

 HYUNDAI Technical Service Bulletin	GROUP RECALL	NUMBER 18-01-019
	DATE MAY, 2018	MODEL SONATA PLUG-IN HYBRID (LF PHEV)
SUBJECT: 2016-2017 SONATA PHEV BATTERY BMS AND WIRING REPLACEMENT (RECALL CAMPAIGN 175)		

* IMPORTANT	<p align="center">*** Dealer Stock & Retail Vehicles ***</p> <p>Dealers must perform this Recall Campaign on all affected vehicles prior to customer retail delivery and whenever an affected vehicle is in the shop for any maintenance or repair.</p> <p>When a vehicle arrives at the Service Department, access Hyundai Motor America's "Warranty Vehicle Information" screen via WEBDCS to identify open Campaigns.</p>
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Description:

The subject vehicles are equipped with a Voltage Protection Device (“VPD”) designed to monitor the hybrid battery’s state of charge and safeguard the hybrid battery from overvoltage by disconnecting the power to the electric motor. In limited instances, during the charging/discharging process, the hybrid battery could swell and inadvertently activate the VPD switch. If the VPD switch is activated while the vehicle is driven in the Electric Vehicle (“EV”) drive mode, the electric motor could become inoperative and the vehicle could lose motive power.

The vehicle may display a Check Hybrid System Light On with the following DTC in the Battery Management System (BMS):

- DTC P1BA7 - Overcharge Detection Active

This bulletin’s Service Procedure will convert the PHEV battery overcharge detection system from a Voltage Protection Device (VPD) mechanical type switch to an Overvoltage Protection Device (OPD) electronic type device internal to both the new SUB BMS and MAIN BMS.

The following will be performed to achieve the conversion to an OPD type system:

- Replace the Sub and Main BMS.
- Replace Sub and Main BMS Wiring.

Applicable Vehicles:	Certain 2016-2017MY Sonata Plug-In Hybrid (LF PHEV) vehicles produced between Jun 24, 2015 to Aug 31, 2017.
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Warranty Information:

Model	Op Code	Operation	Op Time	Causal Part	Nature Code	Cause Code
Sonata Plug-In Hybrid (LF PHEV)	81C016R0	BMS & WIRING REPLACEMENT	2.0 M/H	37503-E6AS1	I3A	ZZ3

NOTE 1: Submit Claim on Campaign Claim Entry Screen

NOTE 2: If a part is found in need of replacement while performing Recall 175 and the affected part is still under warranty, submit a separate claim using the same repair order. If the affected part is out of warranty, submit a Prior Approval Request for goodwill consideration prior to performing the work.

Parts Information:

PART NAME	FIGURE / PART NUMBER	REMARK
MAIN BMS		1 per vehicle
	37513-E6520QQH	
SUB BMS		1 per vehicle
	37513-E6620QQH	
MAIN BMS WIRING		1 per vehicle
	37517-E6520QQH	
SUB BMS WIRING		1 per vehicle
	37517-E6620QQH	

Required Tools List:

- Insulated safety gloves
- Cordless impact gun 3/8"
- Cordless screw gun
- Ratchet - 3/8" with extensions and 10, 12, and 17 mm sockets
- Torque wrench
- Trim tool remover
- Electrical tape
- Pocket flat head

Service Procedure:

1. Per HEV “General Safety Information and Caution” in the Shop Manual, wear insulated safety gloves for this entire service procedure.
 - Open the trunk and access the safety plug under the luggage compartment floor. Unfasten the hook (a) and remove the safety plug (b) by pulling the lever (c) in the direction of the arrow.
 - Record the customer radio presets.
 - Remove the negative terminal from the 12V battery.

