

 HYUNDAI NEW THINKING. NEW POSSIBILITIES.	GROUP	MODEL
	CAMPAIGN	SONATA HEV
Technical Service Bulletin	DATE	NUMBER
	October 2013	13-01-042
SUBJECT HEV MULTI-ECU UPDATE (VER.2) - (SERVICE CAMPAIGN TQ8)		

  **ECU Update**

*** IMPORTANT**

*******RETAIL VEHICLES*******

Dealers must perform this Campaign on all affected vehicles 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 "Warranty Vehicle Information" screen via WEBDCS to identify open Campaigns.

Description:

This bulletin provides information related to software update of the following controllers: **ECM/TCM/HCU/MCU/AHB/OPU** by GDS **Event#302**, and **BMS** by **Event#303**.

This ECU Update provides vehicle drivability refinements.

Applicable Vehicles: 2012MY SONATA (YF) 2.4L Hybrid Electric Vehicle (HEV) produced between November 2, 2011 to January 17, 2012.

GDS Information:

EVENT #	DESCRIPTION
302 ECM/TCM/HCU/MCU/AHB/OPU	YF HEV 11/12MY DRIVING PERFORMANCE IMPROVEMENT(VER.2)
303 BMS	YF HEV 11/12MY DRIVING PERFORMANCE IMPROVEMENT(VER.2)-BMS."

Warranty Information:

Model	Op Code	Operation	Op Time
SONATA (YF) HEV	30C059R0	MULTI ECU UPGRADE	0.7M/H

HEV Multi-ECU Update Service Procedure Summary:

Follow all 4 steps below and detailed instructions of this TSB to ensure success. Since this is a long complex ECU Update (30 mins) it requires adequate vehicle preparation and multiple resets. All 7 ECU updated should result in "OK". Further steps must be taken if any are "FAIL". Test drive must be performed followed by HEV Calibrations at warmed up powertrain condition.

1. **Auto Mode ECU Update** of 7 ECU sequentially as initiated from the Engine System:
 - Event #302 - ECU Update of TCM/HCU/MCU/AHB/OPU.
 - Event #303 - ECU Update of BMS.

2. **All Fault Code Searching** for DTC stored in All Systems, and then **All Erase**.
3. **Important Step:** Perform a **Test Drive** to confirm adequate operation of the vehicle and ensure engine/transmission are **warm** for the final repair step of HEV Calibrations.
4. Perform **HEV Calibrations** to optimize the smoothness of the HEV driving transitions:
 - **Motor/HSG Resolver Calibration** (in MCU system)
 - **E/C Fluid Pressure Calibration** (in HCU system)

ROM ID Information Table:

- Event #302 ECU Update for ECM/TCM/MCU/HCU/AHB/OPU:

Model	MY	System	ECU P/N	ROM ID	
				Previous	New
SONATA (YF) HEV	12MY	ECM	39105-2G911	YCY4RC1A	YCY4RG2A
	12MY	TCM	39105-2G911	TYF2H24SA3	TYF2H24SA5
	12MY	MCU*	36690-3D000 36690-3D001	HM04500DR0 HM04500ER0 HM04501ER0 HM04503ER0 HM04505ER0 HM04506ER0 HM04507ER0	HM04510ER0
	12MY	HCU*	39700-2G101	GYFECNEH HS0-C000 GYFECNEH HS1-C000 GYFECNEH HS2-C000	GYFECNEH HS3-C000
	12MY	AHB**	58620-4R000	D32BAF1F15-1-0916 D32BAG1F15-1-1228 D32BAH1F15-1-1408 D32BAI1G16-1-1420 D32BAJ1G16-1-1B15 D32BAK1H17-1-2430 D32BAL1I17-1-2717 D32BAM1J18-1-2822	D32BAN1J19-1-2A18
	12MY	OPU	46150-3D110	FLSN01 FLSN02	FLSN03

*MCU and HCU are part of the HPCU assembly.

** AHB is part of the HPU assembly.

NOTE:

If Auto Mode ECU Update fails in any of the systems recover by Manual Mode ECU Update of page-16.

- Event #303 BMS ECU Update:

Model	MY	System	ECU P/N	ROM ID	
				Previous	New
SONATA (YF) HEV	12MY	BMS	37513-4R000 (OLD H/W)	4600 4700 4800 4900	5080
			37513-4R000 (NEW H/W)	4920 4940 4960	5060

NOTE:

If Auto Mode ECU Update fails in the BMS try recover by Manual Mode ECU Update of page-16.

GENERAL PRECAUTIONS:

- Connect the USB cable between the GDS and the VCI.
- Connect the 16-pin DLC connector from the VCI into the DLC located under the driver's side dash.

*** NOTE**

This Multi-ECU Update can take up to 30 minutes so it is very important to make sure the battery icon at the bottom right of the GDS laptop shows at least 75%. If lower than 75%, you must charge the GDS. When possible keep the power cord connected to the GDS Laptop while doing the update.

