



NOTE

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ± 0.13 [± 0.005] 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 the Power Versa-Lock connector system with a 5.0 mm centerline. The Power Versa-Lock connector system is available in 2, 3, 4, 6 and 9 position panel mount configurations and a 1 position free hanging configuration for a 14 to 26 AWG wire range, including 2x22 AWG.

The twist and lock connector version is available in a 6 and 9 position, dual and three row panel mount configuration for a 14 to 26 AWG wire range, including 2x22 AWG.

Terminal position assurance (TPA) accessories are available for all wire sizes. Cap and plug housings are available in multiple keying and color configurations.

The optional seals are rated to IP67. If seals are required, the mating interface seal must be used in conjunction with a gang seal. An optional back cover accessory is available for connectors utilizing the optional seals.

Basic terms and features of this product are provided in Figure 1.

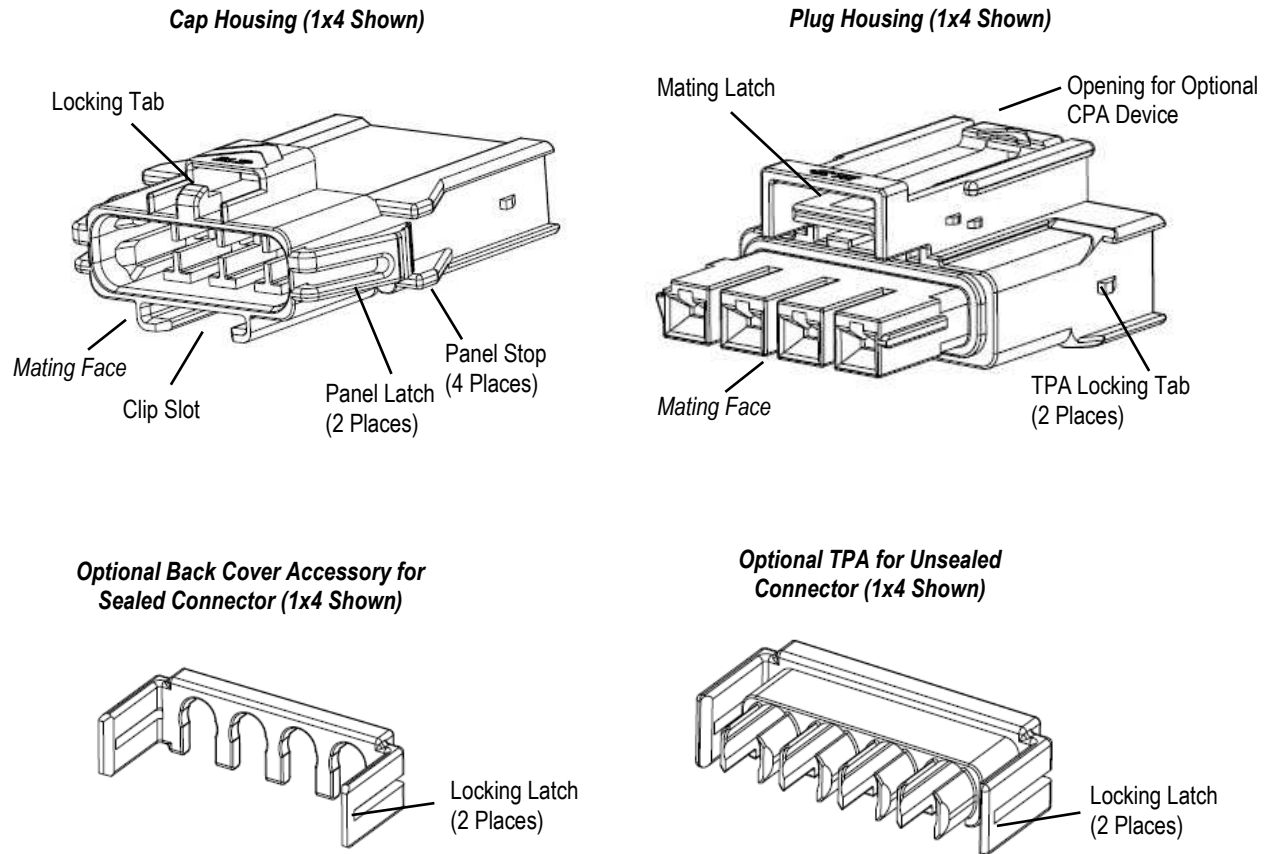
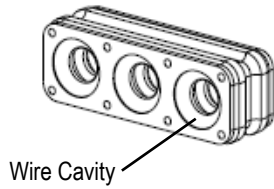
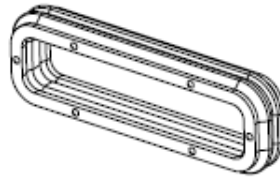