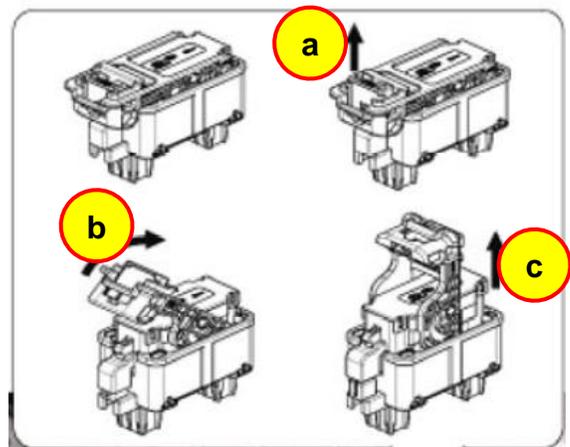


Tightening torque:

4.0 ~ 6.0 N.m (0.4 ~ 0.6 kgf.m,
3.0 ~ 4.4 lb-ft)

▲ WARNING

- Be sure to read and follow the “General Safety Information and Caution” before doing any work related with the high voltage system.
- Wait 5 minutes after disconnection to allow for high voltage system capacitor discharge.
- Failure to follow the safety guidelines may result in serious electrical injuries.



NOTICE

The safety plug disconnects both the PHEV Main and Sub High Voltage Battery.

2. Remove the following to access the PHEV Main and Sub High Voltage Battery:

- Rear Seat Lower Assembly.
- Rear Seat Back Assembly.
- Trunk Partition Board.
- Trunk Cover Board and Felt.
- Trunk Felt Side Trims on both sides.

Refer to the Service Manual for detailed removal instructions.



This diagram identifies both the Main and Sub High Voltage Battery Packs in the PHEV.



3. Disconnect the BMS and high voltage connectors (A) from the Sub High Voltage Battery.



4. Remove the mounting nuts and cooling duct (B) from the Sub High Voltage Battery.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



5. Remove the mounting bolts and Sub High Voltage Battery Pack from the vehicle.

Tool: 17mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

78.4 ~ 117.7N.m (8.0 ~ 12.0 kgf.m, 57.9 ~ 86.8lb-ft)



6. Remove the mounting bolts and cover from the Sub High Voltage Battery Pack.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

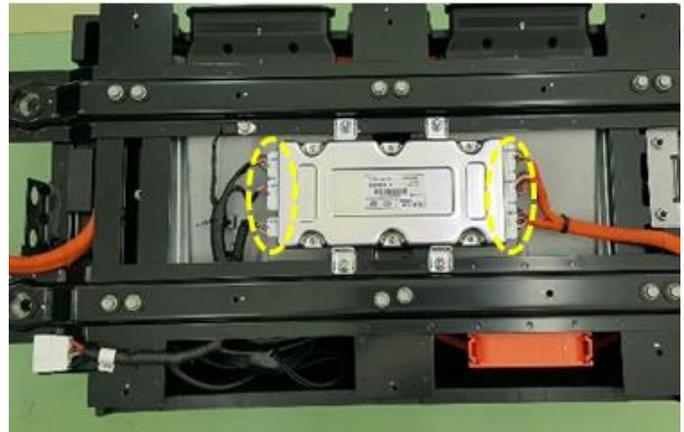
7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



7. Disconnect the BMS connectors and remove the Sub-BMS.

NOTICE

The old Sub-BMS ECU will be discarded and replaced later by the new SUB BMS P/N 37513-E6620QQH.



8. Loosen the ground bolt socket and mounting clips.

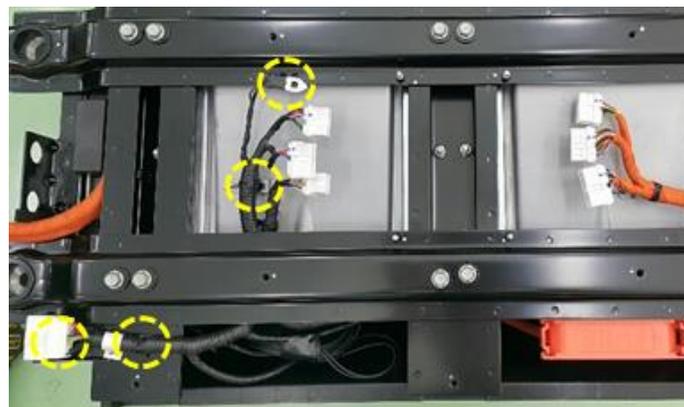
Pull out the wiring as shown in the picture to the right.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Trim tool remover and pocket flat head.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



