



## 2nd Charger Upgrade, 2nd Generation

<b>Classification</b>	Parts and Accessories Bulletin	<b>Section/Group</b>	44 - High Voltage System	<b>Country/Region</b>	All
<b>Year</b>	2013-2016	<b>Model</b>	Model S	<b>Version</b>	2nd Generation Charger

**Bulletin Classification:** *This bulletin provides instructions and guidelines for a vehicle procedure that is not the result of a defect. This bulletin might not be VIN-specific. These instructions assume knowledge of motor vehicle and high voltage electrical component repairs, and should only be executed by trained professionals. Tesla Motors assumes no liability for injury or property damage due to a failure to properly follow these instructions or repairs attempted by unqualified individuals.*

*This Service Bulletin supersedes SB-13-44-010 R3, dated 1-Sep-15. Each content change is marked by a vertical line in the left margin. Discard the previous version and replace it with this one.*

This bulletin describes how to install a second (slave) charger in a vehicle that is currently configured with only one (master) charger.

**NOTE:** This bulletin is valid for the following Model S vehicles:

- European vehicles built before approximately April 11, 2016
- Asian Pacific vehicles built before approximately April 11, 2016
- North American vehicles built between October 16, 2013 and October 31, 2013
- North American vehicles built between December 3, 2013 and approximately April 11, 2016

Correction Description	Correction	Time
Install 2nd Generation Slave Charger	S011344010	2.4
(Obsolete code; do not use)	<del>S021344010</del>	—
SB-13-44-010 Not Applicable	S031344010	0.0

Required Part(s):	Part Number	Description	Quantity
<b>Choose one of the following kits, as appropriate:</b>			
		<b>Vehicles in China:</b>	
	1047977-20-A	GEN 2 DUAL CHARG UPGRADE KIT, CN	1
		<b>Vehicles in all other locations:</b>	
	1047977-00-B	GEN 2 DUAL CHARG UPGRADE KIT, NA/EU	1

These part numbers were current at the time of publication. Use the revisions listed or later, unless otherwise specified in the Parts Manual.

## Configure the New Slave Charger

**⚠ 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 00 (500V) 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.

1. Disconnect the First Responder Loop.

**NOTE:** Do not disconnect 12V power.

2. Connect an external charger to the 12V battery.

**NOTE:** It is necessary to support the 12V battery with the external charger while configuring the slave charger.

3. Remove the 2<sup>nd</sup> row seat frame:

- For vehicles with standard 2<sup>nd</sup> row seats, refer to Service Manual procedure 13023002
- For vehicles with executive 2<sup>nd</sup> row seats, refer to Service Manual procedure 13021002

4. Confirm that the vehicle has a 2<sup>nd</sup> generation charger (Figure 1).

**NOTE:** If the vehicle has a 1<sup>st</sup> generation charger, do not perform this procedure; refer to SB-12-44-005 instead.

**NOTE:** If the vehicle has a 3<sup>rd</sup> generation charger, do not perform this procedure; refer to Toolbox article 28740 to perform the “High Amperage Charger Upgrade”.

5. Disconnect the front 12-pin harness from the master charger, then disconnect the rear 10-pin harness from the master charger (Figure 1).

**⚠ CAUTION:** Do not disconnect the rear harness first. Disconnecting harnesses in the wrong order triggers multiple high-priority alerts.

