

# **Imperium™**

## **High Voltage High Current (HVHC) Connector System and Application Tools**

**SERIES:**

Shielded version with HVIL interlock:

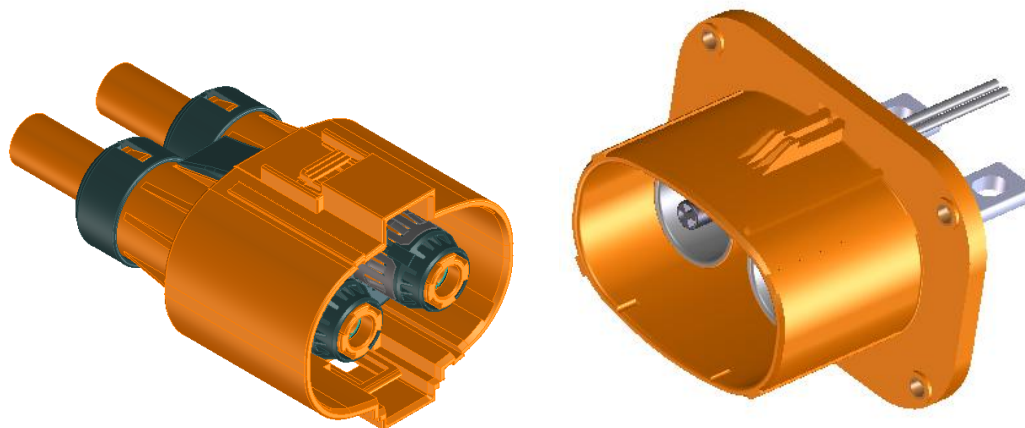
171467-100\* Bulkhead Mount Header Assembly

171466-90\*\* Cable Harness Component Kit

Unshielded version without HVIL interlock:

171467-102\* Bulkhead Mount Header Assembly

171466-92\*\* Cable Harness Component Kit



(Shielded Version Shown for Reference Only)

**APPLICATION TOOLS:**

62203-0600 Ferrule Install Press  
62203-0623 Cable Stripping Aid  
19286-2000 Hydraulic Crimping Press  
19290-0100 Crimp Die Set 1 AWG  
19290-0080 Crimp Die Set 1/0 AWG  
19286-0370 Assembly Go/No-Go Gage  
62203-1000 Wire Seal/Seal Cap Assembly Press

**Note: Wire stripping equipment not provided by Molex (see section 9.2)**

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<b>DOCUMENT NUMBER:</b>  <b>AS-171467-001</b>	<b>CREATED / REVISED BY:</b>  <b>J.QUILES</b>	<b>CHECKED BY:</b>  <b>M.DATA</b>	<b>APPROVED BY:</b>  <b>A.PATEL</b>



## DANGER – HIGH VOLTAGE

- This connector is intended for use in high-voltage or high current applications.
- If this connector has been modified, damaged, contaminated, or otherwise compromised, please discontinue using it immediately.
- Proper use and care of this product is required to ensure it functions properly.
- Service of this connector should only be performed by a trained and qualified technician.
- Do NOT connect or disconnect this product while under load.

*Use of this product requires that appropriate high voltage warning labels be applied to the cable assembly and/or in close proximity of the mated connector application in a manner that provides suitable warning to the end user and meets applicable laws. It is the responsibility of the OEM or manufacturer of the product in which this connector system is used to apply the appropriate high voltage warning label(s) to the final product. To the extent Molex is not responsible for the final cable assembly, MOLEX DISCLAIMS ALL WARRANTIES AND LIABILITY THAT RESULT FROM A FAILURE TO PROVIDE AN APPROPRIATE WARNING.*

**Note: Handling of Terminals: See Section 9.4 for detailed information**

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## 1.0 SCOPE:

This specification applies to the IMPERIUM 2 circuit harness and In-Line Header to device connector system for function, assembly and use of this product.

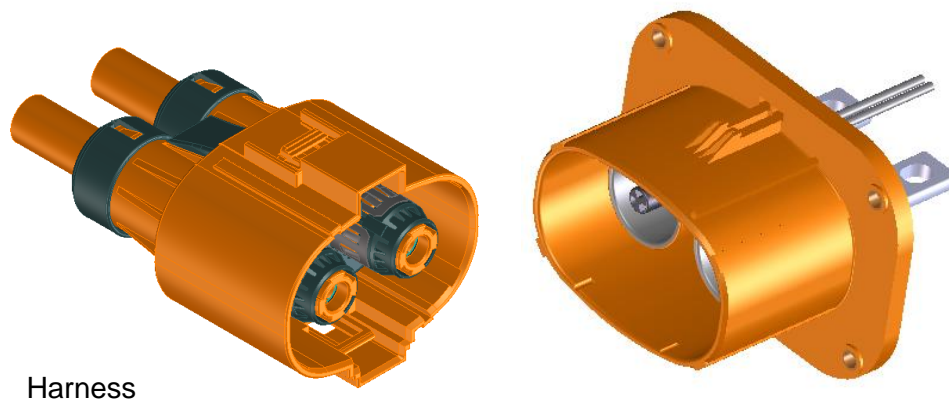
The high voltage connectors in this product must **NOT** be mated with any other type of connector

## 2.0 PRODUCT DESCRIPTION:

The Imperium connector system is a 2 circuit wire to device connector with polarization to prevent mis-mating and keying for multiple harness/header use (Figure 1). The Header connection tails bolt to the device application power hookup and the the two circuit signal connection is used as a high voltage interlock.

The product contains a power circuit, power circuit shield, HVIL interlock and sealing to IP69. Connector versions are available without shielding and HVIL interlock.

The header portion is available only as a finished unit. The harness can be purchased as a completed product or in kit form for harness assembly.



Harness

Figure 1

Header

## 3.0 REFERENCE DOCUMENTS:

- 3.1 SD-171467-1000 Header Sales Drawing (with shielding, HVIL interlock version)
- 3.2 SD-171466-9000 Receptacle Harness kit for customer build (with shielding, HVIL interlock version)
- 3.3 SD-171467-1200 Header Sales Drawing (without shielding, HVIL interlock version)
- 3.4 SD-171466-9200 Receptacle Harness Kit for customer build (without shielding, HVIL interlock version)
- 3.5 PS-171467-001 Imperium Product Specification
- 3.6 ATS-622030600 Application Spec for power cable/ferrule sub-assembly
- 3.7 ATS-192900080 Application Spec for power cable crimping

