HYUNDAI Technical Service Bulletin	GROUP **FUEL SYSTEM**	NUMBER **20-FL-004H**
	DATE **MAY, 2020**	MODEL(S) **ELANTRA (AD/ADA)** **PALISADE (LX2)** **SANTA FE (TM)** **SONATA (DN8)**
SUBJECT:	IDLE STOP & GO SYSTEM OPERATION, DIAGNOSTIC AND BATTERY SENSOR RECALIBRATION PROCEDURE	

This bulletin supersedes TSB 19-FL-002H to include additional models, and ISG system diagnostics and requirements.

Description: This bulletin describes the Idle Stop and Go (ISG) system operation, diagnostic and battery sensor recalibration procedure. Refer to applicable Shop Manual and Owner's Manual for additional information.

Applicable Vehicles: Elantra (AD/ADA), Palisade (LX2), Santa Fe (TM) and Sonata (DN8) vehicles equipped with Idle Stop and Go (ISG) System

Note: Normal Warranty Applies

System Operation:
When the vehicle comes to a stop after brake pedal is depressed, the ISG system automatically and temporarily shuts down the engine to improve fuel efficiency and reduce exhaust gas emissions. The ISG system then restarts the engine when the brake pedal is released or the accelerator pedal is depressed (if Auto Hold feature is equipped and activated).

The ISG system is active by default whenever the ignition is cycled to start the vehicle. To deactivate the system, press the **ISG OFF** button.

Some Notable Prerequisites for ISG System Activation:

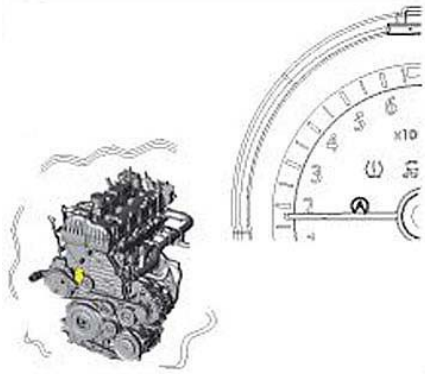
- Battery has a 70% or above State of Charge (SOC)
- Shift lever is in **DRIVE** or **NEUTRAL**
- Driver's seatbelt is fastened
- Driver's door and the hood are closed
- Brake vacuum pressure is adequate
- Vehicle is not on a steep slope
- Outside temperature is between 14 ~ 95°F
- Engine coolant temperature is over 86°F
- Air Conditioning system is not in high load or demand
- Steering wheel is turned less than 180 degrees
- System is not in the diagnostic mode
- No related diagnostic trouble codes

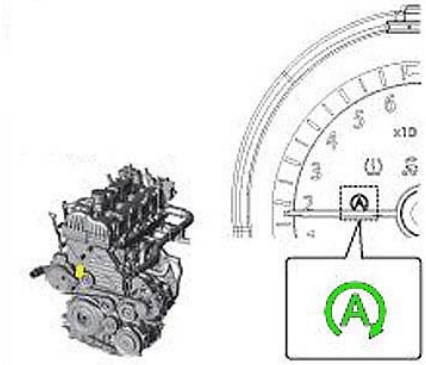
NOTICE

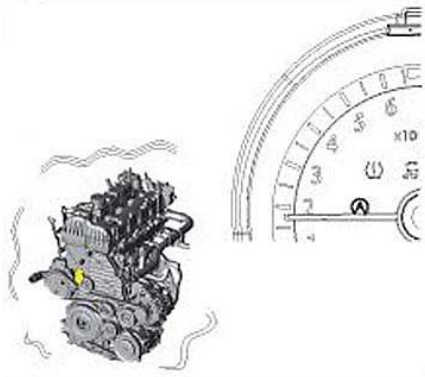
- **The ISG system will not be activated until all prerequisites are satisfied. If not satisfied, the orange color Auto Stop symbol is illuminated in the instrument cluster when the vehicle is stopped, and the "ISG OFF" button indicator illuminates or flashes depending on ISG system version.**
- **Vehicle speed must reach 5 MPH again for the ISG to activate after the previous stop.**

