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Title: EV TPIM HV DC Cable Shielding Inspection and Installation Instructions

Applies To: 2022 - Present eMV and eCE Bus

CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

08/09/2024 - Initial Article Release
10/21/2024- Updated with cable measurement and acceptance criteria
11/1/2024 - Added DTC 523643-5
6/6/2025 - Added additional photo
10/6/2025 - Added TPIM DC inspection location photo

DESCRIPTION

This document will guide the user through the TPIM HV (High Voltage) DC Cable installation with proper shielding position.

SYMPTOMS

Possible fault codes if the shielding is not properly positioned during the intallation of the 2 DC HV cables into the TPIM.

Diagnostic Trouble Codes

DTC/Light	Description
90 SPN 523644 FMI 5	TPIM/Drive Motor High Voltage Interlock : Current Below Normal Or Open Circuit
90 SPN 523643 FMI 5	HVDM/S-BOX High Voltage Interlock : Current Below Normal Or Open Circuit

REPAIR STEPS

WARNING:

To prevent personal injury or death, NEVER service a high-voltage vehicle without completing high-voltage safety training. Before working on vehicle, read and obey all High-Voltage Safety and Lock-Out Tag-Out procedures and information.

WARNING:

To prevent personal injury or death, wear and use approved high-voltage Personal Protective Equipment (PPE) when near a high-voltage electric vehicle. Inspect PPE before use. Do not use gloves or other PPE with expired dates, holes, cracks or damage. NEVER touch energized orange high-voltage cables or high-voltage components without wearing approved high-voltage PPE.

WARNING:

To prevent personal injury or death, read all information in the Safety Information and High-Voltage Safety sections of the service manual.

Proper shielding position on the DC cables at the TPIM is necessary when replacing or installing the DC cables at the TPIM.

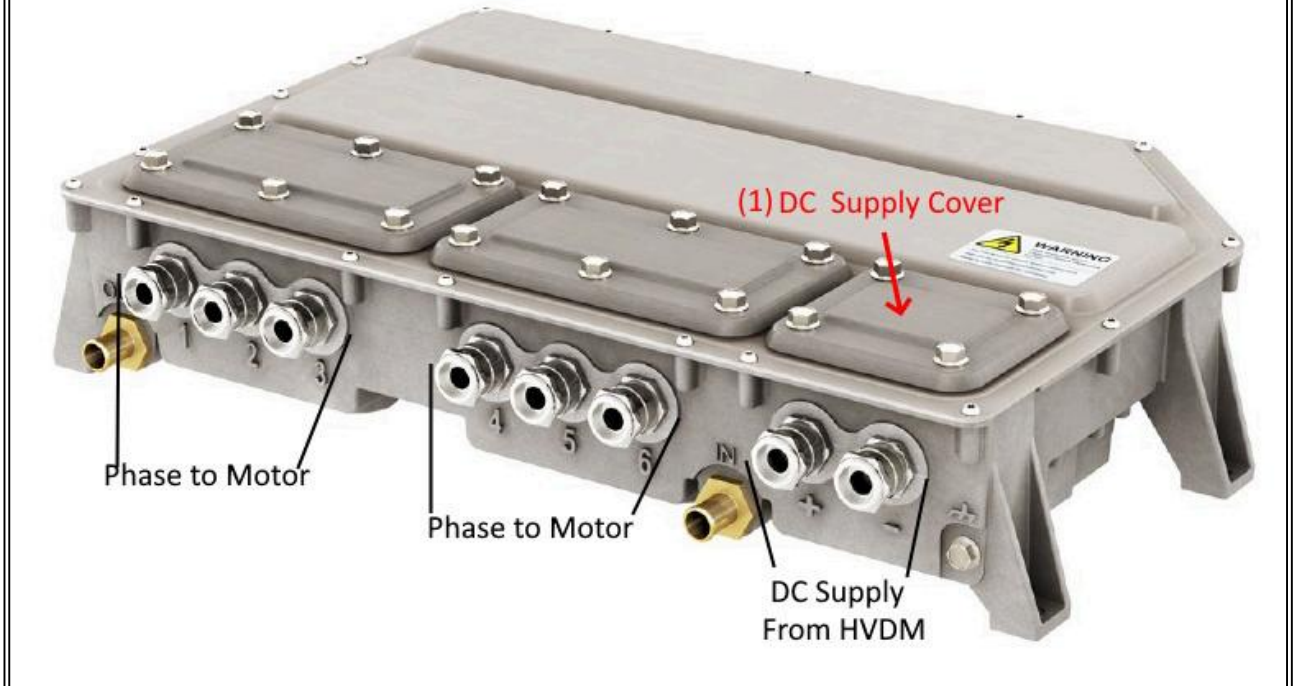

Figure 1:TPIM DC Supply Location- Inspection Location

There are two types of DC cables as shown below.