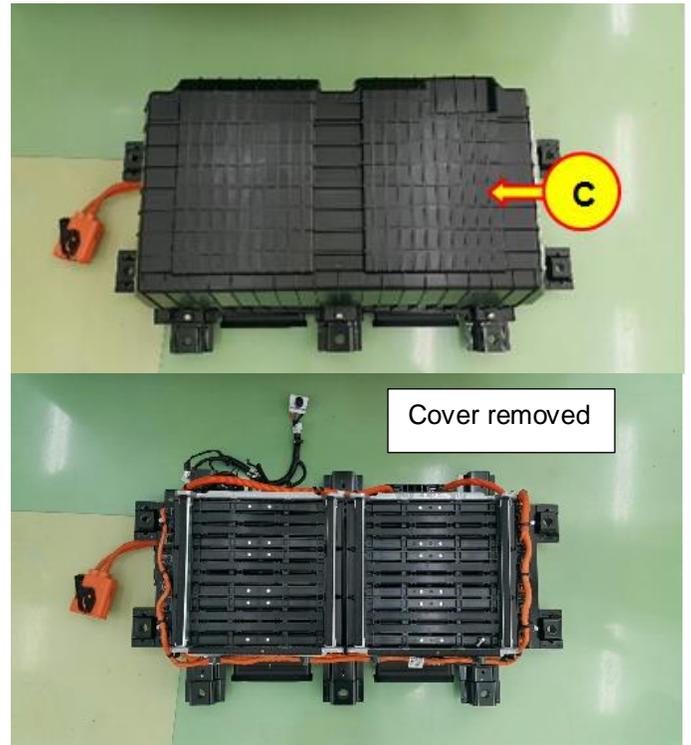
9. Place the Sub High Voltage Battery Pack upside down.

Remove the mounting bolts and the watertight case (C).

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



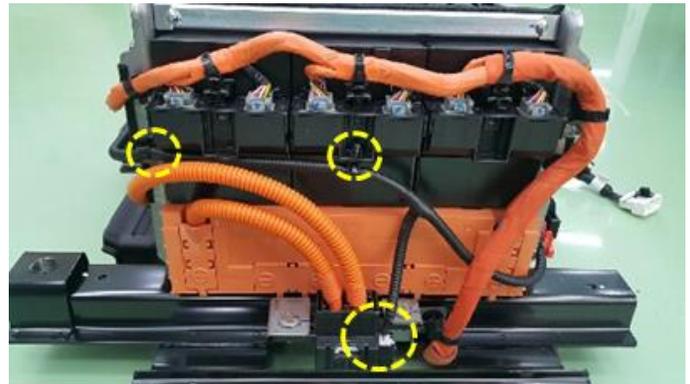
10. Remove the VPD mounting bolts and discard (NOTE: VPD will be discarded with the wiring).

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

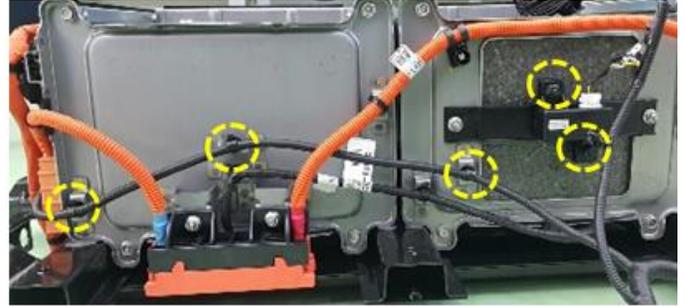


11. Remove the wiring mounting clips and disconnect the connector.

Tool: Trim tool remover and pocket flat head.