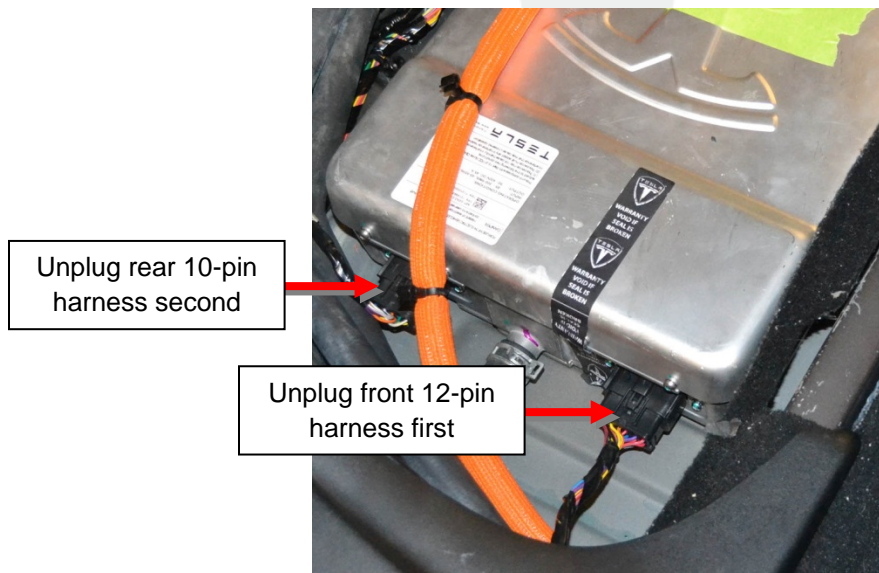


Figure 1

6. Temporarily place the new slave charger on top of the master charger.

7. Connect the rear 10-pin harness to the new slave charger, then connect the front 12-pin harness to the new slave charger.

**⚠ CAUTION:** Do not connect the front harness first. Connecting harnesses in the wrong order triggers multiple high-priority alerts.

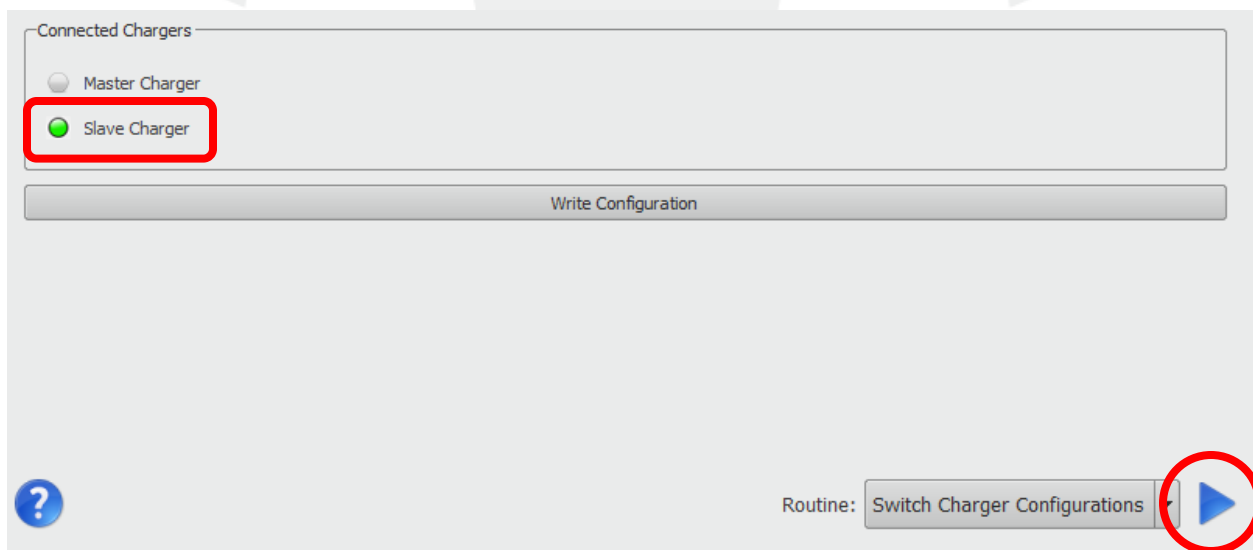
8. Connect a laptop with Toolbox to the vehicle.

9. In Toolbox, open the **Charger Config** panel.

10. Switch the charger configuration from “Master Charger” to “Slave Charger” (Figure 2):

**⚠ CAUTION:** Failure to reconfigure the slave charger can result in alerts later in this procedure.

- a. Click the “Slave Charger” radio button.
- b. Ensure that the “Routine” is set to “Switch Charger Configurations”.
- c. Click the **Start/Play** button.



**Figure 2**

11. Disconnect the front 12-pin harness from the new slave charger, then disconnect the rear 10-pin harness from the new slave charger.

**⚠ CAUTION:** Do not disconnect the rear harness first. Disconnecting harnesses in the wrong order triggers multiple high-priority alerts.