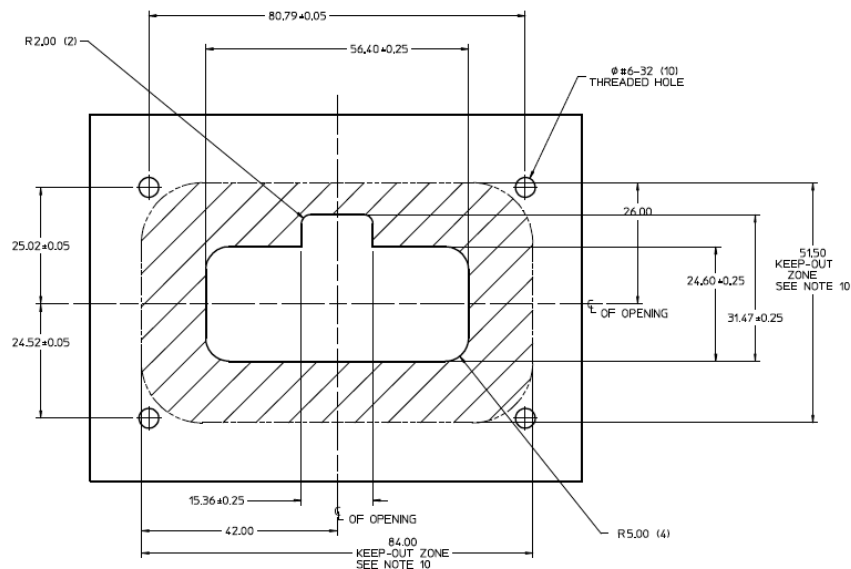
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#### 4.0 HEADER GENERAL REQUIREMENTS:

The Imperium In-Line Header requires mounting to a panel or enclosure with a thru opening per 4.1 cut out detail. The enclosure should be made from a smooth, conductive material to ensure shield ground and ideal sealing condition. Panel surface contour must be flat within .30mm.

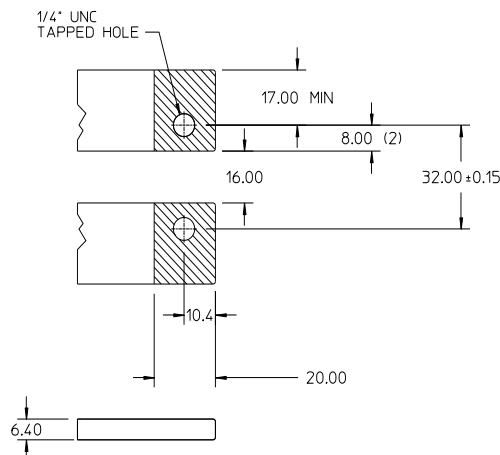
#### 4.1 Header Panel cut-out

\* Panel surface within the keep out zone must be a clean smooth surface with a tin or nickel plating (see Molex sales drawing SD-171467-1000 for panel cut out details)



## 4.2 Bus bar recommended detail

To ensure proper performance attach the Imperium In-Line Header to a bus bar per detail shown:



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## 5.0 INSTALLATION OF IMPERIUM IN-LINE HEADER

### 5.1 Seal Seating Figures 2 and 3

Seal may become dislodged during shipping. To ensure proper sealing, performance check the header surface seal to verify that the seal is fully installed per Figures 2 and 3

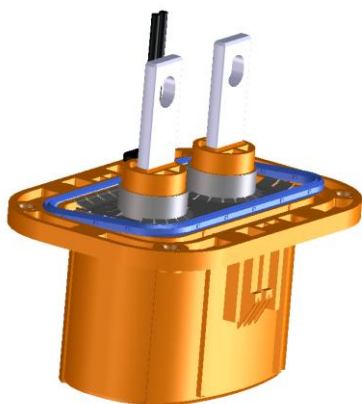


Figure 2

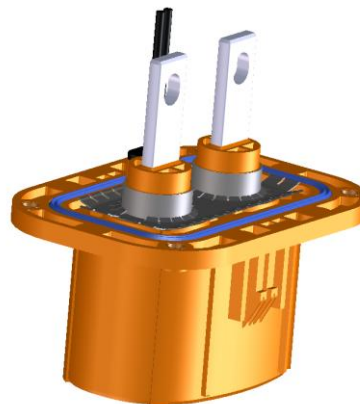
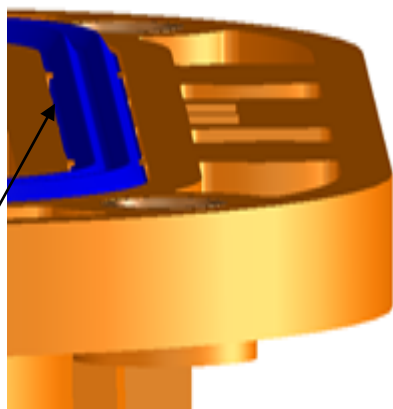
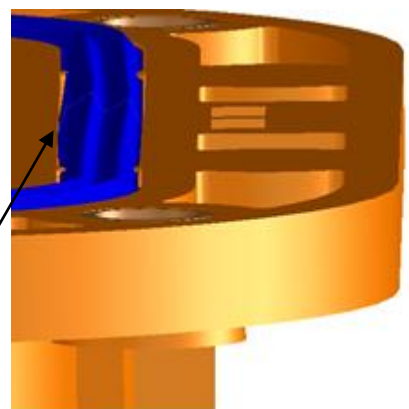


Figure 3

For maximum sealing the seal glands should sit evenly in the track without rolling



Acceptable seal insertion into track



Seal insertion not acceptable into track due to seal roll

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## 5.2 Attachment to panel per Figures 4 and 5