1. Figure 2 is the original build with contained shielding and can be reused as is and does not need any further attention to the shielding.

Figure 2: Original build with contained shielding

2. Figure 3 is the DC cable type with exposed shielding that will need to have the cable measured and the shielding properly positioned before installing.

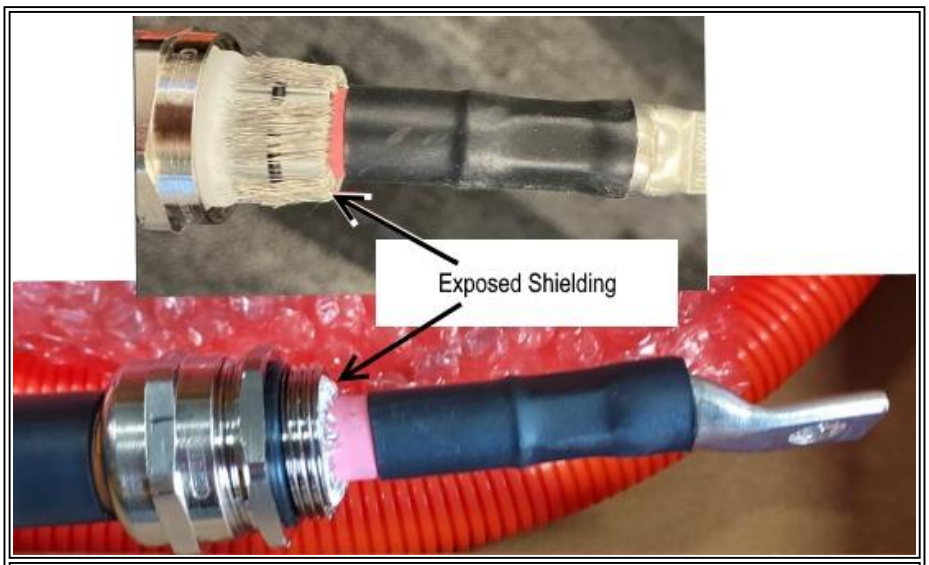

Figure 3 :DC Cable with exposed shielding

3. Figure 4 - 7 shows examples of the incorrect positioning of the shielding

