Tesla, Inc. Service Bulletin		Replace Charge Port Pin Carrier, 3 Phase
SB-16-44-001 September 11, 2019	R7	

Classification	Section/Group	Mobile Service
Campaign Bulletin	44 - High Voltage System	N/A

Model Year	Model	Country/Region	Version
2013 - 2015	Model S	Europe, Asia Pacific	All

The model(s) and model year(s) listed are a general approximation of the affected VIN list. Refer to the VIN/Bulletin Tracker or Customer/Vehicle profile to determine applicability of this bulletin for a particular vehicle.

Campaign Bulletin: This campaign bulletin addresses a known non-safety-related condition and provides recommended technical diagnosis and repair procedures. Apply this procedure to all vehicles in the affected VIN list.

This Service Bulletin supersedes SB-16-44-001 R6, dated 06-Mar-17. Each content change is marked by a vertical line in the left margin. Discard the previous version and replace it with this one.

Condition

On some European and Asia Pacific Model S vehicles, the charge port pin carrier might allow water ingress to the charge port HV harness. This might cause a fault during vehicle charging, leading to warning messages on the instrument cluster and an inability to charge the vehicle.

Correction

Inspect the charge port HV harness and HV harness connections for signs of water ingress, corrosion, or damage If water is present, or water damage or corrosion are found, replace the charge port pin carrier, HVJB, or charge port HV harness.

Correction Description	Correction	Time
SB-16-44-001 Not Applicable	S011644001	0.00
Replace Charge Port HV Harness	S021644001	0.75
Replace HVJB	S031644001	1.05
Replace Charge Port Pin Carrier; No Water Ingress Found	S041644001	1.10
Replace Charge Port Pin Carrier And Pin Carrier Cap; No Water Ingress Found	S051644001	1.15
Replace HVJB And Charge Port Pin Carrier	S061644001	1.45
Replace HVJB, Charge Port Pin Carrier, And Pin Carrier Cap	S071644001	1.50
Replace Charge Port HV Harness And HVJB	S081644001	1.75

	Part Number	Description	Quantity
Parts Required			
If Necessary	1083168-00-A	KIT,SVC REPLCMNT,PIN CARRIER,EU CP HARN	1
	1023488-10-C	ASY,PIN CARRIER CAP,EV INLET, EU	As required
	1006190-00-B	SCR,PLASTITE,4-24X3/8,ZI ST	As required
	1011627-00-A	SCR,PLASTITE,4-20X1/2,TORX T10,PAN HD	As required
	1021154-00-H	ASY, 3 PHASE HVJB	1
	1022622-10-C	PIN HOLDER,EV INLET,EU	1
		NOTE: 1021154-00-H, J and K are interchangeable.	
	1048912-00-C	ASY, HVJB, DUMO, 3P	1
	1059698-00-A	ASM, HVJB 3P WITH RELAY	1
	1022620-66-F	ASY,HV HARN,HVJB-CP,GEN2,EU,SERVICE PART (Vehicles with charge port harness 1022620-00-A through F or 1022620-10-F)	1
	1022620-10-H	ASY,HV HARN,HVJB TO CHG PORT,GEN2,3P (Vehicles with charge port harness 1022620-00-G or 1022620-10-G)	1
	These part numbers were current at the time of publication. Use the revisions listed or later, unless otherwise specified in the Parts Catalog.		
Special Tools	1080559-10-A	WIHA TORQUE SCREWDRIVER 0.1 - 0.6NM	
	1060071-00-A	TORQUE WRENCH 1-5 NM	
	1076971-00-A	ELECTRONIC TORQUE WRENCH 1/4 DRIVE	
	1053604-00-A	6 INCH DIGITAL CALIPER	
	1069866-00-A	CRL TAPERED PLASTIC END STICK	
	1082487-00-A	CLIP REMOVER BLADE APERTURE 7-12 MM	
	1076921-00-A	FLUKE 1587 INSULATION METER	
	1076988-00-A	ESD-SAFE VACUUM	
	1080560-00-A	TORX TORQUE CONTROL BLADE	

WARNING: Only technicians who have been trained in High Voltage Awareness are permitted to perform this procedure. Proper personal protective equipment (PPE) and insulating HV gloves with a minimum rating of class 0 (1000V) must be worn any time a high voltage cable is handled. Refer to TN-15-92-003, “High Voltage Awareness Care Points” for additional safety information.

HVJB Inspection and Testing

1. Move both front seats fully forward.
2. Open the liftgate, LH front door, and the rear doors.

WARNING: Perform all of the voltage checks listed in the procedure. If any voltage reading is more than 10V, the high voltage contactors are not fully opened. Due to the risk of electrocution, contact Service Engineering before performing any further work.

3. Remove the HVJB cover (refer to Service Manual procedure 44301102).

4. Inspect the components inside the HVJB (Figure 1):

   - If water, corrosion, or damage is found, replace the HVJB (refer to Service Manual procedure 44301002) but do not connect the charge port HV harness to the new HVJB at this time. Skip to the "Charge Port HV Harness Inspection" section of this document.
   - If no corrosion, water, or damage is found, continue this procedure.

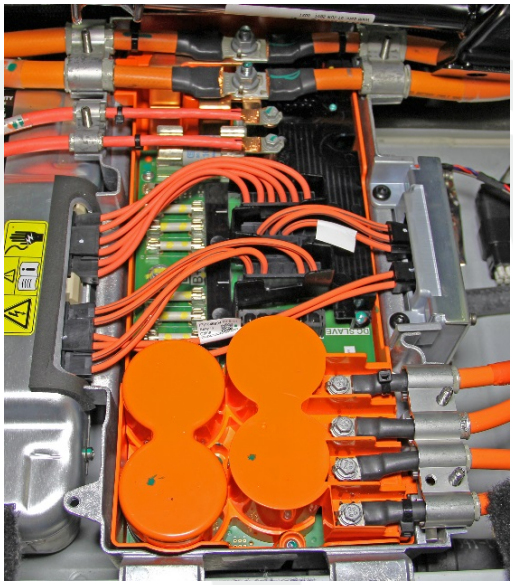


Figure 1

5. Release the bolts (x4) that secure the charge port HV harness to the HVJB (Figure 2). Move the harness away from the HVJB.

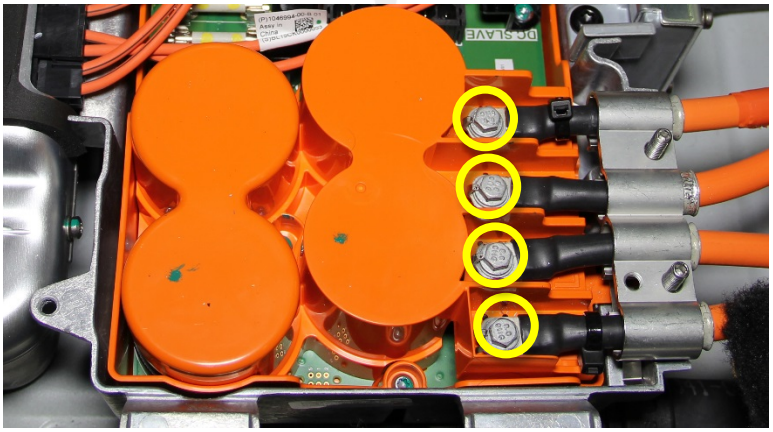


Figure 2

CAUTION: Do not remove the orange cover from the HVJB.

6. Inspect the L1, L2, L3, and N terminal posts on the HVJB (Figure 3) and the HVJB printed circuit board below the orange cover (Figure 4):

TIP: Use a flashlight to assist with the inspection of the HVJB.