12. Temporarily remove the slave charger.

13. Connect the rear 10-pin harness to the master charger, then connect the front 12-pin harness to the master charger.

**⚠ CAUTION:** Do not connect the front harness first. Connecting harnesses in the wrong order triggers multiple high-priority alerts.

**NOTE:** Leave the laptop connected to the vehicle.

## Install the New Slave Charger

1. Disconnect the slave charger harness connector from the HVIL termination connector (Figure 3).

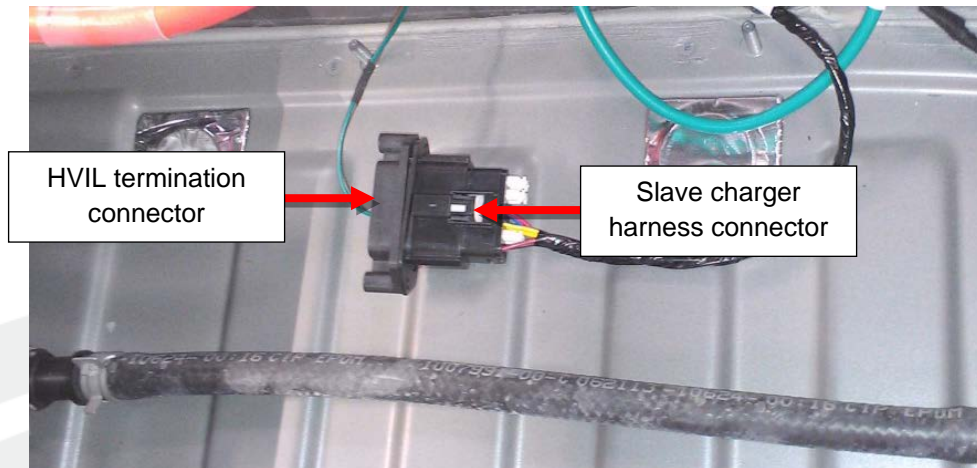


Figure 3

2. Use the cable tie to secure the HVIL termination connector to the coolant hose (Figure 4).

**NOTE:** Ensure that the HVIL termination connector is tightly secured so that it does not move or rattle.



Figure 4

3. Move the slave charger harness connector out of the way so that it is not damaged if coolant is spilled in later steps.

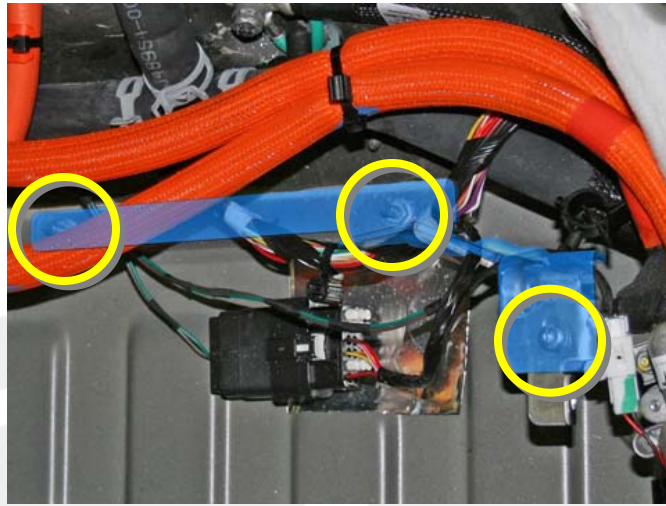
**NOTE:** This connector is secured to the new slave charger in a later step.

4. Disconnect the 12V external charger.

5. Disconnect 12V power:

- **Rear wheel drive (RWD) vehicles:** refer to Service Manual procedure 17010100
- **Dual Motor vehicles:** refer to Service Manual procedure 17010200

6. **Dual Motor vehicles only:** Release the bolt and 2 nuts that secure the mounting bracket (torque 9 Nm) (Figure 5).