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

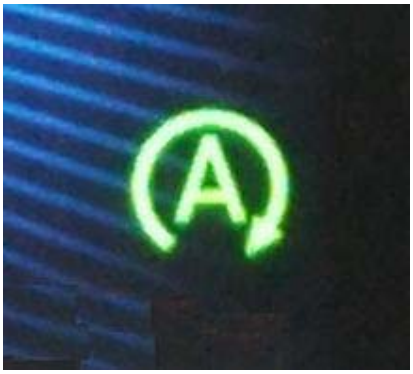
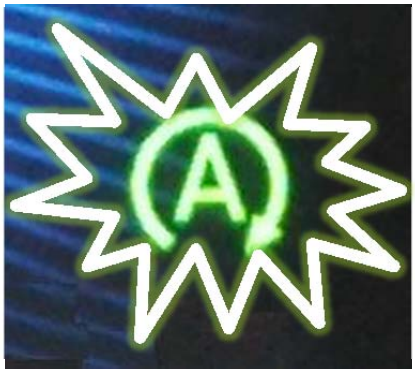
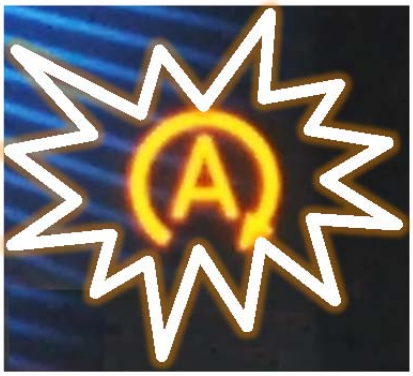
ISG System Operation Illustrations

1. Vehicle is moving.	2. Shift lever is in **DRIVE**. Brake pedal is released.	3. Engine is running.
		

4. Driver brakes until vehicle is stationary.	5. Shift lever is in **DRIVE**. Brake pedal is pressed.	6. Engine stops running. Green color Auto Stop symbol illuminates in the instrument cluster.
		

7. Driver wants to continue moving.	8. Shift lever is in **DRIVE**. Brake pedal is released.	9. Engine restarts and running. Auto Stop symbol goes out.
		

Idle Stop and Go System Illuminations and Conditions

Auto Stop symbol illuminated in green color • ISG activated • Engine stopped 	**Auto Stop symbol illuminated in yellow color** • ISG prerequisites unsatisfied • Engine running 	**ISG OFF button illuminated** • ISG prerequisites unsatisfied • Idle Stop deactivated • Battery sensor is recalibrating • Engine running 
Auto Stop symbol flashing in green color • ISG automatically restarted • Engine running 	**Auto Stop symbol flashing in yellow color** • ISG system malfunction • Engine running 	**ISG OFF button flashing** • Battery cable or sensor was recently disconnected • Battery sensor is recalibrating • Engine stopped 

Situations ISG May Abort and Engine Automatically Restart:

- The vehicle is shifted to **PARK** or **REVERSE** when the brake pedal is depressed or Auto Hold is activated
- The battery State of Charge (SOC) is below 70% threshold limit or the battery is weak
- The brake vacuum pressure is low
- The climate control system blower fan speed is set above the 6th position with air condition **ON**
- A certain period of time has elapsed with air condition **ON**
- The defroster is activated
- The driver door is opened or the driver seat belt is unfastened when the brake pedal is depressed or Auto Hold is activated
- The Electronic Parking Brake (EPB) is pressed when Auto Hold is activated (if EPB is equipped)