- If water, corrosion or damage is found, replace the HVJB (refer to Service Manual procedure 44301002) but do not connect the charge port HV harness at this time. Skip to the “Charge Port HV Harness Inspection” section of this document.
- If small particles are found near the posts (Figure 5), do not replace the HVJB. Use an ESD-safe vacuum and a lint-free cloth to clean the printed circuit board. Continue this procedure.

NOTE: Complete removal of all particles is not necessary. Any debris left after vacuuming will not affect the operation of the HVJB.

- If no water, corrosion, or damage is found, continue this procedure.

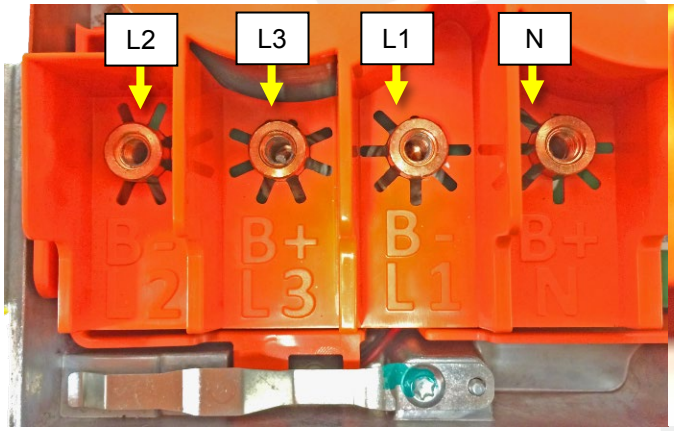


Figure 3

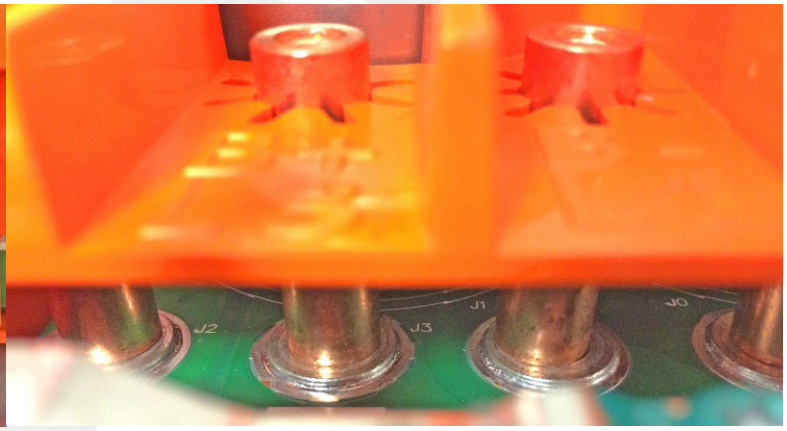


Figure 4

Figure 5

WARNING: Ensure that both HV insulating gloves and leather glove protectors are on while performing measurements with the Fluke insulation meter.

7. Disconnect the 2 master charger and 2 slave charger (if equipped) electrical connectors from the HVJB (Figure 6).

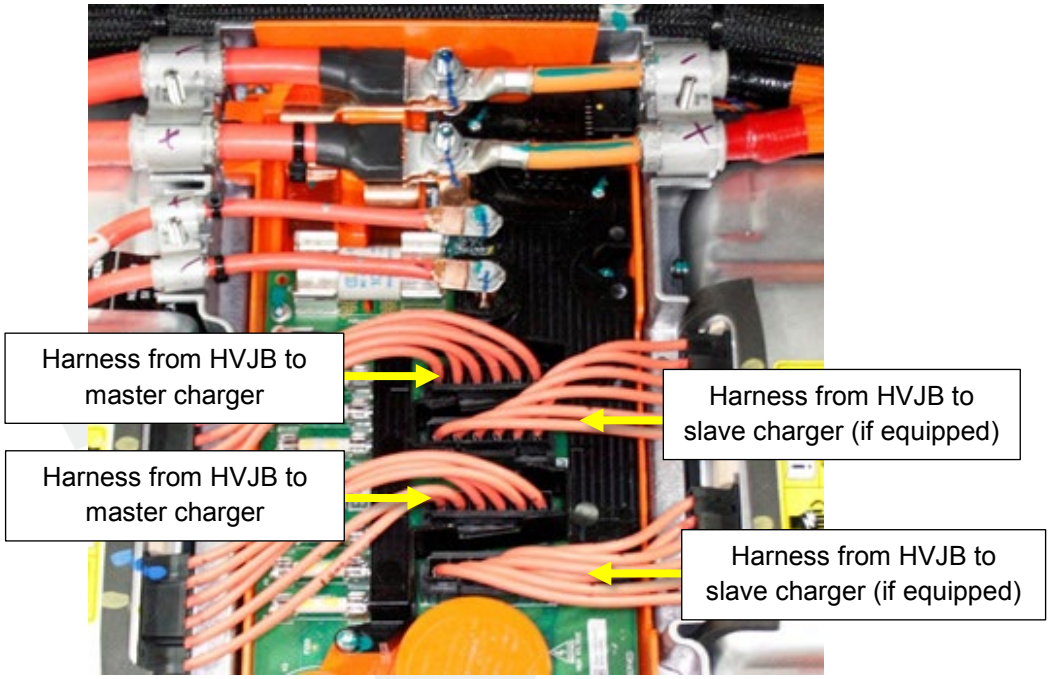


Figure 6 (Dual Charger configuration shown)

8. Set the Fluke insulation meter to 1000VDC.

CAUTION: Before performing the electrical insulation measurement, test for a good connection by measuring the electrical insulation to another part of the HVJB enclosure. Make sure that the electrical insulation meter displays 0.0 MOhms.

9. Measure the electrical insulation at the HVJB between the following points and record the measurements on the Repair Order:

NOTE: Record the measurements in the repair order.

NOTE: Make sure that the insulation meter test lead has a good connection with the copper post on the HVJB (Figure 7).

NOTE: When measuring the electrical insulation to ground, clamp the isolation meter probe to the HVJB enclosure (Figure 8).

- L2 and L3 posts
- L2 and L1 posts
- L2 and N posts
- L3 and L1 posts
- L3 and N posts
- L1 and N posts
- N post and chassis ground
- L1 post and chassis ground
- L3 post and chassis ground
- L2 post and chassis ground

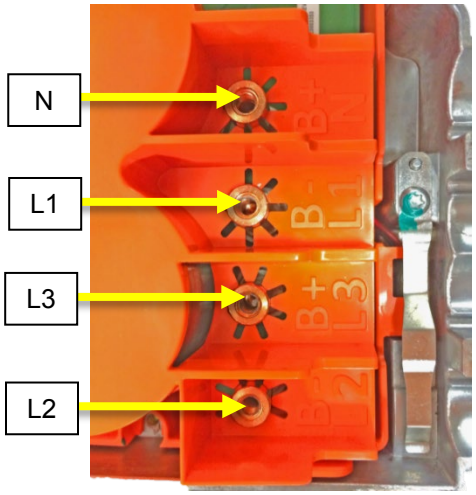


Figure 7

Figure 8

10. Check the results of the HVJB isolation test with the battery power switch closed:

    - If any electrical isolation reading is less than 1000 MΩ, replace the HVJB (refer to Service Manual procedure 44301002) but do not reconnect the charge port HV harness to the new HVJB at this time. Then continue to the “Charge Port HV Harness Inspection” section of this document.
    - If all of the electrical isolation readings are 1000 MΩ or greater, continue to the “Charge Port HV Harness Inspection” section of this document.

