



GROUP
Safety Recall

MODEL
**2017-2018MY
Optima Plug-in
Hybrid (JF PHEV)**

NUMBER
SC162

DATE
May 2018

SAFETY RECALL CAMPAIGN

**SUBJECT: HIGH VOLTAGE MAIN & SUB BATTERY
MANAGEMENT (BMS) & WIRING HARNESS REPLACEMENT (SC162)**

This bulletin provides the procedure to remove the currently installed Voltage Protection Device (VPD) switch and install two newly designed Battery Management Systems (BMSs) that contain new Overvoltage Protection Devices (OPDs) and corresponding wiring harnesses in certain 2017-2018MY Kia Optima Plug-In Hybrid (JF PHEV) vehicles, produced from August 25, 2016 through September 11, 2017. The vehicle's battery VPD is designed to protect the high voltage battery module by detecting any swelling of the battery module. In certain circumstances, the VPD switch can be inadvertently activated. If the VPD switch is activated, electricity to the vehicle's electric motor may be disconnected. If this occurs while the vehicle is driven in Electric Vehicle (EV) mode, the vehicle may experience a loss of motive power and may be accompanied by the illumination of the Hybrid System Warning Light. A loss of motive power may increase the risk of a crash. This condition does not occur in Hybrid Mode.

Before conducting the procedure, verify the vehicle is included in the list of affected VINs.

DANGER

When performing this procedure, follow all EV battery safety procedures found in the Service Materials → Service Info → EV Battery System → General Safety Information and Caution” chapter in the applicable Shop Manual, and wear all required Personal Protection Equipment (PPE).

*** NOTICE**

There is no charge to the vehicle owner for this repair. Under applicable law, you may not sell or otherwise deliver any affected vehicle until it has been repaired pursuant to the procedures set forth in this bulletin.

*** NOTICE**

To assure complete customer satisfaction, always remember to refer to WebDCS Warranty Coverage (validation) Inquiry Screen (Service → Warranty Coverage → Warranty Coverage Inquiry) for a list of any additional campaigns that may need to be performed on the vehicle before returning it to the customer.

File Under: <Safety Recall>

Circulate To: General Manager Service Manager Parts Manager
 Service Advisors Technicians Body Shop Manager Fleet Repair

SUBJECT:

HIGH VOLTAGE MAIN & SUB BATTERY MANAGEMENT (BMS) & WIRING HARNESS REPLACEMENT (SC162)

Sub High Voltage Battery BMS and Wiring Replacement Procedure:

1. With the ignition off, open cargo trunk lid, remove battery cover on the right (passenger) side, and disconnect the Negative (-) and Positive (+) cables from the battery.



2. Remove the luggage floor cargo mat.

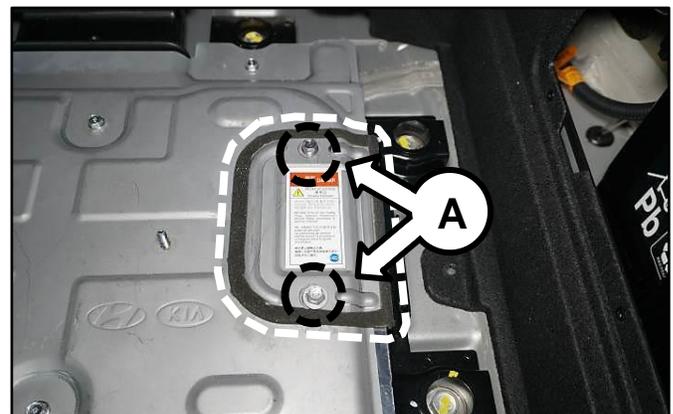


3. Remove the inner luggage foam cover.



4. Remove the two (2) safety plug cover bolts (A).

Tightening torque for bolt (A):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



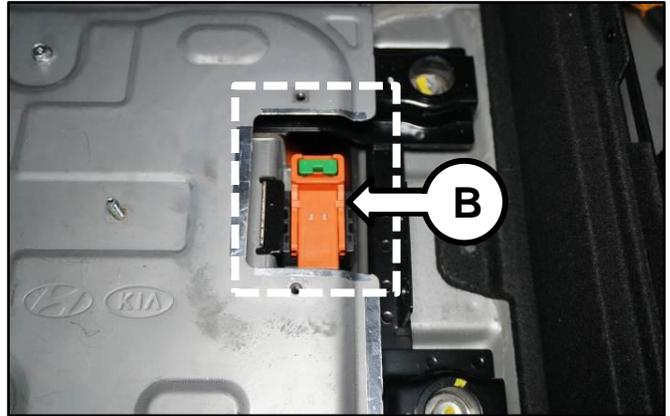
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5. Remove the safety plug (B) by referring to the “Hybrid Control System → High Voltage Shut-off Procedures” chapter in the applicable Shop Manual on KGIS.

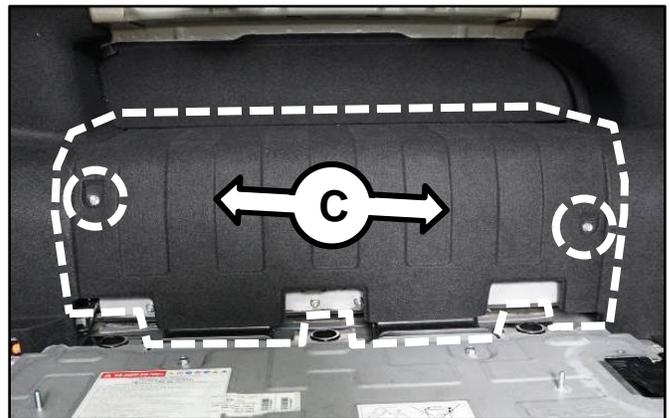
⚠ DANGER

Failure to follow the High Voltage Shut-off Procedure may result in serious electrical injuries or death.