- Turn off all lights (Do not leave the headlight switch in auto mode) and all accessories (including heater/air conditioner/fan, audio, front/rear heated seats, rear defroster, etc) to ensure the battery will not be discharged during the update.
- Perform the update with the ignition in the ON position.
- Do not disconnect any cables connected to the vehicle or the GDS during the update.
- Do not start the engine or turn the ignition switch OFF during the update.

*** NOTE**

If you encounter GDS related problems, call the GIT Helpline at 888-437-0308.

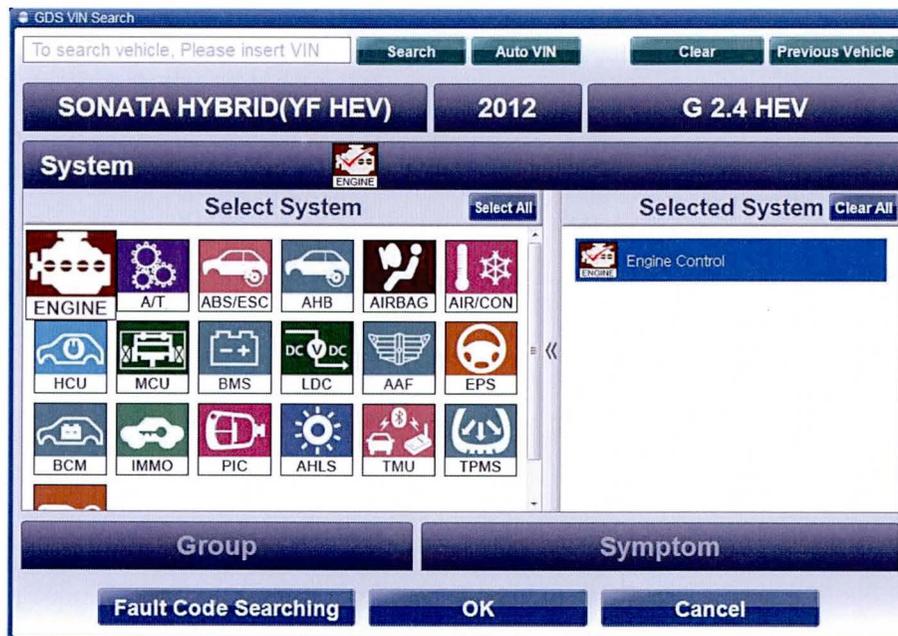
SERVICE PROCEDURE:

GDS AUTO MODE ECU UPDATE**⚠ IMPORTANT - HEV 12V Battery Preparation:**

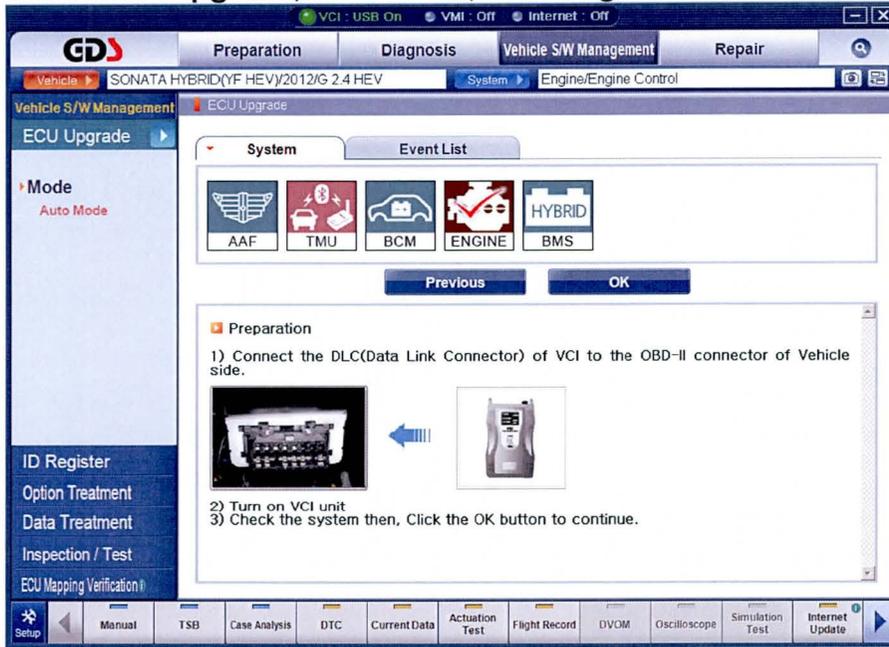
- Turn off Daylight Running Lights (DRL OFF on the light pod switch).
- Make sure heated seats and other accessories are off.
- Climate control OFF.
- This is a very long Multi-ECU Update that can take up to 30 minutes with warning lights and chimes occasionally activated, so 12V Battery condition is critical:
 - For cold vehicles that have sat overnight, turn on the vehicle in READY mode for 10 minutes to ensure the 12V battery is sufficiently charged before beginning the ECU Update.
 - If the ECU update procedure indicates Battery Voltage less than 12V, exit the update procedure and run the vehicle in READY mode 5 more minutes until Battery Voltage reaches above 12V before conducting the ECU Update.
- ECU Update must be done with Ignition ON only (do not perform in the READY mode)

Procedure for Event #302 ECU Update for ECM/TCM/MCU/HCU/AHB/OPU:

1. From the GDS home page, select **ECU Upgrade**. If necessary, select the VIN.
2. Select **Engine** as the system and then select **OK**.