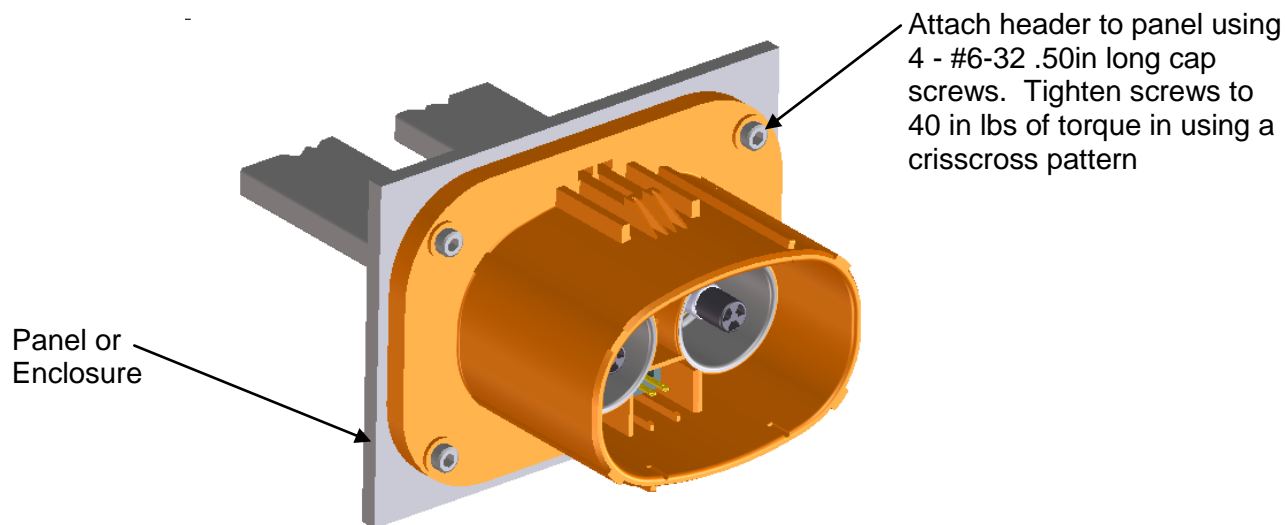


Figure 4

## 5.3 Attachment to buss bar

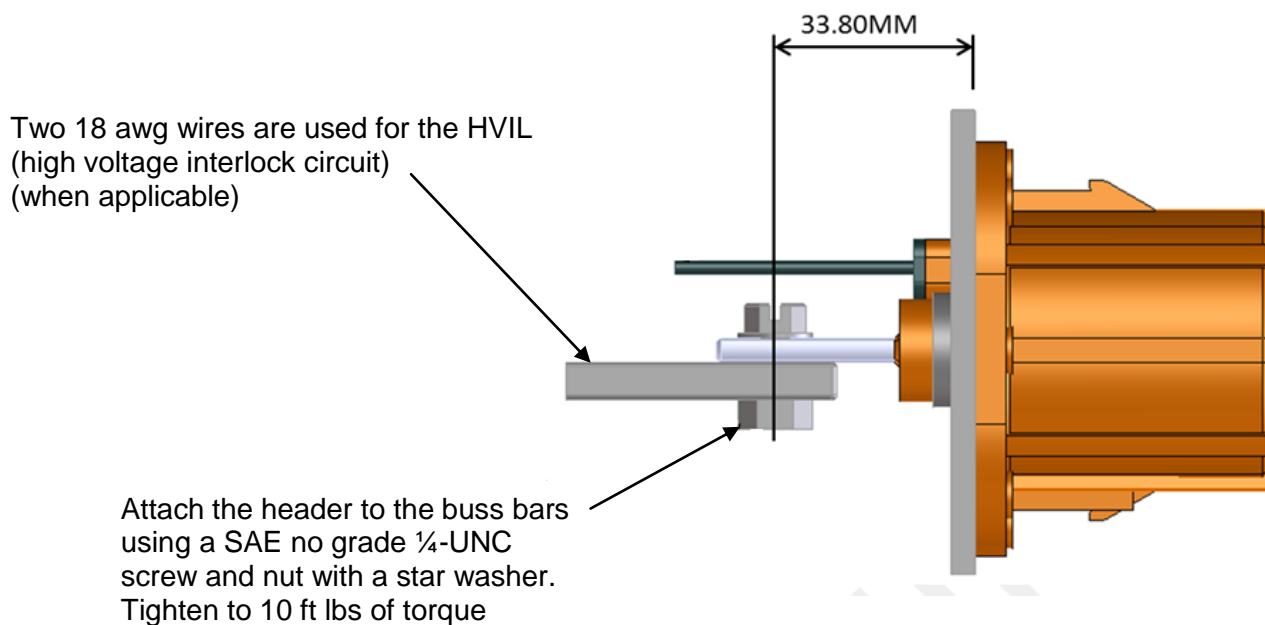


Figure 5

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## 5.4 HVIL connection (when applicable)

2 – 18 AWG HVIL wires are provided as a HVIL interlock during mate and unmate of harness

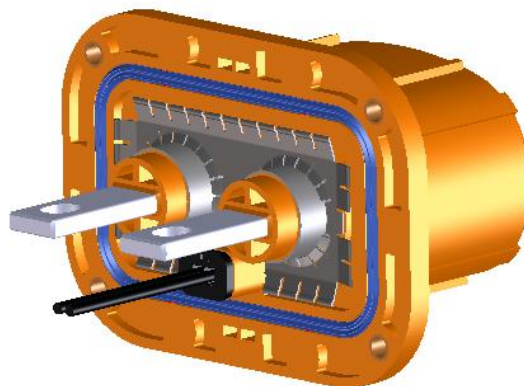


Figure 6

## 6.0 RECEPTACLE HARNESS GENERAL REQUIREMENTS:

The Imperium Receptacle Harness mates to the Imperium Header and includes mating latches to secure the two connector halves together. It is recommended the cables be attached to a support to prevent dangling cables from becoming entangled or snagged and to support the inter-connect between the two connector halves. During mating the connector will give an “audible click” indicating the two are fully mated.

The product allows for either purchased as harness or purchased as connector sub-assembly requiring harnesses to be built.

## 7.0 MATING TO THE HEADER:

7.1 Align Receptacle Harness to the Header. Verify polarization ribs and keying features on the header align to polarization towers on the Receptacle Harness in (Figure 7).

7.2 Push the Receptacle Harness onto position on the Header until an audible click is heard and the receptacle front face bottoms out on the header flange face (Figure 8).

NOTE: Due to vacuum (Sealed Connector) and the force mating contacts, high mating force required. See PS-171467-0001

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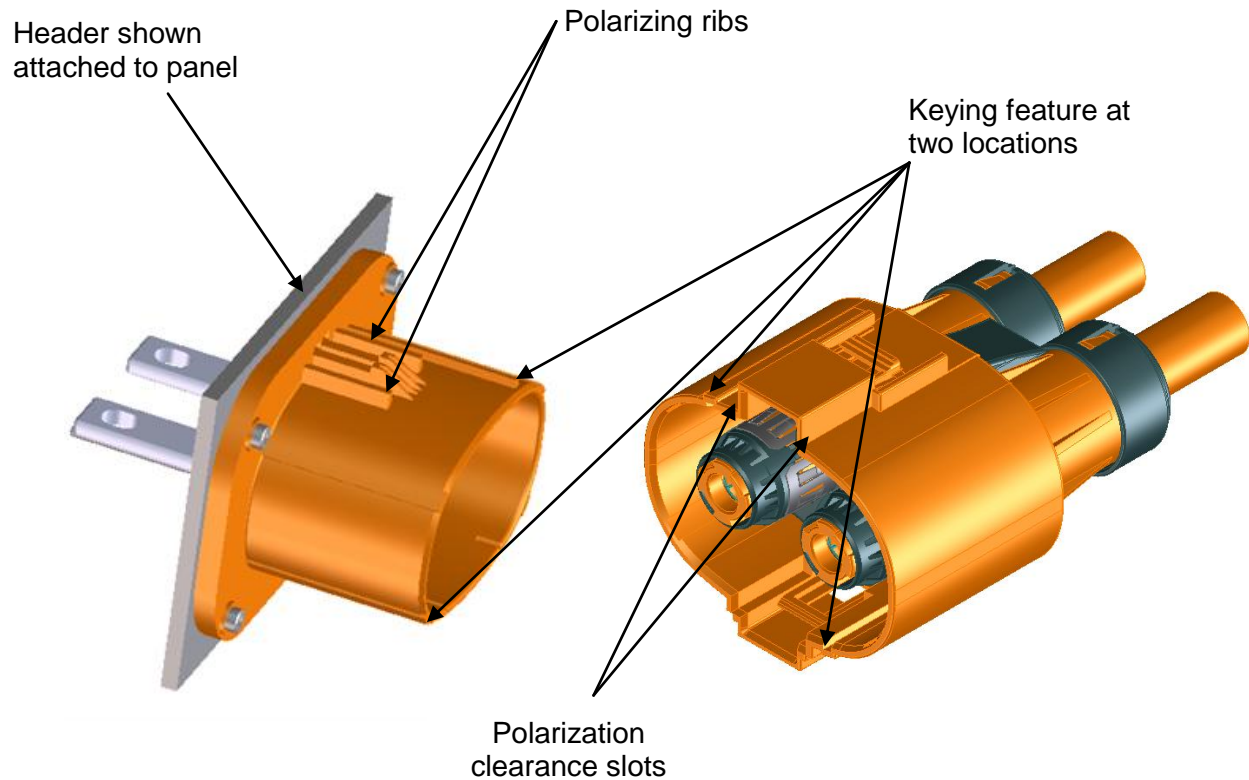