Figure 1 (continued below)

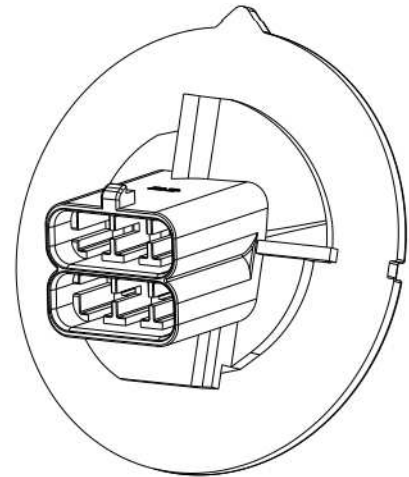
Optional Gang Seal (1x3 Shown)



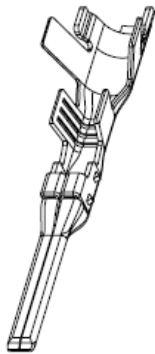
Optional Mating Interface Seal



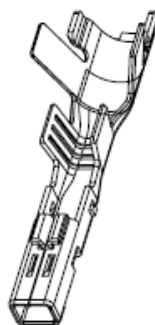
Angled Twist and Lock Cap (2x3 Shown)



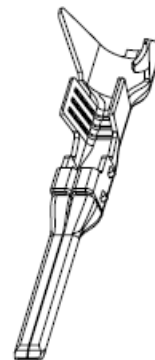
Tab Terminal (Unsealed)



Receptacle Terminal (Unsealed)



Tab Terminal (Sealed)



Receptacle Terminal (Sealed)



Figure 1 (end)

2. REFERENCE MATERIAL

2.1. Revision Summary

- Update paragraph 1 to identify 2x22 AWG and add new sizes.
- Updated wording in paragraph 2.2
- Removed part numbers from para 2.3 since it is becoming a big list
- Clarified wire size and insulation in paragraph 3.3
- Clarified insulation crimp
- Updated crimp height for 24 and 26 AWG
- Clarified Keying in paragraph 3.5
- Added 3x3 contact insertion and TPA/Back cover instructions

2.2. Customer Assistance

Reference Product Base Part Number in Figure 3 are representative of the Power Versa-Lock connector system. Use of these numbers will identify the product line and help you to obtain product and tooling information when visiting www.te.com or 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.

2.4. Instructional Material

Instructional material that pertains to this product is:

[408-143099](#) Power Versa-Lock Connector System Assembly Procedure

2.5. Specifications

Product Specification [108-143081](#) provides product performance and test results.

3. REQUIREMENTS

3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

3.2. Storage

A. Ultraviolet Light

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

B. Shelf Life

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

Do not store product 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.

3.3. Wire Selection and Preparation

The contacts designed for unsealed applications accept a single stranded copper wire sizes 14 AWG to 26 AWG or 2 stranded copper wire sizes 22 AWG. Insulation diameter range is noted in Figure 3.

The contacts designed for sealed applications accept a single stranded copper wire sizes 14 AWG to 26 AWG. Insulation diameter range is noted in Figure 3.

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

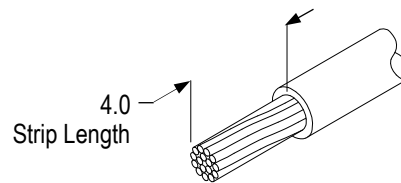


Figure 2

3.4. Contact Crimp

A. Cutoff Tab

The cutoff tab is the remaining portion of the carrier strip after the contact is cut from the strip. The cutoff tab must not exceed the dimensions 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 given in Figure 3.