⚠ WARNING

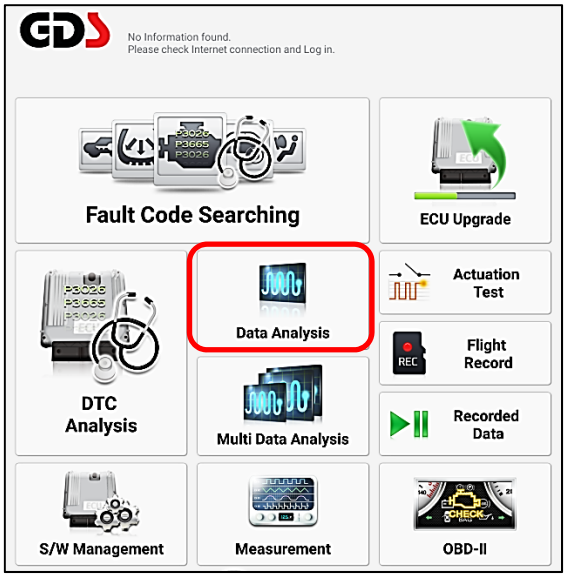
- **When the engine is in Auto Stop mode, the engine may restart on its own.**
- **Never work the engine when the ignition is in "ON" or "ACC" position as the engine may restart without warning.**
- **Before leaving the vehicle or checking the engine compartment, stop the engine by pushing/turning the ignition switch to the OFF position, and remove the key(s) from the vehicle.**

ISG System Diagnostics:

1. Turn the ignition key to the **ON** position or press the **Start-Stop Button** two times without depressing the brake pedal.

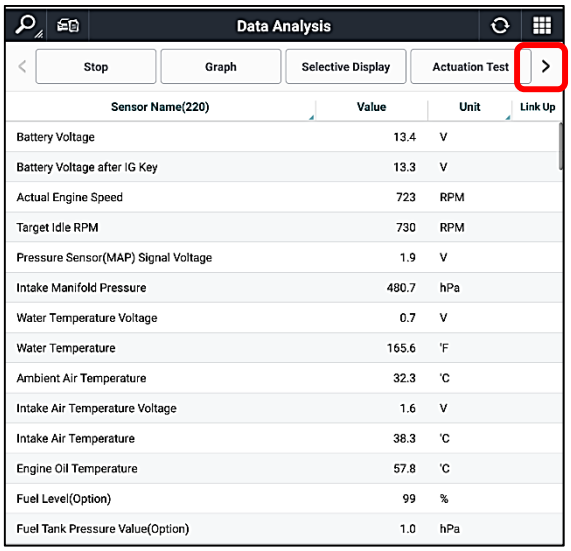
   Connect a **GDS Mobile VCI-II** to the vehicle data link connector.

2. Select **"Data Analysis"** within the GDS app.



3. Select **"Engine"**.

4. Scroll down the data analysis page and look for Battery Voltage, SOC & SOH and ISG parameters.



Quick Tips:

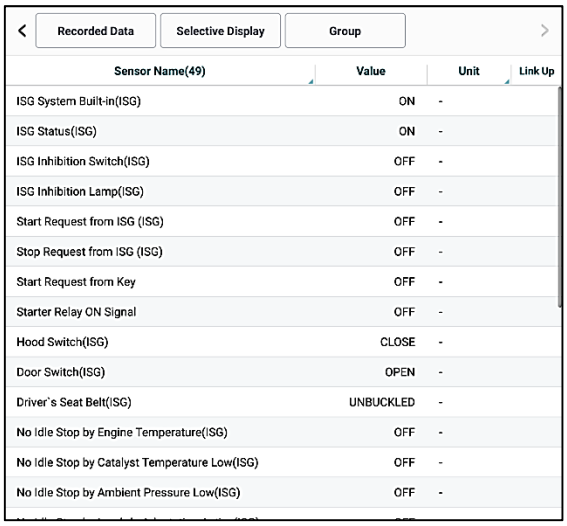
Click on the forward arrow (**>**) next to **"Actuation Test"**. Then click **"Group"** and select the desired data group to view corresponding data.