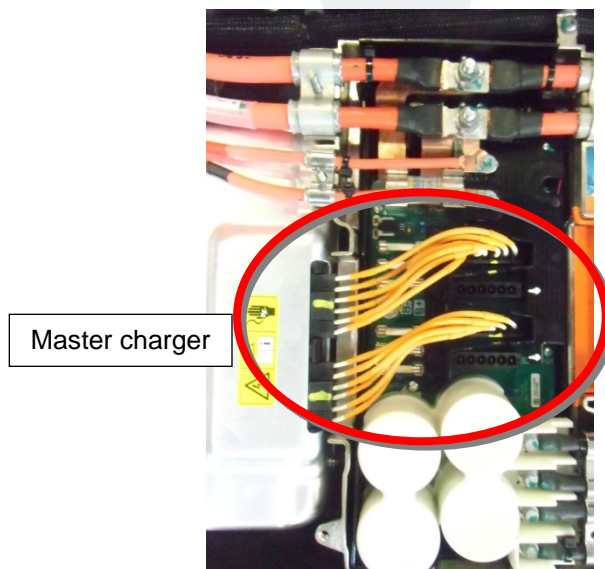
**Figure 5 (Bracket highlighted in blue)**

**⚠ WARNING:** Do not continue this procedure without wearing proper HV gloves.

7. Remove the High Voltage Junction Box (HVJB) cover (refer to Service Manual procedure 44301102).

**⚠ WARNING:** Perform all of the voltage checks listed in the HVJB cover 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.

8. **Europe only:** If equipped, remove the relay box from the vehicle.
9. Remove and discard the 2 harnesses between the connections inside the HVJB that lead to the master charger (Figure 6).



**Figure 6**

10. Release the 3 or 4 bolts that secure the HVJB to the body (torque 5 Nm). Gently lift up the front of the HVJB and support it.

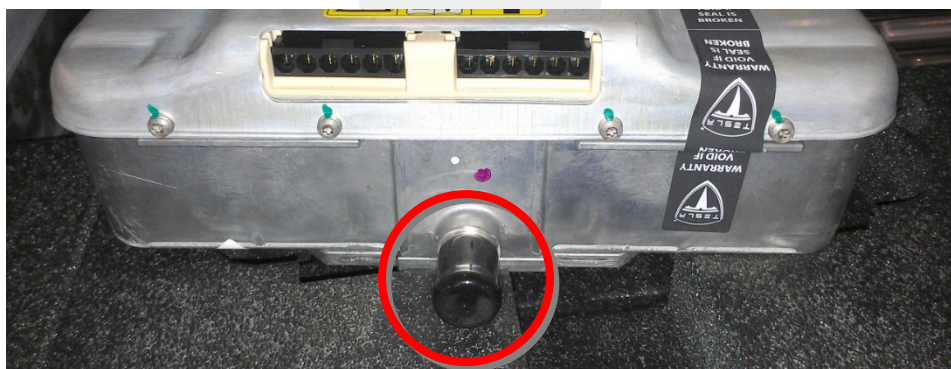
11. Cover the rear LH floor of the vehicle with shop towels or other absorbent material to catch any coolant that is spilled in later steps.
12. Clamp the main coolant hose at both ends of the temporary coolant hose. Ensure that the clamps are placed outboard of the locking rings (Figure 7).

**⚠ CAUTION:** It might be necessary to gently pull the main coolant hose out from underneath the HVJB in order to clamp it. Do not damage the main coolant hose.