Charge Port HV Harness Inspection

1. Remove the LH rear trunk side trim (refer to Service Manual procedure 15245002).

2. Release the 4 barrel clips that secure the charge port HV harness to the studs on the body (Figure 9)

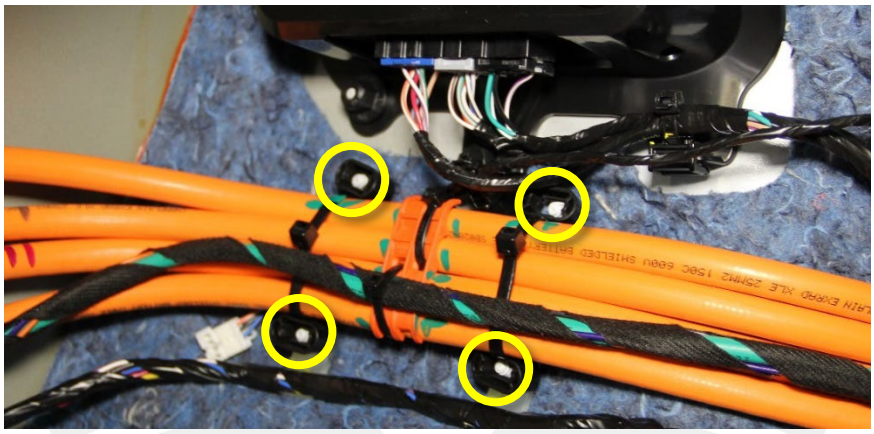


Figure 9

⚠ **CAUTION:** Make sure that the grounding bracket does not have direct metal contact with any metal part of the vehicle. This may induce false readings during the following tests.

3. Remove the nut that secures the grounding bracket to the body (Figure 10). Ensure that the charge port HV harness bends so that the grounding bracket does not touch the vehicle body. Put a clean dry shop towel between the ground bracket and the body, if necessary.

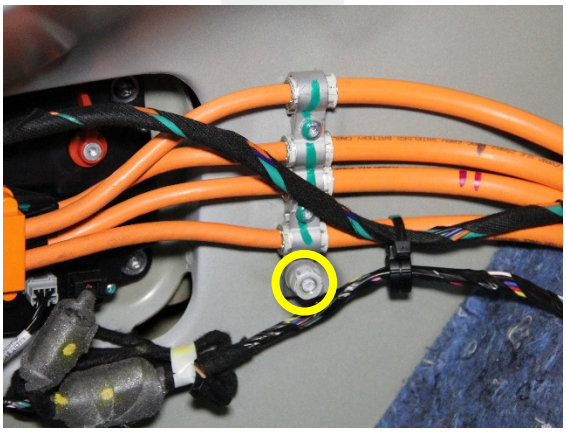


Figure10

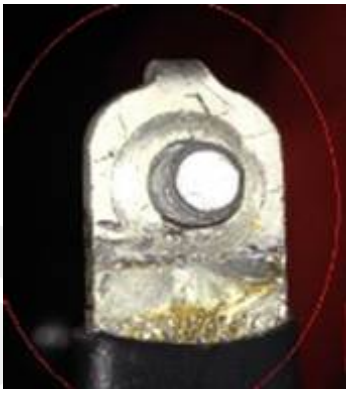
4. Inspect both sides of the 4 charge port HV harness cable terminals:

   - If no green oxidation or visible moisture is found (Figures 11–13), continue this procedure.
   - If green oxidation or visible moisture is found (Figures 14–16), replace the charge port HV harness (refer to Service Manual procedure 44500402), and then perform the “Functional Testing” section later in this procedure.

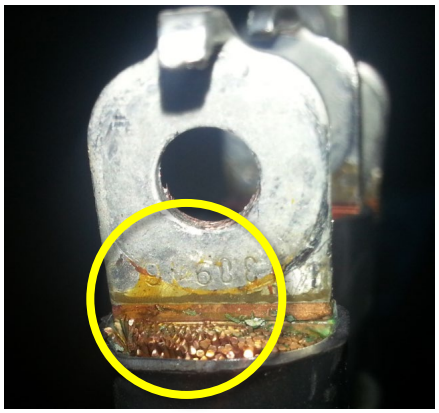
⚠ **CAUTION:** Black tin oxide is an acceptable condition that does not require replacement of the charge port HV harness.

✓ **Figure 11**

✓ **Figure 12**



✓ **Figure 13**



✗ **Figure 14**

✗ **Figure 15**

✗ **Figure 16**

5. Make sure that the charge port door is closed.

6. Set the Fluke insulation meter to 1000VDC.

CAUTION: Do not allow the cable terminals to touch each other or any surface during this test to prevent false test readings.

7. Measure the electrical insulation in the charge port HV harness:

NOTE: Record the measurements in the Repair Order**.**

NOTE: Connect the meter test leads to the metal collar (cable shield ground) and the cable terminal (Figure 17). Do not connect the test lead to the harness bracket or on the bolt on the cable terminal (Figure 18).

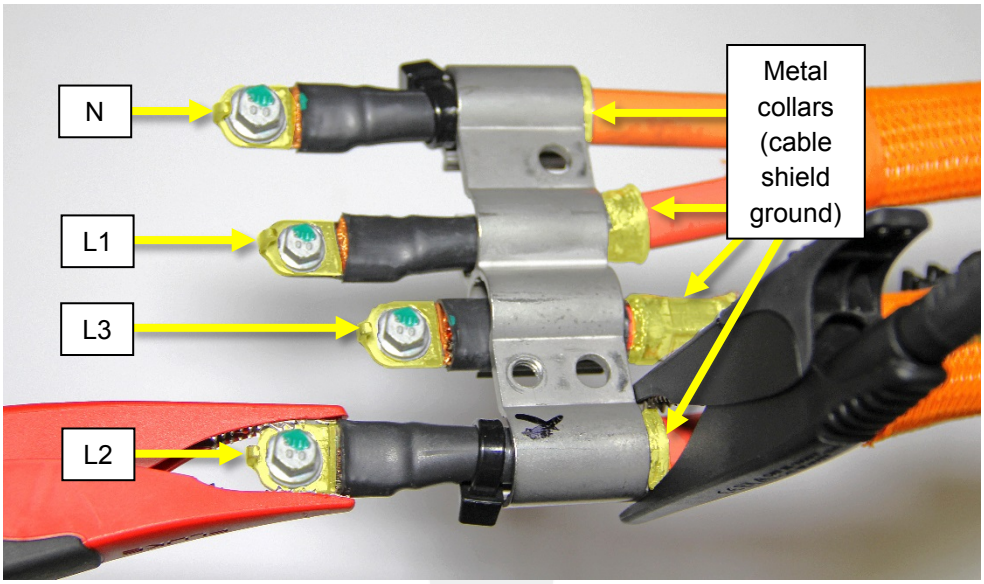


Figure 17

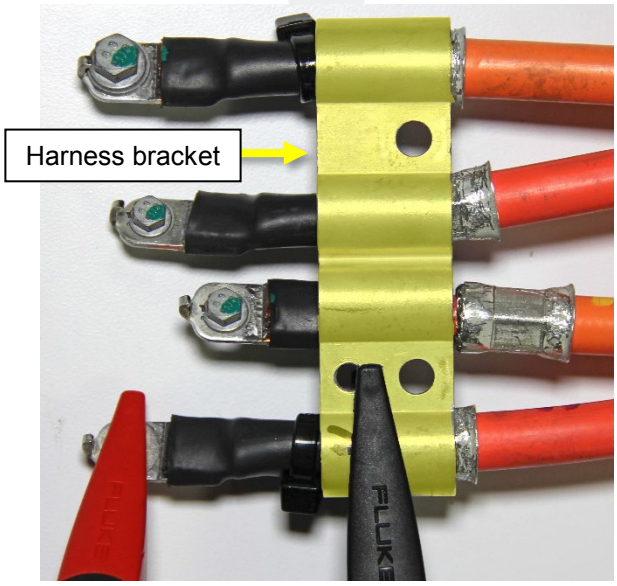


Figure 18

NOTE: Have an assistant record the electrical insulation test results. Do not transfer any values to the Repair Order until the end of this procedure.

