

HC-STAK 25-2phi High Voltage Connector



All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters. Unless otherwise specified, dimensions have a tolerance of ± 0.13 and angles have a tolerance of $\pm 2^\circ$. Figures and illustrations are for identification only and are not drawn to scale.



HIGH-VOLTAGE - MORTAL DANGER

- This connector is intended for use in high-voltage applications. Special care must be applied to ensure that the connector functions as intended.
- If you suspect that the connector has been modified, damaged, contaminated, or otherwise compromised, please discontinue its use immediately.
- This connector should only be serviced by a trained and qualified technician.

1. INTRODUCTION

This specification covers the requirements for assembly and mating/un-mating of the HC-STAK 25-2phi Plug.



These high-voltage connectors must NOT be mated with any other type of connector.

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

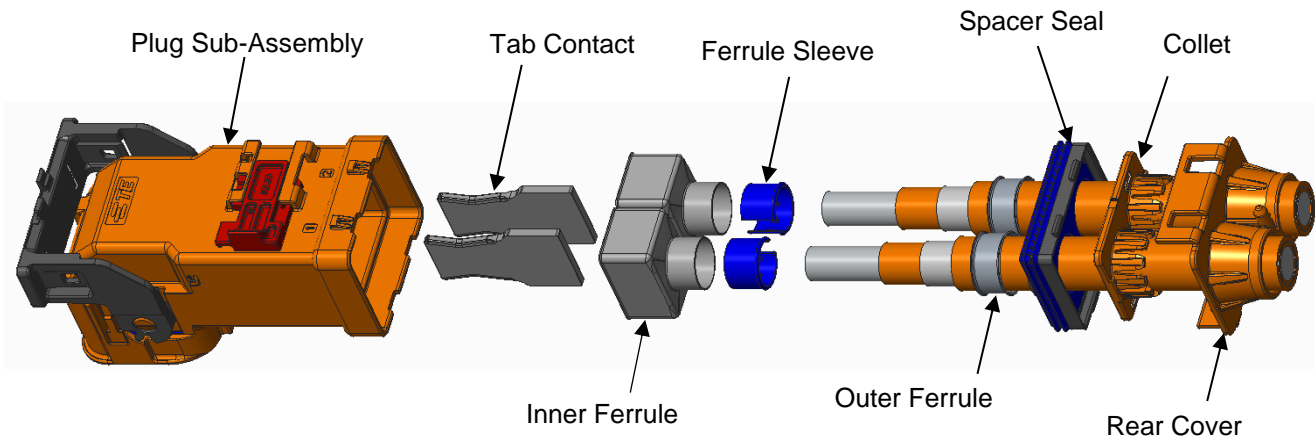


Figure 1: Exploded View HC-STAK 25-2phi

2. REFERENCE MATERIAL

2.1. Revision Summary

- A. Initial release of document
- B. **2.2.:** replaced 2840569 with 2840439
2.3.B: replaced 2840569 with 2840439
Table 1: replaced 2840569 with 2840439
added 2840712 (collet)
3.6.2: replaced 2x46±1 with 2x45±1
3.6.5: replaced 2x27.0±0.5 with 2x27.5 MAX
3.6.6: new layout
3.6.7: added
- Presence and orientation of all components
 - No deformation to the rectangular section of the inner ferrule
 - No damage (scratches, etc.) to the HV tab contact surfaces
- 3.6.8:** was Install the cable assembly into the plug sub-assembly in the orientation shown until it is fully locked as shown in Figure 9. Verify that the cable assembly is completely installed by gently pulling back on the cable.
- Figure 9:** removed "Click"
added bottom view
- 3.6.11.:** was Slide the rear cover forward on the cable and latch to the plug sub-assembly as shown in Figure 12. Verify that both of the rear cover latches are fully locked.
- 3.6.12.:** added 1.0mm MAX gap
- 5.:** added
6.: added
- C. **3.7.:** added HVIL shunt probing note
added Figure 14
- D. **2.4 :** PART# x-2840572-x changed to x-2329023-x
- E. **3.6.:** Pt.6 Fig 8 – Added note "If using a knurled tab (2840393-2) knurling is on welded side. Removed all references to low volume tooling in sec 2.2,2.3 and 2.4 – Table 1.
- F. **3.6.7:** Added Champlain 50mm² and 25mm² dimensions on the ferrule crimp. Added USCAR38 spec for ultrasonic weld parameters
2.4: Removed table with component part numbers.
2.2 – Replaced customer drawing PN with 2349157.
3.8.6 – Added Point 6 and Image to show tie-down point
- G. **3.6.6:** Criteria and weld tensile strength replaced with mechanical and electrical
- H. **3.6.5:**– Added Coroplast 50mm² cable information for ferrule crimp dimensions

2.2. Customer Assistance

Reference drawing 2349157 and Product Code L983 are represent the HC-STAK 25. Use of this base numbers and product code 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 TE Representative or, after purchase, by calling the Product Information Center at the number at the bottom of page 1.

2.3. Drawings

2.3.1 Customer 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 Customer Drawing takes preference.

2.3.2 Reference drawings

i **Reference Drawing C-2349157 is available for part number relationships only and is not a sellable item.** Refer to this drawing only for compatible part numbers for customer inquiry. For more information on Reference Drawings, call **PRODUCT INFORMATION** at the number at the bottom of page 1.

2.4. Cable and Subcomponent Specification

The following cable and subcomponent combinations must be used together to ensure optimum connector performance.



Do NOT nick, scrape, or cut the wire conductor during the stripping process.

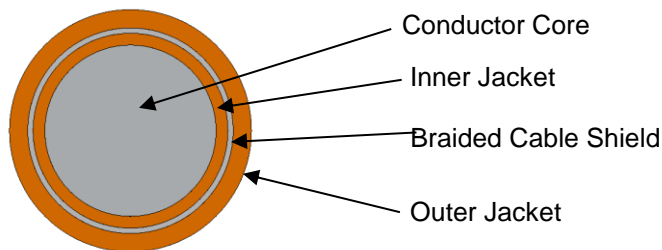


Figure 2: Single Conductor Cable

i See the reference drawing **C-2349157** for specific validated wire sizes and part numbers

3. REQUIREMENTS

3.1. Safety

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

3.2. Shelf Life

The contacts should remain in the shipping containers until ready for use to prevent deformation to the contacts and/or damage to the housings. The products should be used on a first in, first out basis to avoid storage contamination that could adversely affect signal transmissions.

3.3. Chemical Exposure

Do not store contacts near any chemicals listed below, as they may cause stress corrosion cracking in the contacts.

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

3.4. Material

The connector assemblies are made of thermoplastic materials and the terminals, shields, and ferrules are tin and silver plated copper alloy.

3.5. Circuit Identification

The terminal cavities are numbered on the outer housing of the connector at the wire entry end.

3.6. Assembly Procedures

The following procedures show the details of the cable assembly and insertion instructions into the plug subassembly.



Refer to Table 1 for the various components of the cable as shown in an end view of the cable.

1. From the plug end of the cable, slide the rear cover, collet, and spacer seal in the order and orientation as shown in Figure 3.