C. Insulation Barrel Crimp

The crimp applied to the insulation barrel of the contact must result in either an overlap crimp where the tips of the insulation barrel wraps overlap each other or a wrap crimp where the tips of the insulation barrels by-pass each other. Both versions 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. Chemlube 1102 can aide with the overlap crimp.

D. 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.

E. 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 for allowable limits.

F. Wire End Extrusion Length and Height

The wire conductor ends must extend beyond the end of the wire barrel within the dimensions given in Figure 3. The wire end extrusion height may not exceed the limits given in Figure 3.

G. Bellmouths

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

H. 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.

I. Bend Allowance

Then bend allowance between the wire barrel and the cable is acceptable within the limits given in Figure 3.

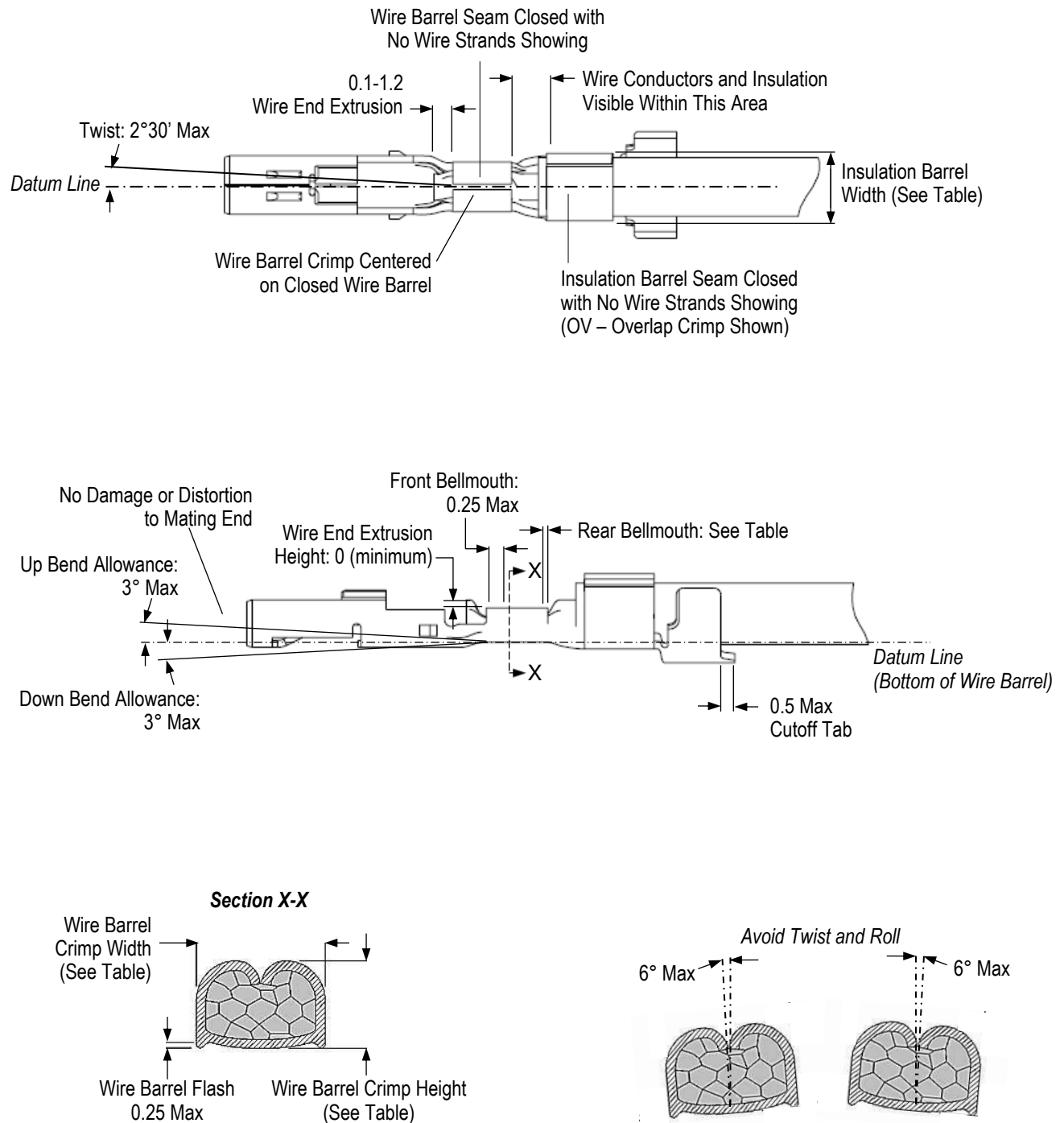


Figure 3 (continued below)