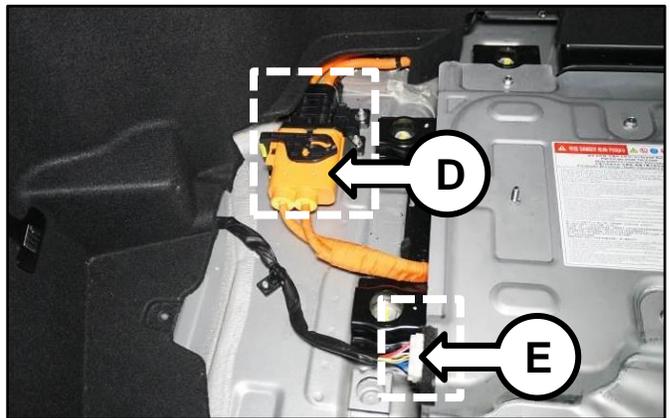


6. Remove the two (2) battery trunk trim cover retaining bolts (C) and remove the cover.

Tightening torque for bolt (C):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



7. Disconnect the Sub High Voltage cable connector (D) and BMS connector (E).



8. Remove the rear cargo transverse trim.



SUBJECT: HIGH VOLTAGE MAIN & SUB BATTERY MANAGEMENT (BMS) & WIRING HARNESS REPLACEMENT (SC162)

- 9. Remove the left (driver) side luggage trim.

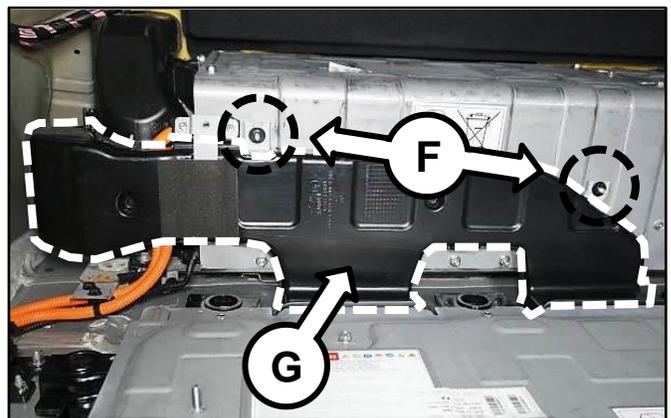


- 10. Remove the right (passenger) side luggage trim.



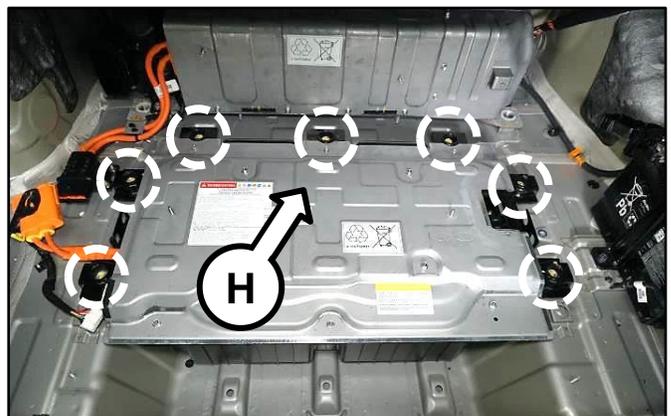
- 11. Remove the two (2) Sub High Voltage Battery cooling duct retaining nuts (F) and remove the cooling duct (G).

**Tightening torque for nut (F):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)**



- 12. Remove the seven (7) Sub High Voltage Battery Pack retaining bolts (H).

**Tightening torque for cover bolts:
18.0 – 26.5 lb. ft (78.5 – 118.0 N.m,
8.0 – 12.0 kgf.m)**



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13. Attach and secure a lifting strap/chain using the two (2) battery tabs (I) located on the sides of the battery as shown. Using an engine hoist, carefully remove the HV battery pack from the cargo area and place battery over a clean surface.

★ NOTICE

Be careful not to damage any surrounding parts and trim when removing battery pack.



14. Remove the ten (10) sub high voltage battery cover bolts to remove the top cover.

Tightening torque for cover bolts:
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



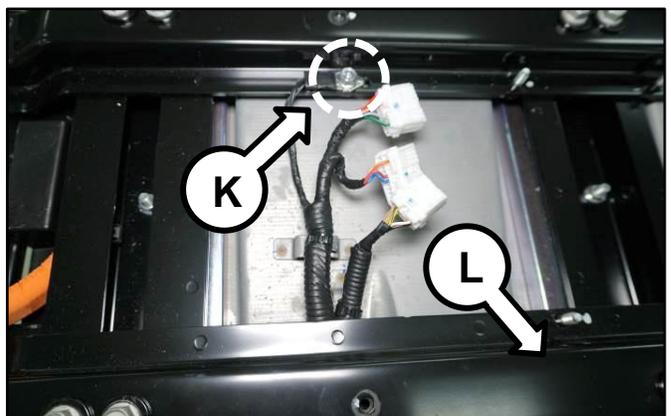
15. Disconnect the Sub Battery Management System (SUB-BMS) ECU connectors on left and right side of the ECU. Loosen the four (4) Sub BMS retaining nuts (J) and remove the SUB-BMS ECU assembly.