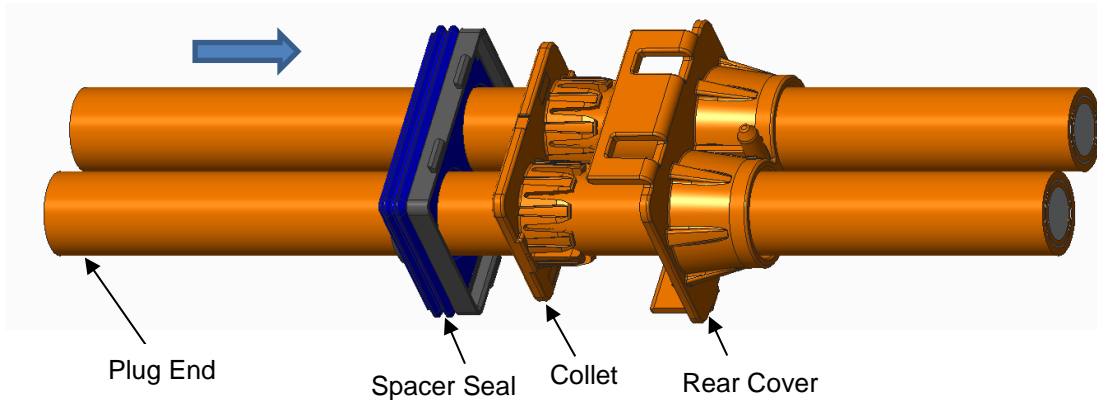


Figure 3: Rear cover, collet, and spacer seal loaded on cable

- Strip and remove the outer cable jacket, foil (if present), braided shield, and inner jacket from the plug end as shown in Figure 4.

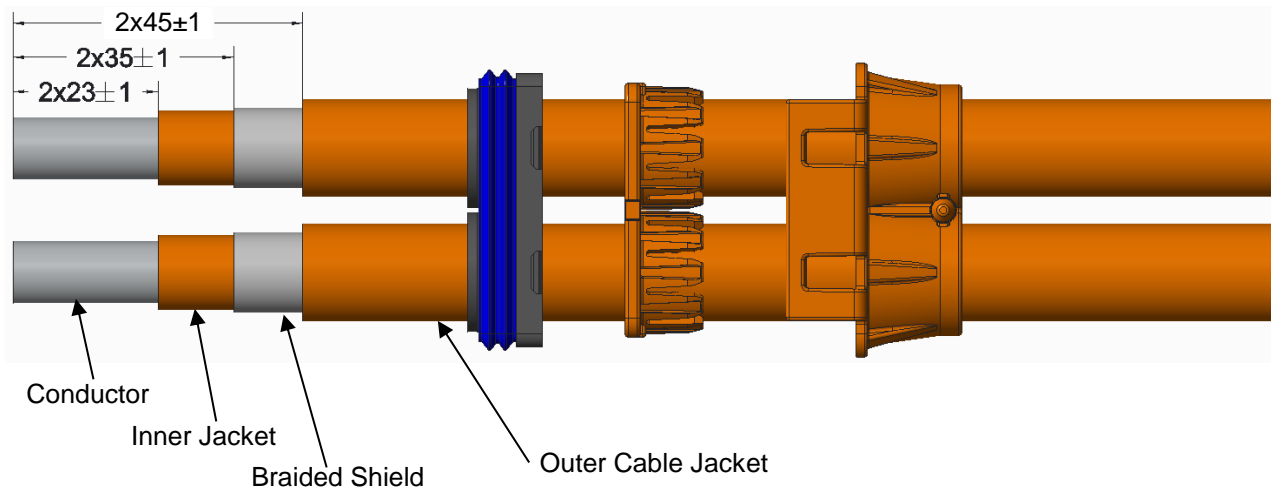


Figure 4: Cable Stripping



Do not cut, nick or scrape the conductive wires during the stripping process.

- Slightly compress the inner ferrule sleeve and install into the inner ferrule from the cable end as shown in Figure 5.

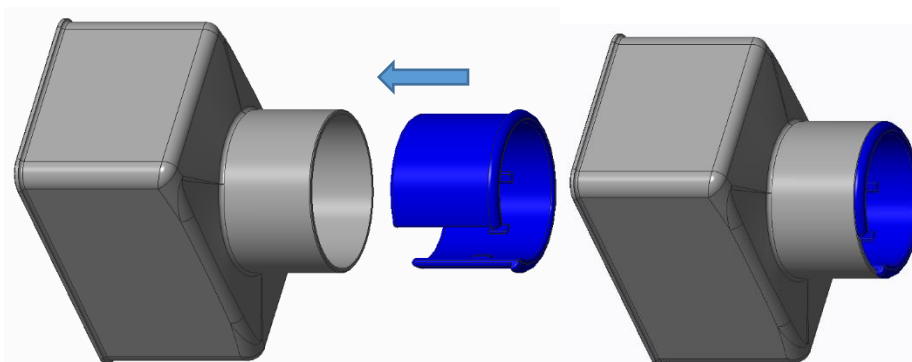


Figure 5: Inner ferrule sleeve into inner ferrule

4. Slide the outer ferrule over the outer cable jacket then the inner ferrule sub-assembly under the braided cable shield up as shown in Figure 6.

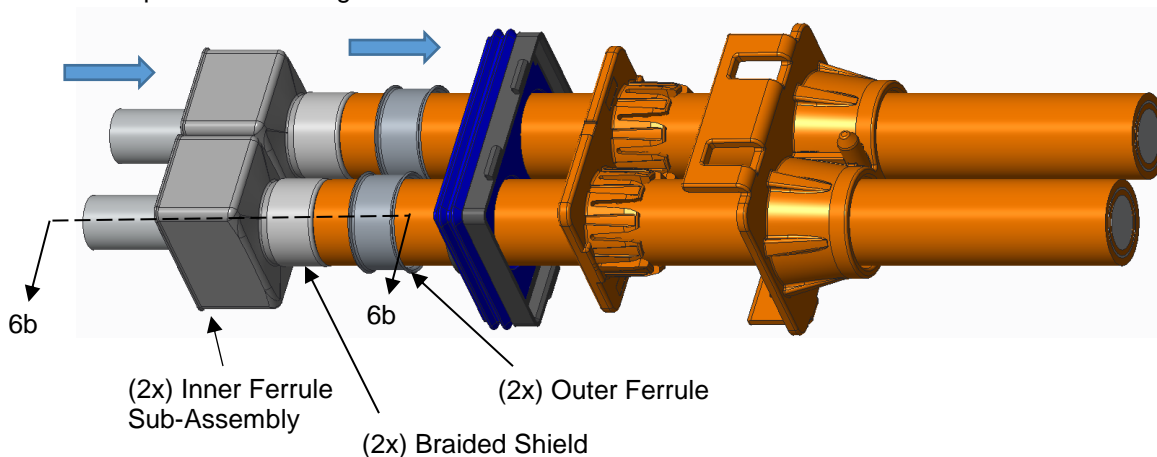


Figure 6a: Slide the outer ferrule over the outer cable jacket

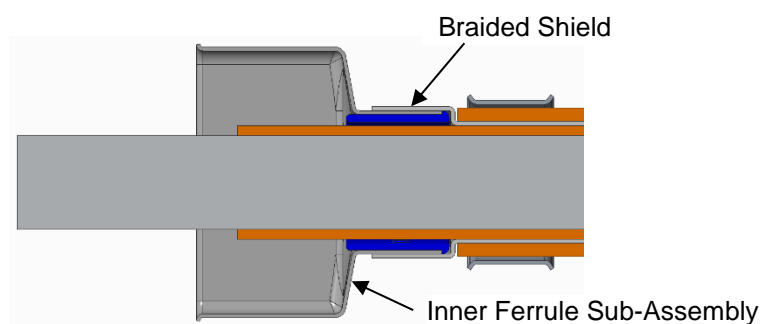


Figure 6b: Slide the inner ferrule under the braided shield



The shielding braid must be spread uniformly on the circumference of the ferrule.