- L1 and the cable shield ground
- L2 and the cable shield ground
- L3 and the cable shield ground
- N and the cable shield ground

8. Check the results of the charge port HV harness isolation test:

- If any of the electrical isolation readings is greater than 2.2 GΩ (indicating an incomplete connection), repeat the previous step to verify the test results. Ensure that the meter test leads make a good connection to avoid the possibility of a false positive.
- If any of the electrical isolation readings are less than 100 MΩ, replace the charge port HV harness (refer to Service Manual procedure 44500402). Before closing the HVJB cover, proceed to the “Functional Testing” section of this document.
- If all of the electrical isolation readings are between 100 MΩ and 2.2 GΩ, continue with this procedure.

Charge Port Pin Carrier Replacement

NOTE: Do not perform the following procedure if a new charge port HV harness was installed.

1. Use a trim tool to release the 3 tabs that secure the charge port cover to the cable connector (Figure 19).

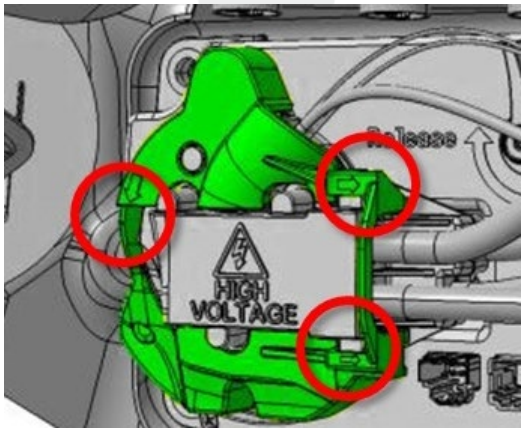


Figure 19

2. Remove the 3 bolts that secure the cable connector assembly to the charge port (Figure 20), and then remove the cable connector from the charge port.

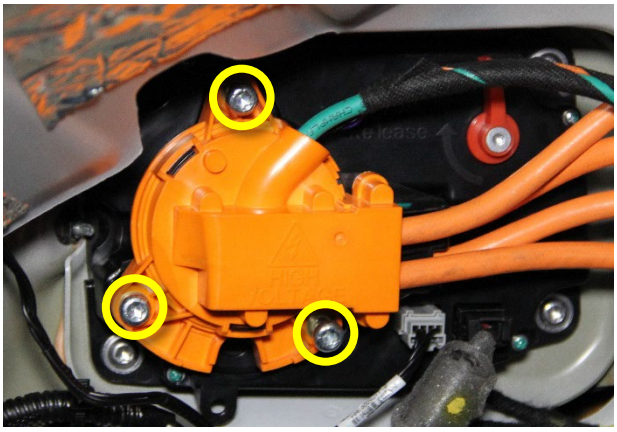


Figure 20

3. Remove the screws (x2) that secure the pin carrier (clear plastic) to the pin carrier cap (orange plastic) (Figure 21).

NOTE: If the screws are corroded, discard the screws and install new ones during reassembly.

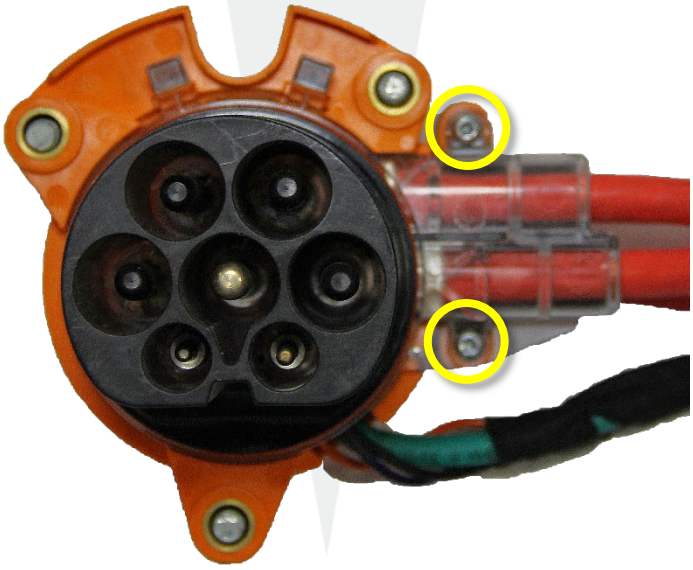


Figure 21

⚠ **CAUTION:** Avoid pinching or damaging any wires inside the charge port.

4. Use a small flat screwdriver or similar tool to partially separate the pin carrier from the pin carrier cap near the screw holes (Figure 22).

Figure 22

5. While keeping the screwdriver wedged between the pin carrier and pin carrier cap, use another flat screwdriver or similar tool to separate the pin carrier from the pin carrier cap (Figure 23).

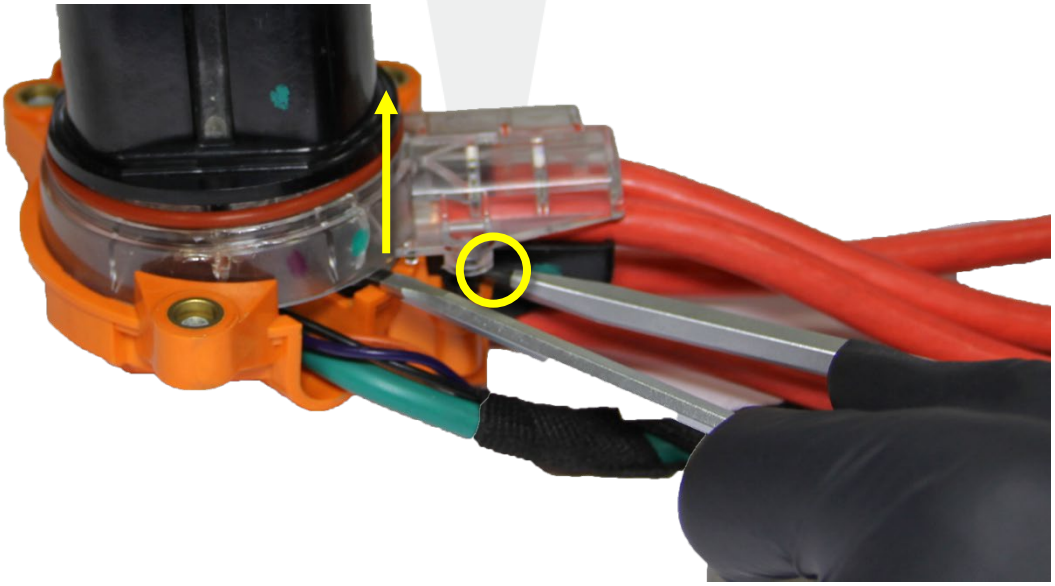


Figure 23

6. Position a trim tool below the 2 clear tabs (Figure 24), then separate the pin carrier from the pin carrier cap until the 2 rear tabs disengage (Figure 25). Slide the pin carrier away from the pin carrier cap.