Tightening torque for nut (J):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



16. Remove the Ground (–) bolt (K) to detach the SUB-BMS wiring harness connectors from the frame (L).

Tightening torque for nut (L):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



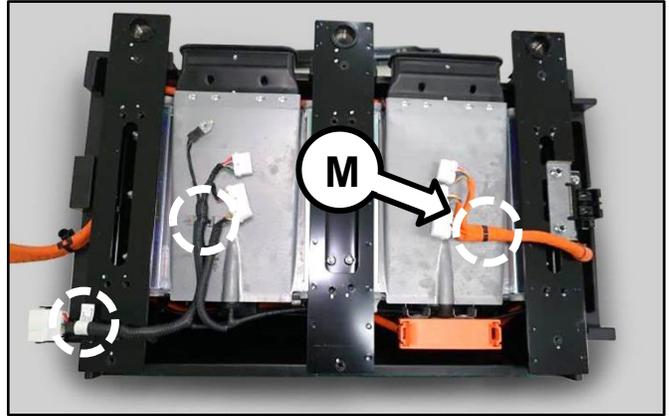
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- Disconnect the three (3) partial SUB-BMS wiring harness retaining clips (M) shown and detach the two (2) wire harnesses.

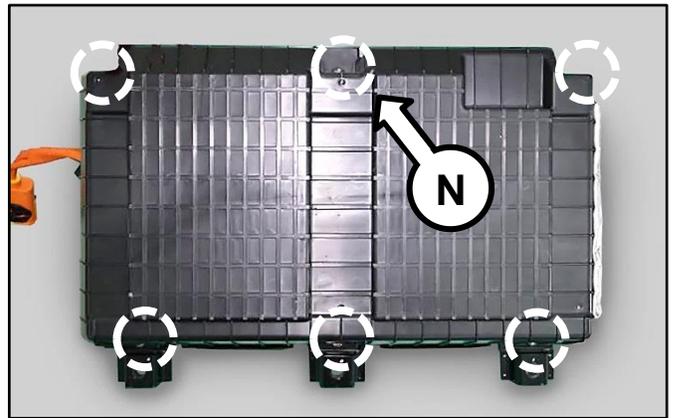
*** NOTICE**

Ensure that the loose SUB-BMS wire harnesses and connectors are moved aside before turning the HV Battery pack upside down.



- Carefully place the Sub High Voltage Battery Pack upside down and remove the six (6) Sub High Voltage Battery Pack Water Tight Case bolts (N) and remove the case/cover.

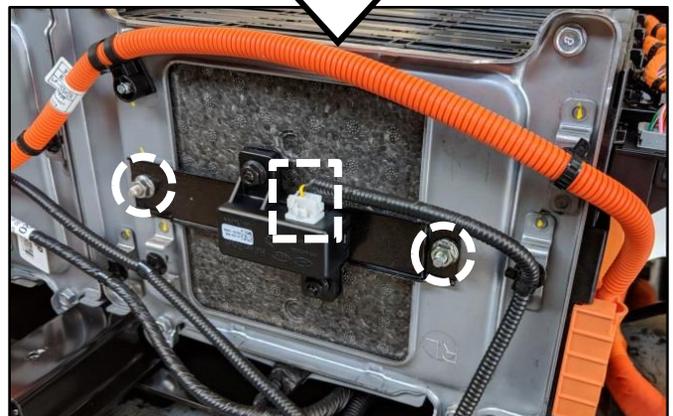
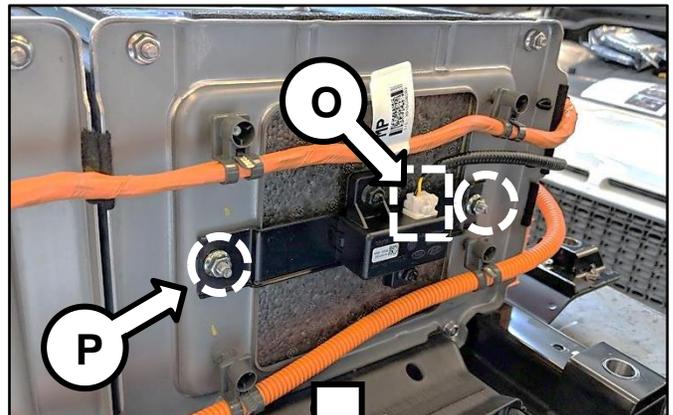
Tightening torque for nut (O):
 1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
 0.8 - 1.2 kgf.m)



- Disconnect the Voltage Protective Device (VPD) connector (O), then remove the two (2) retaining nuts (P) and remove the VPD located on the back side. Repeat for opposite front side VPD.

*** NOTICE**

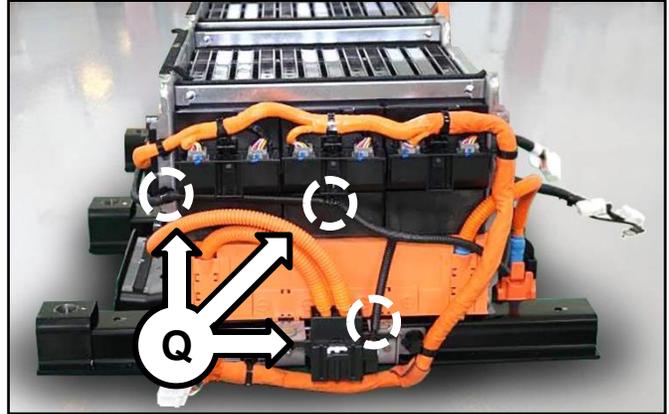
Discard the existing Sub-BMS wiring, including VPD with bracket and retaining hardware.



