



Technical Service Bulletin

GROUP CAMPAIGN	NUMBER 20-01-018H
DATE APRIL, 2020	MODEL(S) Kona Electric (OS EV)

SUBJECT: HIGH VOLTAGE BATTERY MONITORING UPDATE
(SERVICE CAMPAIGN 960)

★ IMPORTANT

*****Dealer Stock and Retail Vehicles*****

Dealers must perform this Service Campaign on all affected vehicles prior to customer retail delivery and whenever an affected vehicle is in the shop for any maintenance or repair.

When a vehicle arrives at the Service Department, access Hyundai Motor America's "Vehicle Information Screen (VIS)" screen via WEBDCS to identify open Campaigns.

Description: This bulletin provides instructions for:

- A. High Voltage Battery Inspection.
- B. "NO PASS" Inspection Result: The campaign cannot currently be completed. Perform TSB 20-EE-001H as a warranty claim, then return to complete this campaign.
- C. "PASS" Inspection Result: Perform GDS software updates to the following 4 systems to update the High Voltage Battery Monitoring:
 - a. BMS (Battery Management System)
 - b. IGPM (Integrated Gateway Power Module)
 - c. MCU (Motor Control Unit)
 - d. VCULDC (Vehicle Control Unit & Low DC-DC Converter)

Applicable Vehicles: Certain 2019-2020MY Kona Electric (OS EV)

Warranty Information:

Model	Op. Code	Operation	Op. Time	Causal Part	Nature	Cause
Kona Electric (OS EV)	00D005R0	BMS & MCU & VCULDC & IGPM UPGRADE	0.7 M/H	375A0-K4000	I11	ZZ3

NOTE 1: Submit Claim on Campaign Claim Entry Screen.

NOTE 2: If a part is found in need of replacement while performing Service Campaign 960 and the affected part is still under warranty, submit a separate warranty 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.

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

Service Procedure:

A. High Voltage Battery Inspection

1. Connect GDS and display Battery Management (BMS) system Data Analysis.

Scroll down to check **“Isolation Resistance”** parameter value.

Sensor Name(170)	Value	Unit	Link Up
Min Cell Voltage No.	69	-	
Auxiliary Battery Voltage	14.6	V	
Accumulative Charge Current	3752.5	Ah	
Accumulative Discharge Current	3761.2	Ah	
Accumulative Charge Power	1434.0	kWh	
Accumulative Discharge Power	1404.8	kWh	
Accumulative Operating Time	1343699	Sec	
MCU Ready	YES	-	
MCU Main Relay Off Request	NO	-	
MCU Controllable	YES	-	
VCU Ready	YES	-	
Inverter Capacitor Voltage	386	V	
Motor Speed	0	RPM	
Isolation Resistance	1000	kOhm	
Battery Cell Voltage 1	3.94	V	
Battery Cell Voltage 2	3.94	V	
Battery Cell Voltage 3	3.94	V	
Battery Cell Voltage 4	3.94	V	
Battery Cell Voltage 5	3.94	V	

2. Continue scrolling down to check **“Battery Cell Voltage Deviation”** parameter value.

Sensor Name(170)	Value	Unit	Link Up
Battery Cell Voltage 81	3.94	V	
Battery Cell Voltage 82	3.94	V	
Battery Cell Voltage 83	3.94	V	
Battery Cell Voltage 84	3.94	V	
Battery Cell Voltage 85	3.94	V	
Battery Cell Voltage 86	3.94	V	
Battery Cell Voltage 87	3.94	V	
Battery Cell Voltage 88	3.94	V	
Battery Cell Voltage 89	3.94	V	
Battery Cell Voltage 90	3.94	V	
Battery Cell Voltage 91	3.94	V	
Battery Cell Voltage 92	3.94	V	
Battery Cell Voltage 93	3.94	V	
Battery Cell Voltage 94	3.94	V	
Battery Cell Voltage 95	3.94	V	
Battery Cell Voltage 96	3.94	V	
Available Charge Power	130.14	kW	
Available Discharge Power	179.60	kW	
Battery Cell Voltage Deviation	0.00	V	

A. i) For vehicles less than 22,500 miles:

- Determine High Voltage Battery Inspection result based on this table:

ii) For vehicles more than 22,500 miles:

- Assume PASS result and go to step-C

For vehicles with less than 22,500 miles:		
Result	Isolation Resistance	Battery Cell Voltage Deviation
PASS (Go to Step-C)	More than 900 kOhm	Less than 0.10 V
NO PASS (Go to Step-B)	900 kOhm or less	0.10V or more

Inspection Result Action

B. NO PASS:

The campaign cannot currently be completed.

Perform TSB 20-EE-001H as a warranty claim, then return to complete this campaign.

C. PASS:

Continue with the below steps 1-3 to perform the Multi-ECU update:

(NOTE: Refer to TSB 15-GI-001 for the general GDS Mobile ECU update procedures).

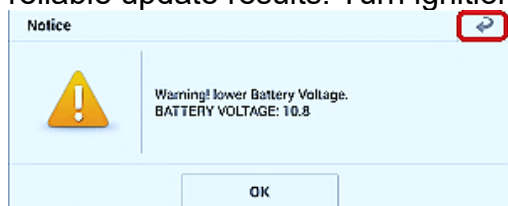
1. Perform the GDS ECU updates for each of the 4 systems as shown on the next page.
2. After successful completion of all 4 system updates, perform an All Fault Search for Diagnostic Trouble Codes and erase any DTC.
3. Confirm normal vehicle operation.