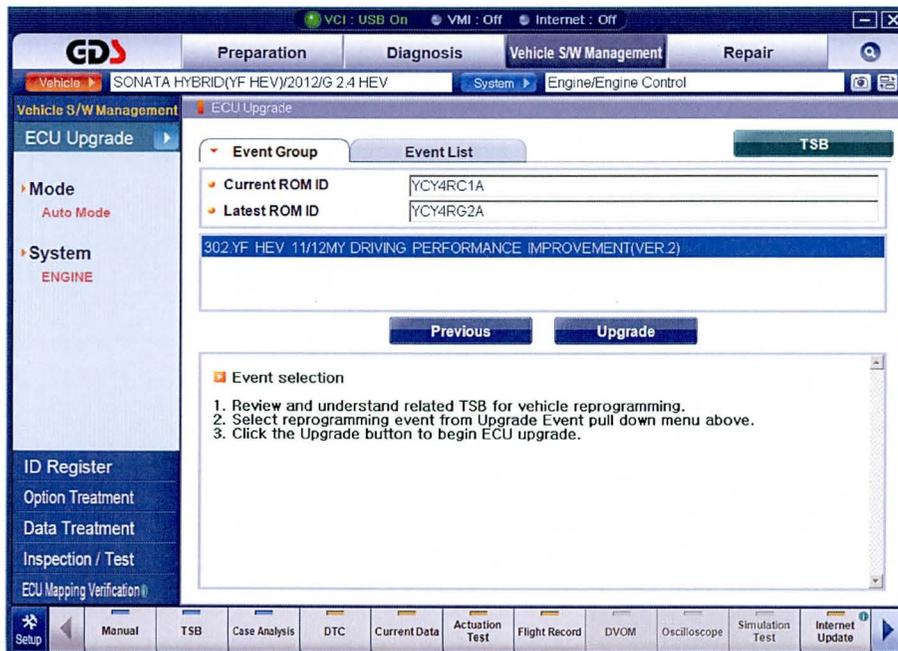
3. Select ECU Upgrade, Auto Mode, then Engine and OK.



The GDS will read the ROM ID to confirm if an update applies to the vehicle's ROM.



4. Select Upgrade Event, "302.YF HEV 11/12MY DRIVING PERFORMANCE IMPROVEMENT(VER.2)". and then Upgrade.



- 5. If the screen indicates “Voltage is OK” (Voltage > 12V), select **OK**.

NOTE: If <12V select CANCEL and charge the vehicle’s 12V battery by putting the vehicle into READY mode for a few minutes, then return to Ignition ON mode again.

Voltage is <12V – Do Not proceed!

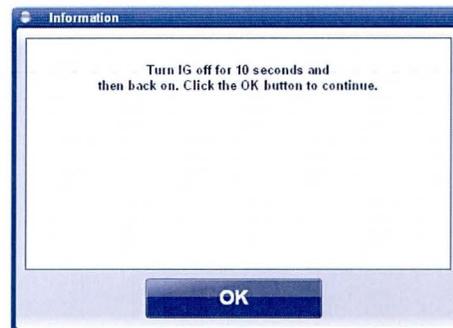


Voltage is OK to proceed:



- 6. Updating of ECM begins first and then you will reach a prompt to turn the ignition key OFF for 40 seconds, then turn ignition ON and select **OK**.

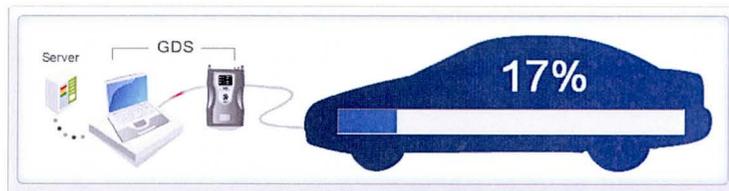
NOTE: The “Check Brake” and “Charge System Warning” will flash and beep on the dash as the ECU Update occurs.



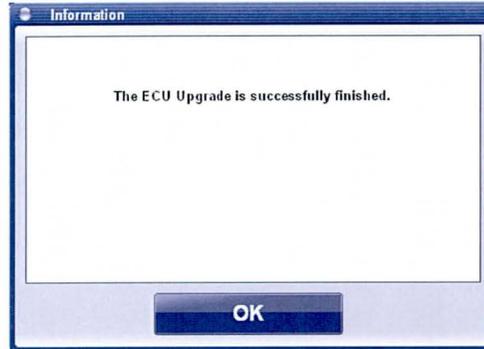
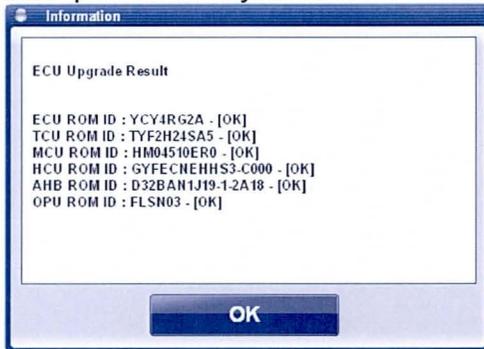
- 7. Each of the remaining 5 ECU of Event#302: TCM/HCU/MCU/AHB/OPU will be updated in sequence. As each ECU completes you will get a prompt that will require you to turn OFF ignition for 10 secs then back ON. Select **OK** after each reset and the progress bar graph will advance as outlined by the below range for each ECU.