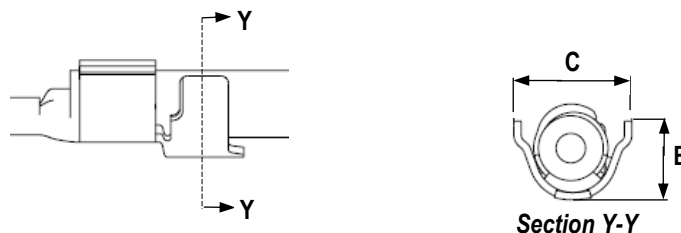
Base Number	Wire Size (AWG [mm ²])	Insulation Diameter Range	Wire Crimp		Insulation Crimp Width	Insulation Crimp Form	Insulation Crimp Height (Ref)	Rear Bellmouth Length
			Width	Height				
2329907■ 2329916■	14 [2.00] 16 [1.25]	Gang Seal: 2.29-3.5 [.090-.138]	2.03 [.080]	1.68±0.05 [.066±.002] 1.45±0.05 [.057±.002]	Gang Seal: 3.3 [.130]	Wrap	Gang Seal: 2.8 [.110] for min Dia. insulation 3.5 [.138] for max Dia. insulation	0.25±0.2 [.0098±.008]
2329910 2329913	14 [2.00] 16 [1.25]	2.3-3.5 [.090-.138]	2.03 [.080]	1.68±0.05 [.066±.002] 1.45±0.05 [.057±.002]	3.3 [.130]	OV	Crimp until tight per guidelines in Paragraph 3.4.C	0.25±0.2 [.0098±.008]
2329906 2329912	18 [0.80] 20 [0.50] 2x22 [2x0.30]	1.74-2.76 [.069-.109] 2.4 [.094] (max)	1.78 [.070]	1.08±0.05 [.043±.002] 1.00±0.05 [.039±.002] 1.04±0.05 [.041±.002]	2.79 [.110]	OV	Crimp until tight per guidelines in Paragraph 3.4.C	0.2±0.15 [.0079±.006]
2329908■ 2329914■	18 [0.80] 20 [0.50]	Gang Seal: 1.74-2.8 [.069-.110]	1.78 [.070]	1.08±0.05 [.043±.002] 1.00±0.05 [.039±.002]	Gang Seal: 3.3 [.130]	Wrap	Gang Seal: 2.7 [.106] for min Dia. insulation 2.9 [.114] for max Dia. insulation	0.2±0.15 [.0079±.006]
2329909 2329915	22 [0.30] 24 [0.20] 26 [0.14]	1.3-2.34 [.051-.092]	1.27 [.050]	0.97±0.05 [.038±.002] 0.89±0.04 [.035±.0015] 0.86±0.03 [.034±.001]	2.29 [.090]	OV	Crimp until tight per guidelines in Paragraph 3.4.C	0.15±0.10 [.0059±.004]
2329911■ 2329917■	22 [0.30] 24 [0.20] 26 [0.14]	1.3-2.4 [.051-.092]	1.27 [.050]	0.97±0.05 [.038±.002] 0.89±0.04 [.035±.0015] 0.86±0.03 [.034±.001]	Gang Seal: 2.29 [.090]	Wrap	Gang Seal: 1.6 [.063] for min Dia. insulation 2.5 [.098] for max Dia. insulation	0.15±0.10 [.0059±.004]

Note: ■ Indicates sealed terminal
OV – Overlap Crimp
O – O Crimp

Figure 3 (end)

J. Contact Stabilizer

The contact stabilizer must not be crimped or deformed in any way. The width of the stabilizer must be within the limits specified in Figure 4.