! WARNING

- **THE 12V BATTERY VOLTAGE CHECK IS CRITICAL FOR THIS MULTI- ECU UPDATE AS IT WILL DRAW DOWN THE 12V BATTERY FOR 40 MINUTES AT IGNITION ON.**
- **STOCK VEHICLES ARE PRONE TO LOW BATTTERY CONDITION, SO IT IS BEST TO OPERATE A STOCK VEHICLE AT READY ON FOR 20 MINUTES PRIOR TO STARTING THE MULTI-ECU UPDATE.**
- **THIS WILL ENSURE 12V BATTERY WILL BE CHARGED TO AN ADEQUATE LEVEL, PREVENTING POTENTIAL UPDATE FAILURE OR CONTROLLER DAMAGE.**

GDS Vehicle Battery Voltage Warning:

If voltage is below 12 volts as per the below GDS warning, then select **Back** and operate the vehicle in Ready mode for at least 20 minutes to ensure an adequate battery state of charge for reliable update results. Turn ignition back on, and then retry the ECU update again.



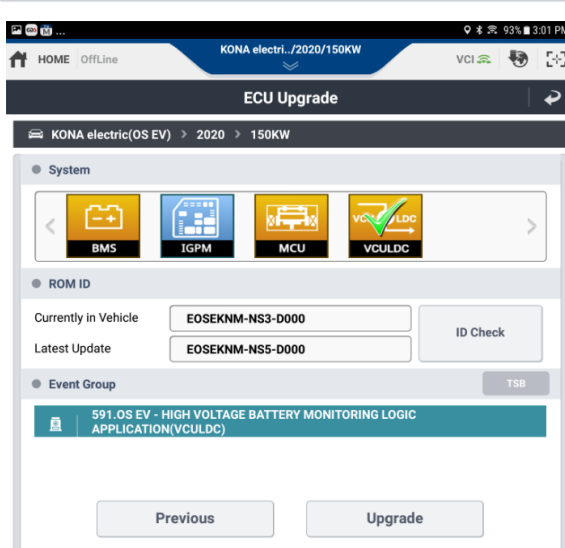
SUBJECT:**HIGH VOLTAGE BATTERY MONITORING UPDATE
(SERVICE CAMPAIGN 960)****GDS Information:****NOTICE**

You must initially perform GDS ECM Update in Auto Mode.

If ECM Update starts but then fails in Auto Mode, perform update in Manual Mode to recover.

Event #	Description
589*	OS EV - HIGH VOLTAGE BATTERY MONITORING LOGIC APPLICATION(BMS)
590*	OS EV - HIGH VOLTAGE BATTERY MONITORING LOGIC APPLICATION(MCU)
591*	OS EV - HIGH VOLTAGE BATTERY MONITORING LOGIC APPLICATION(VCULDC)
592*	OS EV - HIGH VOLTAGE BATTERY MONITORING LOGIC APPLICATION(IGPM)

(*or later event if one is shown for each system)

GDS Screenshots showing the Multi-ECU (4 System) Updates to be done:

ROM ID INFORMATION TABLE:

1) BMS:

VEHICLE	SYSTEM	BMS P/No.	ROM ID	
			OLD	NEW
OS EV	BMS	375A0-K4000	5302	6062
			5402	
			5502	
			5702	
			5802	
			5902	
375A0-K4001	6002	375A0-K4001	6022	6562
			6042	
			6052	
			6202	
			6222	
			6242	
375A0-K4002	6542	375A0-K4002	6402	6742
			6502	
			6702	
			6732	
375A0-K4050	6060	375A0-K4050	5300	6060
			5400	
			5500	
			5700	
			5800	
			5900	
375A0-K4051	6060	375A0-K4051	6000	6560
			6020	
			6040	
			6050	
			6200	
			6220	
375A0-K4052	6740	375A0-K4052	6240	6740
			6540	
			6550	
			6400	
375A0-K4052	6740	375A0-K4052	6500	6740
			6700	
			6730	
			6730	

2) MCU:

VEHICLE	SYSTEM	MCU P/No.	ROM ID	
			OLD	NEW
OS EV	MCU	36601-0E170	EOSEJDL-MS0-D000 EOSEJDL-MS1-D000 EOSEKNLMS1-D000	EOSEKNLMS2-D000

3) VCULDC:

VEHICLE	SYSTEM	VCULDC P/No.	ROM ID	
			OLD	NEW
OS EV	VCULDC	36601-0E170	EOSEJNM-NS0-D000 EOSEJNM-NS1-D000 EOSEJNM-NS2-D000 EOSEKNM-NS3-D000 EOSEKNM-NS4-D000	EOSEKNM-NS5-D000

4) IGPM:

VEHICLE	SYSTEM	IGPM P/No.	ROM ID	
			OLD	NEW
OS EV	IGPM	91950-K4060 91950-K4070 91950-K4061 91950-K4071	K602	K603

MANUAL MODE PASSWORD INFORMATION TABLE:

#589(BMS)

MENU	PASSWORD
OS EV BMS 375A0-K4000	4000
OS EV BMS 375A0-K4001	4001
OS EV BMS 375A0-K4002	4002
OS EV BMS 375A0-K4050	4050
OS EV BMS 375A0-K4051	4051
OS EV BMS 375A0-K4052	4052

#590(MCU)

MENU	PASSWORD
OS EV MCU 36601-0E070	0170

#591(VCULDC)

MENU	PASSWORD
OS EV VCULDC 36601-0E170	0171

#592(IGPM)

MENU	PASSWORD
OS EV IGPM 91950-K4010~K140, K4011~K141(ROM ID : K602)	3001