



GROUP
General

MODEL
**All Models
w/Smart Key Fob
System**

NUMBER
057

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October 2014

TECHNICAL SERVICE BULLETIN

**SUBJECT: GENERAL INFORMATION AND DIAGNOSIS
FOR SMART KEY FOB SYSTEMS AND START/STOP BUTTONS**

This bulletin provides information related to the Smart Key Systems on vehicles equipped with A/T (automatic transaxle) and Start/Stop Buttons (SSB). On these types of vehicles, the engine will only start if the right conditions are met and in combination with the inhibitor switch signal, the stop lamp switch signal and the shift lever position. In most instances, when attempting to start the engine without the brake pedal being depressed, the engine will not start as no signal is being received from the stop lamp switch. Frequently, stop lamp switch replacements are performed in the field without proper diagnosis, therefore, in order to prevent unnecessary replacement of stop lamp switch and other components, refer to the basic operation of the Start/Stop Button, Smart Key Fob and the Shift Lock system, as outlined below.



★ NOTICE

The Smart Key Fob may fail to operate correctly when in close proximity to other devices (i.e. cellphones, etc.) which use Radio Frequency (RF) and Low Frequency (LF) for transmission. Always keep the Smart Key FOB away from possible sources of radio interference.

File Under: <General>

Circulate To: **General Manager** **Service Manager** **Parts Manager**
 Service Advisor(s) **Technician(s)** **Body Shop Manager** **Fleet Repair**

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Smart key programming procedure

1. Connect the power supply cable to the GDS.

*** NOTICE**

If attempting to perform the upgrade with the power supply cable disconnected from the GDS, be sure to check that the GDS is fully charged before upgrade. If the GDS is not fully charged, failure to perform the upgrade may occur. Therefore, it is strongly recommended that the power supply connector be connected to the GDS.

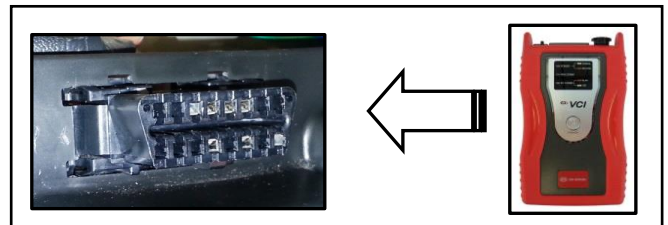
2. Connect the USB cable between the VCI and the GDS.

*** NOTICE**

When performing the ECM upgrade using the GDS, wireless communication between the VCI and GDS is not available. Therefore, be sure to connect the USB cable between the VCI and the GDS.

3. Connect the Main 16-pin DLC cable (GHDM – 241000) to the VCI.

4. Connect the Main 16-pin DLC cable (GHDM – 241000) to the OBD-II connector, located under the driver's side of the instrument panel.



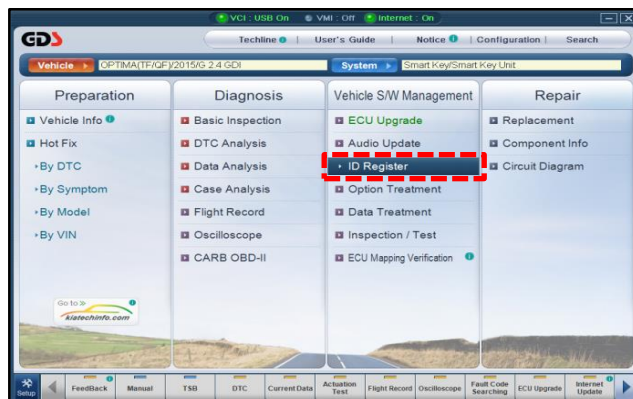
5. Select **ENGINE** and click **OK**.