**Figure 7**

13. Remove the cap from the inboard pipe on the new slave charger (Figure 8) and have it ready for the next step.



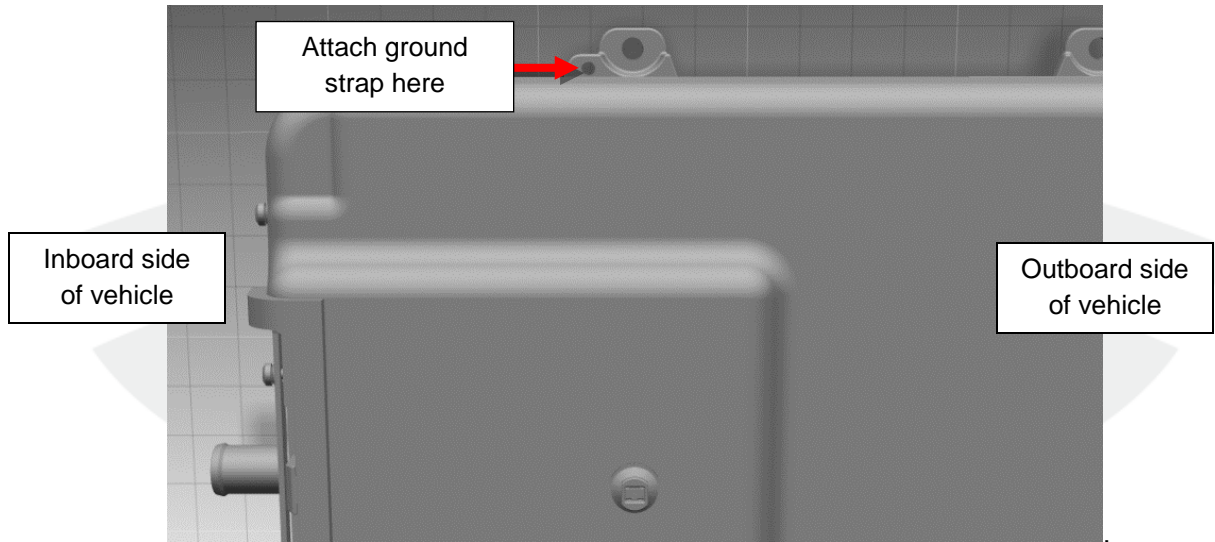
**Figure 8**

14. Use a pair of pliers to release the locking ring that secures the inboard side of the main coolant hose (Figure 7). Release the inboard restrictor from the main coolant hose, and immediately tilt the open edge of the temporary coolant hose upwards to reduce spilling. Place the cap from the new charger over the restrictor on the main coolant hose.
15. Repeat the 2 previous steps for the outboard side of the temporary coolant hose. Remove the temporary coolant hose from the vehicle.
16. Clean up any spilled coolant.
17. Set the new slave charger into position over the 4 mounting studs.

**⚠ CAUTION:** Do not damage the mounting studs.

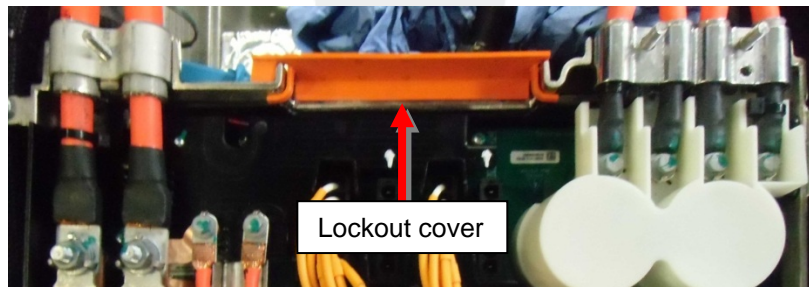
18. Install the 4 nuts that secure the slave charger to the studs on the body (torque 7 Nm).

19. Attach both ends of the main coolant hose to the new slave charger.
20. Remove both clamps from the main coolant hose.
21. Secure the new ground strap to the small bolt hole at the inboard rear of the new slave charger (torque 7 Nm) (Figure 9).



**Figure 9**

22. Set the HVJB back into position and reinstall the 3 or 4 bolts that secure it to the body (torque 5 Nm).
23. Remove the lockout cover from the LH side of the HVJB (Figure 10).



**Figure 10**

24. Install the 4 new harnesses that connect the HVJB to the chargers (Figure 11).

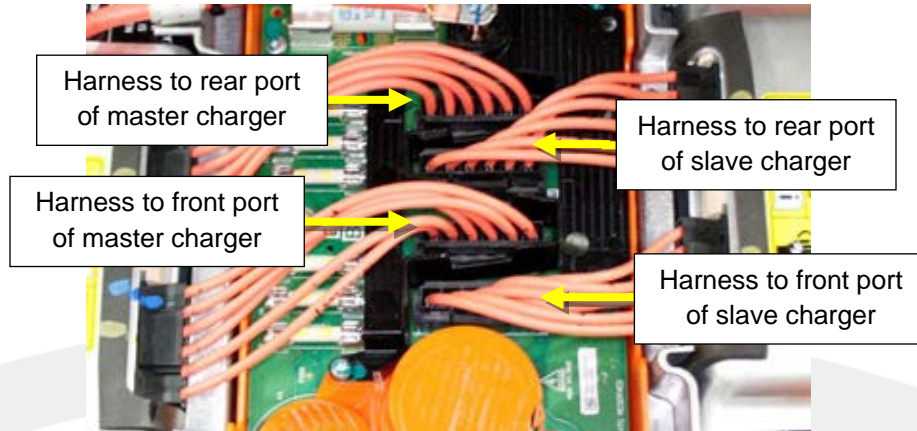
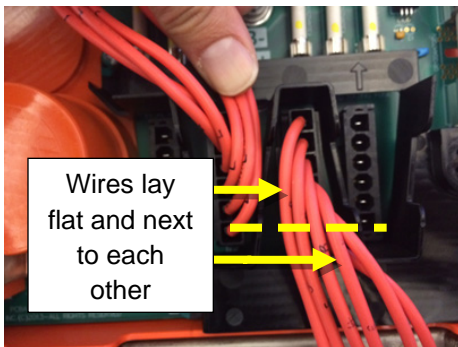