Upgrade processing bar graph:

- 1st step: ECM update (1~17 %)
- 2nd step: TCM update (18~33 %)
- 3rd step: MCU update (34~63 %)
- 4th step: HCU update (64~96 %)
- 5th step: AHB update (96~98 %)
- 6th step: OPU update (98~100 %)

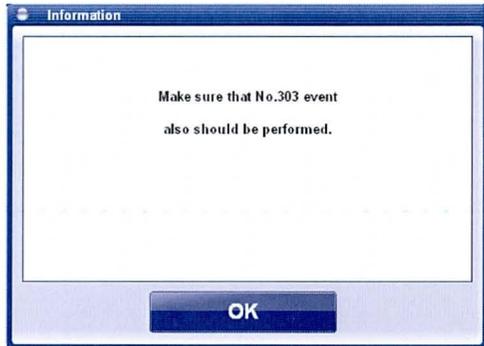


8. The GDS will confirm that the Multi-ECU updates are successfully finished. Make sure that all 6 ECU performed by Event#302 show as **OK** and that none indicated **FAIL**, then select **OK**.

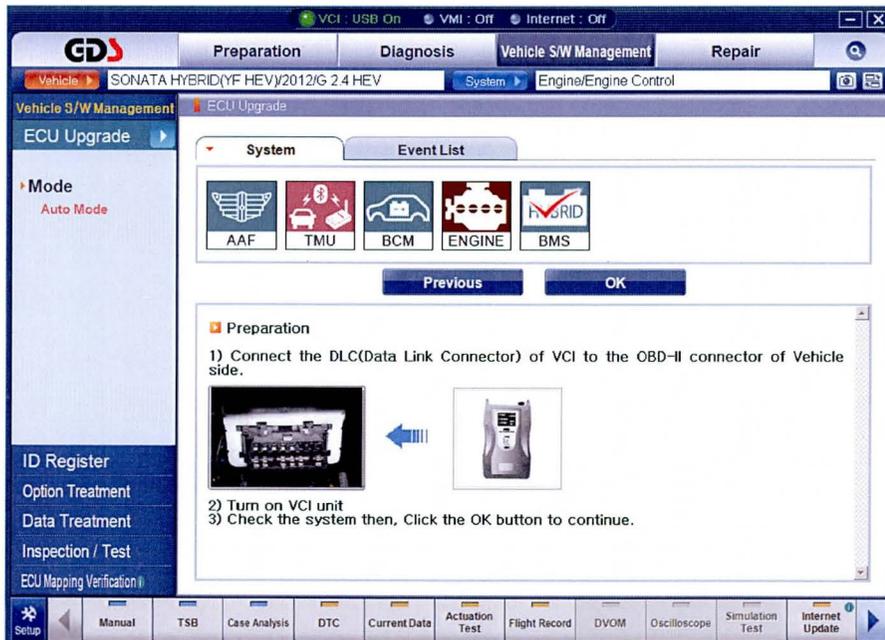


9. If Event#302 ECU update was interrupted or any ECU are indicated as **FAIL**, go to **GDS MANUAL MODE ECU UPDATE PROCEDURE** of last page of this TSB to recover Event #302.

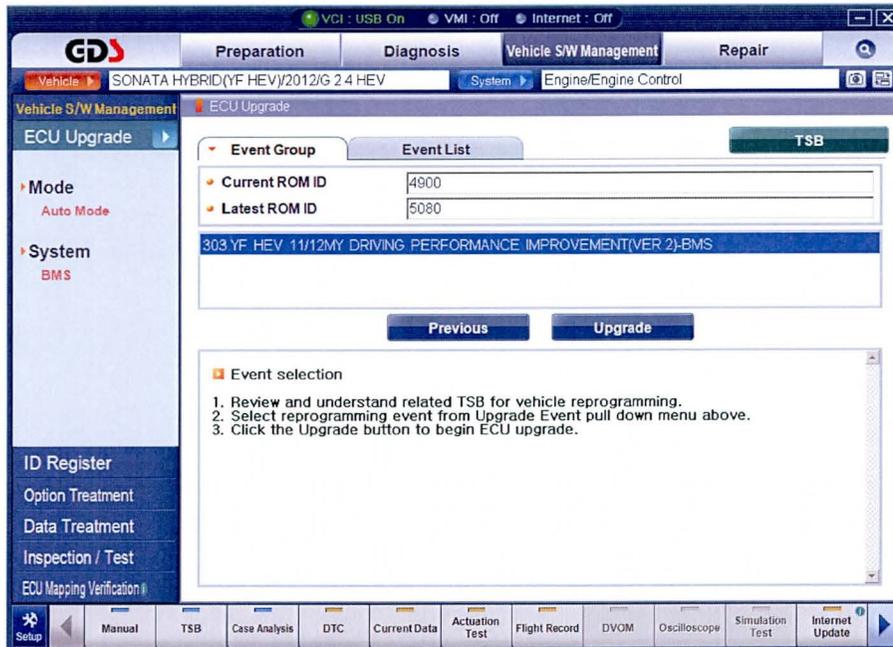
Procedure for Event #303 BCM ECU Update:



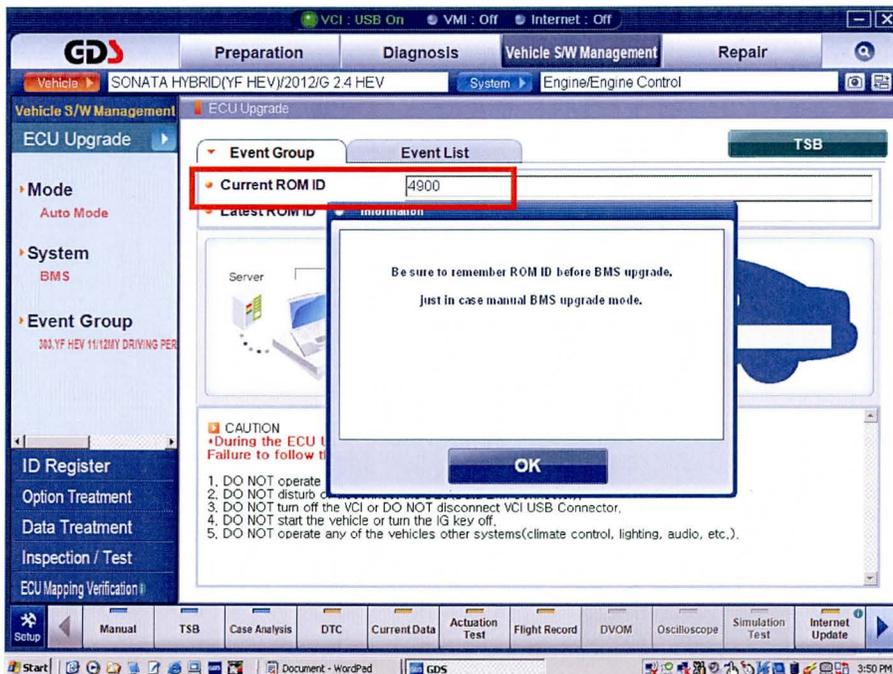
10. Select **ECU Upgrade, Auto Mode, BMS** and then **OK**.



11. Select the **Upgrade Event**, "303.YF HEV 11/12MY DRIVING PERFORMANCE IMPROVEMENT(VER.2)-BMS." and then select **Upgrade**:



12. Make a note of the BMS **Current ROM ID** displayed. In case the ECU Update fails, you will know which one the vehicle had in order to be able to recover it in ECU Update Manual Mode.



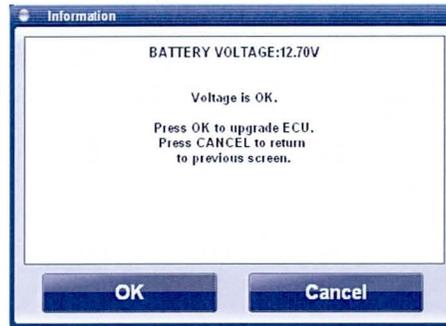
13. If the screen indicates "**Voltage is OK**" (Voltage > 12V), select **OK**.

NOTE: If <12V select CANCEL and charge the vehicle's 12V battery by putting the vehicle into READY mode for a few minutes, then return to Ignition ON mode again.

Voltage is <12V – Do Not proceed!

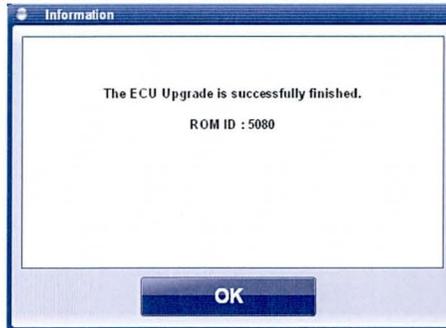


Voltage is OK to proceed:



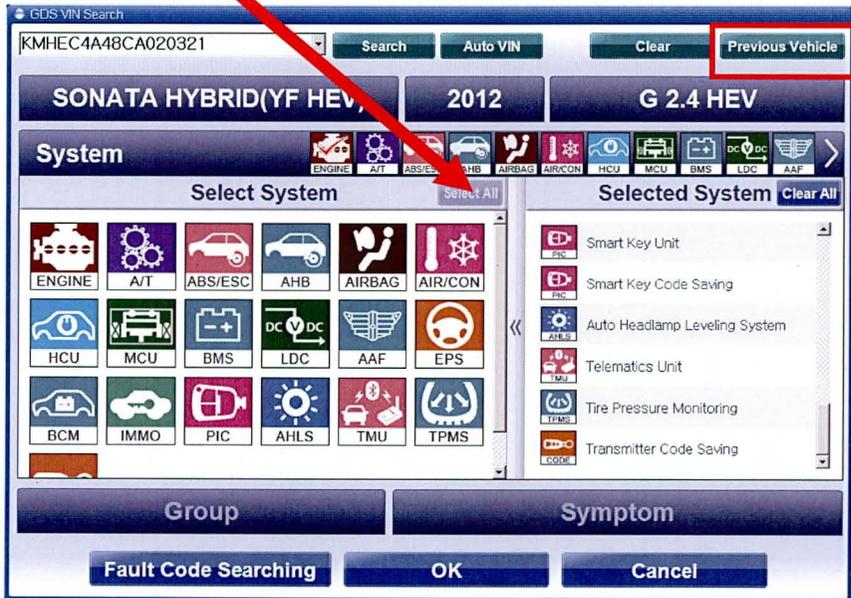
- After the Upgrade occurs you will be prompted to complete a 10 second reset and you should receive this confirmation that Event#303 BMS ECU Upgrade successfully finished.