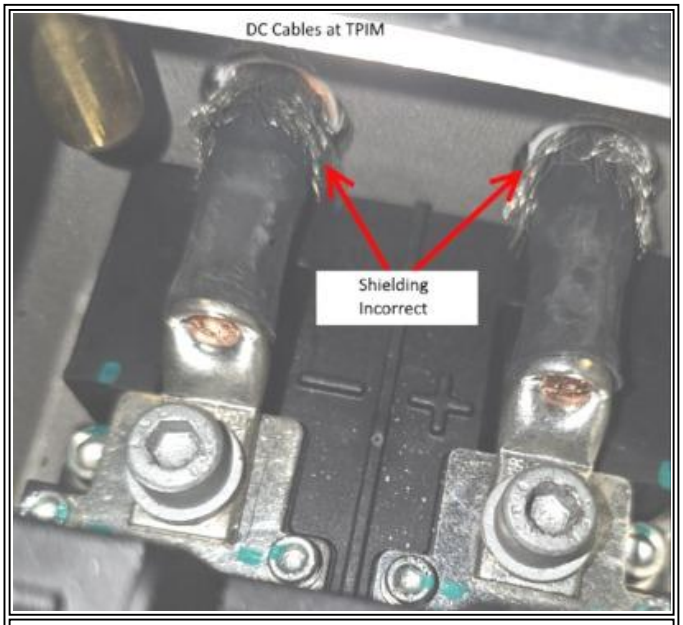

Figure 4:DC Cable shielding incorrect positioning

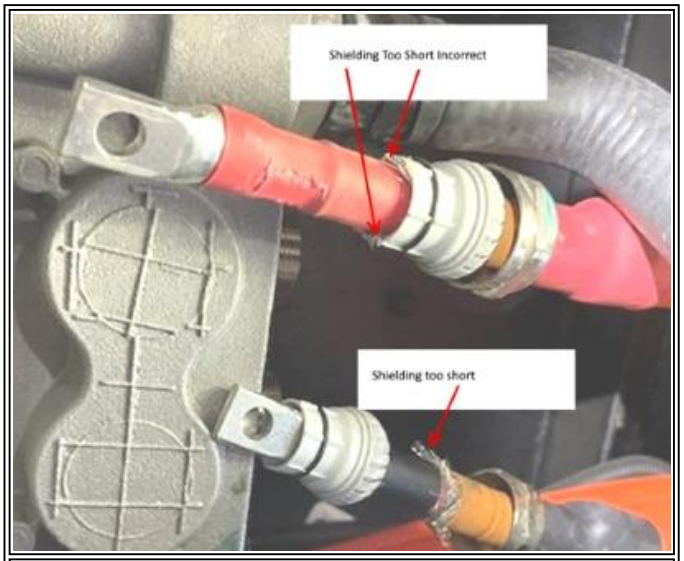

Figure 5:DC Cable shielding too short

Figure 6:DC Cable shielding incorrect

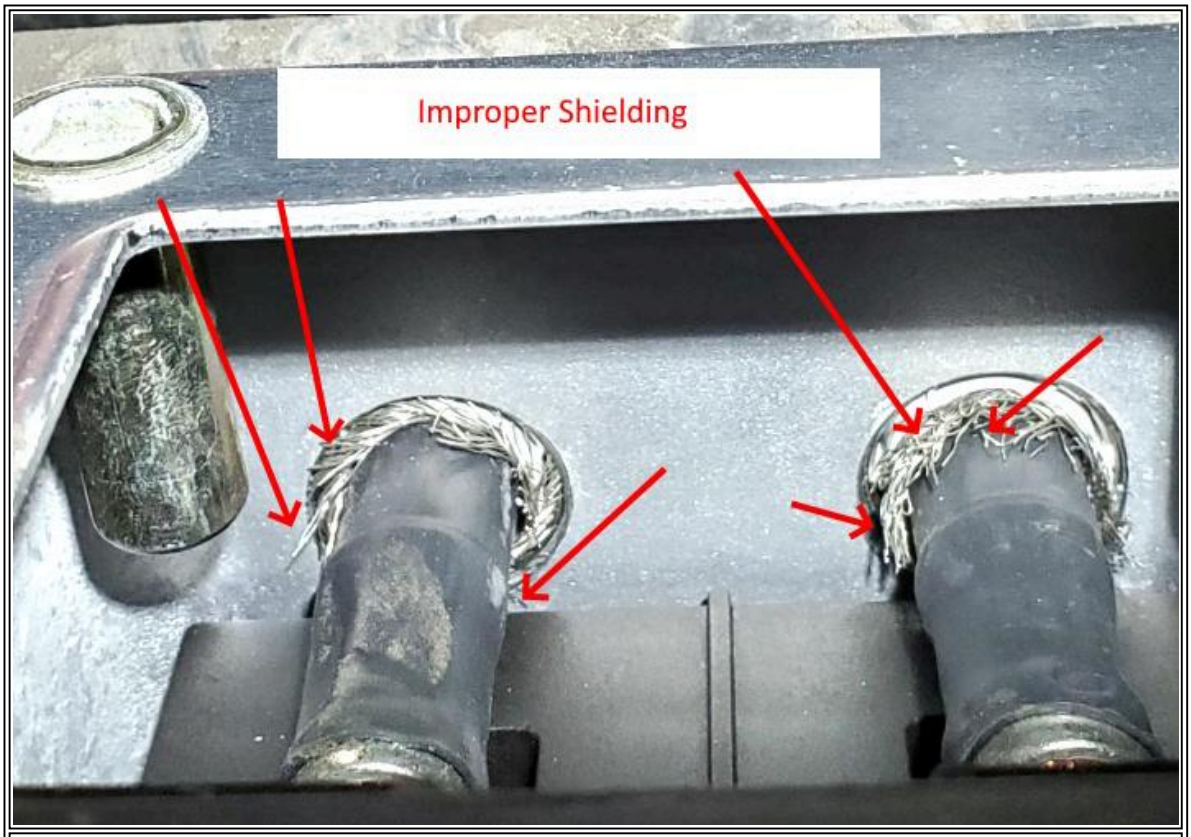

Figure 7:DC Cable improper / loose shielding

INSPECTION AND MEASUREMENT

1. Measurement of the Cable Gland to the terminal eyelet must be performed on all cables including new cables from the PDC.