Figure 11

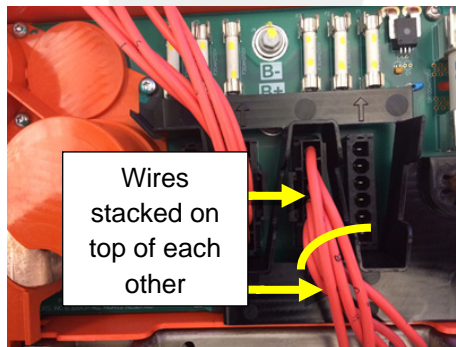
**⚠ CAUTION:** The harnesses for the different chargers are visually similar and have similar part numbers. Ensure that the correct harnesses are installed in the correct location. Note that the harnesses to the master charger are slightly longer than the harnesses to the slave charger.

**⚠ CAUTION:** During installation, ensure that the harnesses are arranged neatly and are not twisted, and that they do not put unnecessary stress on the ports inside the HVJB or the charger (Figures 12–14).



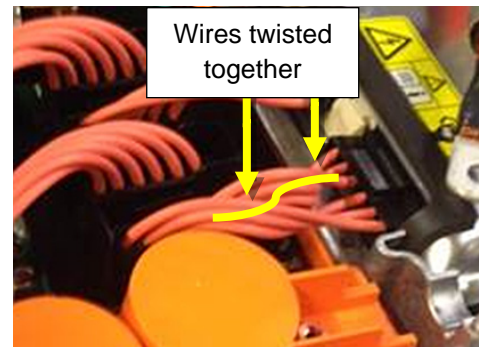
✓ Correct

Figure 12



✗ Incorrect

Figure 13



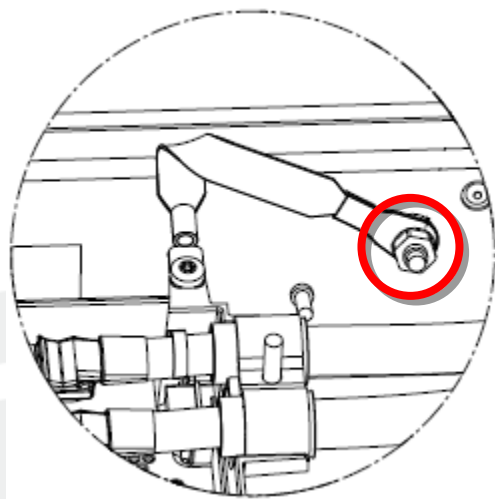
✗ Incorrect

Figure 14

25. Secure the HVJB cover. Refer to Service Manual procedure 44301102 for the proper bolt torque sequence.