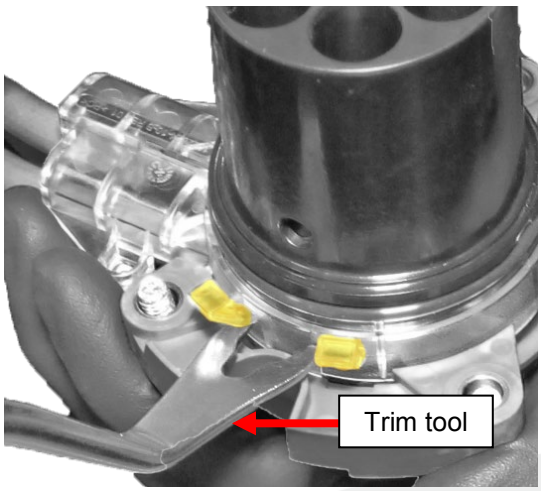


Figure 24 (Tabs highlighted)

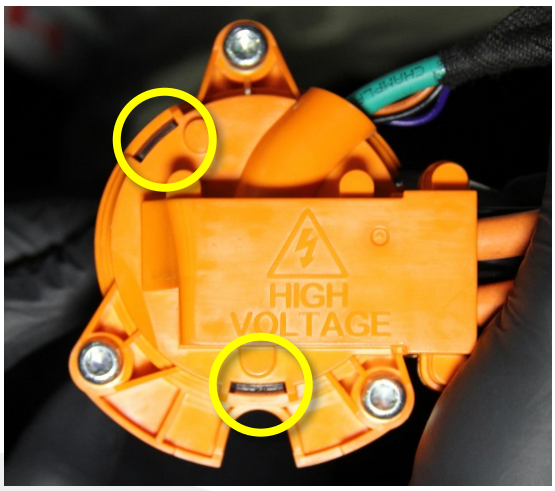


Figure 25

7. Remove the screw that secures the pin housing (black plastic) to the pin carrier (Figure 26).

NOTE: If the screw is corroded, discard the screw and install a new one during reassembly.

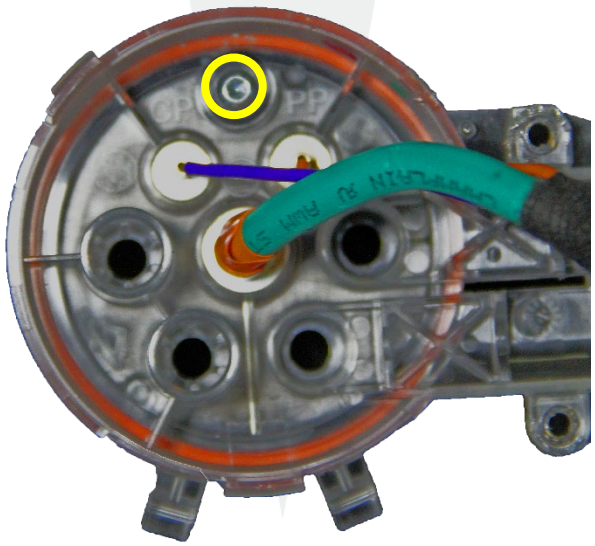


Figure 26

CAUTION: When handling the pins, hold the pin by the pin body. Do not handle the pins by the wires.

8. Remove the pin housing away from the pin carrier (Figure 27).

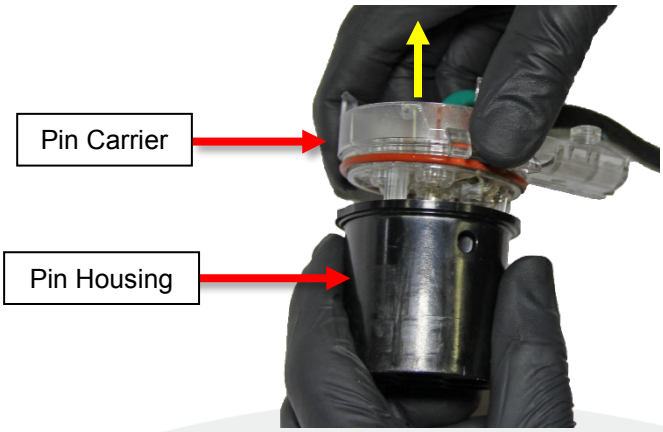


Figure 27

9. Place a shop cloth on top of the trunk floor insulation pad, and then push the pin carrier down onto the shop cloth to release the 3 pins from the pin carrier (Figure 28). Discard the pin carrier.

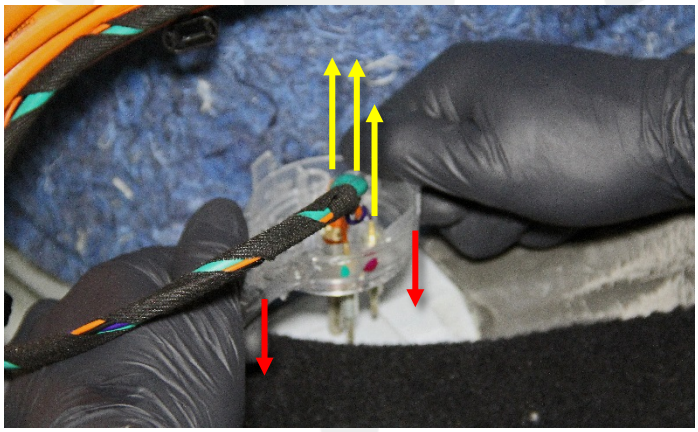


Figure 28

10. Inspect the pin carrier cap and pin holder for cracks or damage:

- If no damage is found on the pin carrier cap or the pin holder, skip step 11.
- If the pin carrier cap or the pin holder was damaged during disassembly, replace the pin carrier cap and/or the pin holder:

    a. Remove the 3 screws that secure the pin holder to the pin carrier cap (Figure 29) and discard the pin carrier cap and/or the pin holder.

    NOTE: If the screws are corroded, discard and replace the screws.

    b. Install the screws (x3) that secure the new pin carrier cap to the pin holder (torque 1 Nm) (Figure 29).

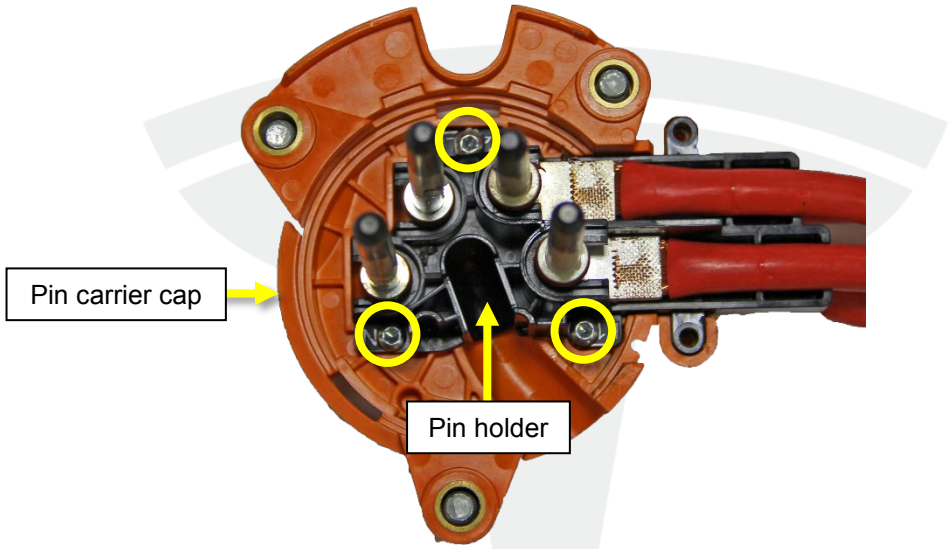


Figure 29

CAUTION: Hold the pin by the pin body. Avoid holding the pins by the wires.