2. New cables will come preassembled with the Cable Gland. When reusing cables you must remove a Cable Gland from the TPIM to properly measure the cable.

3. Pull back the shielding over the tapered compression sleeve and insert in the cable gland and hand tighten the compression nut as shown in Figure 8 .

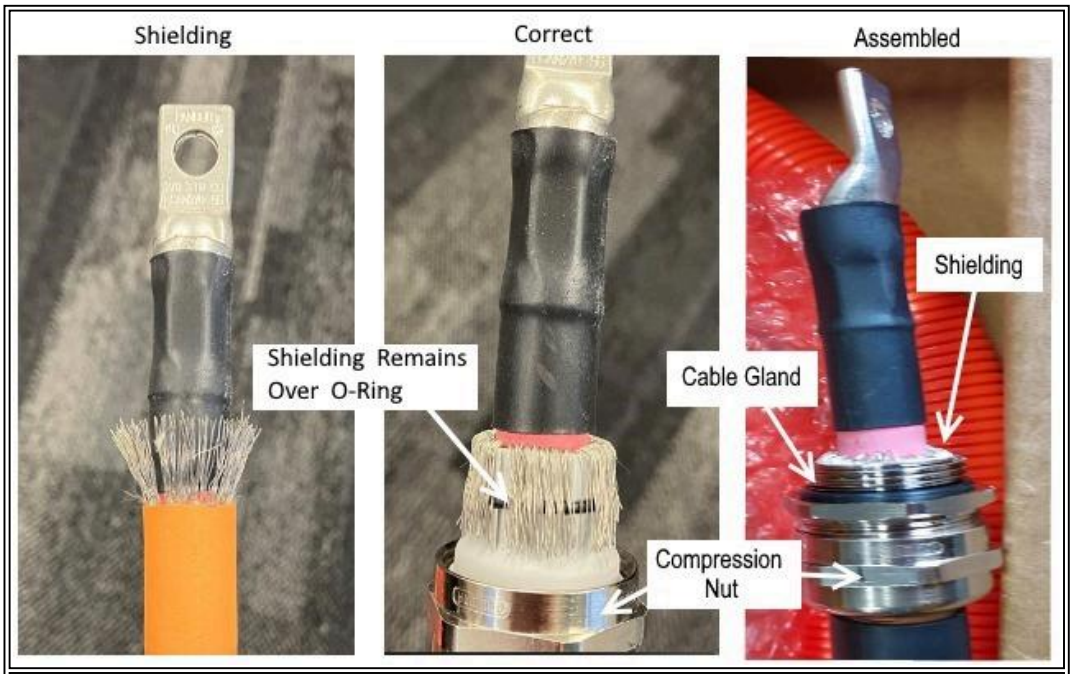

Figure 8 :DC Cable Shield Position

4 . Measure from the cable gland to the center of the eyelet terminal hole as shown below Figure8

5. This measurement must be 68.5 +/- 1.5 mm.

7. Adjustment of the shielding may be needed to meet the specific measurements. The shielding must remain over the o-ring.