12. Remove the mounting clips and remove the VPD mounting bolts.
13. Remove and discard the existing Sub-BMS Wiring including VPD and its 2 mounting bolts.



14. Install the new **SUB BMS WIRING 37517-E6620QH**.

NOTICE

The new SUB BMS WIRING does not have a VPD, it is no longer needed.



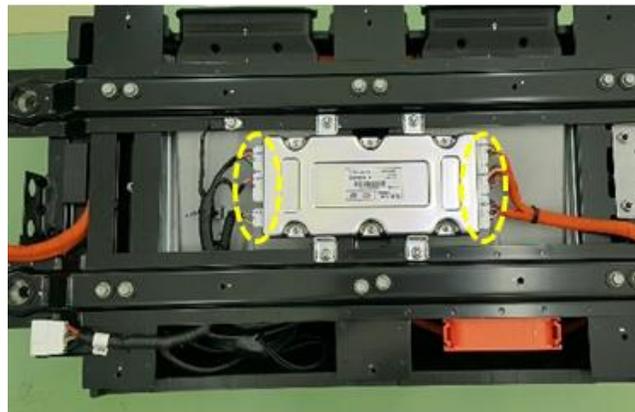
15. Reinstall the watertight cover to the Sub High Voltage Battery Pack.

Turn the battery pack back over on the cover side.

16. Install the new **SUB BMS 37513-E6620QQH**.

NOTICE

Make sure to fully connect all BMS connectors until a clicking sound is heard.



17. Reinstall the removed parts on the Sub High Voltage Battery Pack in reverse order of removal.

NOTE: The Main High Voltage Battery Pack will not be removed from the vehicle.

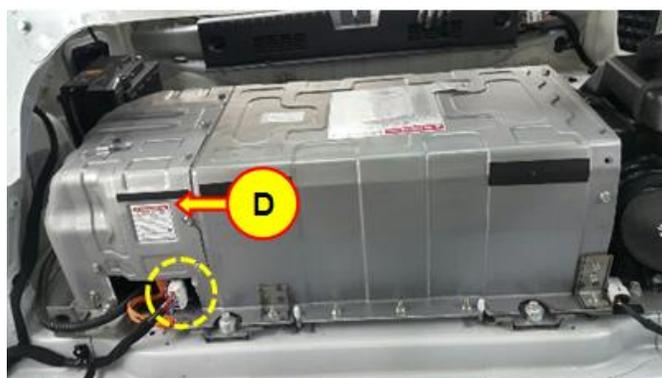


18. Loosen the mounting bolts and remove the front cover (D) of the Main High Voltage Battery Pack.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



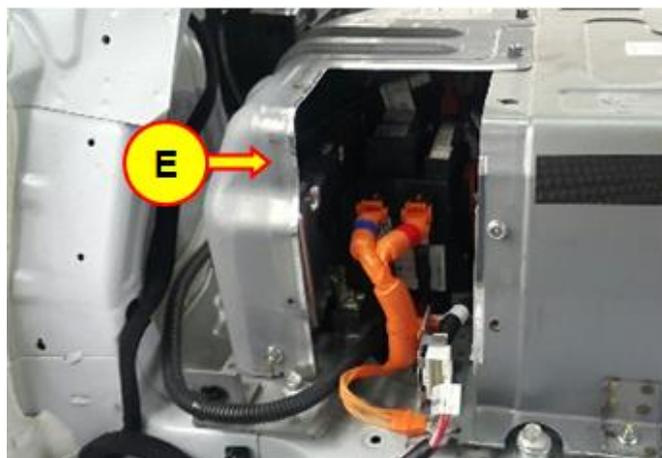
19. Disconnect the BMS connector

20. Loosen the mounting bolts and remove the rear cover (E) of the Main High Voltage Battery Pack.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