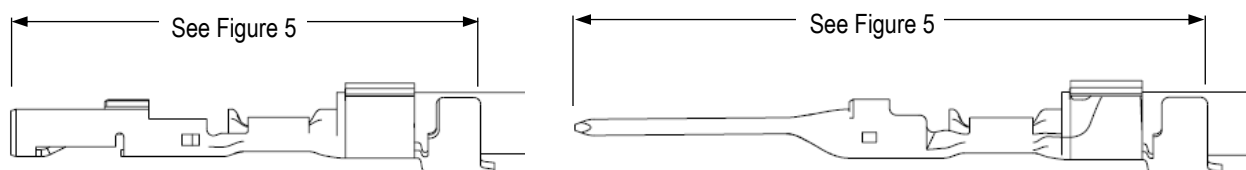


Part Number	Dimension B	Dimension C
2329906 2329912	2.5 [.098]	4 [.157]
2329909 2329915	2.32 [.091]	4 [.157]

Figure 4 (end)

K. Contact Length

The contact length measured on the upper portion of the contact at the back of the contact stabilizer (not including the carrier strip cutoff tab) must be within the dimensions given in Figure 5.



Part Number	Contact Length (after Crimping)
2329906 2329909	22.1 +0.50/-0.10 [.870 +.020/- .004]
2329912 2329915	17 +0.50/-0.10 [.669 +.020/- .004]

Figure 5

3.5. Keying

Only plug housings and cap housings of the same resin type and identical keying configuration will mate; for example, Key A PBT Plug will not mate with a Key A Glow wire Cap. The TE Connectivity customer drawing provides keying configurations.

3.6. 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 in the same direction as they key in the housing. The contact must be inserted into the circuit cavity until the contact internal latch locks onto the circuit cavity locking finger.

In the 2x3 cap and plug configurations, one row of contacts is inverted from the other row. Terminals in the top row must be inverted 180° from terminals in the bottom row. See Figure 6.

In 3x3 cap and plug configurations, each row of contacts is inserted in the same orientation as noted in the first paragraph of this section and no 180 deg inversion of the contacts is required.



NOTE

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

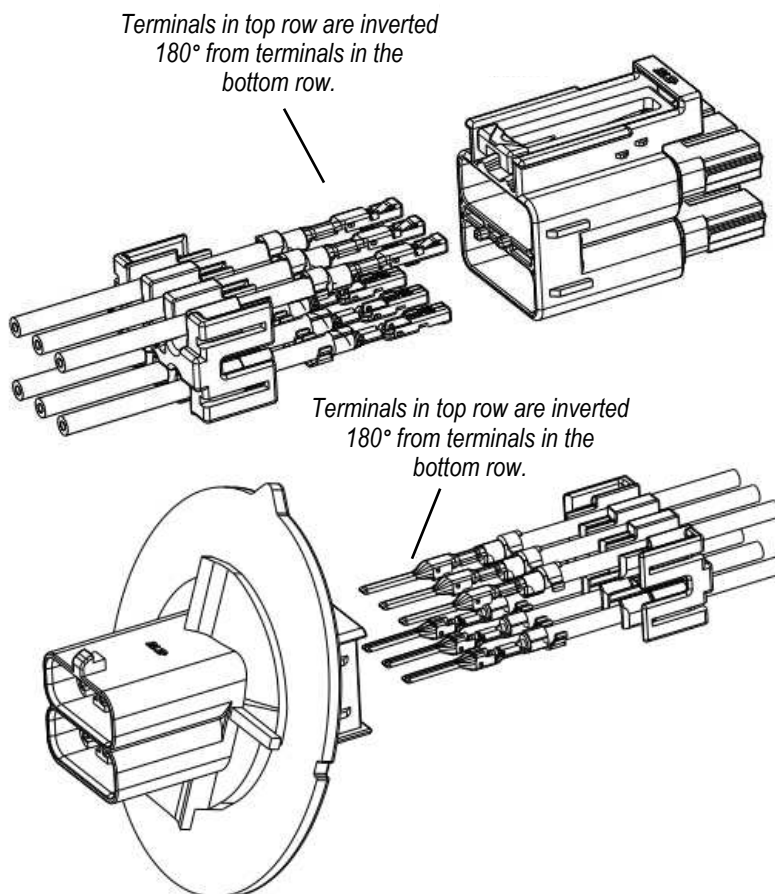


Figure 6

B. Extraction

If the optional TPA or Back Cover accessories are used, the contacts cannot be removed until the accessory is removed from the housing. Contacts must be removed individually from the housing. After extraction, the contact must be inspected for damage or deformation; if evident or questionable, the contact must be replaced. After contact extraction, discard the housing as it may have internal damage. It is important that the housing not be re-used because internal damage cannot always be easily determined.