5. Slide the outer ferrule into position over the braided cable shield and crimp in place as shown in Figure 7 using dimensions in Table 2.

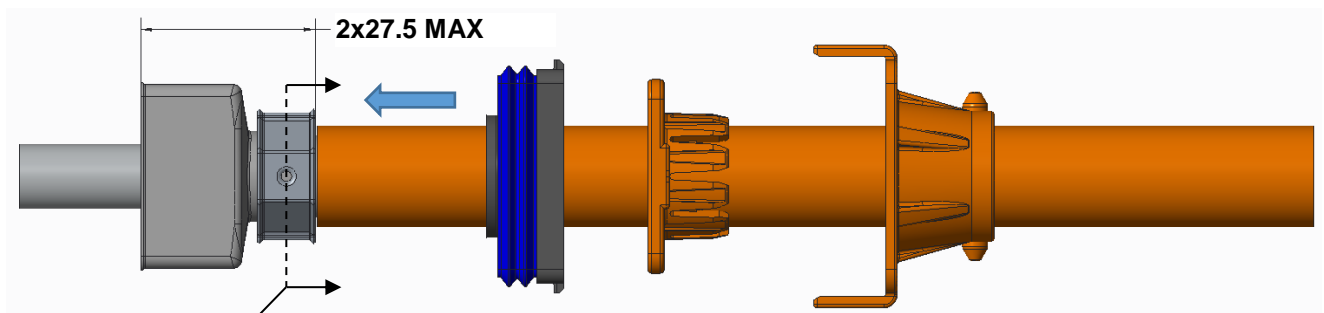
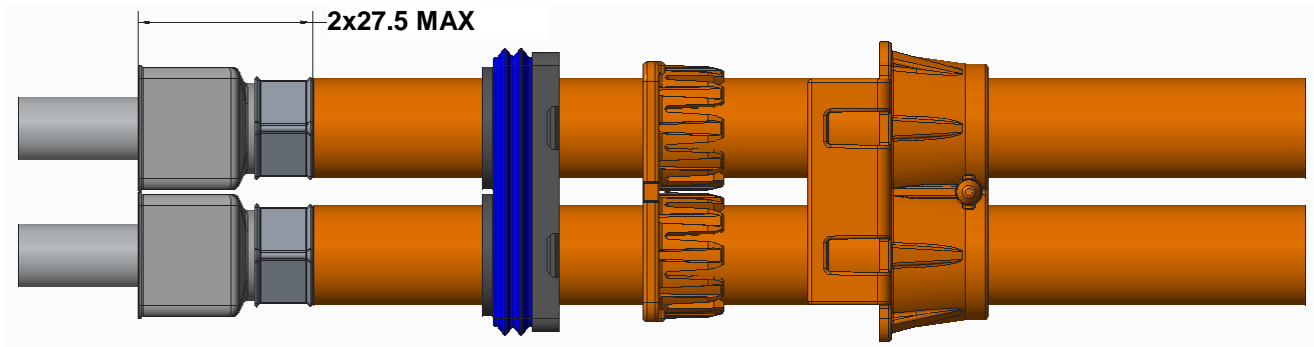


Figure 7b Section

Figure 7a: Ferrule Crimp

i Hex crimp dimple and crimp wings must be correctly oriented (Long sides of the inner ferrule box)

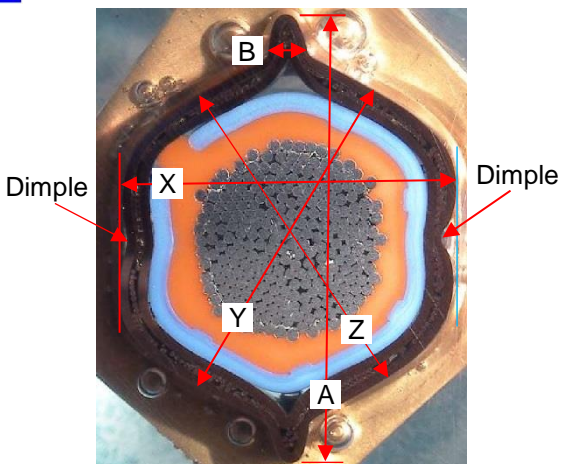


Figure 7b: Hex Crimp

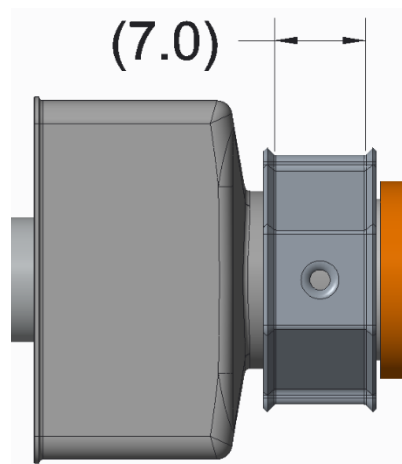


Figure 7c: Bellmouth

Table 2: Hex Crimp Dimensions

Cable	Dim X	Dim Y	Dim Z	Dim A	Dim B
GEBAUER & GRILLER X8663 50mm ² Coroplast 9-2611 (FLR2GCB2G) 50mm ² Champlain 15-08403-XXX 50mm ²	14.8±0.2	15.0 Max	15.0 Max	19.8 Max	1.6 Max
Champlain 15-08126-XXX 25mm ²	12.1±0.1	12.35 Max	12.35 Max	15.7 Max	1.8 Max

* GEBAUER & GRILLER, Champlain and Coroplast are trademarks of the respective owners

Wire insulation shall NOT be cut or broken during the crimping operation, nor shall the insulation be crimped into the ferrule

Any loose strands of the braided cable shield seen protruding from the outer ferrule should be trimmed, taking special care not to leave any detached strands attached to the assembly.

i Periodic inspections must be made to ensure crimped contact formation is consistent as shown.

6. Ultrasonic weld HV Tab as shown in Figure 8. See SAE/USCAR-38 for weld bond appearance, mechanical and electrical requirements. Ensure that the keep-out zones are not violated. This is critical to ensure proper assembly.