NOTE: If BMS ECU Upgrade is interrupted or ends in **FAIL**, go to **GDS MANUAL MODE ECU UPDATE PROCEDURE** of the last page of this TSB and recover **Event #303**.



- Check for Diagnostic Trouble Codes in All systems which had occurred while CAN is inoperative during the ECU Update.

- Select **VIN** screen then **Previous Vehicle** to get back to the display with the Systems.
- Touch **Select All** to choose all systems in the **Selected System** tray.



- Select **Fault Code Searching** to check all selected systems for DTC set.



- Select **All Erase** (only necessary if there were any DTC listed above):



16. Important Step: Perform a **Test Drive** to confirm adequate operation of the vehicle and to ensure engine/transmission are **warm** for the HEV Calibration final step.

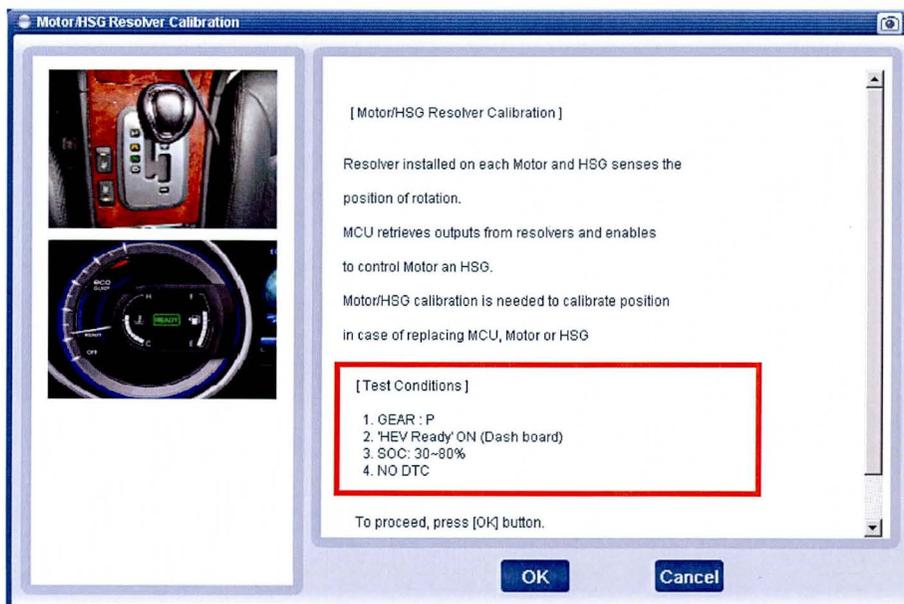
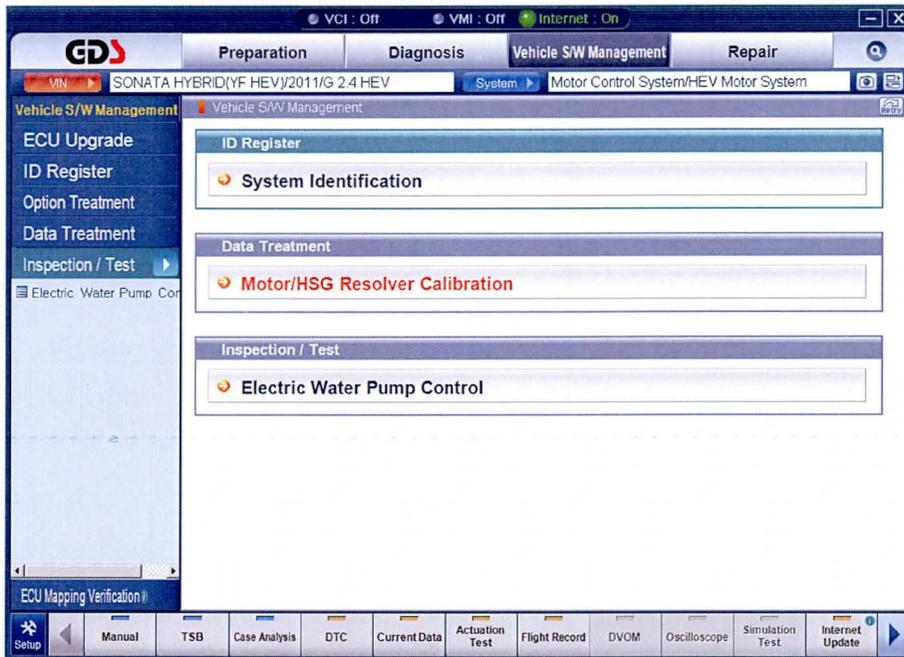
*** NOTE**

The HEV Calibration cannot be done on a cold vehicle it may result in degradation of the vehicle smoothness and performance.