11. Use a pick to remove the O-rings from all 7 pins (Figure 30). Discard the O-rings.

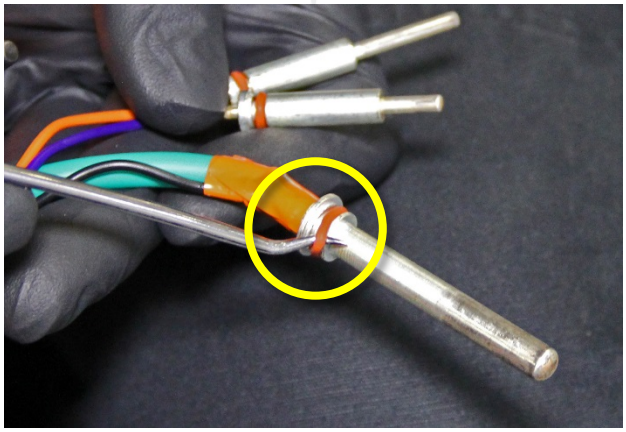


Figure 30

12. Clean the pins with an alcohol wipe. Allow the area to dry before continuing to the next step.

CAUTION: Do not use a pick to install new O-rings. Slide the new O-rings on by hand.

13. Install new O-rings on the 7 pins.

NOTE: Install the smaller O-rings (Tesla part number 1022624-00-A or later) on the 2 data pins (Figure 31), and the larger O-rings (Tesla part number 1022636-00-A or later) on the rest of the pins.

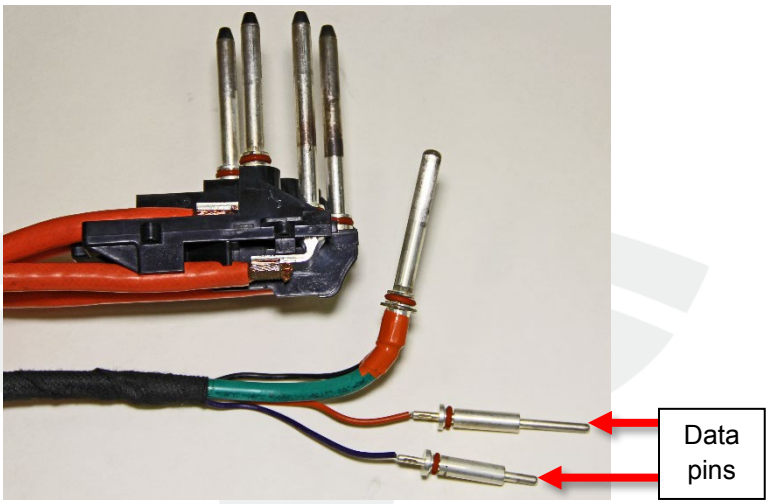


Figure 31

14. Install a new O-ring onto the new pin carrier (Figure 32).

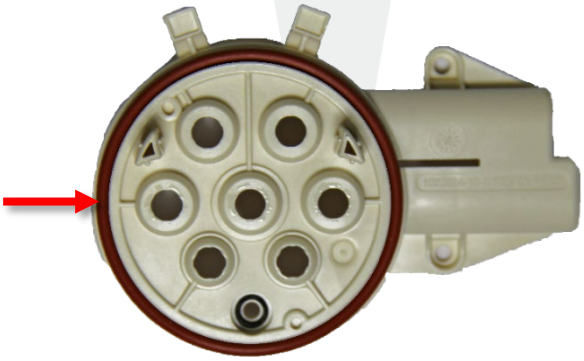


Figure 32

15. Insert a new smaller O-ring on the pin carrier screw bore (Figure 33).

Figure 33

16. Install the pin housing onto the pin carrier, and then install the screw (x1) that attaches the pin housing to the pin carrier (torque 0.5 Nm) (Figure 34).

Figure 34

⚠ **CAUTION:** Avoid applying Krytox lubricant on the pins. Use a clean shop cloth to remove any lubricant on the pins.

17. Apply Krytox lubricant onto the O-ring pins (x7). Use a disposable glove to spread the lubricant into a thin layer around the O-rings.

18. Partially insert the 2 data pins and the ground pin into the pin carrier ports (Figure 35), and then use a small flat screwdriver or similar tool to fully insert each pin into the pin carrier until the pin stops (Figure 36).

NOTE: Inserting the pins into the pin carrier requires a significant amount of force.

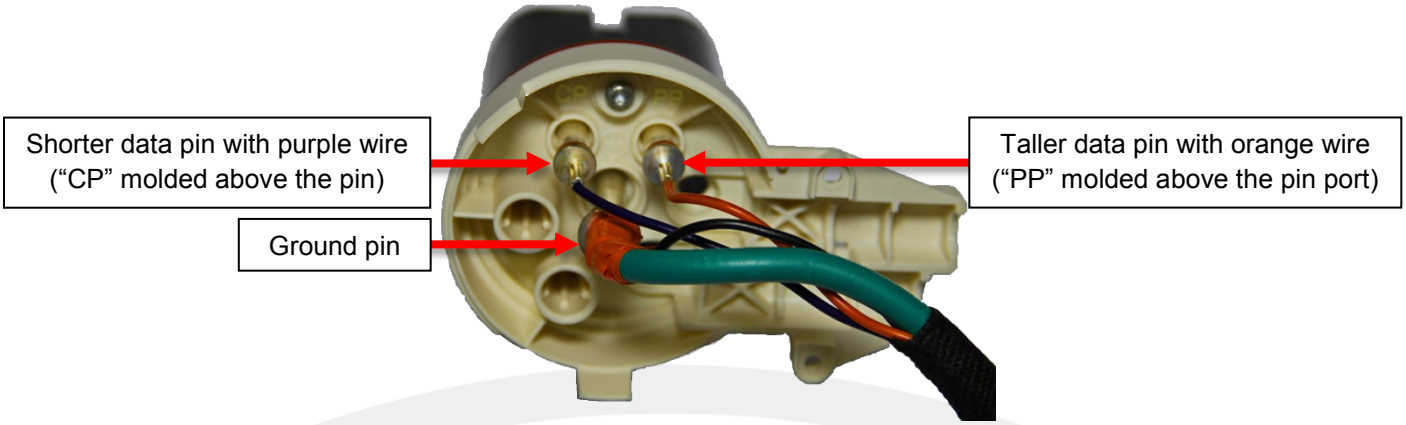


Figure 35

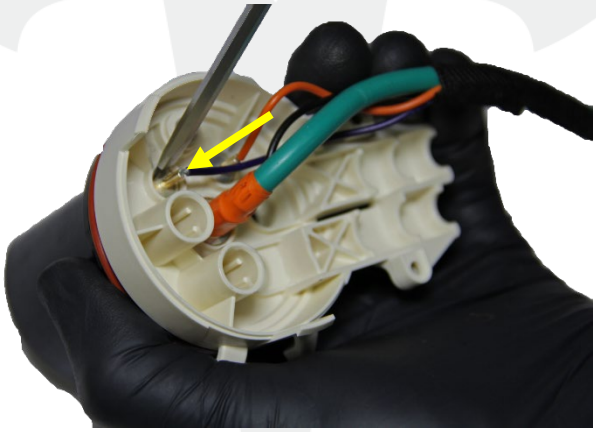
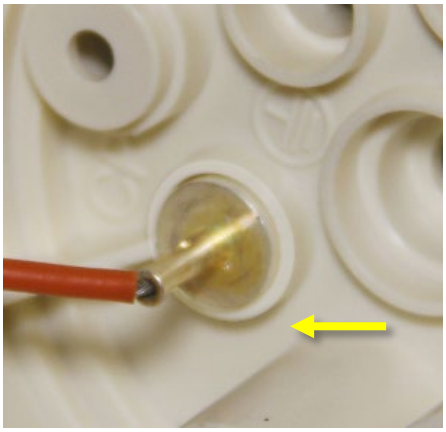


Figure 36

19. Verify that the pins are fully inserted into the pin carrier (Figures 37 and 38). The pins must be inserted at least 2 mm past the edge of the pin bore.