Figure 7

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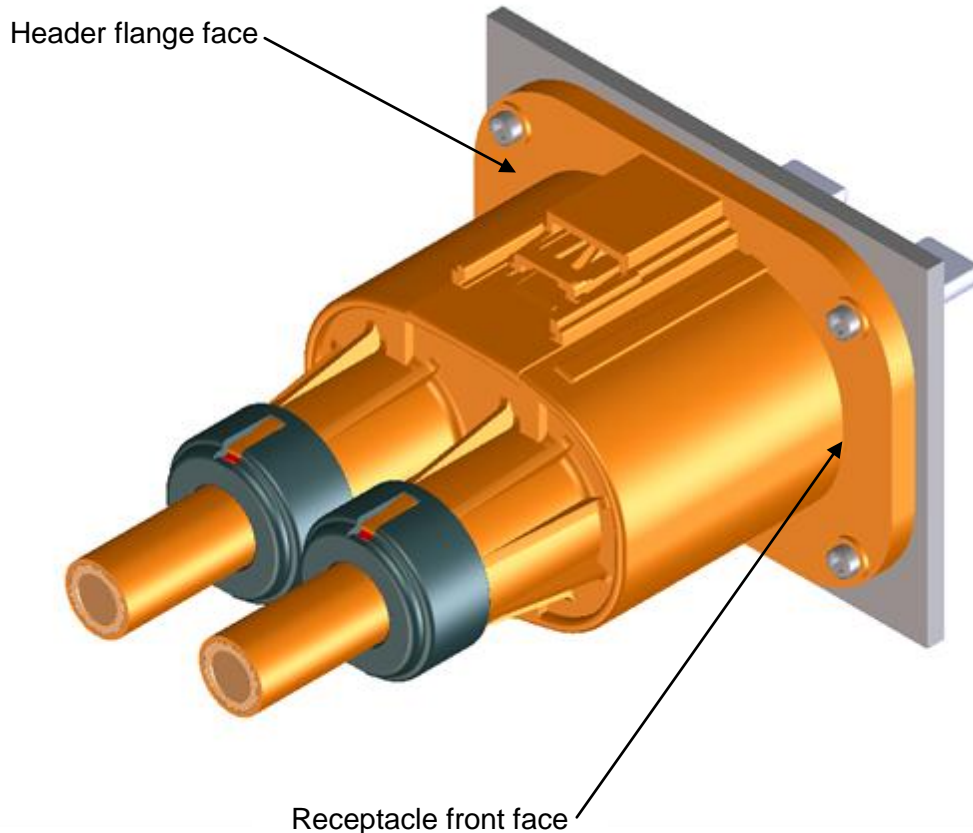


Figure 8

FULLY MATED CONNECTOR

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## 8.0 ROUTING THE HARNESS:

8.1 To ensure the receptacle harness operates optimally, avoid bend radii within 200mm of the harness as shown in Figure 9.

8.2 Anchor the harness to the chassis or other rigid member 200mm from cable harness head as shown in Figure 10. This will keep the mated connector halves properly aligned and will maintain the 32 mm pitch between the cables.

8.3 Cable bend radius to be determined by cable manufacturers cable spec for bending, space available and cable overall length