HEV CALIBRATION PROCEDURE:

17. Perform each of the following HEV Calibration in vehicle's **READY** mode as per the GDS screen examples provided on the attached pages:

- **Motor/HSG Resolver Calibration** (as shown on pages 10-12)
- **E/C Fluid Pressure Calibration** (as shown on pages 13-14)
- **Motor HSG Resolver Calibration:**



Motor/HSG Resolver Calibration



[Motor/HSG Resolver Calibration]

Resolver installed on each Motor and HSG senses the position of rotation.

MCU retrieves outputs from resolvers and enables to control Motor and HSG.

Motor/HSG calibration is needed to calibrate position in case of replacing MCU, Motor or HSG.

※ This will take approximately 20 seconds.

<<Calibration in progress>> 9 sec elapsed.

Motor/HSG Resolver Calibration



[Sensor Output]

Motor Resolver OFFSET: 2.329 el (electrical angle)

Motor Resolver Calibration: Completed

HSG Resolver OFFSET: 6.322 el (electrical angle)

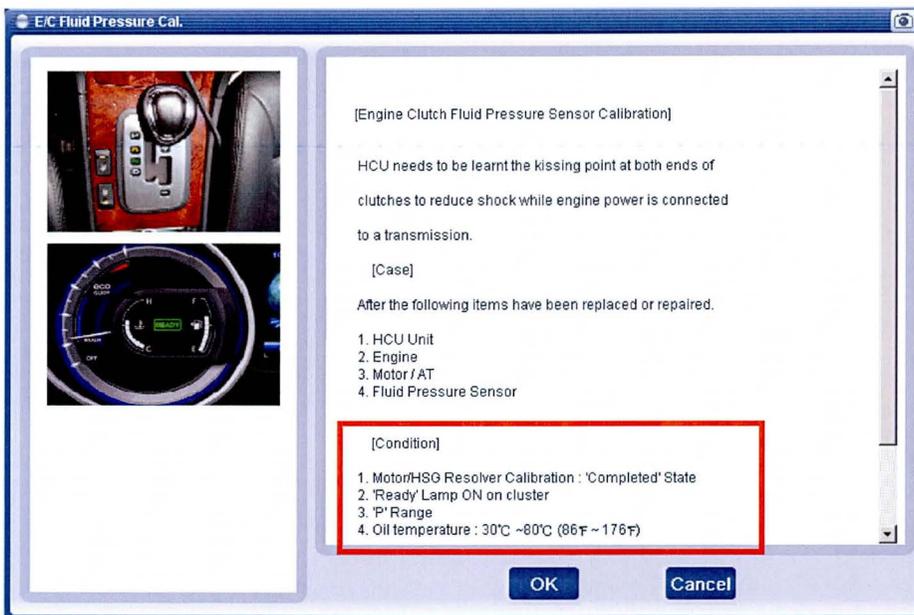
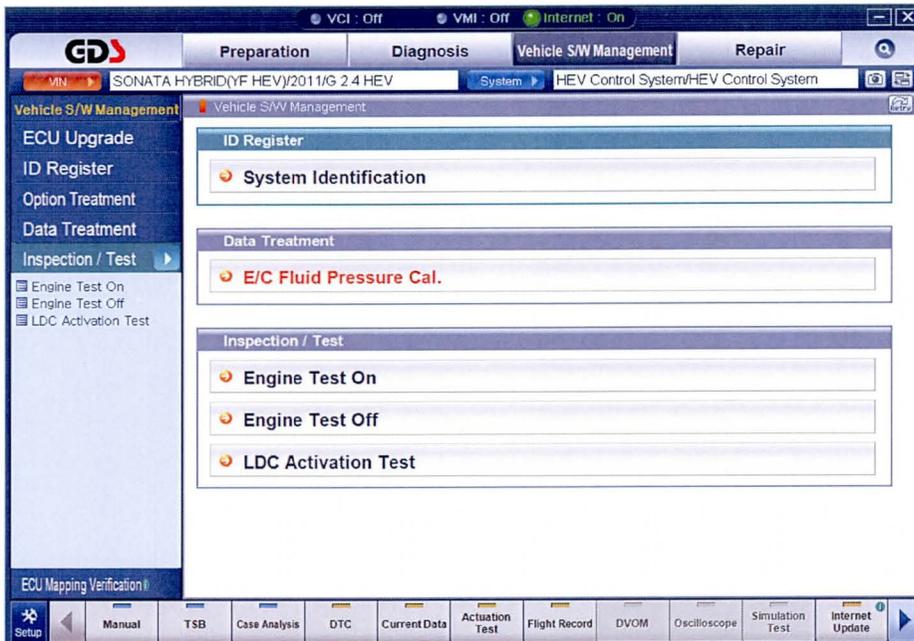
HSG Resolver Calibration: Completed