See Figure 11 for recommended extraction tools for tab and receptacle contacts.

3.7. Optional TPA or Back Cover Accessories

An optional TPA accessory is available for the plug and cap housings when used without seals. An optional Back Cover accessory is available for the plug and cap housings when seals are used. The following requirements apply for installation and removal:



NOTE

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

- The TPA or Back Cover must be installed onto the rear 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.
- The TPA or Back Cover must be removed by lifting each latch so that it clears the housing locking tab and pulling the accessory straight from the housing.
- 3x3 cap and plug configurations use three (3) 1x3 TPA or Back covers

3.8. Panel Mounting

Recommended panel cutout dimensions are provided on the customer drawing for the specific cap housing. The Power Versa-Lock connector system supports panel with thickness 0.8 to 2.0 mm.

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. See Figure 7.

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.

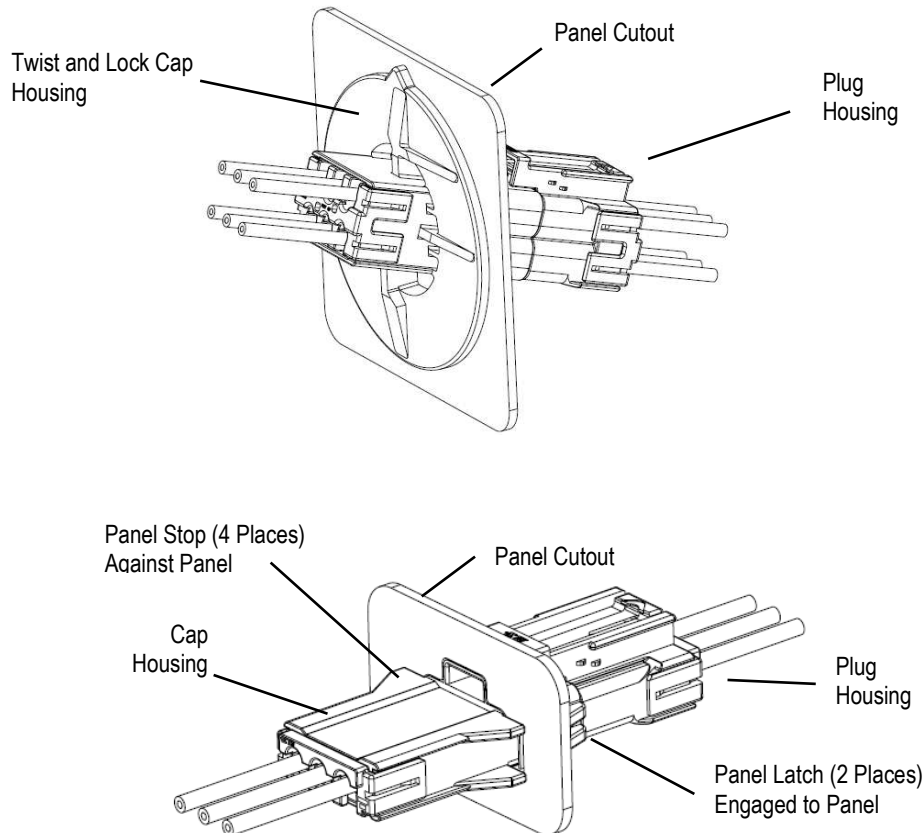


Figure 7

3.9. Clip Mounting

As an alternative mounting configuration, the bottom of the Power Versa-Lock Cap contains an 11 mm wide slot that accepts mounting clips designed to meet USCAR specification EWCAP-005-11. See Figure 8.

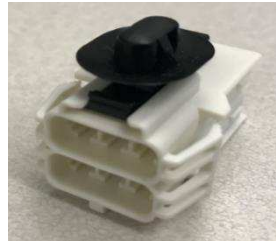


Figure 8

3.10. 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.

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.



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.