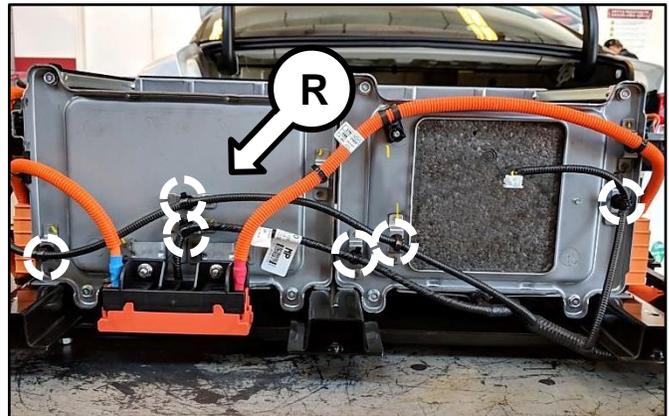
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20. Detach the harness by disconnecting the three (3) retaining clips (Q) located on the right side.



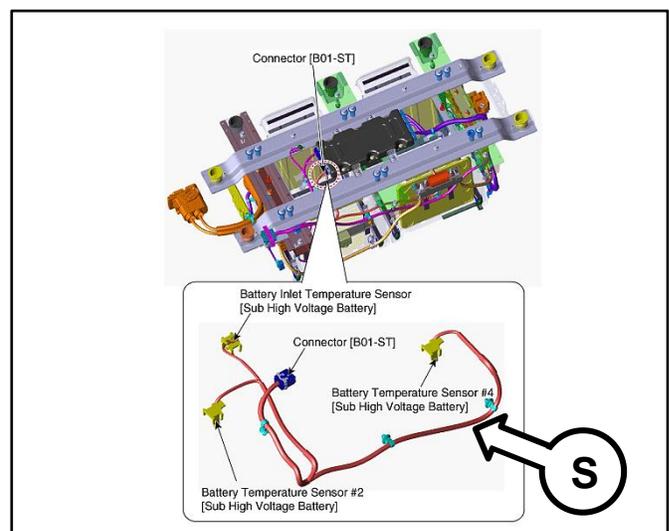
21. Detach the wire harness from the remaining six (6) clips to completely remove the existing SUB-BMS Wiring Harness (R) located on the front side.



22. Install the new and updated SUB-BMS Wiring harness (S) in the reverse order of removal.

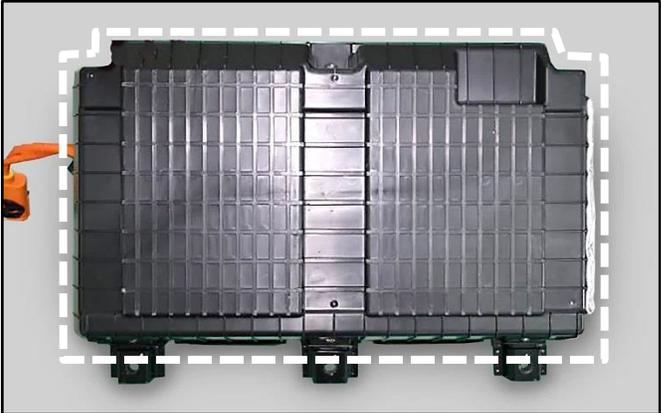
* NOTICE

The new and updated SUB-BMS Wiring Harness (T) does not feature the Voltage Protective Device (VPD) which has been replaced by the OPD inside the new SUB-BMS.



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- 23. Reinstall the Sub High Voltage Battery Water Tight Case in the reverse order of removal.

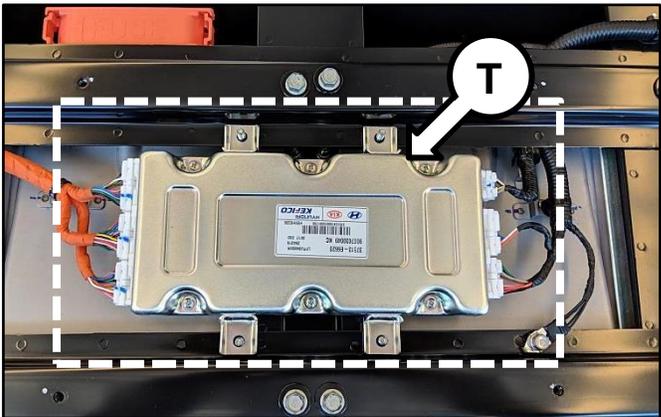


- 24. Carefully turn the Sub High Voltage Battery Pack over.

- 25. Install the new SUB-BMS ECU (T) in the reverse order of removal.

Tightening torque for nut:
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)

*** NOTICE**
Ensure that the **SUB-BMS ECU** connectors click when inserting and are secured into place.



- 26. Reinstall the Sub High Voltage Battery cover. **DO NOT install the Sub High Voltage Battery** into the car until completing the Main BMS and Wiring replacement outlined on following pages.

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HIGH VOLTAGE MAIN & SUB BATTERY MANAGEMENT (BMS) & WIRING HARNESS REPLACEMENT (SC162)

Main High Voltage Battery BMS and Wiring Replacement Procedure:

1. Remove rear seat assembly by referring to the "Body (Interior and Exterior → Rear Seat → Rear Seat Assembly → Repair procedures" chapter in the applicable Shop Manual on KGIS.