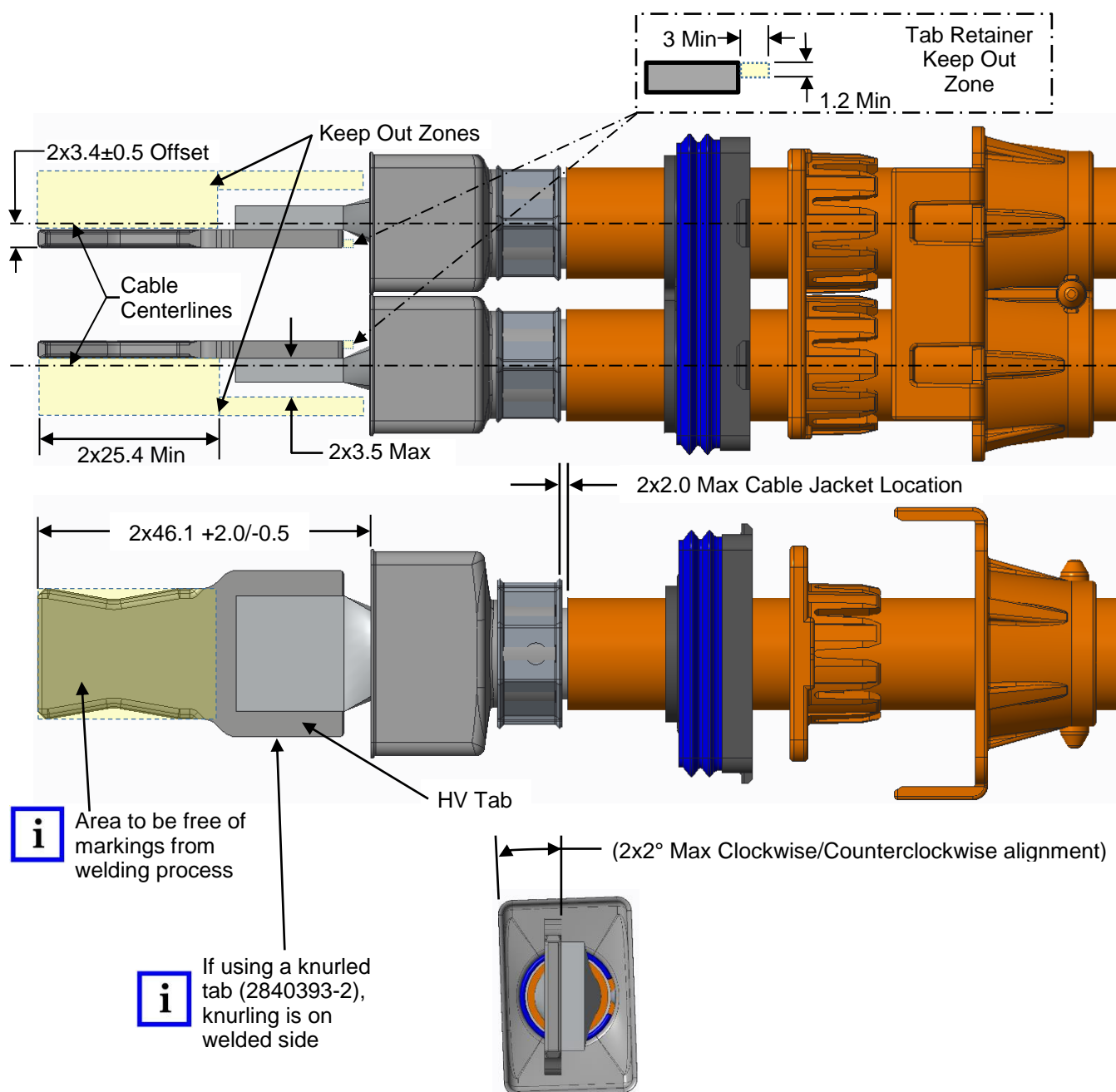


Figure 8: HV Tab ultrasonic welding

7. The following items at a minimum should be inspected and verified:
- Hex crimp dimensions per Table 2
 - No large burrs/flash on the ferrule crimp
 - No visible cracking of the ferrule or shields
 - No loose or detached shield braid strands
 - The cable insulation is not pinched abraded or cut
 - The cable jacket to outer ferrule dimension
 - Weld Nugget, brush, conductor strands, etc. do not violate keep out zone dimensions
 - Presence and orientation of all components
 - No deformation to the rectangular section of the inner ferrule
 - No damage (scratches, etc.) to the HV tab contact surfaces



Verify cable jacket to outer ferrule dimension just prior to installation into plug assembly

8. Install the cable assembly into the plug sub-assembly in the orientation shown until **BOTH** HV Tabs are fully contacting the Plug Inner Housing front surface as shown in Figure 9.

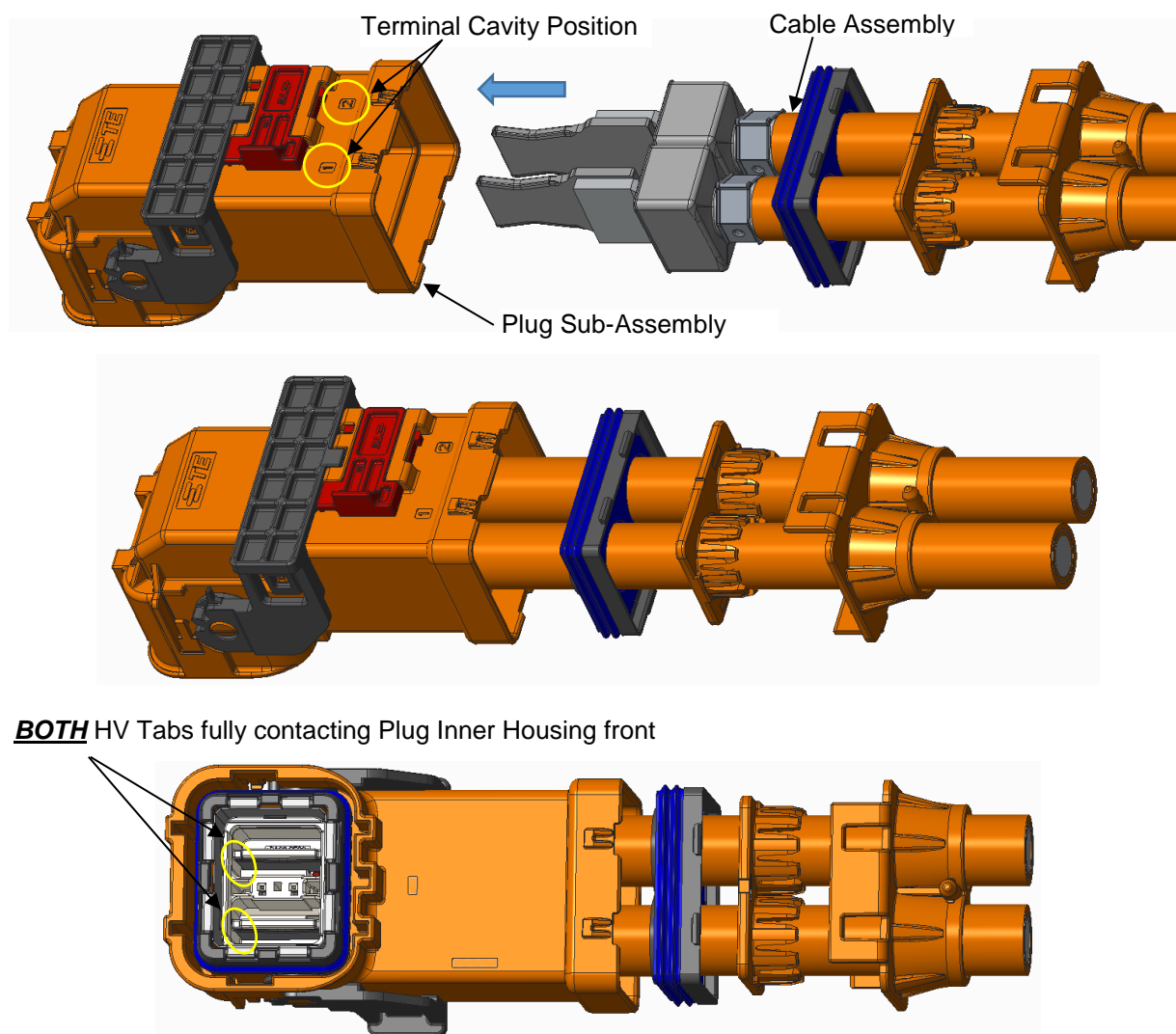


Figure 9: Cable Assembly

9. Slide the spacer seal forward on the cable and into the cable exit end of the plug sub-assembly until it stops against the inside of the plug sub-assembly as shown in Figure 10.