3.11. Strain Relief and Wire Dress

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

3.12. Wire Seal Selection

For a sealed application, the insulation diameter of the wires must be matched to the correct gang seal. The customer drawing for the gang seal identifies the approved wire insulation range. For applications where the wire insulation diameter is noticeably different within the connector, it is important to verify that the insulation diameter range for all wires is correct for the chosen gang seal, otherwise proper sealing may not be achieved. The gang seal should be inserted into the rear of the housing prior to inserting crimped contacts into housing.

Seal Type	Part Number
Gang Seal	2325349-X

Figure 9



NOTE

See Customer Drawing for applicable dash number (-X) based on insulation diameter range.

3.13. Assembly Procedures

See Instruction Sheet [408-143099](#) for assembly procedure instructions. (Refer to Paragraph 2.4.)

3.14. Replacement and Repair

Damaged or defective product must not be used. The housings, contacts, TPA device, and seals are not repairable. If gang seals are used and terminals are extracted, the seals must be carefully examined for damage. If there is any doubt as to the integrity of the seal, it is recommended that the seal be replaced.

3.15. Sealing Plugs (Optional)

In lieu of a terminal, an optional sealing plug can be inserted into the gang seal to maintain the sealing integrity and IP rating of the connector. Sealing plugs must match the inside diameter of the gang seal; see Figure 10 for sealing plug part numbers. Refer to Instruction Sheet [408-143099](#) for assembly procedure instructions for sealing plugs.

Gang Seal	Sealing Plug (Optional)
2325349-1	776363-1
2325349-2	
2325349-3	
1-2325349-1	776364-1
1-2325349-2	
1-2325349-3	

Figure 10

4. QUALIFICATION

4.1. Underwriters Laboratories Inc. (UL)

Selected part numbers in the Power Versa-Lock connector system are recognized by Underwriters Laboratories Inc. (UL) in File E28476 with additional part numbers pending. An exact status can be provided by contacting the TE Product Information Center at the number at the bottom of page 1.

5. TOOLING

Applicators contain the tooling for feeding and crimping strip-form terminals. Automatic machines provide the power to operate the applicator. See Figure 11 for representative images.

Tooling information for product part numbers is available from www.te.com or by calling the Product Information Center at the number at the bottom of page 1.

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 wire.

5.2. Applicator

Applicators and hand tools for product part numbers are available in Figure 11 and from the [Applicator Search Portal](#) on www.te.com or by calling the Product Information Center at the bottom of page 1.

Terminal Part Number	Applicator Part Number	Hand Tool Number
2329907 2329916	2837355-1	2372810-1
2329908 2329914	2837357-1	2372815-1
2329906 2329912	2837356-1	2372175-1 2373180-1 (2x22 AWG)
2329909 2329915	2837358-1	2373180-1 (22 AWG) 2373185-1 (24 AWG) 2373185-1 (26 AWG)

5.3. Hand Tools

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.



Ocean Applicator



Automatic Machine



*Hand Tool
Assembly*



*Extraction Tool
(Part Number 9-1579028-3)*

Figure 11

6. VISUAL AID

Figure 12 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.