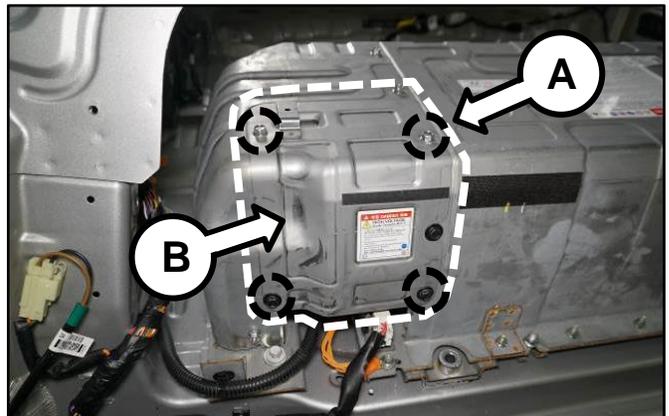
2. Remove the luggage partition panel assembly.

**Tightening torque for retaining bolts:
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)**



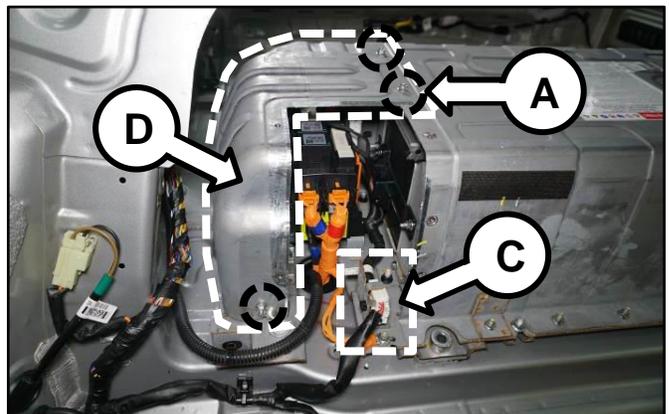
3. Remove the Main High Voltage Battery front cover retaining bolts (A) and remove the cover (B).

**Tightening torque for bolt (A):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)**



4. Disconnect the BMS connector (C) and remove the remaining battery rear cover retaining bolts (A) and remove the rear cover (D).

**Tightening torque for nut (A):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)**

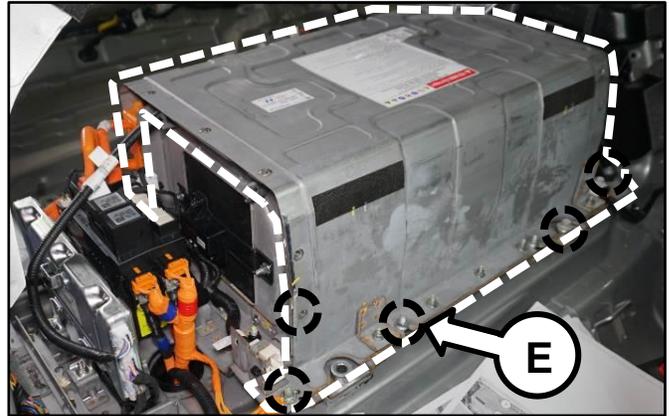


SUBJECT:

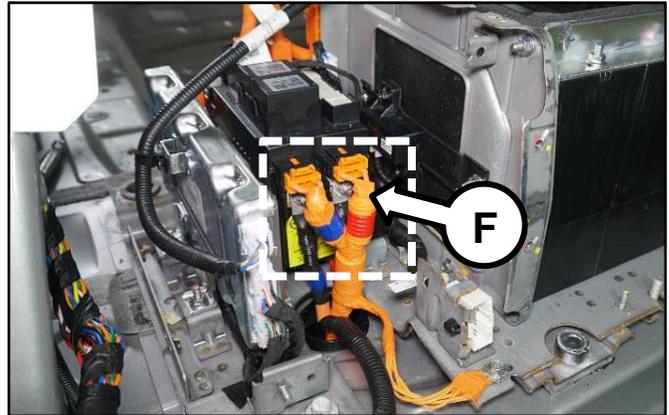
HIGH VOLTAGE MAIN & SUB BATTERY MANAGEMENT (BMS) & WIRING HARNESS REPLACEMENT (SC162)

5. Loosen the main battery cover retaining bolts (E) and remove the outlined battery cover. Only five are shown from cabin area view, there are two additional corner bolts, accessible via the cargo area.

Tightening torque for nut (E):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)

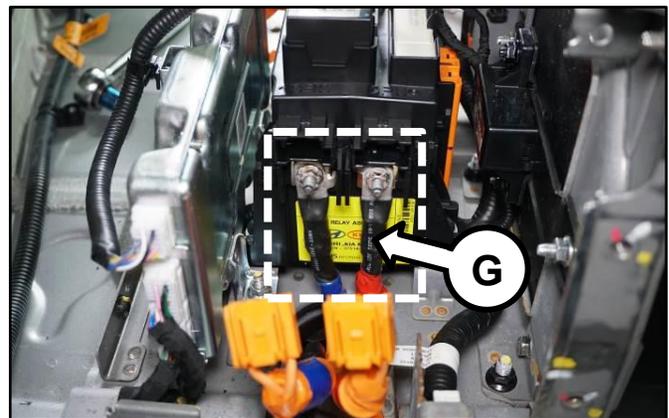


6. On the Power Relay Assembly (PRA), disconnect the Oil Pump Unit (OPU) and On Board Charger (OBC), red and blue labeled connectors (F).