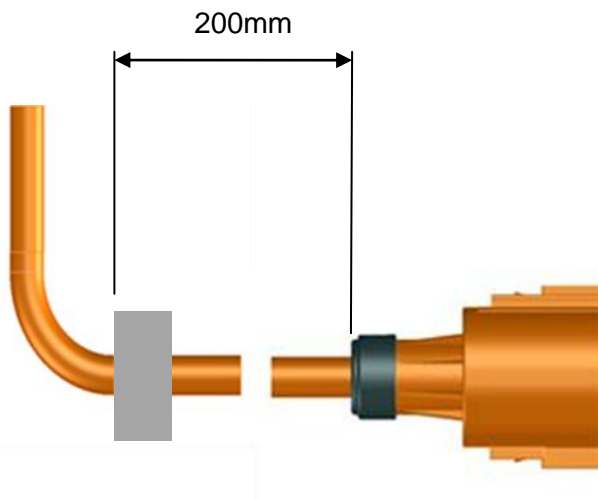


Figure 9

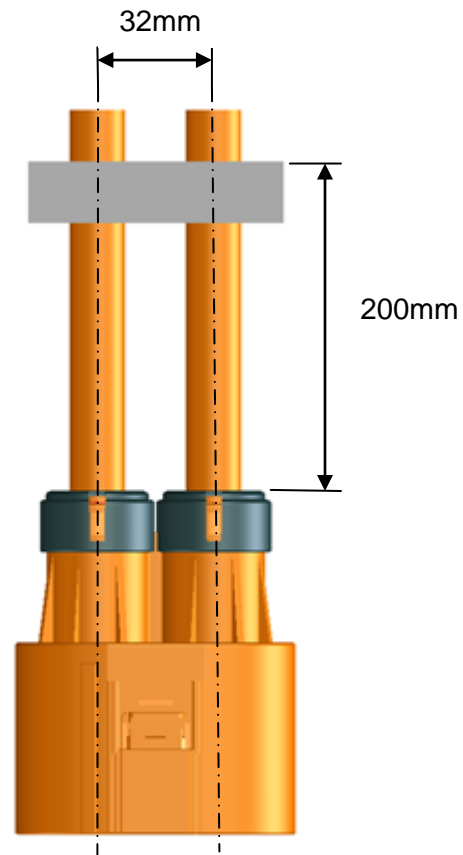


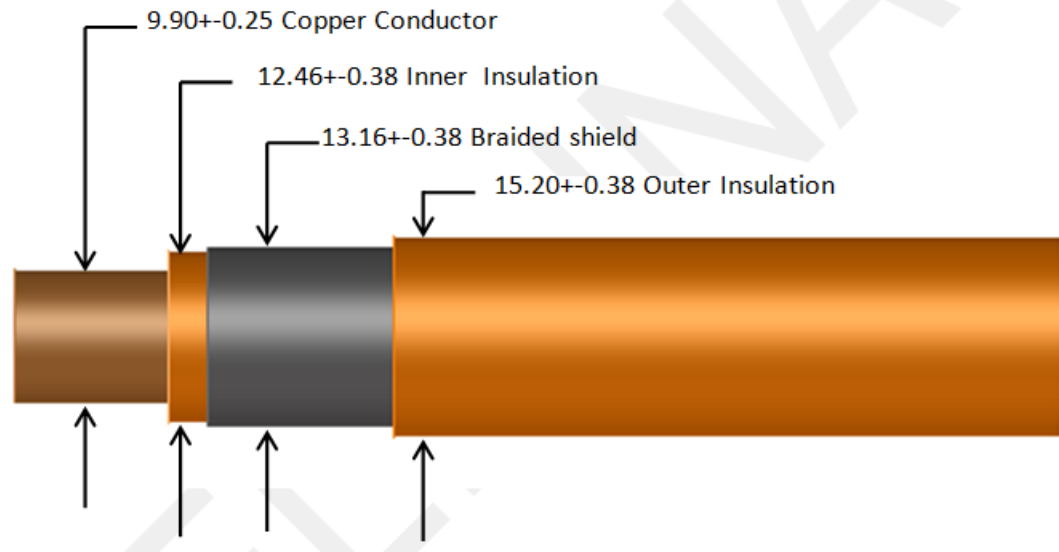
Figure 10

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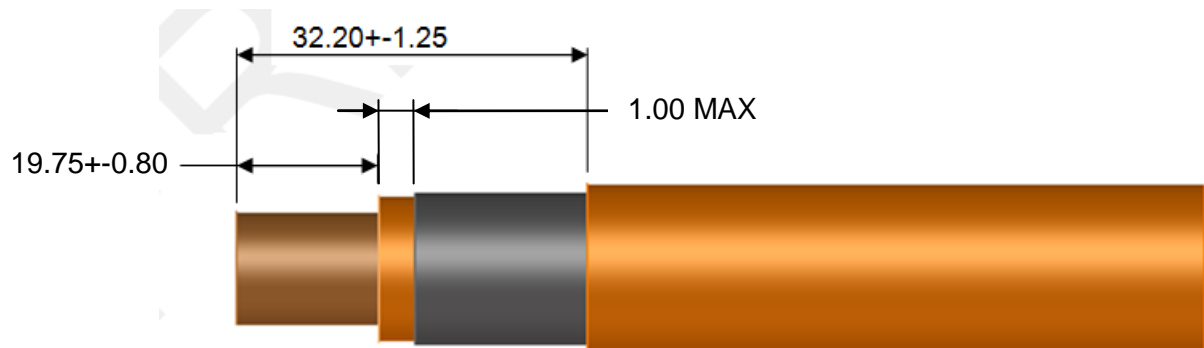
## 9.0 SHIELDED CABLE HARNESS ASSEMBLY REQUIREMENTS:

### 9.1 Shielded Cable requirements:

- 1/0 shielded cable
- Minimum 600 volt rating
- 1007 copper strands of wire
- 70°C – 150°C rated



### 9.2 Cable Stripping requirements (Recommended cable processing machine is a Schleuniger EcoStrip 9600)



The cable stripping aid (tool 62203-0623) is used to pull the insulation slugs off the cable.

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9.3 Ferrule assembly: Use tool 62203-0600 for assembly of the ferrule to the cable:

9.3.1 Load Cable Seal Cover onto cable – orientate as shown on page 13

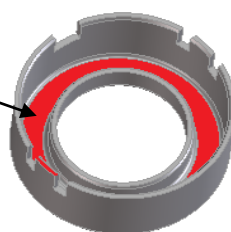
9.3.2 Load Cable Seal onto cable

9.3.3 Load Inner Ferrule onto cable at required location

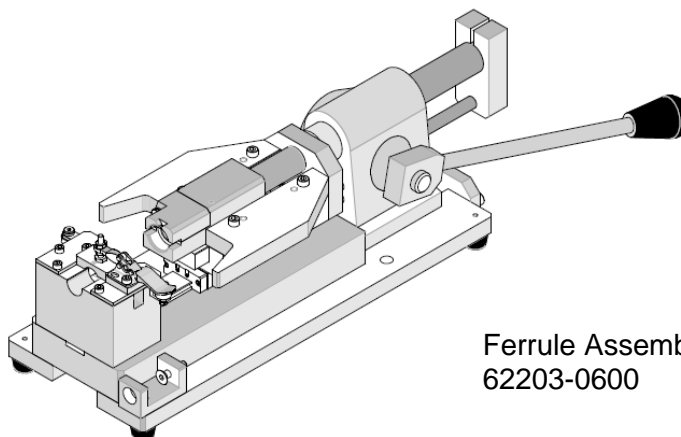
9.3.4 Fold cable braid over Inner Ferrule. A braid flaring tool (62203-0620) is included with the 62203-0600 press.

9.3.5 Dispense solder paste 360° into Outer Ferrule at bottom

Solder Paste 360°  
(as shown in red)



9.3.6 Load Outer Ferrule onto cable and press into position with the Inner Ferrule using Ferrule Assembly Press. See document TM-622030600 for tool operating instructions.