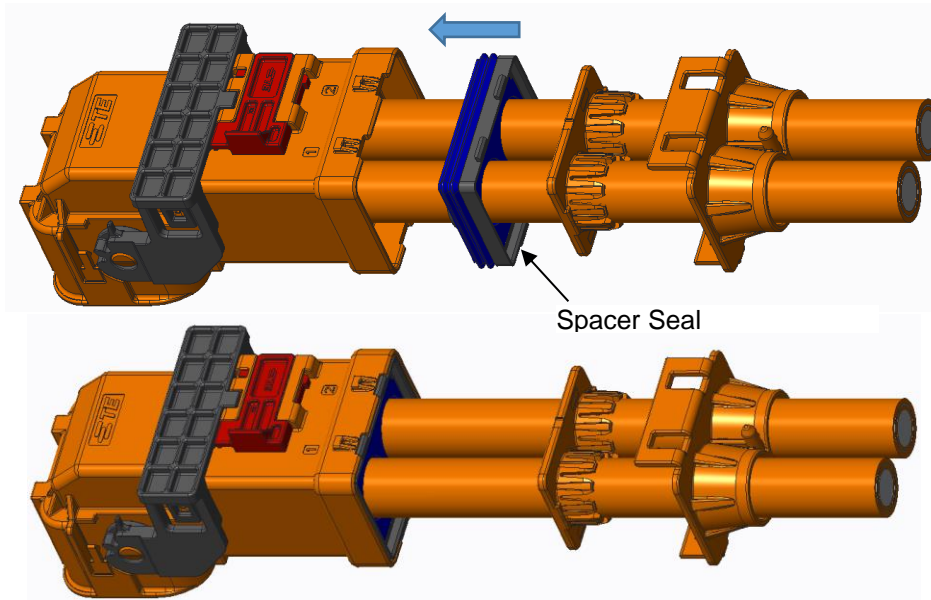


Figure 10: Spacer Seal Assembly

10. Slide the collet forward on the cable and into the spacer seal as shown in Figure 11.

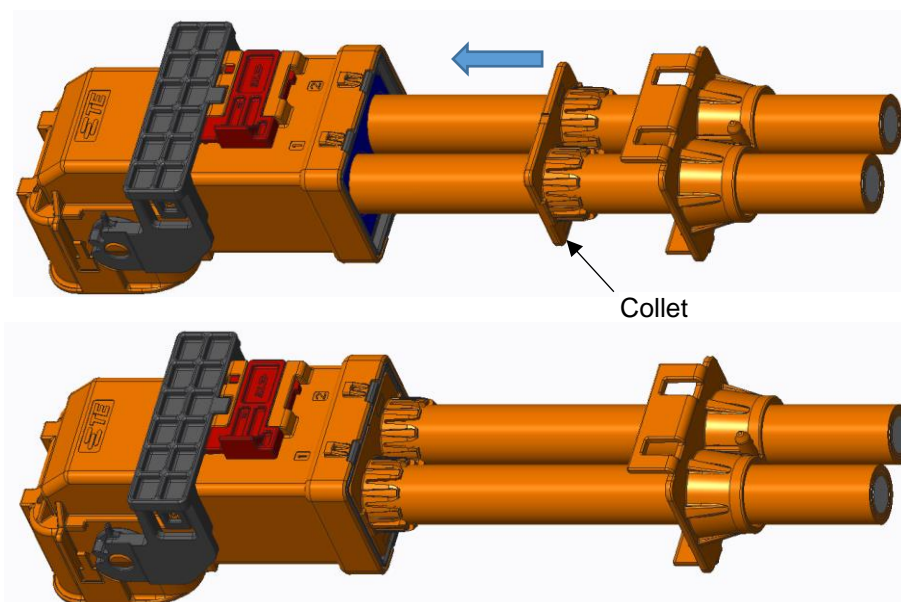


Figure 11: Collet Assembly

11. With ***BOTH*** HV Tabs fully contacting the Plug Inner Housing (refer to Figure 9), slide the rear cover forward on the cable and latch to the plug sub-assembly as shown in Figure 12. Verify that all four rear cover latches are fully locked.

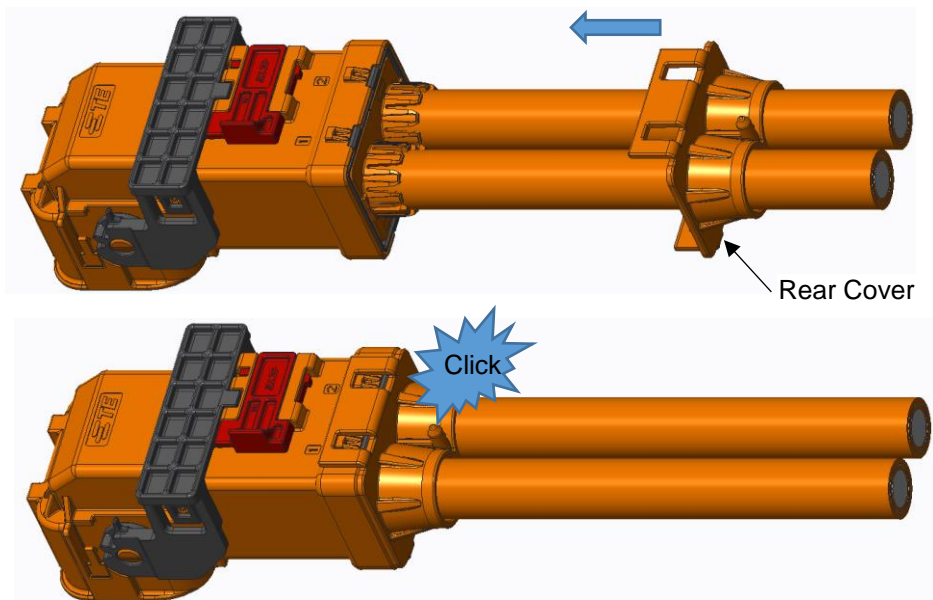


Figure 12: Rear Cover Assembly

12. Verify the gap between ***BOTH*** HV Tabs and the plug inner housing is ***1.0mm MAX*** as shown in Figure 13.

1.0mm MAX gap

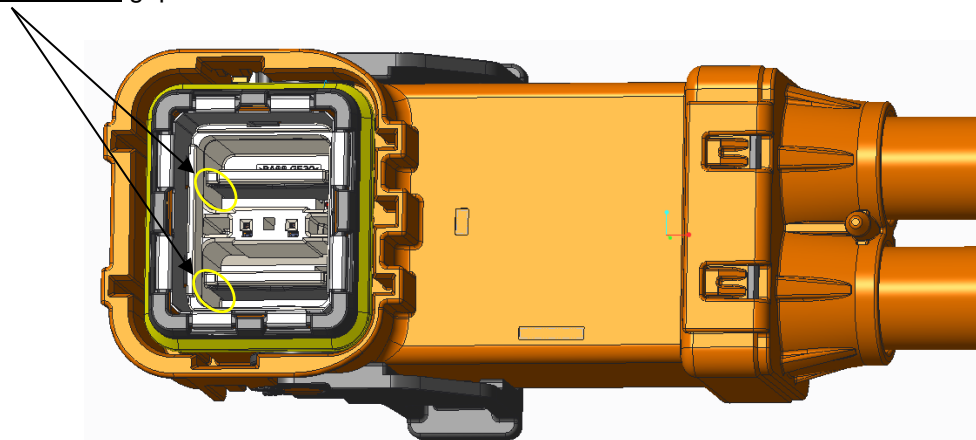


Figure 13: HV Tab Gap

3.7. Contact Probing



Avoid probing the tabs in an area that could damage the plating.