8. If the cable is outside of this measurement, replace the cable.

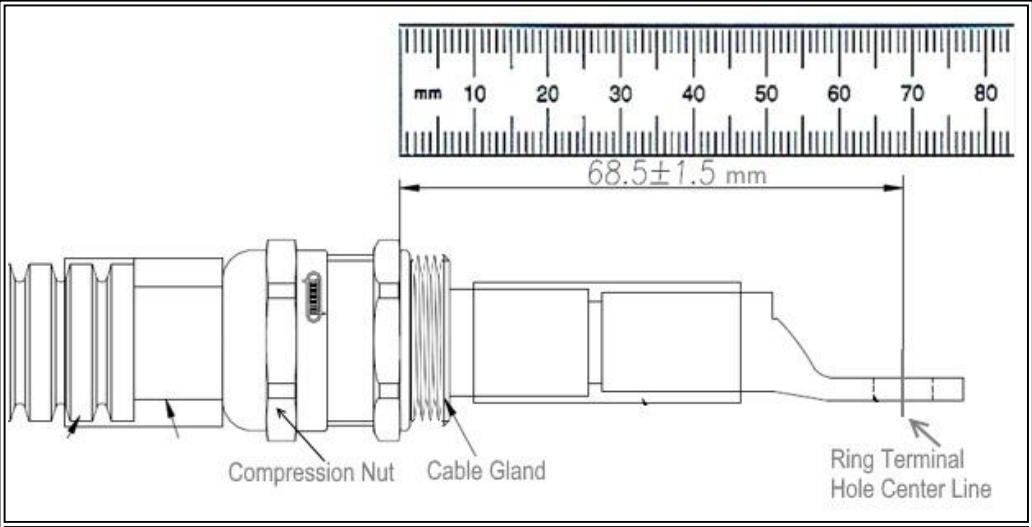

Figure 9:DC Cable Gland to terminal eyelet measurement

6 . Proper cable measurement 69 mm - Figure 10 .

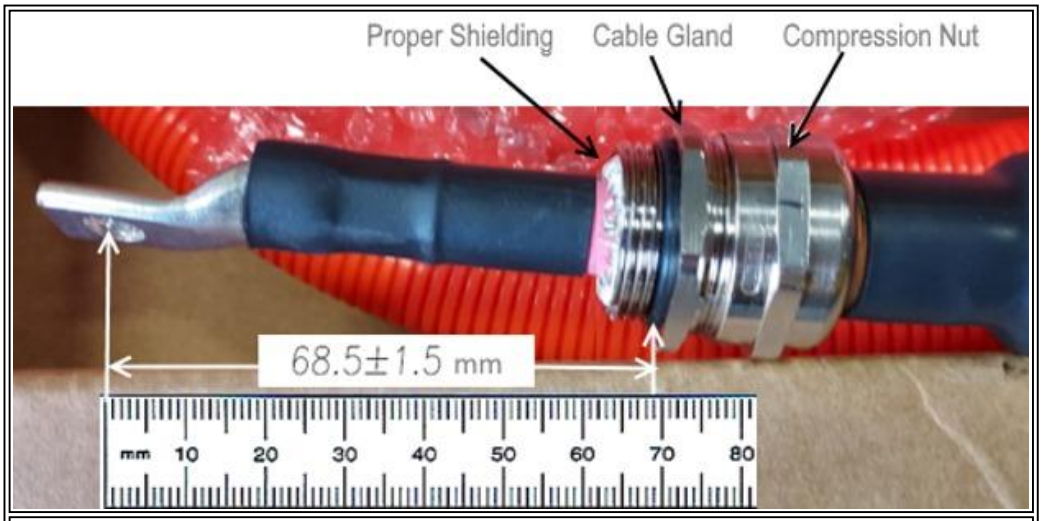

Figure 10:DC Cable Measurement - within spec 69 mm

7. DC cable measurement - out of spec 80 mm do not use Figure11

Figure 11:DC Cable measurement out of spec 80 mm do not use.

8. Correct cable shield position is shown in Figure 12 . The shielding strands must be pulled back over the tapered compression nut as shown before assembling in the TPIM.