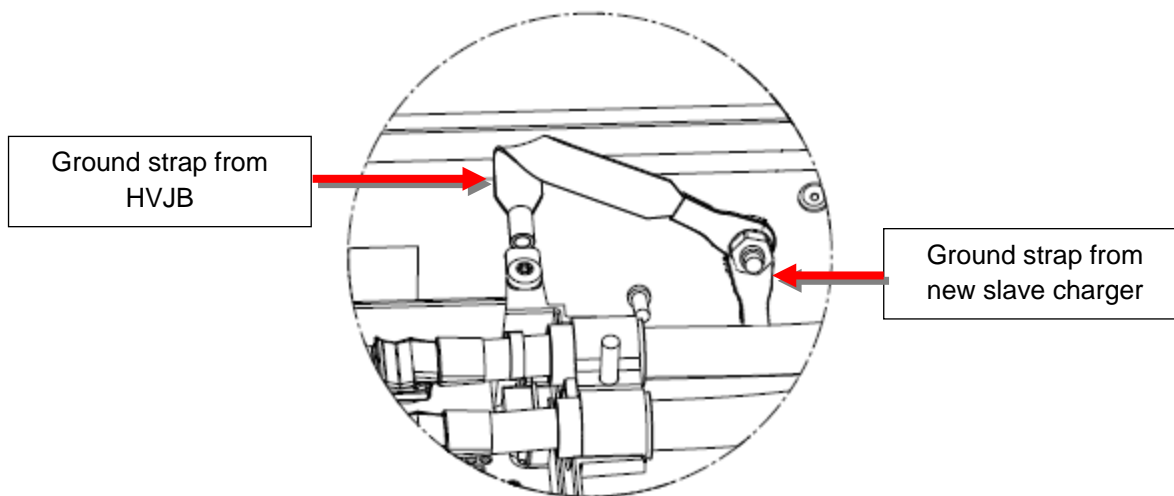


26. Release the nut at the rear of the vehicle that secures the ground strap from the HVJB, and lift the ground strap off of the stud (Figure 15).



**Figure 15**

27. Attach the ground strap from the new slave charger to the ground stud, then secure the ground strap from the HVJB to the ground stud. Ensure that the ground strap for the slave charger points down (Figure 16). Secure the ground stud nut (torque 7 Nm).



**Figure 16**

28. Connect the slave charger HVIL loopback connector to the front of the new slave charger, and connect the 12-pin harness to the rear of the new slave charger (Figure 17).

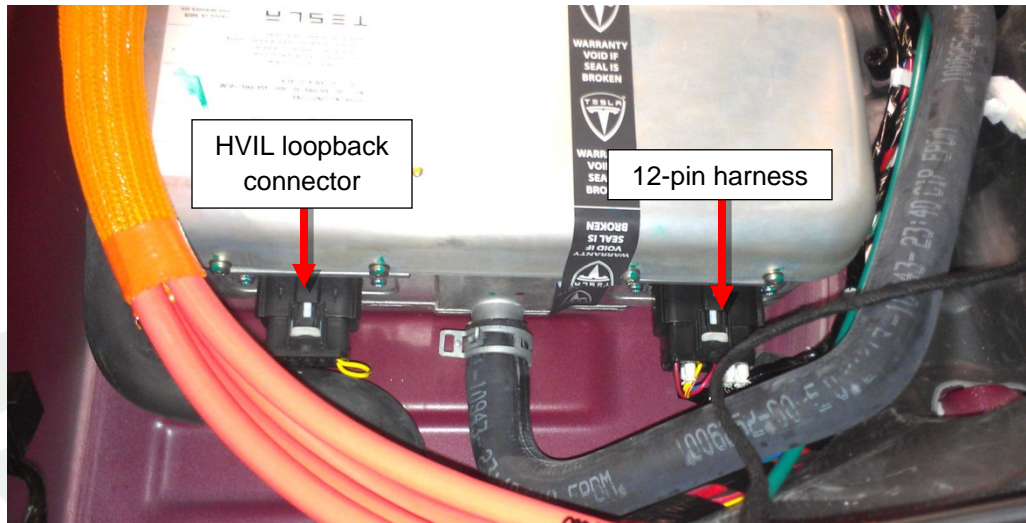


Figure 17

29. **Dual Motor Vehicles only:** Install the screw that secures the fuse bracket to the slave charger (torque 9 Nm) (Figure 18).