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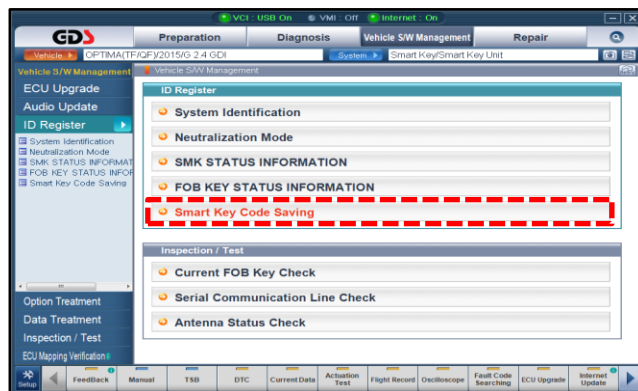
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6. Select ID Register.



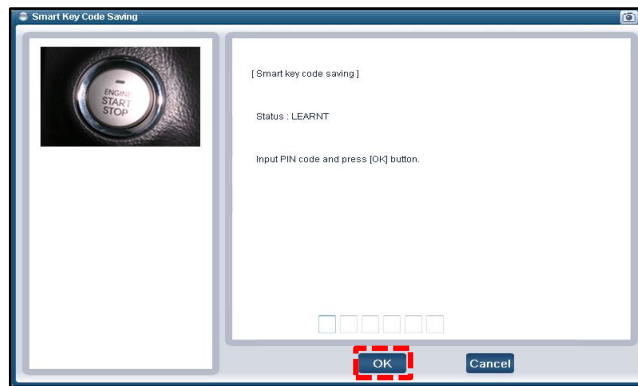
7. Select Smart Key Code Saving.

*** NOTICE**
Do NOT neutralize the SMK module or the PCM module.






8. Enter PIN code (6 digits) and press OK. Repeat step 8 for the second Smart Key fob.

*** NOTICE**
The new PIN code applies to 2008MY vehicles and newer. The old PIN code applies to 2007MY vehicles or older.



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Starting the Engine Using the Start/Stop Button (SSB)

When Smart Key Fob battery is good	When Smart Key Fob battery is discharged	
		
<p>Press the Start/Stop Button after depressing the brake pedal.</p>	<p>Non Fob Holder Type</p> <p>Depress the brake pedal, press the Start/Stop Button and place the fob against the SSB, as shown above.</p>	<p>Fob Holder Type</p> <p>Depress the brake pedal, press the Start/Stop Button and place the fob in the holder, as shown above.</p>

On Borrego (HM), Sorento (XMa), Soul (AM), make sure to place the fob in the holder when discharged.

Start/Stop Button Basic Operation

1. Power ON / Engine ON

- To start the engine, press the Start/Stop Button with the Smart Key Fob in the cabin, while depressing the brake pedal and with the shift lever in 'P' or 'N'. (Hybrid vehicles : 'P' only)
- Whenever the Start/Stop Button is pressed with the Smart Key Fob in the cabin without depressing the brake pedal, the Start/Stop button LED status will be changed in the following sequence: OFF → ACC (Orange) → IGN ON (Green) → OFF.
- LED Color for each vehicle(No LED on engine run state but lights turns on the text)

Vehicle	ACC	ON	Engine run
Sorento (XMa)	Yellow Green	Yellow	Reddish Orange
Cadenza (VG)	Yellow	Green	Reddish Orange
Borrego (HM)	Yellow	Yellow Green	Reddish Orange
Soul (AM)	Yellow	Green	Orange Red
Sorento (XMa)	Amber	Reddish Orange	Reddish Orange
Cadenza (VG)	Amber	Reddish Orange	Reddish Orange
Optima (TF)	Yellow	Yellow Green	Orange Red
Sportage (SL)	Amber	True Green	Reddish Orange
K900 (KH)	Amber	Reddish Orange	Reddish Orange

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2. Power OFF / Engine OFF

- Shut the Engine OFF only when the vehicle is stopped completely. However, the power will completely cut off only in 'P' to prevent the steering column from locking.
- If the brake fuse is blown or the stop lamp switch is inoperative, press the Start/Stop Button for 10 seconds, or more, to start the engine.