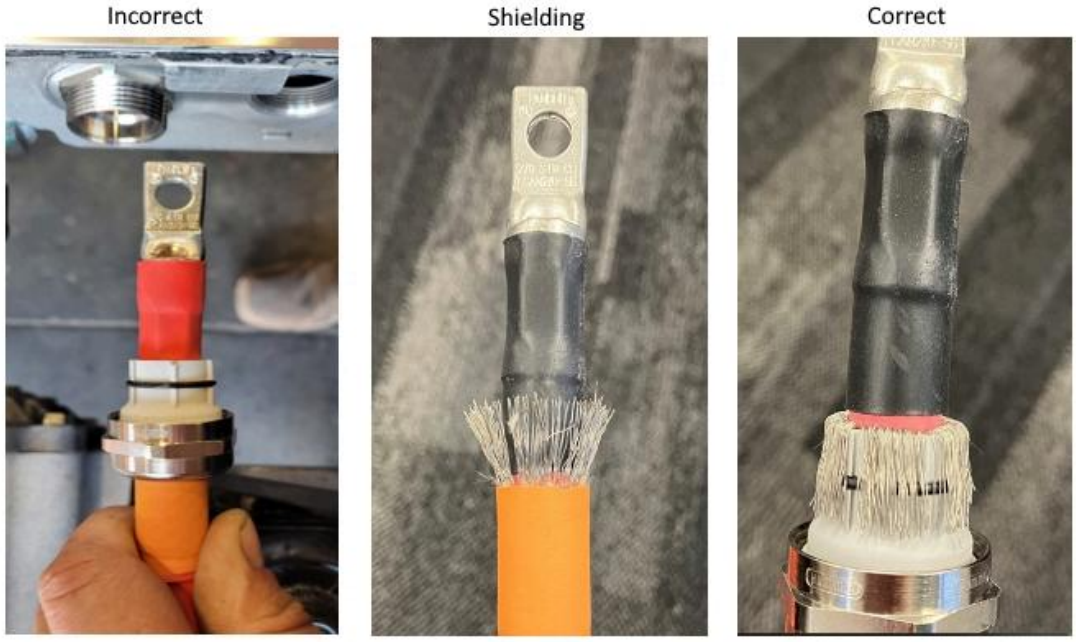

Figure 12:DC Cable Shield Position

INSTALLATION PROCEDURE:

1. Install the Cable Gland into the TPIM and torque to 18 ft-lb (25 N-m)

2. Fold back the cable shielding back over the compression sleeve as shown.

3. Insert the cable into the TPIM Cable Gland while threading the compression nut as you insert the cable until the cable terminal is in position to install the terminal bolt.