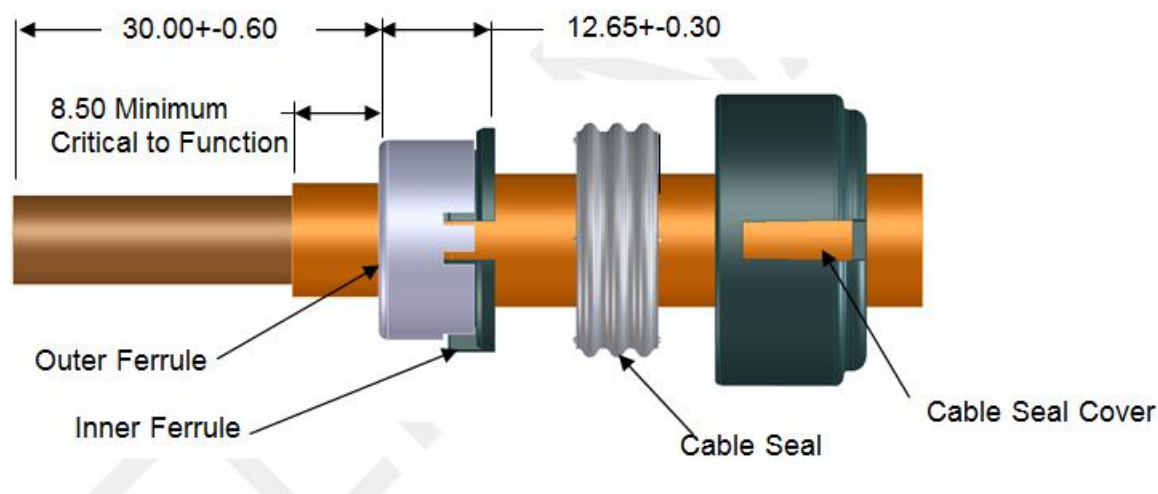


Ferrule Assembly Press  
62203-0600

9.3.7 Visual inspection to verify there are no loose cable shield strands and parts are located per view on page 13

9.3.8 Use induction soldering to completely flow solder paste to join Ferrule to Shield

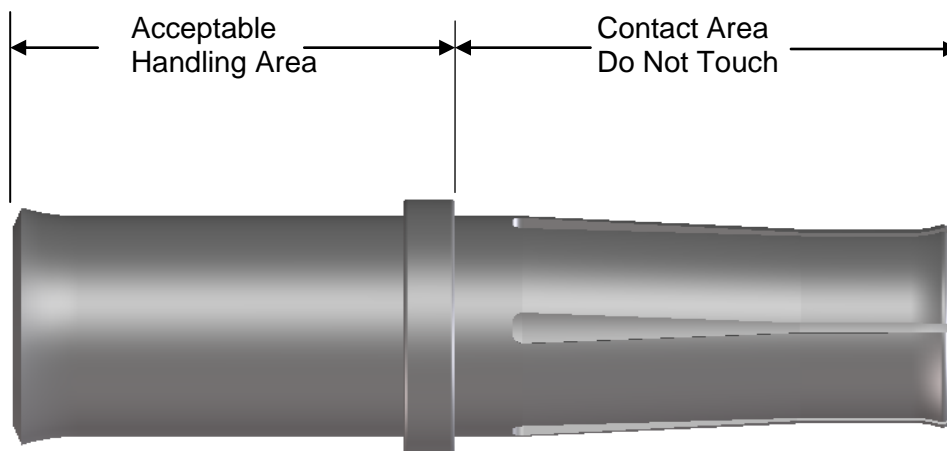
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9.4 Terminal crimp termination: Use press 19286-2000 with die set 19290-0080 (1/0 AWG) or 19290-0100 (1 AWG) to crimp the terminal:

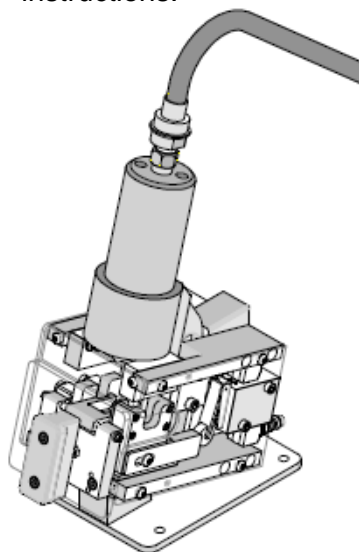
### Handling of Terminals:

Terminal surfaces are coated with a Molex environmental barrier. When handling the terminals, wear protective gloves to prevent cross-contamination. Avoid handling terminals in the contact area (see view below for handling location).

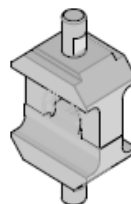


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- 9.4.1 Place terminal onto wire and verify there are no loose strands
- 9.4.2 Minimum inspection to verify there are no loose cable strands and components are located as shown on page 14.
- 9.4.3 Crimp the terminal in the press. See document TM-192862000 for tool operating instructions.

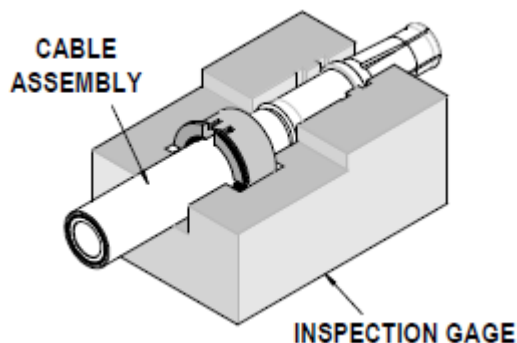


19286-2000 Press



19290-0080/-0100 Die Set

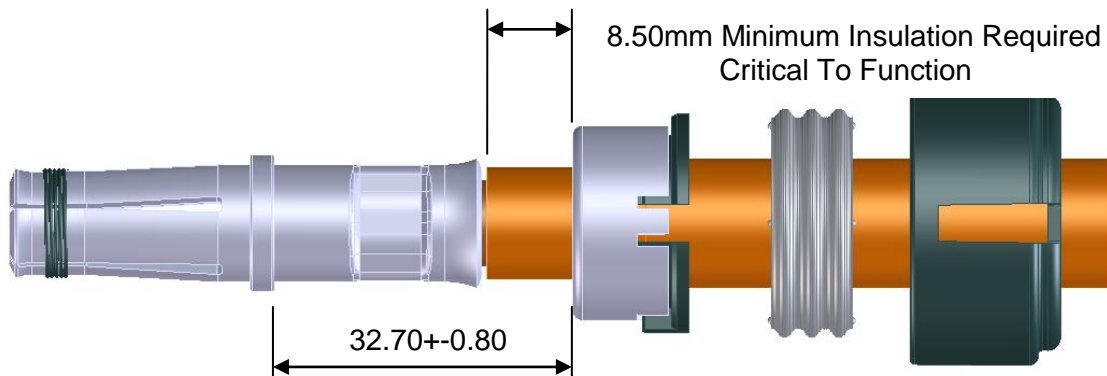
- 9.4.4 Inspect the terminal crimp dimensions specified in documents ATS-192900080 (1/0 AWG crimps) or ATS-192900100 (1 AWG crimps).
- 9.4.5 Use Cable Assembly Inspection Gage 19286-0370 to verify assembled terminal dimensions. See document ATS-192860370 for operating instructions.



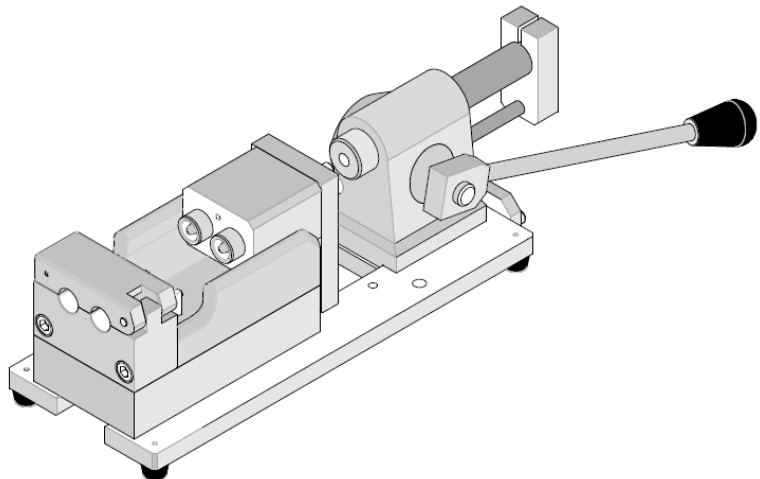
19286-0370 Inspection Gage

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If the Gage is unavailable, the assembly measurement requirements are shown below:



