the circuit cavity until the contact internal latch locks onto the circuit cavity locking finger. See Figure 7.

NOTE
Gently pulling on the wire after the contact has been inserted will ensure that the contact is locked.

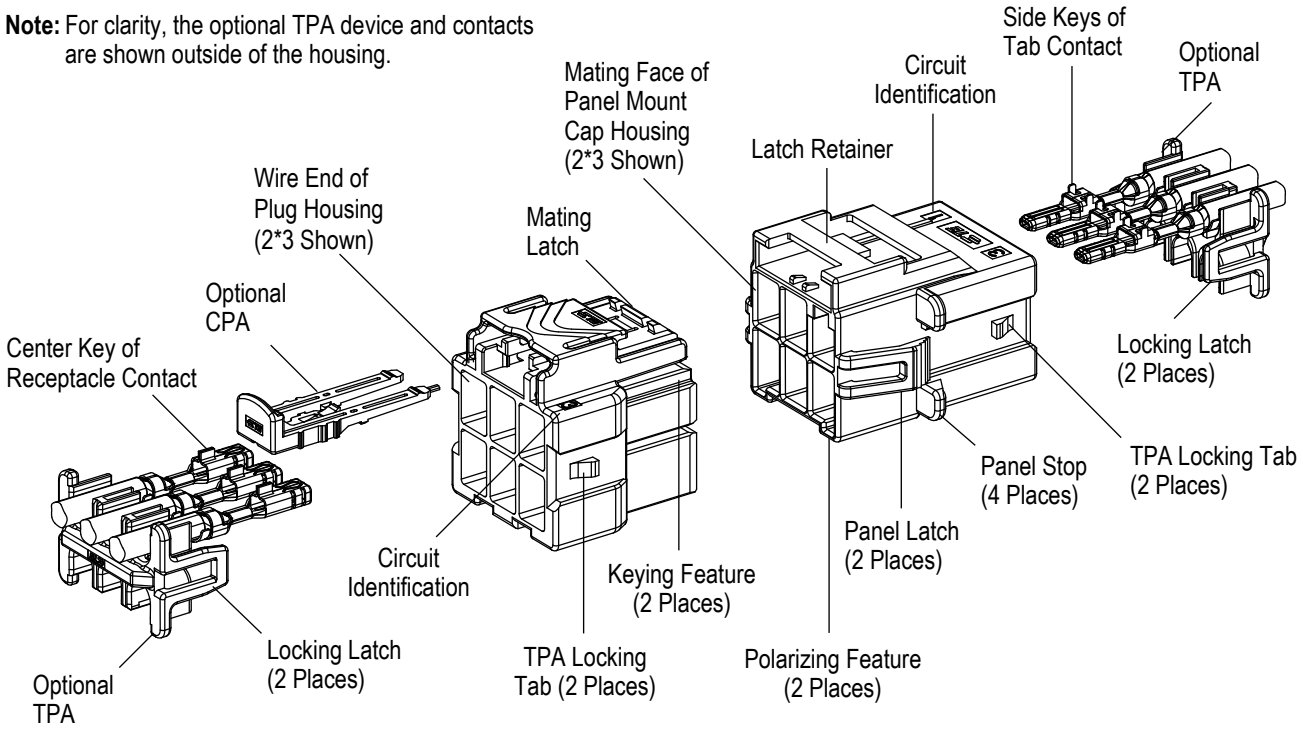


Figure 6

Cross-Section of Contact Insertion

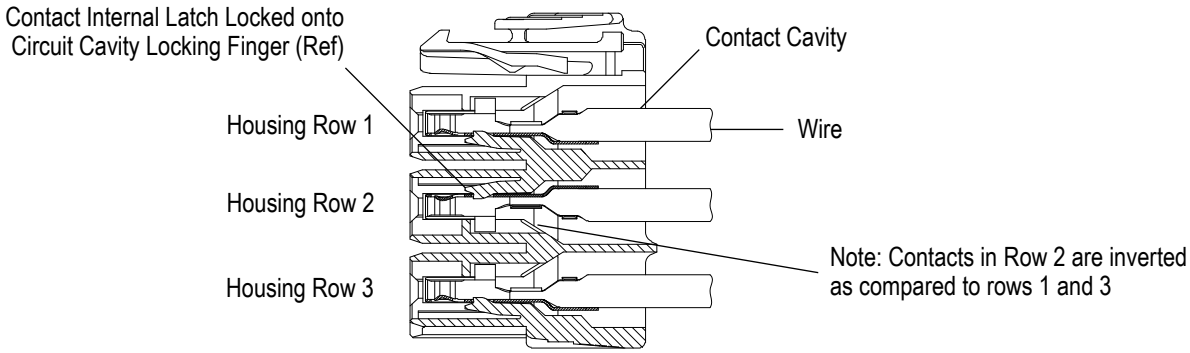


Figure 7

B. Extraction

If the optional TPA device is used, the contacts cannot be removed until the TPA is removed from the housing. Contacts must be removed individually from the housing using the extraction tool given in Paragraph 5.4 and the instructions for removing a contact given in 408-32206. After extraction, the contact must be inspected for damage or deformation; if evident, the contact must be replaced.

NOTE
If the contact has been pushed or pulled out of the housing, the rework procedure given in 408-32206 must be followed.

3.6. Optional TPA and CPA Devices

An optional TPA device is available for the plug housing and cap housing, and an optional CPA device is available for the cap housing.

The following requirements apply for installation (refer to Figure 6):

NOTE
All contacts must be inserted before the devices can be installed into the housing.

— The CPA device must be fully inserted into the opening at the top of the wire end of the plug housing until the latch engages the plug housing. There should be an audible click. After installation, the tips of the legs must be visible at the top of the mating face of the plug housing.