4. Do not tighten the compression nut.

5. Insert the M8 terminal bolt and torque to 15 lb-ft (20 N-m).

6. Tighten the compression nut and torque to 11 lb-ft (15 N-m).

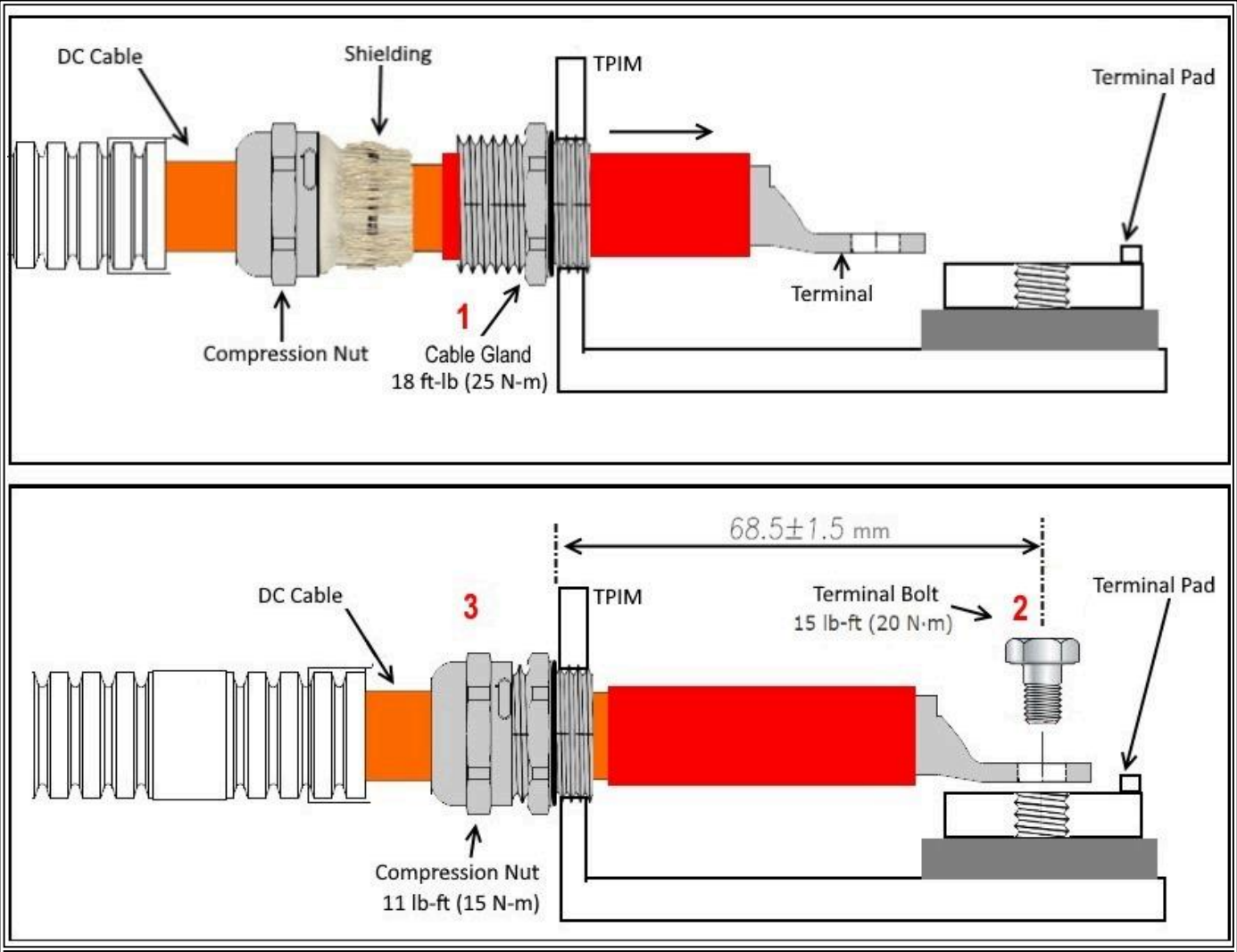

Figure 13: Shielding Position During DC Cable Installation

Item 1 - Install Cable Gland - Torque to 18 ft-lb (25 N-m)
Item 2 - Insert cable and hand tighten compression nut - Install terminal bolt - torque to 15 ft-lb (20 N-m)
Item 3 - Torque Compression Nut to 11 ft-lb (15 N-m)

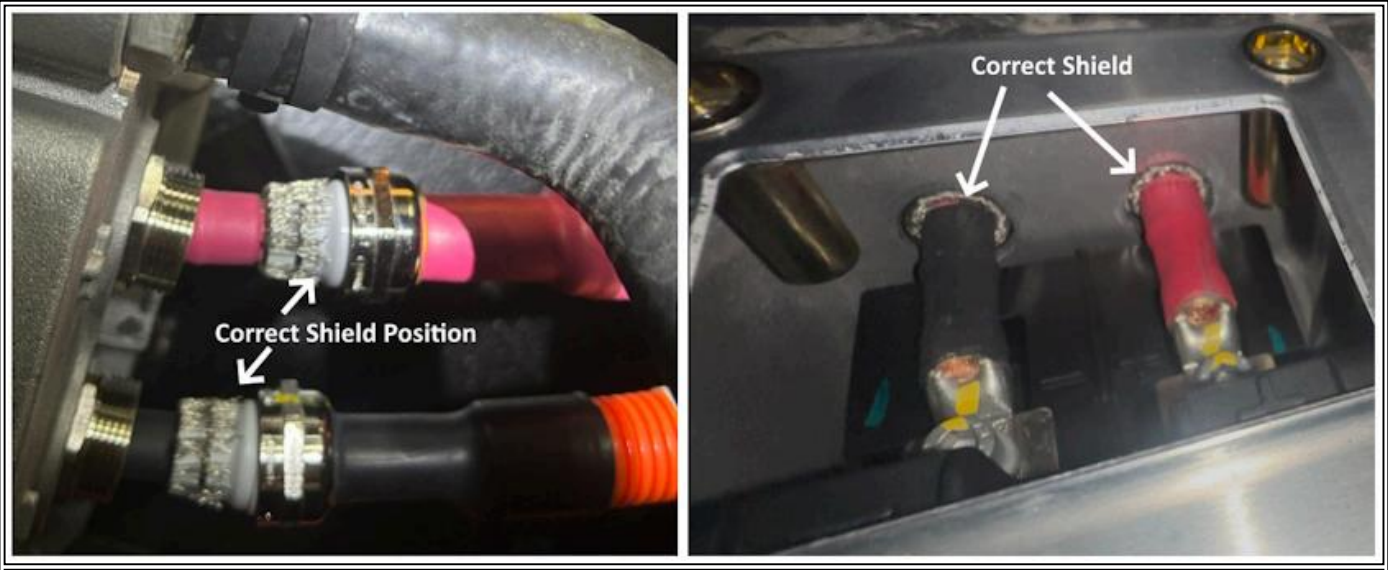

Figure 14: Correct DC Cable Shielding Position

WARRANTY INFORMATION

Warranty Claim Coding:
Refer to the Warranty Coding Manual for Group and Noun Codes.

OTHER RESOURCES

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