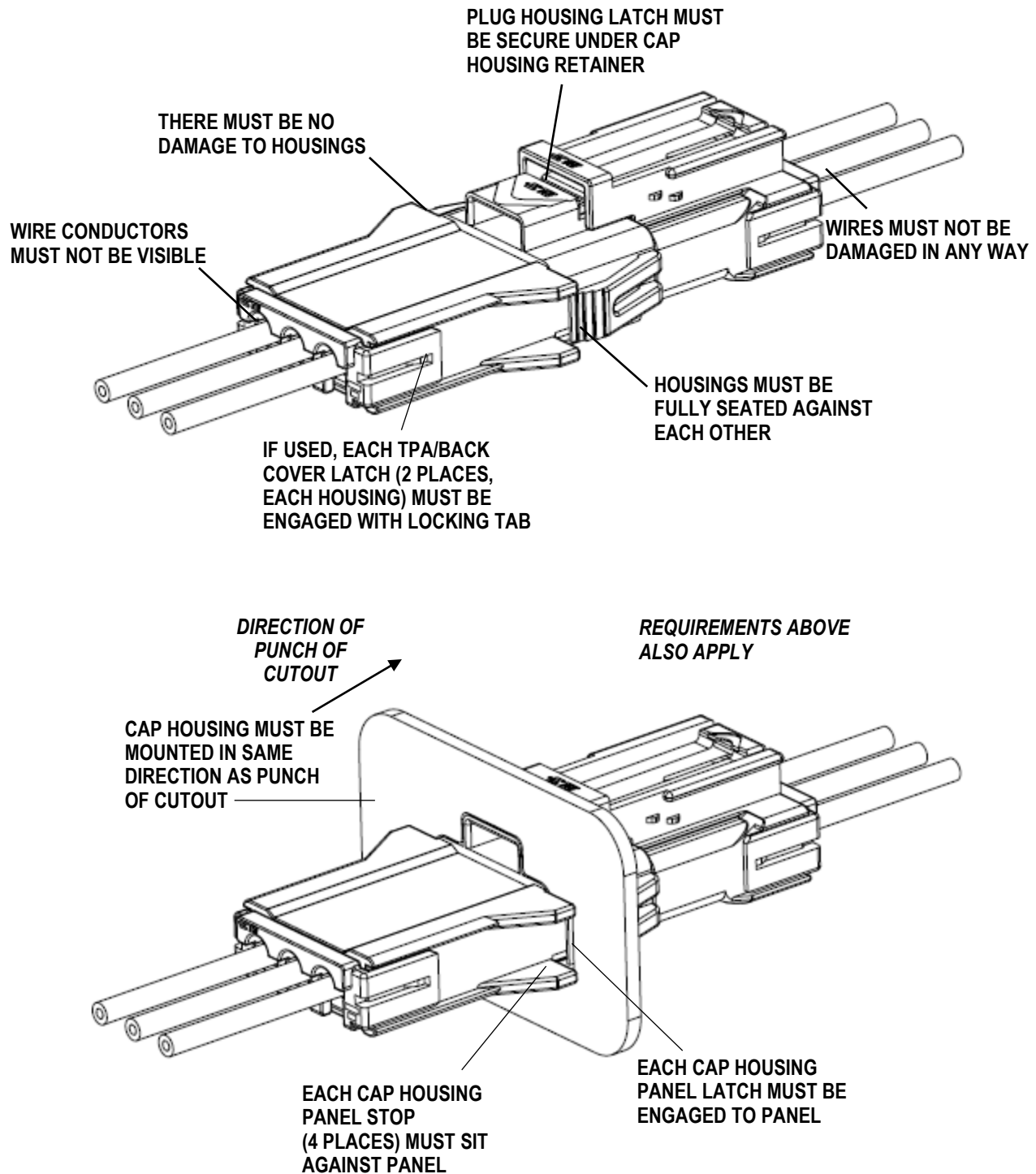


Figure 12 (continued)

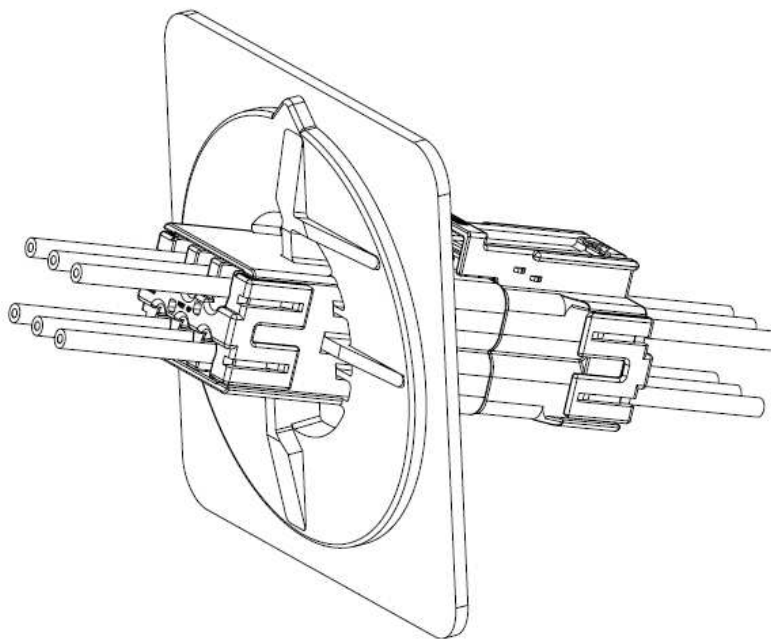


Figure 12 (end)