— The TPA device must be installed onto the wire end of the housing so that the latches are secure to the housing TPA locking tabs. There should be an audible click. If the latches do not reach the locking tabs, this indicates that one or more contacts has not been fully inserted or the contact internal latch has not locked onto the circuit cavity.

The following requirements apply for removal (refer to Figure 6):

— The CPA device must be removed by depressing the tips of the legs, and sliding the CPA device out of the housing.

— The TPA device must be removed by lifting each latch so that it clears the housing TPA locking tab, and pulling the TPA device straight from the housing.

3.7. Continuity Testing

For continuity testing of the housing, design guidelines for the test fixture and pogo pin (probe) must be considered (refer to Paragraphs 2.3 and 2.4); otherwise damage to the contacts may occur.

All contacts must be inserted and locked into the housing prior to placing the housing into the test fixture.

To avoid deformation to the contact, it is extremely important to ensure specific probe location. See Figure 8.

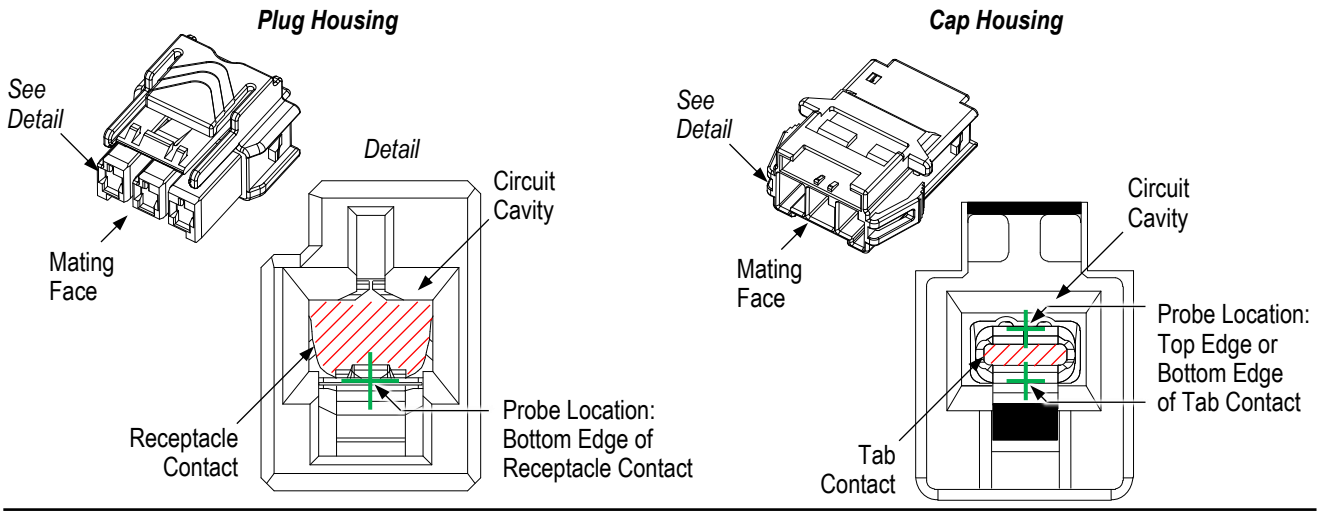


Figure 8

3.8. Panel Mounting

Recommended panel cutout dimensions are provided on the customer drawing for the specific cap housing.