- Select **Alternator Management System (AMS)** group for battery related data
- Select **Idle Stop and Go (ISG)** group for ISG related data

5. Review all ISG parameters and compare the parameters with a properly operating vehicle (if in doubt).

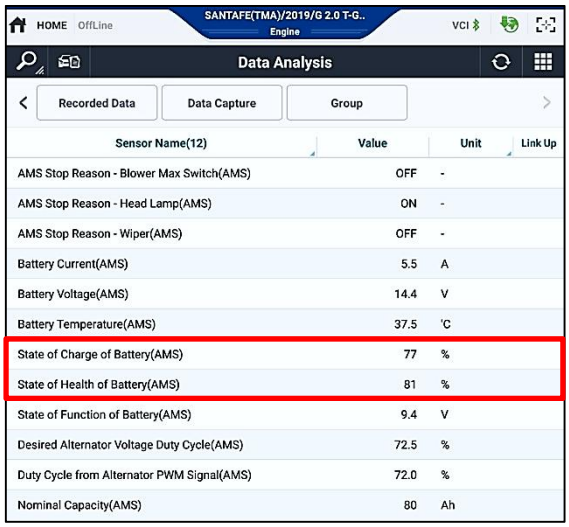
   Inspect any ISG data parameter that is different from the properly operating vehicle and make appropriate correction(s).

   Follow the Shop Manual for additional information.

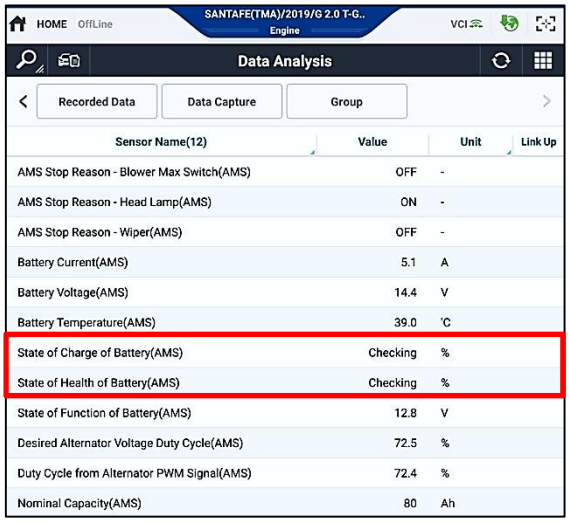


6. Review all battery parameters, and compare the parameters with a properly operating vehicle (if in doubt).

   Ensure **State of Charge of Battery (SOC)** and **State of Health of Battery (SOH)** fields display a percentage value.



7. If SOC or SOH displays **"Checking"** instead of a percentage value, perform the battery sensor recalibration procedure outlined on Page #7 of this TSB.



8. Evaluate the ISG system operation when SOC, SOH and all ISG operation prerequisites are satisfied.

NOTICE

- **ISG does not activate if the Battery SOC is below 70%.**
- **Charge the battery above 70% SOC level before conducting further ISG system diagnosis.**
  - **Idle charging – Idle the engine with headlights ON and monitor SOC value with GDS (recommended procedure)**
  - **Charge with a Battery Charger (if a battery cable was disconnected from the terminal, battery sensor may need recalibration)**
- **If the ISG system is working properly when the battery SOC is above 70% level, inform the customer of the ISG system prerequisites and Battery SOC requirements for ISG Operation. Refer to the Owner's Manual for additional information.**
- **Battery may not get adequate charging when driving short distances and frequent stop & go situations.**

NOTICE

- **The battery should only be replaced if testing with either GR8 or Cadex battery tester resulted in "Replace Battery".**
- **Battery replacement warranty submission without a "Replace Battery" printed ticket along with associated warranty code will likely result in warranty charge back.**

Battery Sensor

- The battery sensor which is mounted on battery negative (-) terminal transmits battery voltage, current, and temperature information to the Engine Control Module (ECM).
- The ISG system utilizes Battery State of Charge (SOC), Battery State of Health (SOH) and other battery data generated by battery sensor.
- The battery sensor requires approximately 4 hours of continuous connection with a battery to generate stabilized data.
- If any battery cable or battery sensor was disconnected from the battery or the battery was recharged, perform the battery sensor recalibration procedure located below after finishing any repair work.

Battery Sensor Recalibration Procedure:

- Switch the ignition **"ON"** and **"OFF"** one time.
- Park the vehicle for a minimum of 4 hours with the hood and all doors closed.
- Verify that battery SOC and SOH data are displayed.