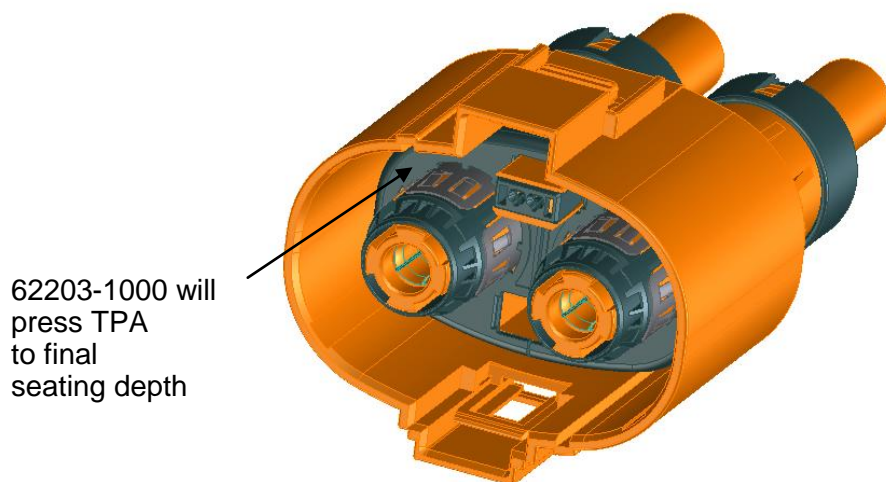
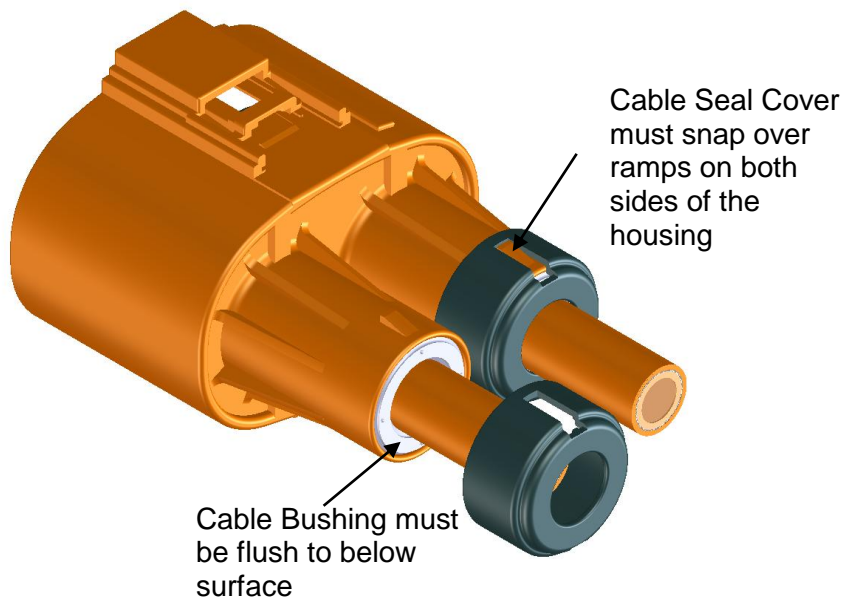
9.5 By hand, insert cable sub-assemblies into towers on connector sub assembly until terminals are latched in position. Use tool 62203-1000 to press seals into position and lock caps into place. The press will also seat the TPA to its final depth. See document TM-622031000 for tool operating instructions.



62203-1000 Seal Install Press

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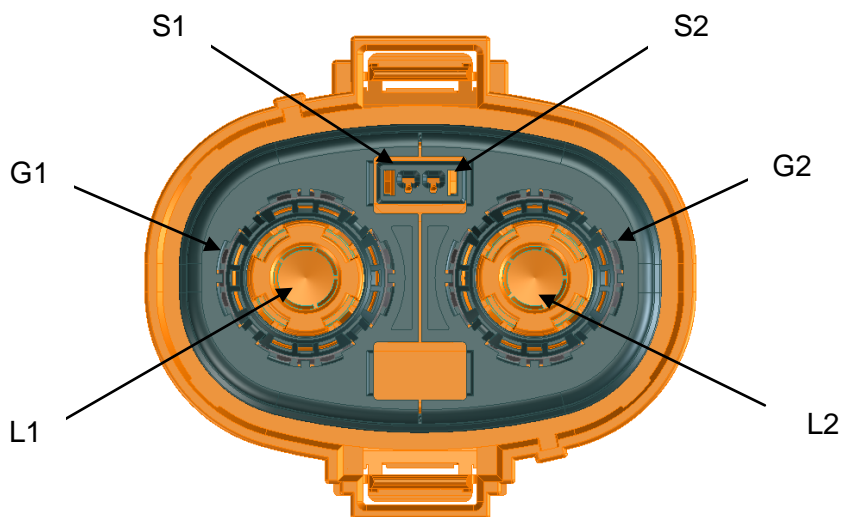
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## 9.6 COMPLETED CABLE HARNESS HI POT TEST

9.6.1 Hi Pot test required at 4000V AC at 10mA with 5 second rise time and 3 second dwell. Product failing Hi Pot testing to be discarded.

9.6.2 Hi Pot test sequence:

L1 to L2  
L1 to G1  
L1 to G2  
L2 to G1  
L2 to G2

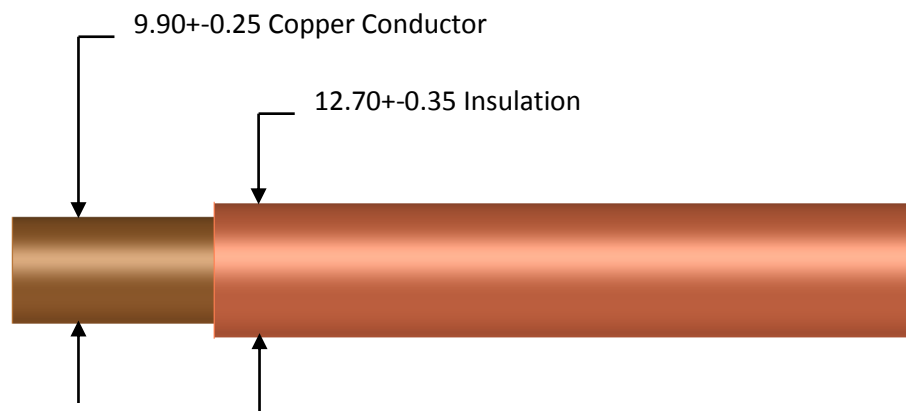


Signal Circuits  
S1 and S2  
Are a Looped  
Circuit  
Configuration

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## 10.0 UNSHIELDED CABLE HARNESS ASSEMBLY REQUIREMENTS:

- 10.1 Unshielded Cable requirements:  
 1/0 cable  
 Minimum 600 volt rating  
 1007 copper strands of wire  
 -70°C – 150°C rated



- 10.2 Cable Stripping Requirements: (Recommended cable processing machine is a Schleuniger EcoStrip 9600)

20.75+/-0.80 Strip Length



The cable stripping aid (tool 62203-0623) is used to pull the insulation slug off the cable.