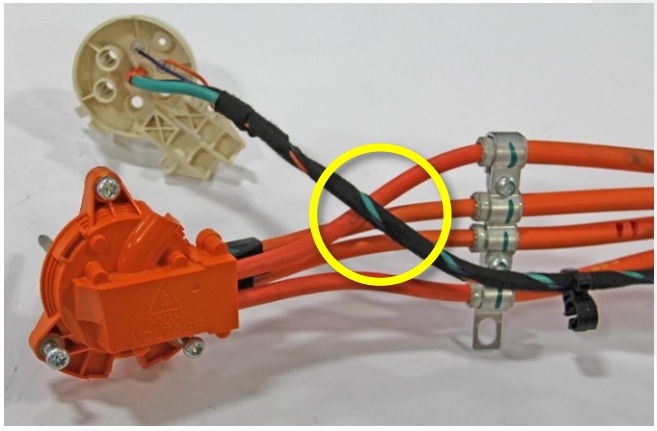
✓ **Figure 37 (Fully inserted; 2 mm of pin bore highlighted)**



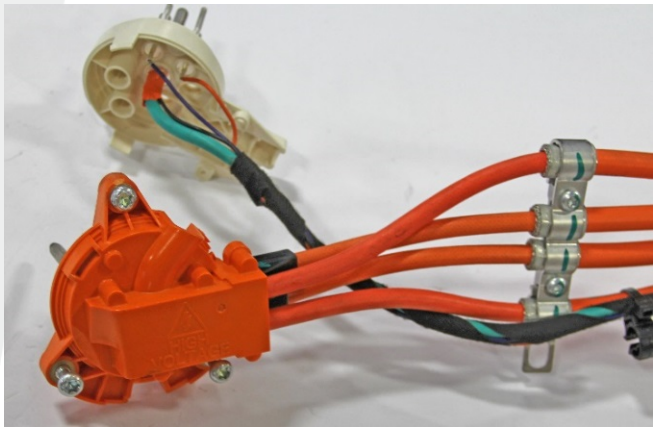
✗ **Figure 38 (Not fully inserted)**

20. Route the charge port HV wiring harness behind the HV cables (Figure 39), not in front of them (Figure 40).

⚠ **CAUTION:** Do not pinch the wires during reassembly.



✓ **Figure 39**



✗ **Figure 40**

21. Carefully slide the remaining pins (x4) into the pin carrier (Figure 41) until at least one of the tabs locks into place (Figures 42 and 43).

NOTE: If only 1 of the tabs locks into place, continue to step 22. The charge port assembly will be secured in place when it is installed on the vehicle. If neither tab locks into place, repeat step 21 to ensure that the pins are correctly installed.

Figure 41

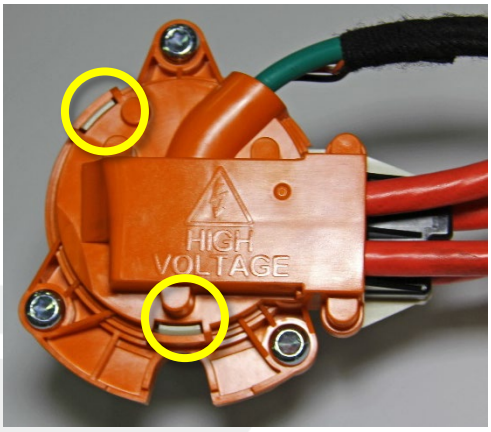


Figure 42

✓ **Figure 43**

22. Install the 2 screws that secure the pin carrier to the pin carrier cap (Figure 44):

- If a new pin carrier cap was installed, torque the 2 screws to 1 Nm.
- If the pin carrier cap was reused, torque the 2 screws to 0.6 Nm.

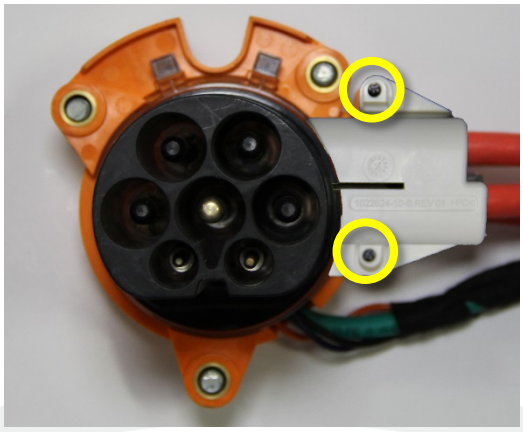


Figure 44

NOTE: If the screws are corroded, discard and replace the screws.