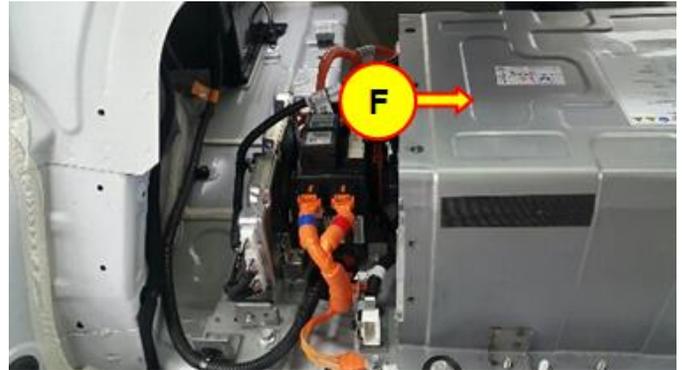
21. Loosen the mounting bolts, nuts, and remove the cover (F) of the Main High Voltage Battery Pack.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Ratchet 3/8".

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



22. Disconnect the OBC and CPU connectors.

Loosen the ground bolt.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



23. Remove the inverter power positive and negative cable terminals.

⚠ WARNING

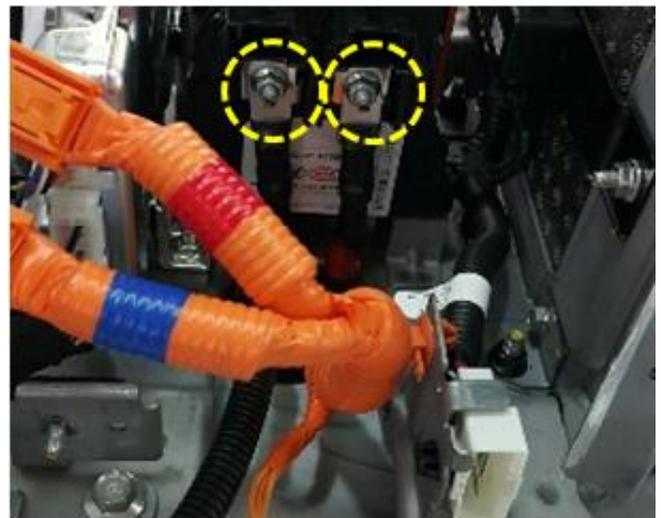
DO NOT allow the positive and negative cable terminals to contact each other. Tape each terminal temporarily with electrical tape to help prevent contact between the terminals.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Ratchet 3/8".

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



24. Disconnect the fan connector.



25. Remove the cooling duct mounting bolts and nuts.

Remove the harness retainers to the cooling fan.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Trim tool remover and pocket flat head.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)

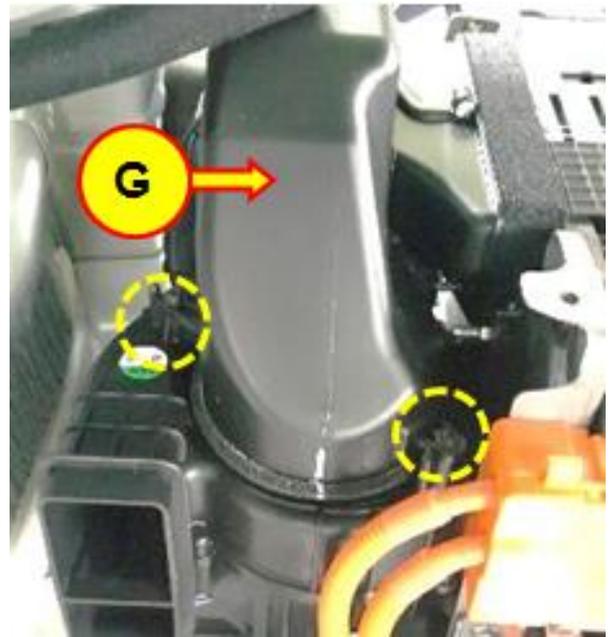


26. Remove the mounting screws and cooling duct (G).

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)