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## 10.3 Terminal Crimp Termination Process:

10.3.1 Load Cable Seal Cover onto cable – orientate as shown

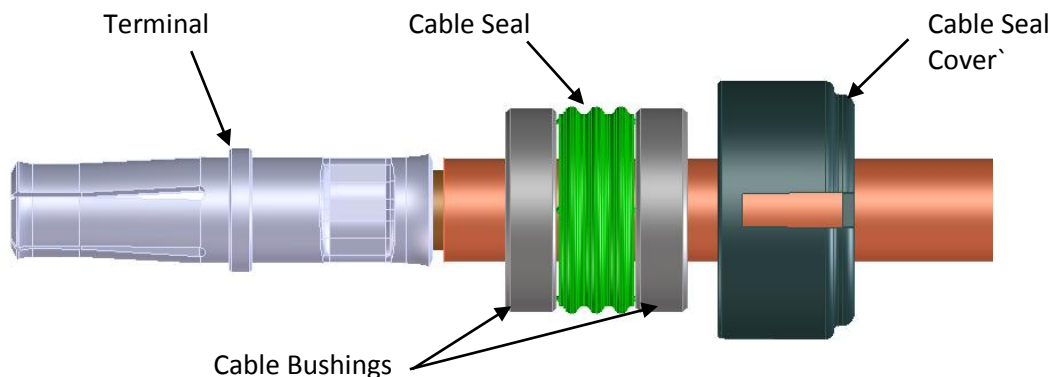
10.3.2 Load the first Cable Bushing onto cable

10.3.3 Load the Cable Seal onto cable

10.3.4 Load the second cable bushing onto cable

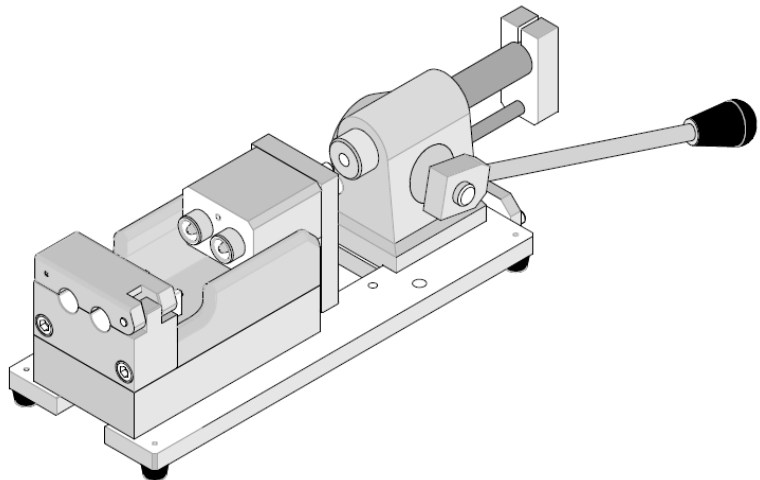
10.3.5 Load terminal onto stripped end of cable. Inspect for loose wire strands. No loose wire strands allowed.

10.3.6 Crimp wire and terminal in the 19286-2000 crimp press. Inspect crimps per document ATS-192900080. No loose strands allowed.



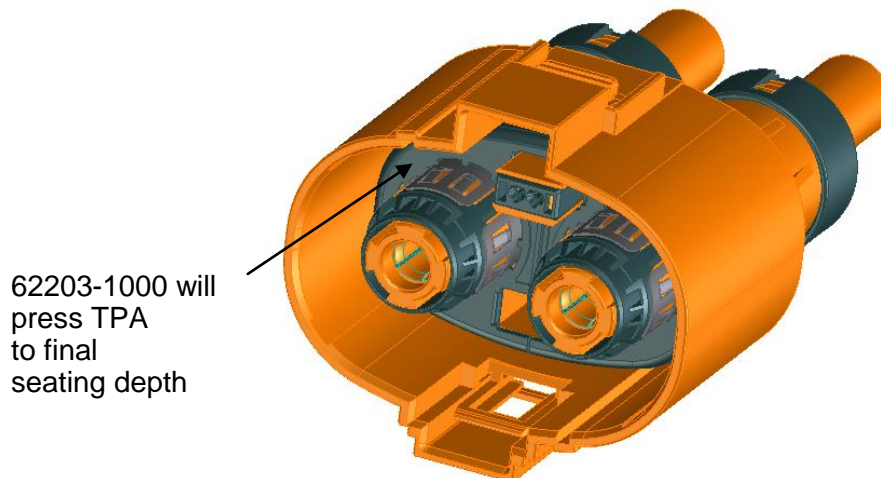
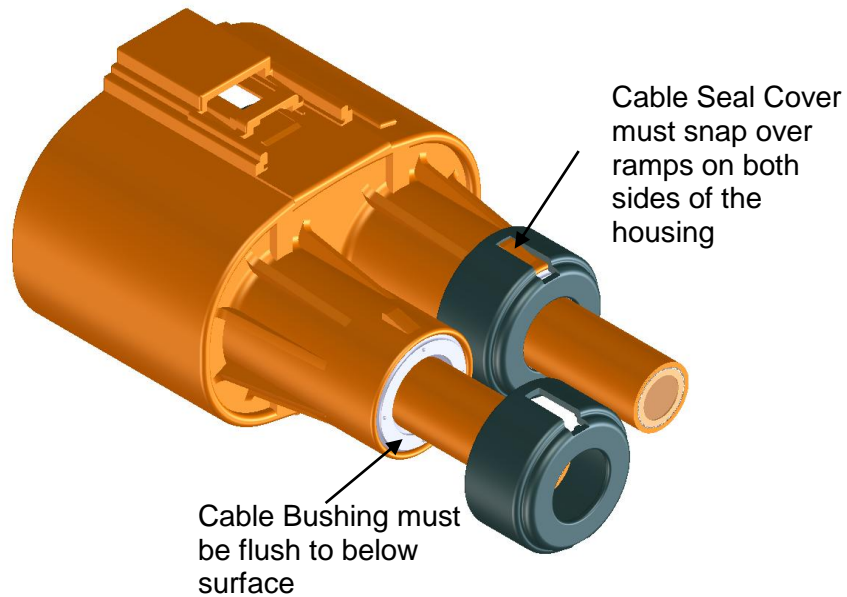
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- 10.4 By hand, insert cable sub-assemblies into towers on connector sub assembly until terminals latch into position. Slide cable bushing into tower followed by the cable seal and the second cable bushing. Use tool 62203-1000 to seat cable seals and lock covers in place.



62203-1000 Seal Install Press

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