Avoid probing the shunted receptacle contacts as shown in Figure 14. This could damage the contact geometry and/or plating.

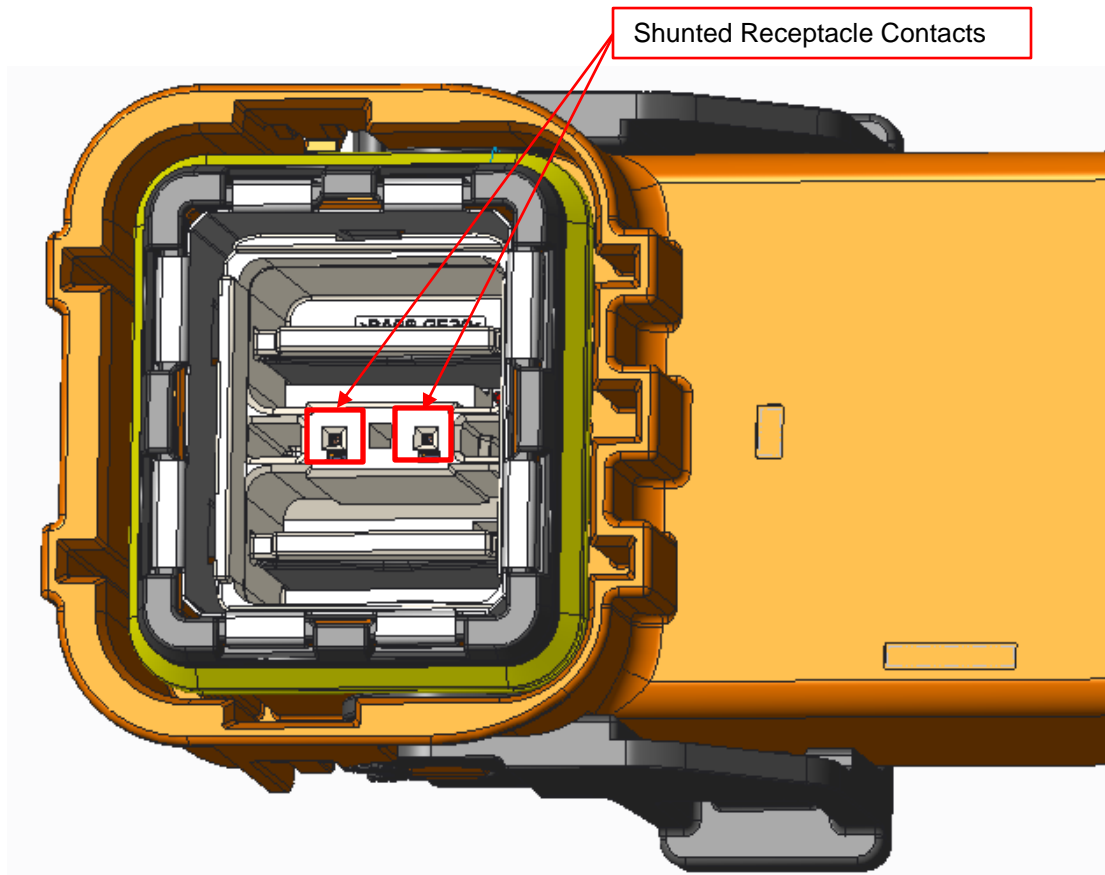


Figure 14: Shunted Receptacle Contacts

3.8. Connector Mating

1. If the assembly is shipped with the Lever and/or red Connector Position Assurance (CPA) in the closed position, first if necessary, actuate the CPA to the open position, then open the lever to the open position as shown in Figure 15.