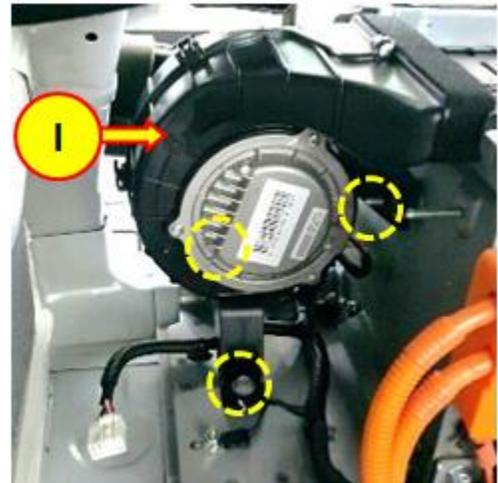


27. Disconnect the cooling fan connectors and mounting nuts to remove both cooling fans (H & I).

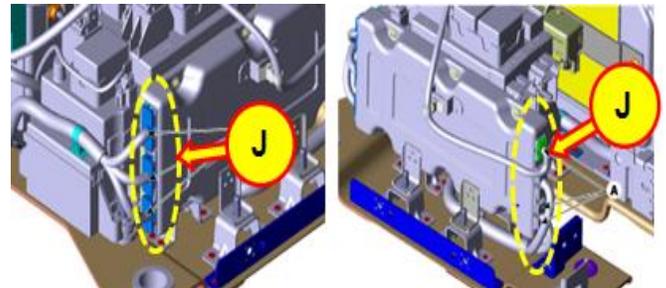
Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



28. Disconnect the BMS connectors (J).



29. Remove the mounting nuts and the Main BMS (K).

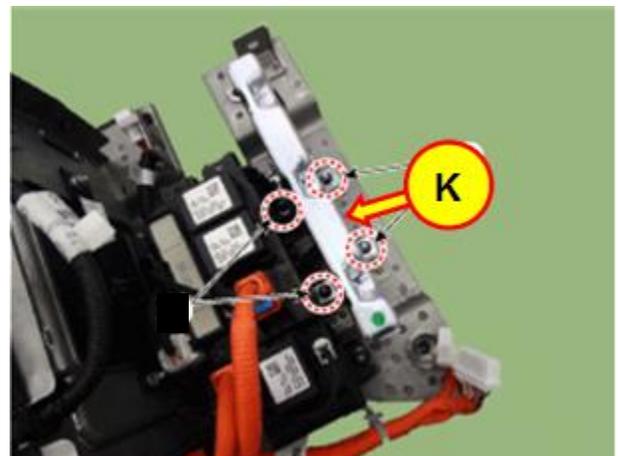
NOTICE

The old Main BMS will be discarded and replaced later by the new MAIN BMS P/N 37513-E6520QQH.

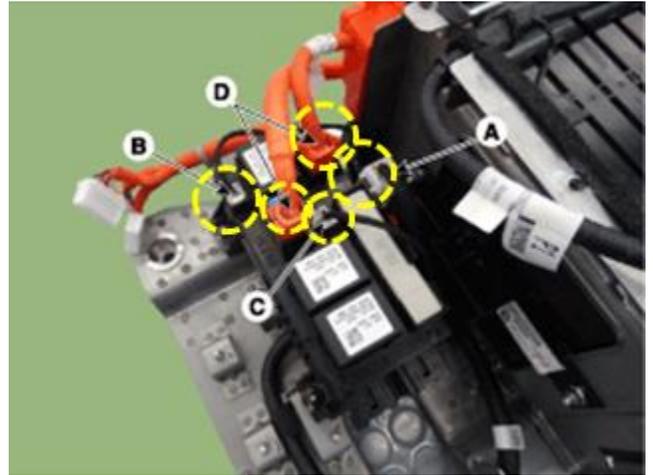
Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