The cap housing is to be held at the rear or wire exit end of the housing during installation. The cap housing must be inserted through the panel in the same direction that the cutout was punched until the panel stops sit against the panel so that the flexible panel latches engage the panel. No hardware is required. Latches are depressed during installation, so no pre-depressing of latches is required. See Figure 9.

To remove the cap housing from the panel, both latches must be simultaneously depressed, then the cap housing must be gently pulled straight out of the panel. If there is no damage to the cap housing, the cap housing can be re-mounted.

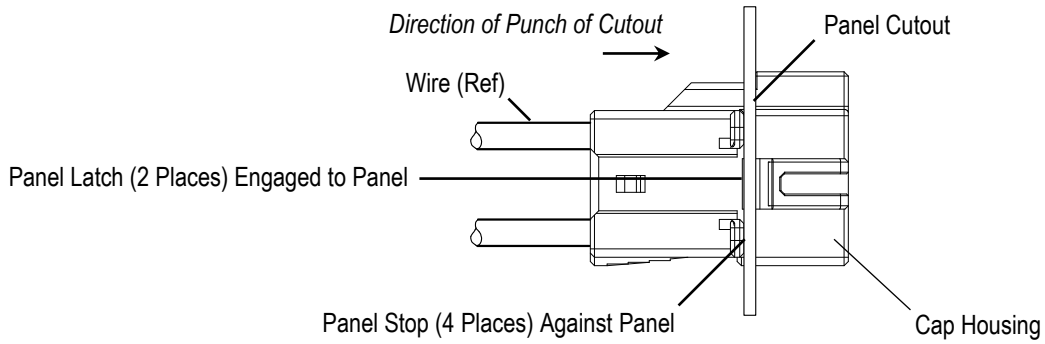


Figure 9

3.9. Mating and Unmating

The mating face of the cap housing must align with the mating face of the plug housing, then the housing must be pushed together until the mating latch is secured to the latch retainer. There should be an audible click. Refer to Figure 6.

To unmate the housings, if used, the CPA device must be withdrawn (but not removed). The plug housing mating latch must be depressed until it is released from the latch retainer, then the housings can be pulled straight apart. Disengaging the latch can be accomplished by applying a downward force on the thumbpad or directly on the exposed portion of the latch.

CAUTION
These housings are not intended to be used as an electrical interruption device. To avoid degradation to the contacts, there must be no current flow when unmating.

3.10. Strain Relief and Wire Dress

Wires can be bundled together and supported using cable ties or electrical tape. The wires must remain perpendicular to the housing and avoid an excessively sharp bend radius. The wire bundle must be at least 76 [3.0] from the back of the housing before bending in any direction. Do not bend unsupported wires as this may cause strain on the contacts.

3.11. Replacement and Repair

Damaged or defective product must not be used. The housings, contacts, CPA device, and TPA device are not repairable.

A contact can be removed using the extraction tool given in Paragraph 5.4. The contact can be re-inserted into the housing provided there has been no deformation or damage to the contact latch opening or housing internal latch. Refer to Paragraph 3.5.B for contact extraction and insertion information. If the contact has been pushed or pulled out of the housing, the rework procedure given in 408-32206 must be followed.

4. QUALIFICATION

4.1. Underwriters Laboratories Inc. (UL)

The POWER TRIPLE LOCK* connector system is recognized by Underwriters Laboratories Inc. (UL) in File E28476.

4.2. Verband der Elektrotechnik (VDE)

The POWER TRIPLE LOCK* high temp and GWT caps and plugs and select contacts are certified by VDE per IEC 61984 in Certificate 40045889.

5. TOOLING

Applicators contain the tooling for feeding and crimping strip-form terminals. Automatic machines provide the power to operate the applicator. Tooling part numbers and instructional material packaged with the tooling are given in Figure 10.

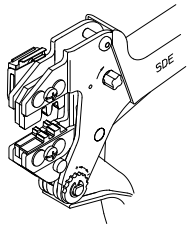
5.1. Machine (Power Unit)

The machine provides the force required to drive an applicator for crimping the contacts. These machines can be set up to automatically measure, cut, strip, and terminate the wire.

5.2. Applicator

The applicators are designed to crimp continuous contacts that are supplied on a reel with a carrier attached onto pre-stripped wire and sever them from the carrier strip. The applicators accept interchangeable die assemblies and must be installed onto a power unit.