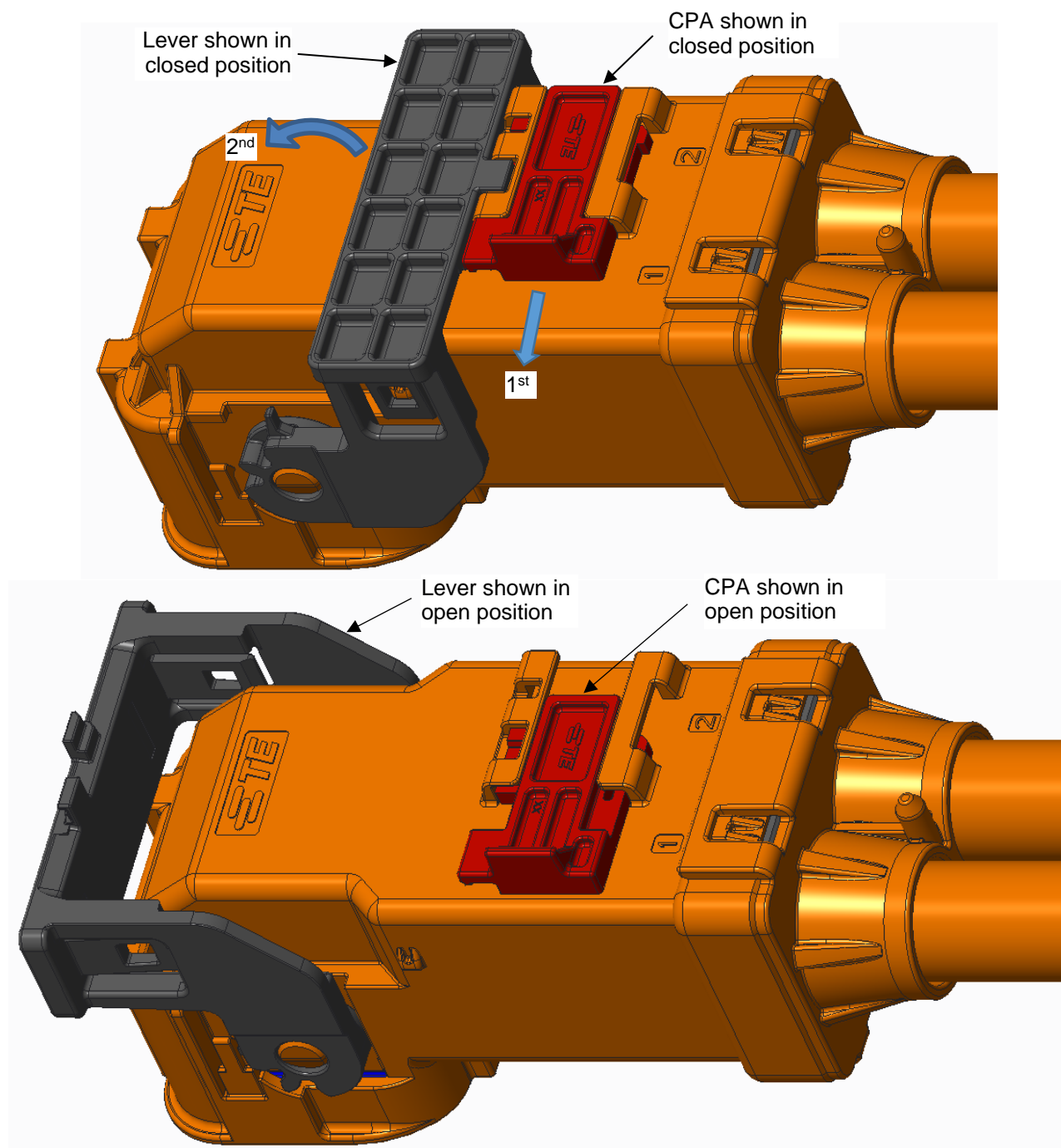


Figure 15: Assembly Lever and CPA Closed

2. Align the plug and header connectors as shown in Figure 16.

i Make sure that the lever is still in the fully open position prior to engagement with the mating header.

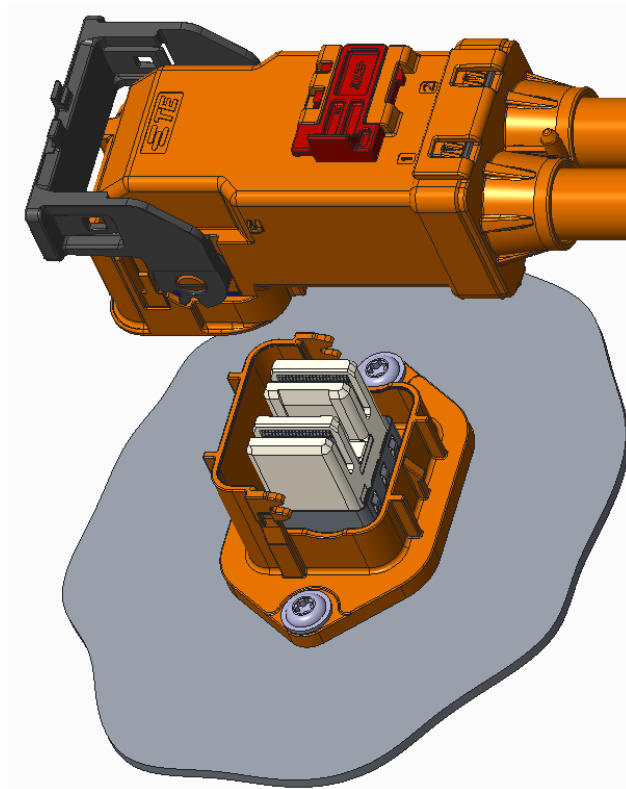


Figure 16: Plug and Header Alignment

3. Holding the Plug connector body, push the connector halves together until the Header gear teeth completely engage with the Lever gear teeth as shown in Figure 17.

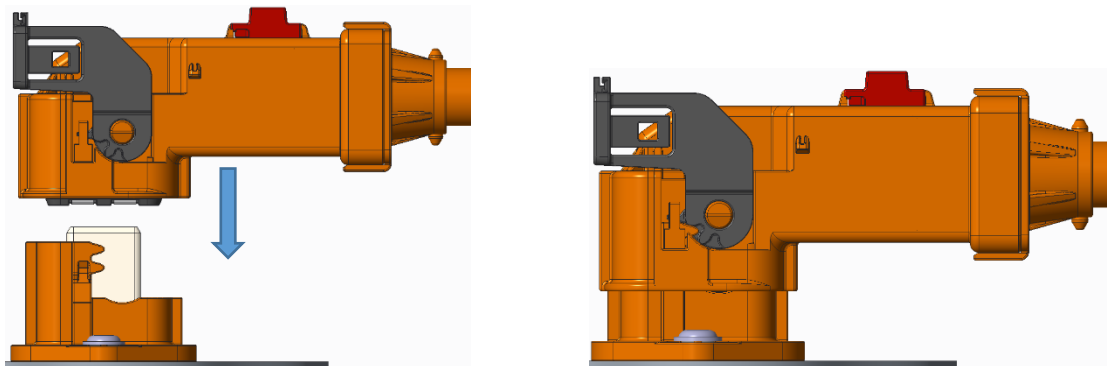


Figure 17: Plug and Header Pre-Lock

4. Rotate the lever towards the connector body until it is completely in the closed position as shown in Figure 18.

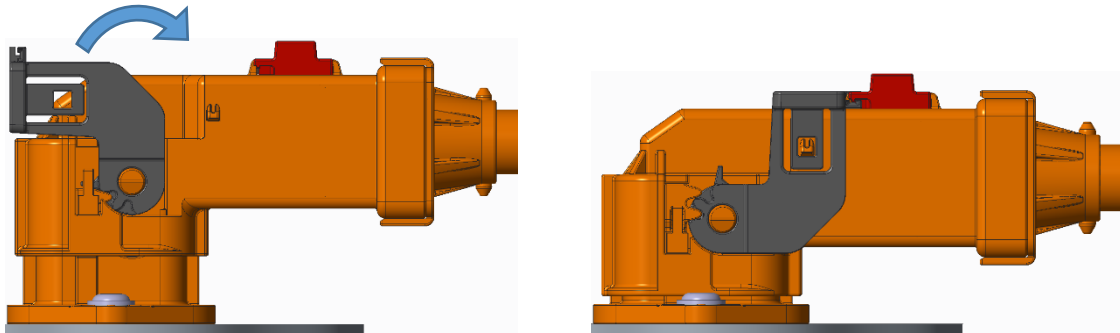


Figure 18: Lever Actuation from Open to Close

5. Push the red CPA forward until it stops as shown in Figure 19.

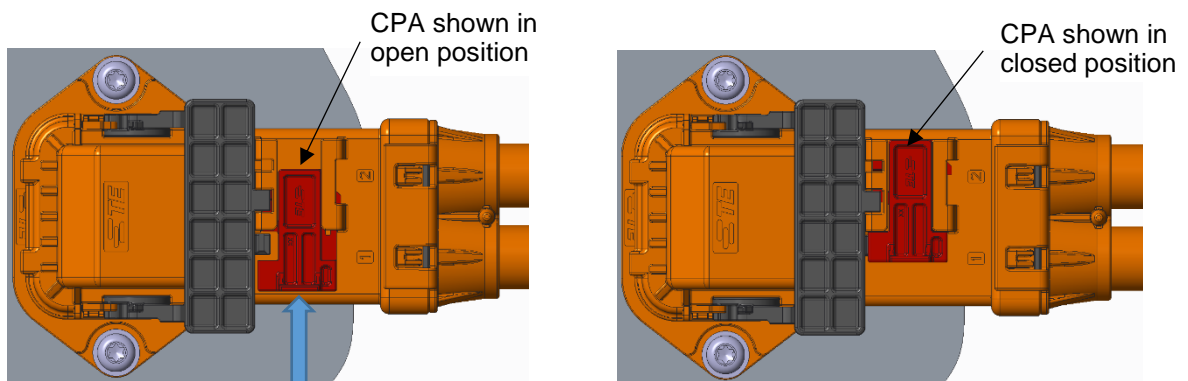
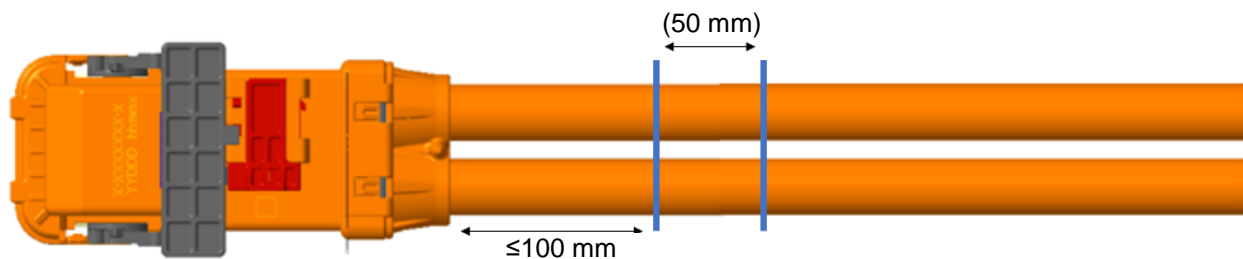