30. Disconnect the Power Relay Assy. (PRA) connectors.

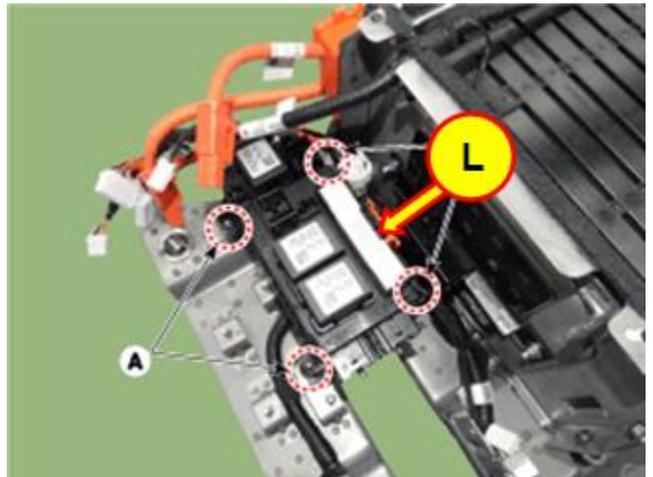


31. Remove the mounting bolts and remove the PRA (L).

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



View after PRA removed.



32. Remove the wiring mounting clips and ground bolt.

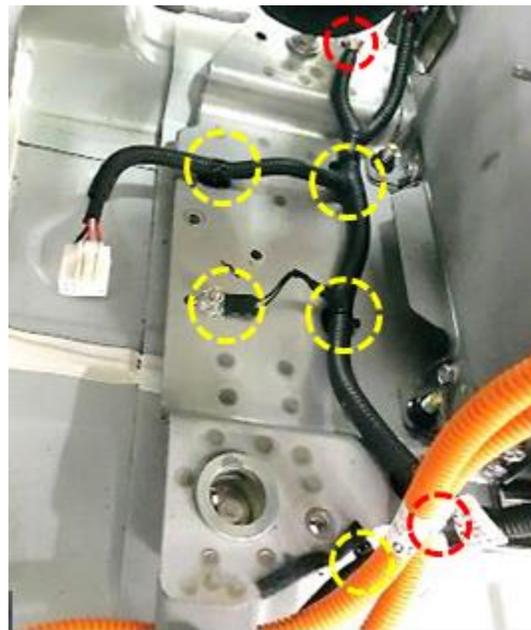
Disconnect the connector.

Tool: 10mm 3/8" socket + cordless 3/8" impact gun.

Trim tool remover and pocket flat head.

Tightening torque:

7.8 ~ 11.8N.m (0.8 ~ 1.2kgf.m, 5.8 ~ 8.7lb-ft)



33. Remove the main wiring harness mounting clips.

Tool: Trim tool remover and pocket flat head.



34. Remove the mounting clips, VPD nuts, and ground bolt.
35. Remove and discard the existing Main BMS Wiring, the VPD and its 2 mounting nuts.

NOTICE

The new MAIN BMS WIRING does not have a VPD. It's no longer needed.



36. Install the new MAIN BMS WIRING 37517-E6520QQH.



37. Reinstall the PRA.
38. Install the new MAIN BMS 37513-E6520QQH.

NOTICE

Make sure to fully connect all BMS connectors until a clicking sound is heard.



39. Reinstall all the remaining parts in the reverse order of removal.
40. Perform a brief test drive for at least 10 minutes to ensure the vehicle is operating normally. If possible, confirm the vehicle can take a charge by looking for the green charging light on the top center of the dash.
41. Perform a **Fault Code Search** of All Systems by GDS to make sure there are no stored DTC.
42. Restore the recorded customer radio presets and set the time.