Applicators for product part numbers are available from the Applicator Search Portal on www.te.com or by calling the Product Information Center at the bottom of page 1.



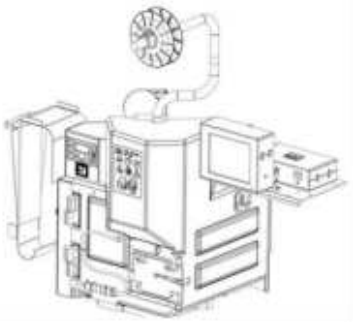
SDE-SA Commercial Hand Tools
2217266-1 and 2217267-1 (408-32082)
2217268-1 (408-32083)
2217208-1 (408-32084)



Ocean Side-Feed Applicators
(Atlantic Style and Pacific Style) 2151741-1,
2151742-1, 2151743-1, 2151744-1,
2151745-1, and 2151746-1 (408-10389)



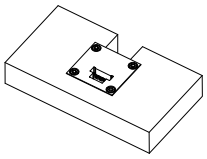
AMP-O-LECTRIC* Model G II
Terminating Machines
2217000-[ ] (409-32035)



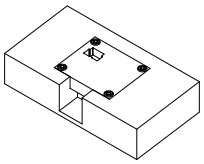
AMP 3K/40 Terminating Machines
2161400-5 and AMP 5K/30 & AMP 5K/40
Terminating Machines 2161500-[ ]
(409-10204)



Extraction Tool 1452426-1
(408-32206)



POWER TRIPLE LOCK*
Receptacle Contact
Continuity Test Fixture
(Customer Supplied)
(408-32184)
(Design Guidelines
Drawing 1969744)



POWER TRIPLE LOCK*
Tab Contact
Continuity Test Fixture
(Customer Supplied)
(408-32187)
(Design Guidelines
Drawing 1969745)

Figure 10 (Cont'd)

WIRE			APPLICATOR			HAND TOOL
NO. OF CONDUCTORS	SIZE (mm² [AWG])	INSULATION DIAMETER RANGE	OCEAN (US/EMEA Only)		HDE (AP Only)	
			Atlantic Style	Pacific Style		
1	0.20 [24]	1.43-2.70	2837163-1 ●	2-2837163-1 ●	—	—
	0.34 [22]	1.43-2.70□	2151744-1	2-2151744-1	1552995-2	2217267-1▲
	0.56 [20]	1.43-2.70□	2151744-1	2-2151744-1	1552995-2	2217267-1▲
	0.70 [19■]	1.80-3.30	2151743-1 ●	2-2151743-1 ●	1552994-2 ●	—
	0.80 [18]	1.80-3.30	2151743-1 ●	2-2151743-1 ●	1552994-2 ●	2217208-1●
	1.27 [16]	1.80-3.30				
	2.10 [14]	3.40-3.70	2151742-1	2-2151742-1	1552993-2	2217266-1
	3.30 [12]	3.85-4.25	2151741-1	2-2151741-1	1552992-2	2217268-1
2	0.34 [22]	2.03 Max‡	2151743-1 ●	2-2151743-1 ●	1552994-2 ●	—
	0.56 [20]†	2.30-2.80‡	2151746-1	2-2151746-1	1552511-2	2217267-1
	0.80 [18]	2.65-2.95‡	2151745-1	2-2151745-1	1552996-2	2217266-1

■ For contacts 1971783 and 1971784. Refer to product customer drawing for minimum cross-sectional area (CMA).
● This applicator will produce an overlap (OV) crimp on the contact insulation barrel.
□ For insulation smaller than 1.76 mm, applicator 2837163-1 or 2-2837163-1 should be used.
▲ Refer to hand tool drawing for insulation diameter restrictions.
† Alternative wire combination 0.80 mm² [18 AWG] + 0.34 mm² [22 AWG]. Crimp with applicator only.
‡ For contacts with 2 wires, the insulation diameter range shown is for each wire. If one wire has a smaller insulation diameter, it is to be placed underneath the wire with the larger insulation diameter.

Figure 10 (End)

5.3. Hand Tool

Hand tools are designed to crimp loose piece contacts onto pre-stripped wire. The hand tool consists of a tool frame and die assembly that has two crimping chambers. The tool features a ratchet (crimp height) adjustment wheel and locator.

Hand tools for product part numbers are available from the Hand Tool Search Portal on www.te.com or by calling the Product Information Center at the bottom of page 1.