Depressing the Brake Pedal at Start-up

1. Be sure to press the SSB after fully depressing the brake pedal to operate the stop lamp switch. The amount of brake pedal effort may vary depending on the amount of vacuum present in the brake booster chamber. If the vacuum is exhausted, more brake pedal effort is needed to operate the stop lamp switch. **NOTE: The engine will not start if the SSB is pressed prior to stop lamp switch operation.**

Start Stop Button Troubleshooting Matrix

Symptom	Ignition Status	Cause	Check Points	Remarks
Vehicle is hard to start (Condition : Press the SSB with the brake pedal depressed.)	Vehicle Power : ACC <Power Status> : OFF → ACC	Poor input signal from brake pedal switch	Stop lamp switch Wiring Power stop lamp switch Brake switch ~ SMK	Check the stop lamp switch for signal. If normal, do NOT replace.
		Press the SSB before pressing the brake pedal.	No check points.	Explain correct operation to customer
	The brake pedal is not depressed enough to operate the stop lamp switch.			
	Vehicle Power : IGN <Power Status> : OFF → IGN	1. Poor input signal of P/N range. 2. Inoperative start-up relay	1. P/N range switch 2. Wiring <ul style="list-style-type: none"> • SMK~ P/N range switch • P/N range switch ~ smart key • SMK~Start-up relay 	Do not replace the stop lamp switch as condition is caused by other components
	Vehicle Power : OFF (No Power Change)	1. Poor input signal of the SSB. 2. Improper battery charge	1. Start/Stop Button 2. Wiring <ul style="list-style-type: none"> - Power ~ SSB - SSB ~ smart key 3. Check the battery for charge.	

★ NOTICE

- The start-up concerns related to the stop lamp switch apply **ONLY** to vehicles equipped with A/T and SSB.
- For vehicles equipped with a manual transaxle and the key type ignition switch, do **NOT** replace the stop lamp switch.

Troubleshooting an RKE Malfunction.

1. Precondition
 - Key **OFF**
 - Close all doors
 - Normal battery voltage (Vehicle Bat. > 12volts, FOB LED blinks)
 - FOB distance to the Vehicle is less than 10ft.
 - If RKE is not working correctly, connect GDS and enter **FOB Key Status Information** screen.
2. Check to make sure the SMK receives RKE frame from the smart key.

Button	Pressing Time	Expected Operation	GDS Screen
Lock button	N/A	Lock all doors	Key Status : Normal Button Status : Lock
Unlock button	N/A	Unlock All doors	Key Status : Normal Button Status : Unlock
Trunk /Tail gate button	More than 2 sec.	Open Trunk / Tail gate	Key Status : Normal Button Status : Trunk /tail gate
Panic button	More than 2 sec.	Set off horn Hazard lamps blink	Key Status : Normal Button Status : Panic

3. Press the fob buttons and check to make sure that when a fob button is pressed the corresponding fob button press information is displayed on GDS. If the expected operation is not performed correctly, perform an **SRx Communication Line Check** on GDS.

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SRx Communication line check

- Once the **SRx Communication Line Check** has been performed, perform a **Current Fob Key Check** on GDS. The system will display one of the following answers:

Test Failure!

FOB key is not in range of antenna

Note: Be sure to press fob against the SSB.

Test Failed!

The Key is "learnt" on a different vehicle

Test Complete!