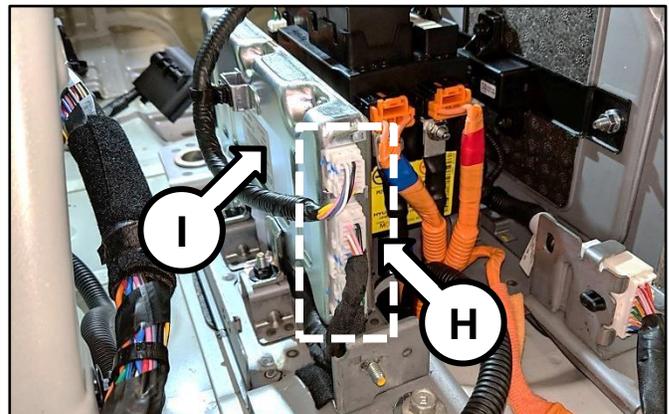


7. Disconnect the inverter positive (red) and the negative (blue) labeled cables (G).

Tightening torque for retaining nut:
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



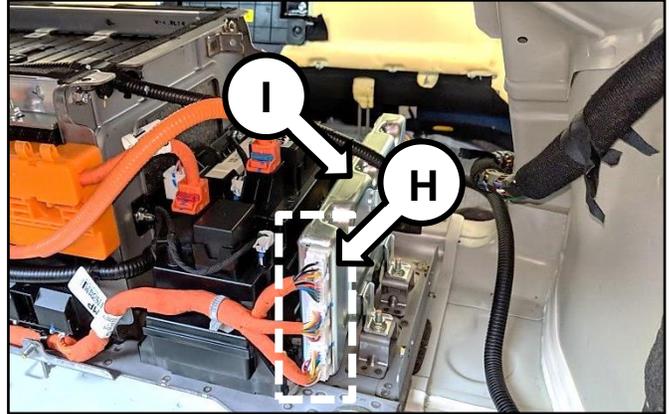
8. Disconnect the connectors (H) of the Main BMS ECU (I).



SUBJECT:

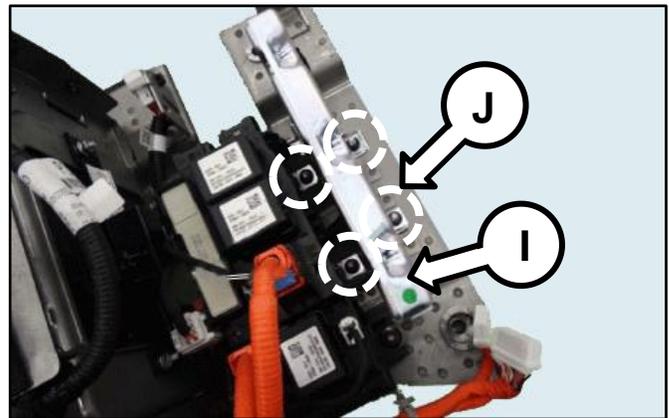
HIGH VOLTAGE MAIN & SUB BATTERY MANAGEMENT (BMS) & WIRING HARNESS REPLACEMENT (SC162)

9. Disconnect the connectors (H) on the opposite side of the Main BMS ECU (I).

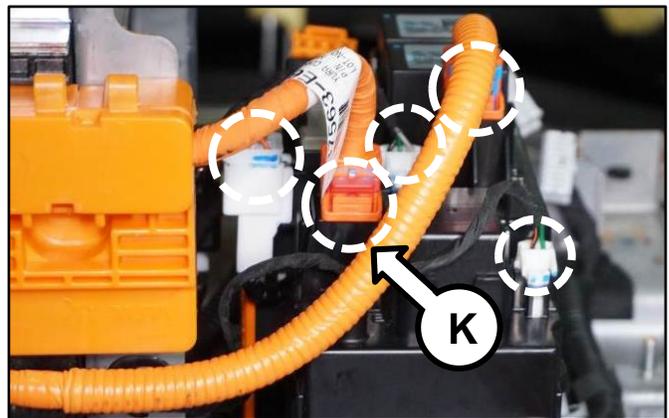


10. Remove the four (4) Main BMS ECU retaining nuts (J) and remove the Main BMS ECU (I) from the PRA.

Tightening torque for nut (J):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)

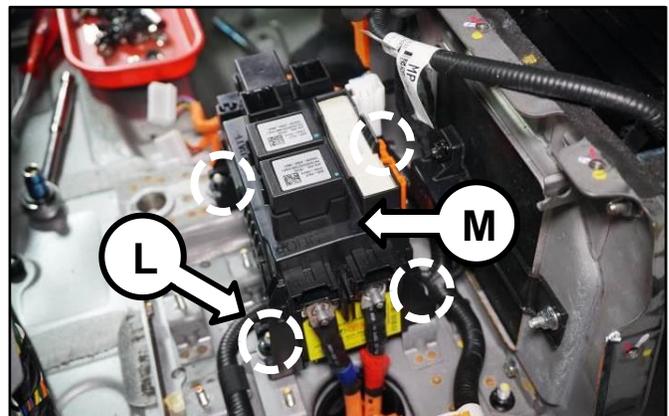


11. Disconnect the five (5) connectors (K) shown, which include two (2) PRA connectors, the OBC connector, the Pre-Charge Relay connector and the Inverter Power (red and blue) labeled connectors.



12. Loosen the four (4) PRA retaining nuts (L) shown and carefully remove the Power Relay Assembly (M). Carefully place the PRA aside in a safe area to reinstall later.