5.4. Extraction Tool

The extraction tool must be used to remove a contact from the housing. The extraction tool is designed to lift the contact latch opening from the housing internal latch without causing deformation or damage. Refer to Paragraph 3.5.B for contact extraction information.

5.5. Test Fixture

The test fixture is used for continuity testing of the housing. The design guidelines drawing provides geometry and instruction of component assembly. Models are available upon request. For information concerning continuity testing of the housing, call the number at the bottom of page 1.

6. VISUAL AID

The illustration below shows a typical application of the POWER TRIPLE LOCK* 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 or tooling.

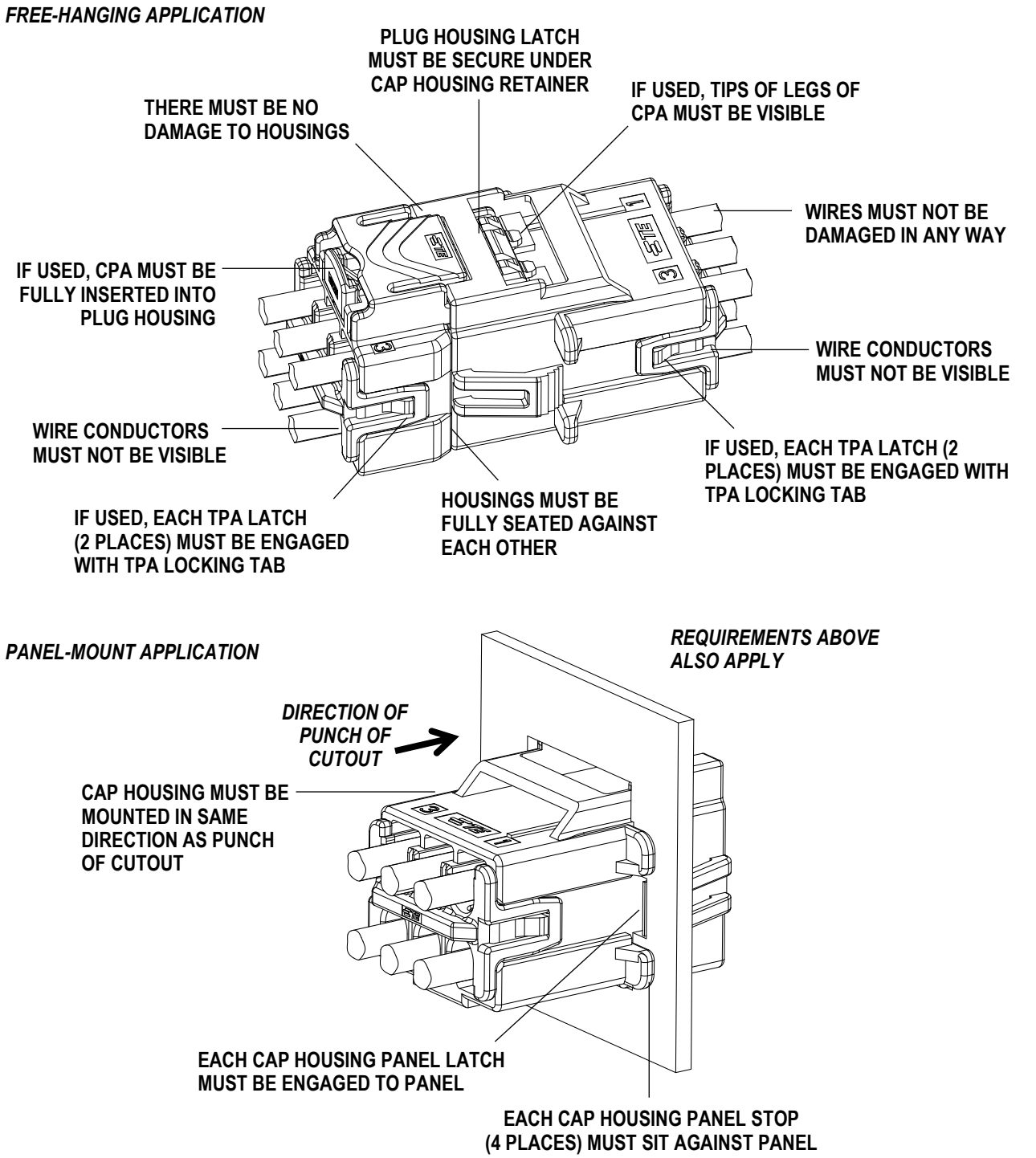


FIGURE 11. VISUAL AID