Figure 19: CPA Actuation from Open to Close

- Ensure that the cables are rigidly secured at harness tie-down point as shown, and that the tie-down point is static relative to the header mounting location. A single tie-down point is required, but at least one additional tie-down point is recommended. See example:



3.9. Connector Unmating

- Push the red CPA forward until it stops as shown in Figure 20.

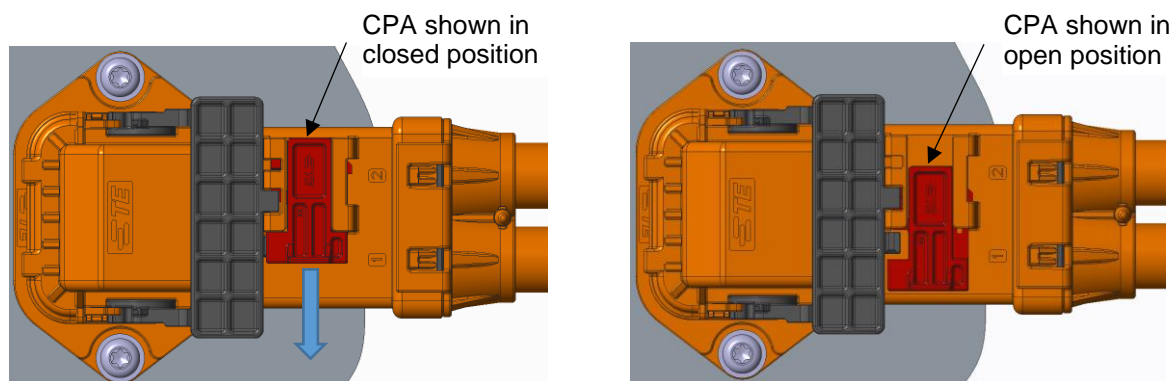


Figure 20: CPA Actuation from Close to Open

- Rotate the lever away from the connector body until it is completely in the open position as shown in Figure 21.

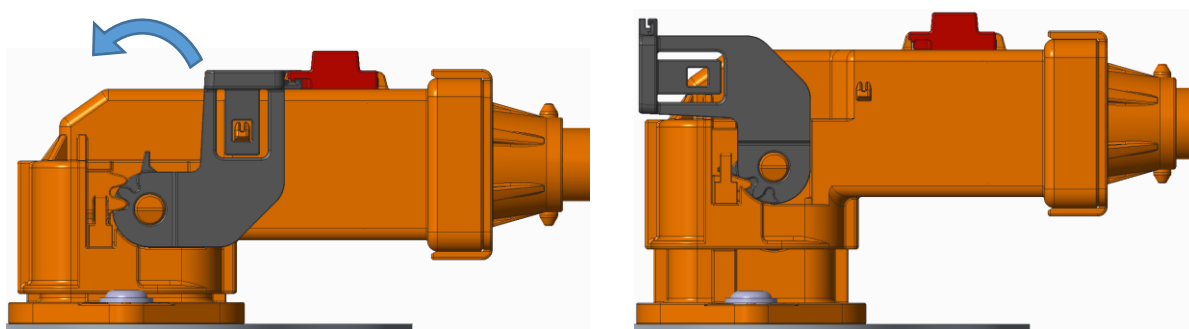


Figure 21: Lever from Close to Open

3. Holding the connector body pull the plug until it is completely separated from the header as shown in Figure 22.

i Do not use the lever as a handle to pull the plug apart.

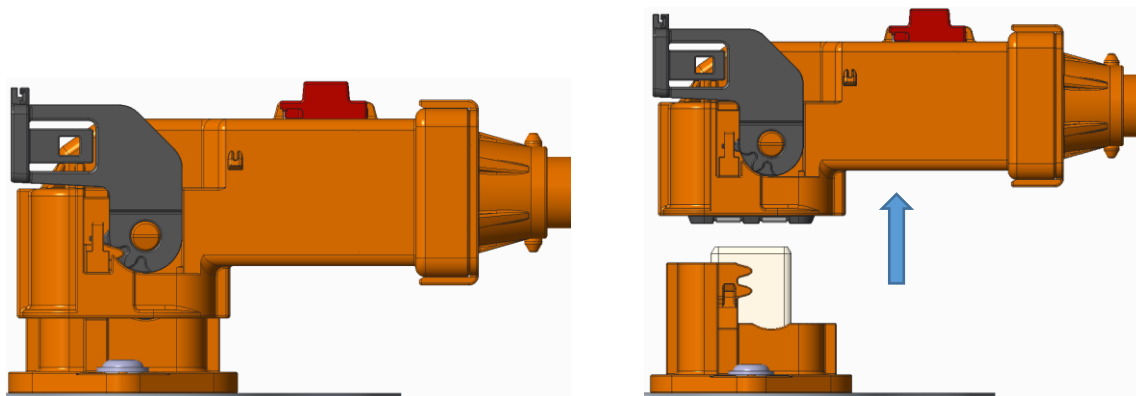


Figure 22: Plug and Header Unmate

4. TOOLING

A listing of tooling recommendations covering the full wire size range is provided in Figure 23. Modified designs and additional tooling concepts may be available to meet other application requirements. For additional information, contact one of the service groups at the bottom of page 1.

CABLE	DIE SET	MANUAL TOOLING	PNEUMATIC TOOLING				
			HAND ASSY	FOOT ASSY	TOOL HOLDER		
					RATCHET	NON-RATCHET	HEAD ASSY
GEBAUER & GRILLER X8663	X-XXXXXXX-X	X-XXXXXXX-X	X-XXXXXXX-X	X-XXXXXXX-X	X-XXXXXXX-X	X-XXXXXXX-X	X-XXXXXXX-X

* GEBAUER & GRILLER is a trademark of its respective owners

Figure 23

5. END OF LINE TESTING

If pressure testing is used to validate sealing function, pressure shall not exceed 7 PSI [48 kPa].

6. NOTE, CAUTION, AND DANGER STATEMENTS

**NOTE**

Highlights special or important information

**CAUTION**

Denotes a condition which may result in product or equipment damage.

**DANGER**

Denotes an imminent hazard which may result in moderate or severe bodily injury.