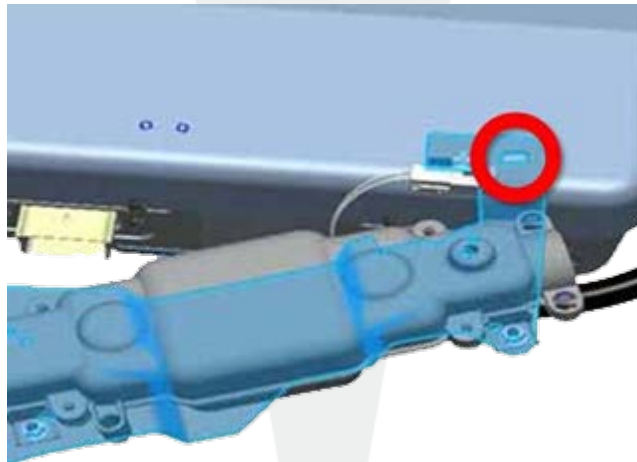


Figure 18

## Change Vehicle Configuration for Dual Chargers

1. Reconnect the First Responder Loop.
2. Reconnect the 12V battery.
3. Reconnect the 12V external charger.

**NOTE:** Even though the 12V battery should draw power from the HV system, it is necessary to connect a 12V power supply in case there is a problem that prevents the contactors from closing.

4. Use Toolbox to change the “Charger Type” configuration variable to **Dual (10kW)** (Figure 19).

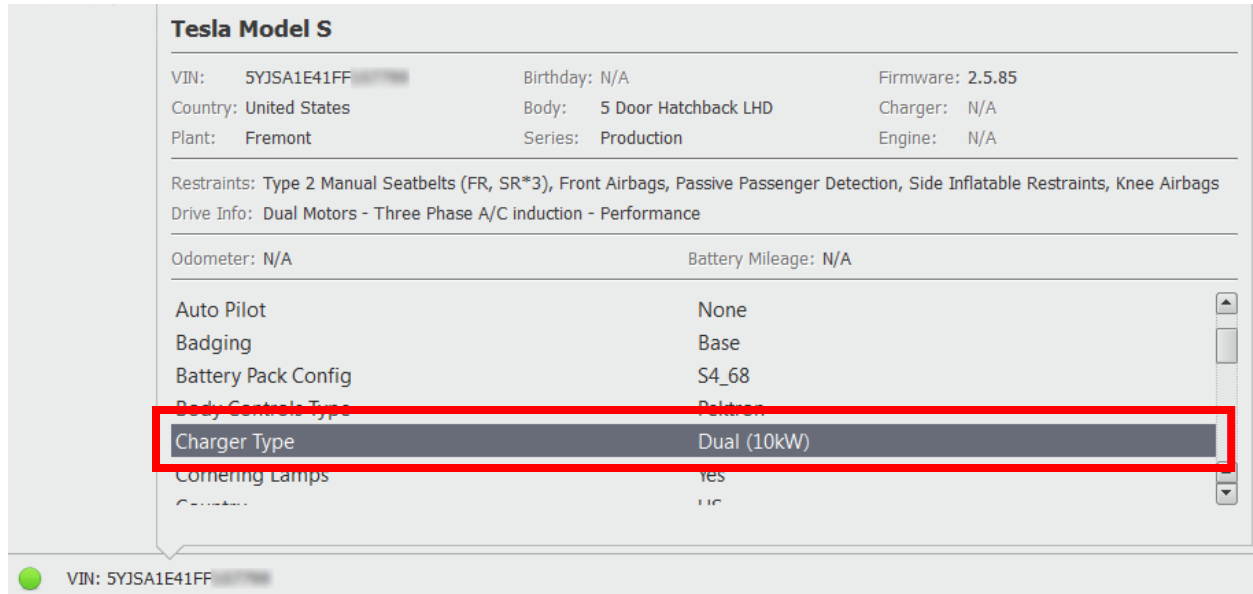


Figure 19

5. Perform a full firmware update.

**NOTE:** Leave the laptop connected to the vehicle.

## Reinstallation and Coolant Purge

1. Perform the coolant purge procedure (refer to Service Manual procedure 18300000).
2. Reinstall all components that were removed for access.
3. Test drive the vehicle and verify that there are no alerts.
4. If possible, charge the vehicle at above 40A for several minutes and verify that there are no alerts.

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**Affected VIN(s)** All Model S vehicles built with a single 2<sup>nd</sup> generation charger, except North American vehicles built before October 16, 2013, or between October 31, 2013 and December 3, 2013.

For feedback on the accuracy of this document, email [ServiceBulletinFeedback@tesla.com](mailto:ServiceBulletinFeedback@tesla.com).