23. Secure the grounding bracket to the body with the nut (torque 9 Nm) (Figure 45).

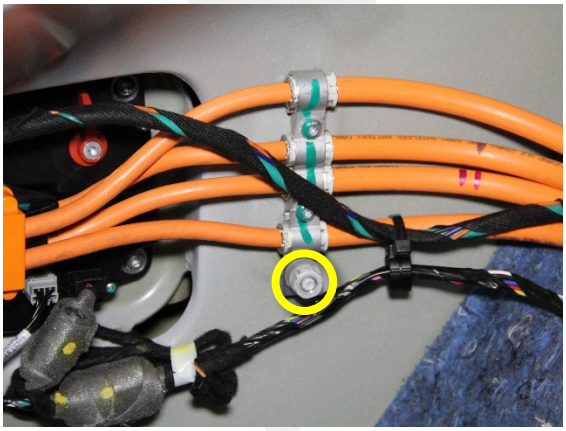


Figure 45

24. Attach the cable connector to the charge port with 3 bolts (torque 5 Nm) (Figure 46).

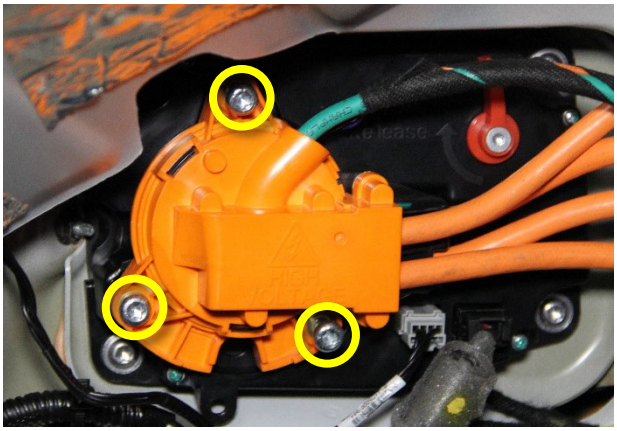


Figure 46

25. Reinstall the charge port cover to the cable connector (Figure 47).

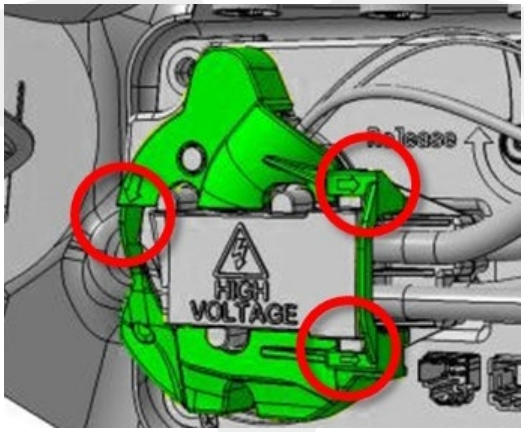


Figure 47

26. Reinstall the barrel clips that secure the charge port HV harness to the studs on the body (Figure 48).

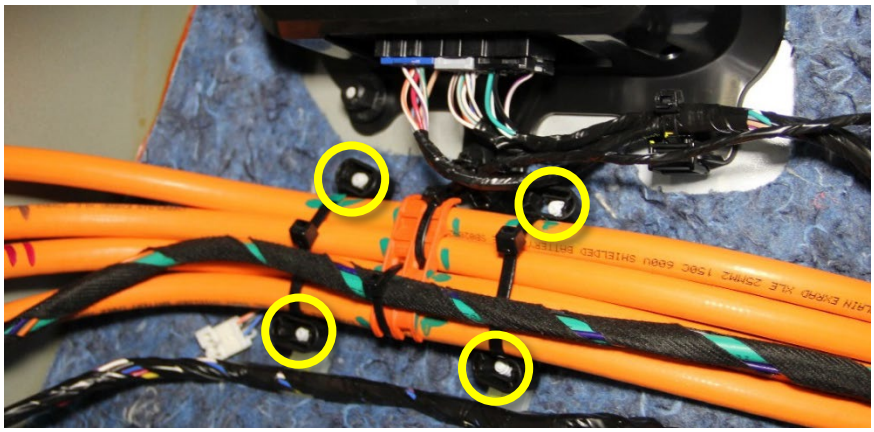


Figure 48

⚠ **CAUTION:** Carefully start to thread each bolt by hand to avoid bolt cross-threading.

27. Hand-tighten the bolts (x4) that attach the charge port HV harness to the HVJB (Figure 49).

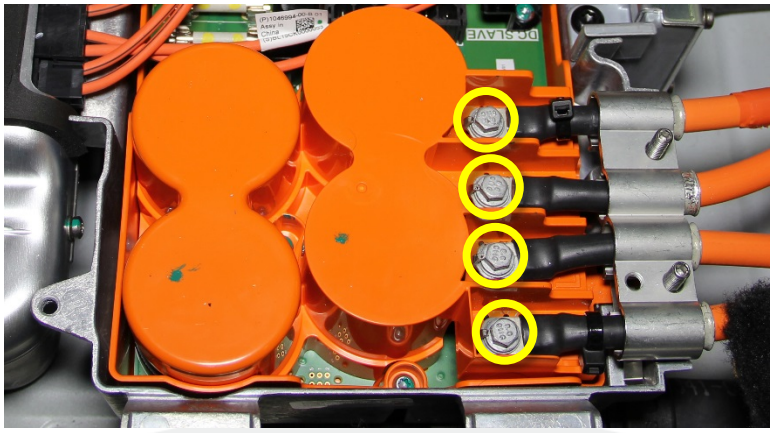


Figure 49

28. Reinstall the LH rear trunk side trim (refer to Service Manual procedure 15245002).

29. Use the torque wrench to tighten the charge port HV harness bolts to 4.4 Nm. Mark each bolt with a pink paint pen once it has been torqued.

30. Connect the master charger and slave charger (if equipped) electrical connectors at the HVJB (Figure 6).

Functional Testing

1. Use a multimeter to verify that the charge port HV harness pinout locations are correct (Figures 50 and 51). Check for continuity between these locations:

   - N charge port pin →N at the HVJB end cable terminal
   - L1 charge port pin → L1 at the HVJB end cable terminal
   - L2 charge port pin → L2 at the HVJB end cable terminal
   - L3 charge port pin → L3 at the HVJB end cable terminal

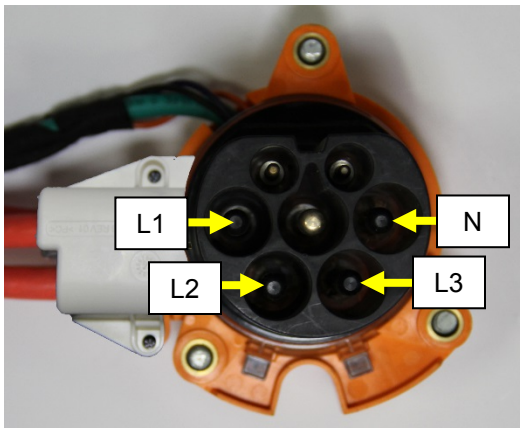


Figure 50

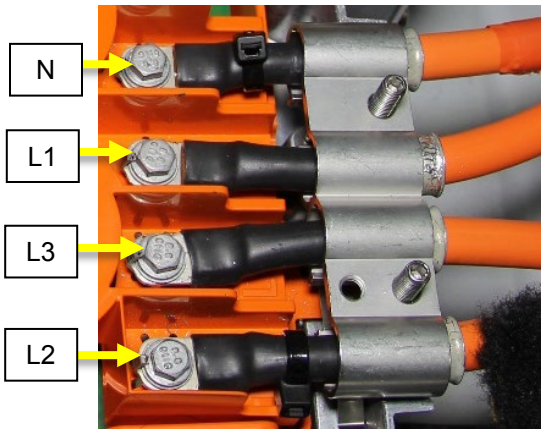


Figure 51

2. Check the results of the continuity measurements:

    - If the pinouts are correct, proceed to the next step.
    - If any of the pinouts are incorrect, perform the following:

        a. For incorrect charge port pin positions: Repeat the “Charge Port Pin Carrier Replacement” section of this document so that the pins match the positions listed on figure 50, then repeat step 1.
        b. For incorrect HVJB end cable terminal positions: Reposition the cable(s) in the shield brackets to match figure 51, then repeat step 1.

3. Reinstall the LH rear trunk side trim (refer to Service Manual procedure 15245002).

4. Connect the master charger and slave charger (if equipped) electrical connections at the HVJB.

5. Reinstall all components that were removed for access.

6. Ensure that the 12V battery negative terminal and first responder loop are connected.

7. Connect a laptop with Toolbox to the vehicle.

8. Sit in the driver’s seat and press the brake pedal to turn on the drive rail.

9. Check for Battery Management System (BMS) alerts. If there are any BMS alerts, discontinue this procedure and escalate a Toolbox session, as appropriate.

10. With the battery power switch closed, check that the isolation resistance is greater than 1500 kOhms. If the isolation resistance is less than 1500 kOhms, discontinue this procedure and escalate a Toolbox session, as appropriate.

11. Disconnect the laptop from the vehicle.

12. Charge the vehicle using AC wall power and verify that the vehicle draws the maximum current possible based on the charger capability:

    - If no alerts are set, continue this procedure.
    - If the vehicle displays any alerts, discontinue this procedure and escalate a Toolbox session, as appropriate.

13. Supercharge the vehicle for at least 5 minutes and verify for normal operation:

    - If no alerts are set, continue this procedure.
    - If the vehicle displays any alerts, discontinue this procedure and escalate a Toolbox session, as appropriate.

Post-Repair

1. Add the results of the HVJB and charge port HV harness electrical isolation tests to the Repair Order.

2. Add the new HVJB and/or charge port harness serial number(s) to the correction part record of the Repair Order, if applicable.