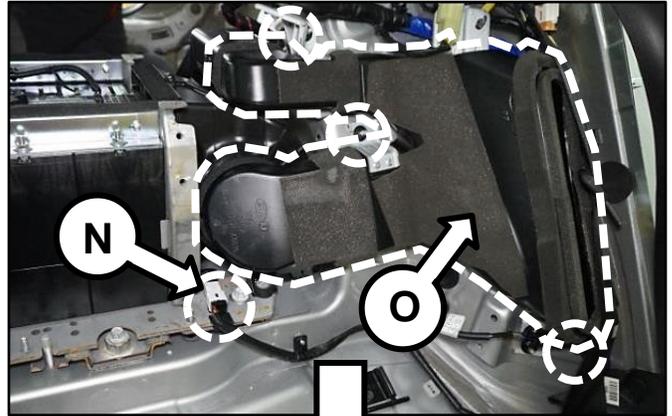
Tightening torque for nut (L):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



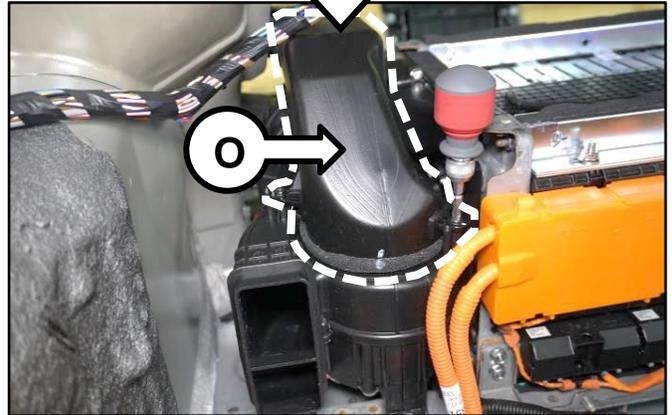
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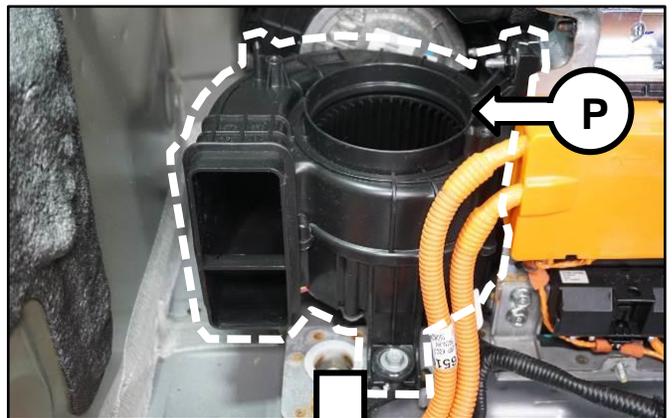
13. Disconnect the Main High Voltage Battery cooling fan connector (N) and remove the inlet cooling duct (O).



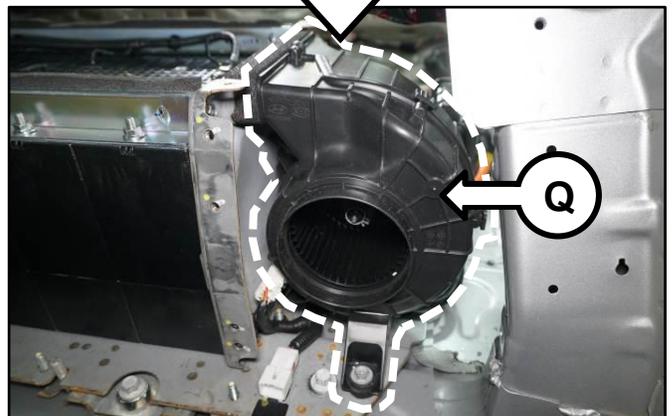
**Tightening torque for bolt/nut:
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)**



14. Remove the Main High Voltage Battery cooling fans, front cooling fan (P) and rear cooling fan (Q).



**Tightening torque for bolt/nut:
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)**



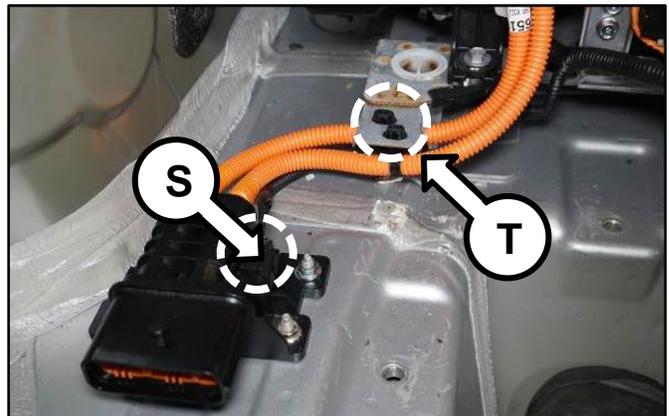
SUBJECT:

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15. Remove the four (4) Main BMS wiring harness retaining clips (R).

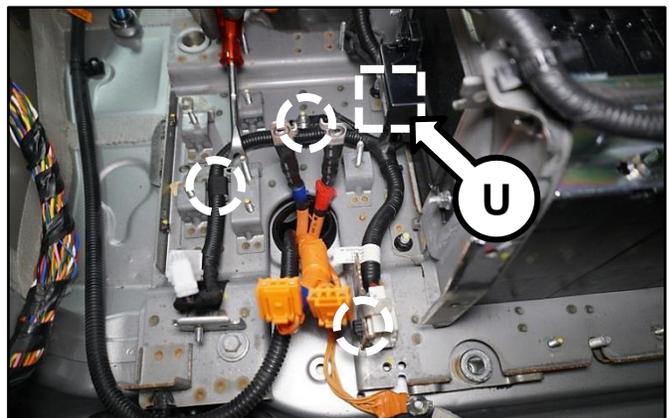


16. On the orange high power cable, disconnect the Main BMS wiring harness interlock connector (S) and the wiring retaining clip (T).