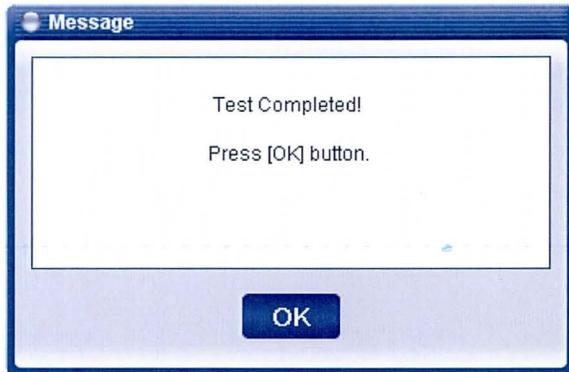
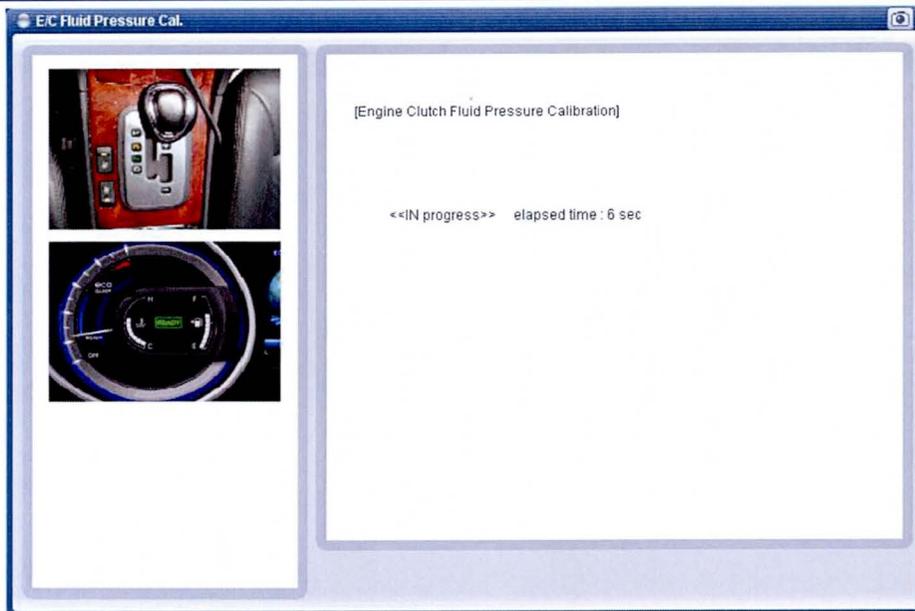
Calibration completed!!

Press [OK] button.

OK

- Engine Clutch E/C Fluid Pressure Calibration:





GDS MANUAL MODE ECU UPDATE PROCEDURE

★ NOTES

- GDS Manual Mode is intended for recovery of an Auto Mode ECU Update should it begin, but then later fail in process.
- The vehicle battery must be disconnected for 15 minutes to reset the system before performing this Manual Mode Update.
- Do not force Manual Mode if you get an error in Auto Mode that the vehicles Current ROM ID did not apply.
- **Event #302 AHB Update Failed:**
 - *After turning ignition key off, remove the AHB2 (30A) fuse from E/R fuse & relay box for 10 seconds and put the fuse back according to GDS message (message will be pop up automatically).*
- **Event #303 BMS Manual Mode Update Failed:**
 - *If wrong ECU version had been selected at first in a Manual ECU Update attempt, then DTC P1B74 will occur and abnormal battery voltage (max voltage) data will display in BMS System Current Data.*
 - *Perform manual upgrade again by selecting the other part number from what was used before, then DTC should disappear and BMS data back to normal.*

1. From the GDS home page, select **ECU Upgrade**. If necessary, select the VIN.
2. Select **Engine** as the system and then select **OK**.
3. Select **ECU Update Manual Mode** and then select **Next**.
4. From the **System** tab, select **Engine and Event #302** or **BMS and Event #303** depending on which Event had Failed prior and that you are now trying to recover. Select **Upgrade**.
5. Enter the **Password** from the table below depending on the Event# you are trying to recover and then select **OK**.

#302.YF HEV 11/12MY DRIVING PERFORMANCE IMPROVEMENT(VER.2)

MENU	PASSWORD
YF 12MY HEV ECM/TCM/MCU/HCU/AHB/OPU	2911

#303.YF HEV 11/12MY DRIVING PERFORMANCE IMPROVEMENT(VER.2)-BMS

MENU	PASSWORD
YF 11/12MY HEV BMS OLD H/W*	4000
YF 11/12MY HEV BMS NEW H/W*	4001

NOTE: * Refer to Event#303 BMS ROM ID Table and the BMS Current Rom ID you had noted in the Auto Mode Update step to determine whether BMS OLD or NEW H/W.

6. The remaining steps are the same as found in each of Event #302 and Event#303 **Auto Mode** Procedures depending on the Event you are recovering.