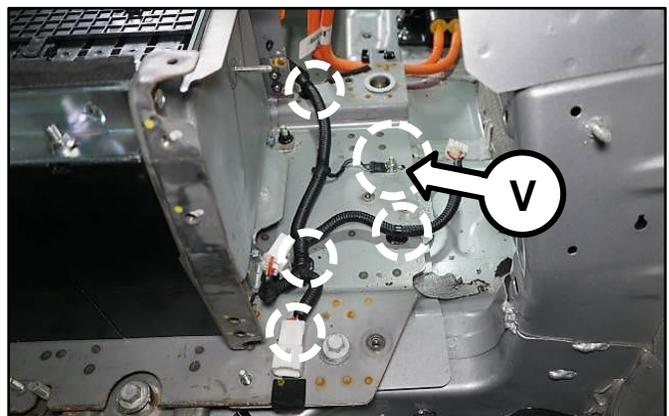
17. Disconnect the Voltage Protective Device (VPD) (U) connector and the three (3) Main BMS wiring harness retaining clips shown.

Tightening torque for retaining nut:
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)



18. Disconnect the remaining Main BMS wiring retaining clips and the grounding nut (V), and remove the Main BMS wiring harness.

Tightening torque for ground nut (V):
1.8 - 2.7 lb. ft (7.9 – 11.8 N.m,
0.8 - 1.2 kgf.m)

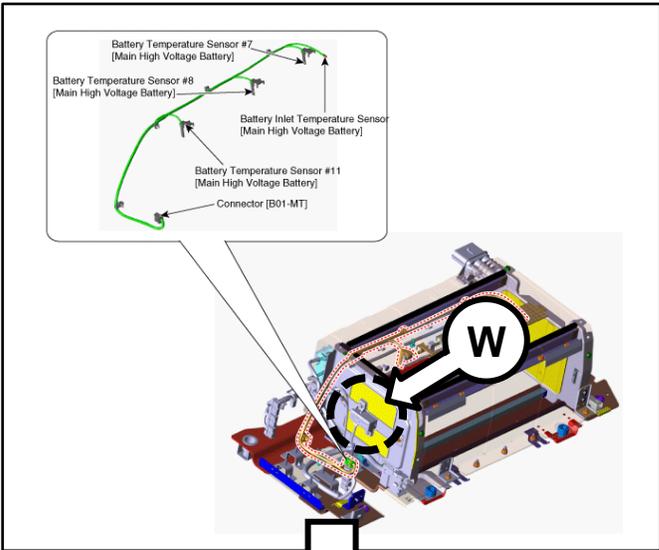


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19. Install the new and improved, Main BMS wiring harness, without VPD (W), in the reverse order of removal.

*** NOTICE**

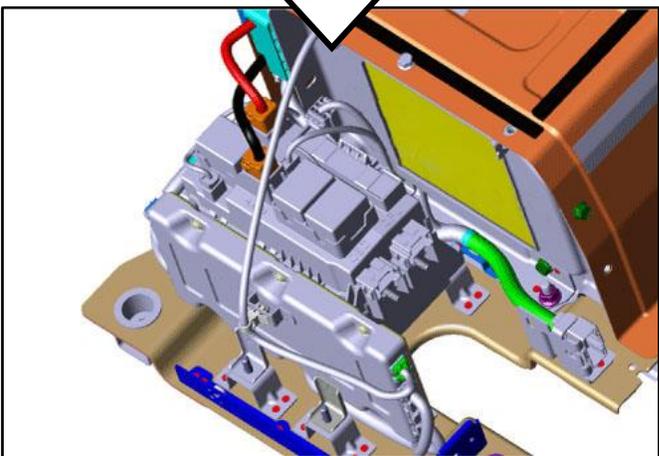
Discard the VPD (W) with bracket and retaining hardware.

20. Install the new and improved Main BMS ECU to the old PRA assembly in the reverse order of removal.

*** NOTICE**

The new and updated Main BMS Wiring Harness (T) does not feature the Voltage Protective Device (VPD) which has been replaced by the OPD inside the new Main BMS.



21. Reinstall all removed components, including the sub battery pack and its parts, in the reverse order of removal.

*** NOTICE**

Ensure all connections are inserted and secured properly.

22. Using KDS, confirm no DTCs are present.
23. Perform a short test drive to confirm the vehicle is operating as designed, and that no warning lamps come on.

SUBJECT:

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AFFECTED VEHICLE RANGE:

Model	Production Date Range
Optima (JF PHEV)	August 25, 2016 through September 11, 2017

REQUIRED PART:

Part Name	Part Number	Figure
MAIN BMS	37513 A8520QQK	
SUB BMS	37513 E6620QQK	
MAIN BMS Wiring	37517 E6520QQK	
SUB BMS Wiring	37517 E6620QQK	

WARRANTY INFORMATION:

N Code: N99 C Code: C99

Claim Type	Causal P/N	Qty.	Repair Description	Labor Op Code	Op Time	Replacement P/N	Qty.
R	37513 A8520	0	(SC162) Main and Sub BMS and Wiring Replacement	181019R0	2.0 M/H	37513 A8520QQK	1
						37513 E6620QQK	1
						37517 E6520QQK	1
						37517 E6620QQK	1

NOTE: If necessary, use sublet code 'RX' for rental expense reimbursement.

*** NOTICE**

VIN inquiry data for this repair is provided for tracking purposes only. Kia retailers should reference SC162 when accessing the WebDCS system.