This key is successfully "learnt"

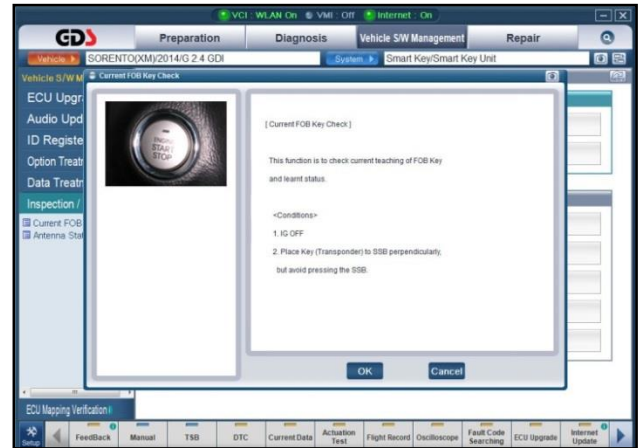
Press[OK]Button.

Test failed!

This key is not "learnt"

Press[OK] button

Note:This fob is virgin.



Troubleshooting an Inoperative Smart Key Fob

- Press the "Unlock" or "Lock" buttons on the Fob. If the LED light blinks, the fob should be functioning correctly.
- LED light is also an indicator of fob battery status. If after pressing the "Unlock" or "Lock" buttons the LED does not blink, open the fob housing and replace the fob battery.
- Press the "Unlock" or "Lock" buttons, if LED does not blink after battery replacement, the fob could be damaged and should be replaced.



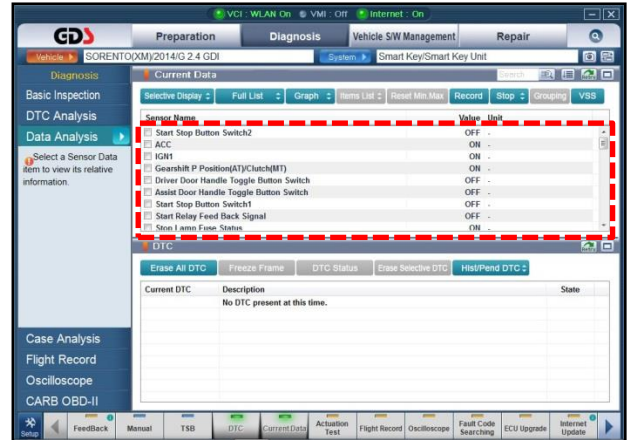
When the Passive Access function is not working

This test checks functions related to Passive Door Lock/Unlock and Passive Trunk/Tail-gate open operation using the toggle button.

- Precondition
- Key OFF
- Close all doors
- Normal battery voltage (Vehicle Battery > 12volts, FOB LED blinks).

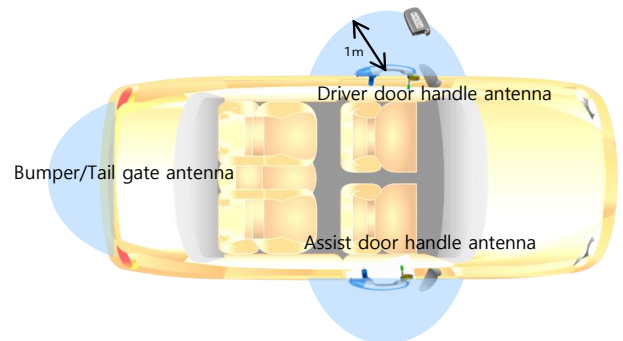
Checking the Toggle Button Operation using GDS > Current Data Screen

- Connect GDS and enter **Current Data**.
- Check 'FL/FR Toggle switch' is **ON** whenever pressing FL/FR Toggle button.
- Check 'Trunk switch' is **ON** whenever pressing Trunk switch.



Checking the operation of the External Antennas 1 (Antenna connection check)

- Connect GDS and access the **Antenna Actuation Test** screen.
- Set the parameters for the Actuation Test for one of the exterior antennas (i.e. 'Driver's, Assist, Bumper/Tail gate Antenna).
- Hold Smart Key Fob less than 3ft (1m) away from the antenna while performing the **Actuation Test**.
- Smart Key Fob LED will blink until stop the command.



Checking the operation of the External Antennas (Antenna connection and FOB communication – Scans only one time)

This test uses the SSB and one of the internal antennas to sense the Smart Key fob inside the vehicle.

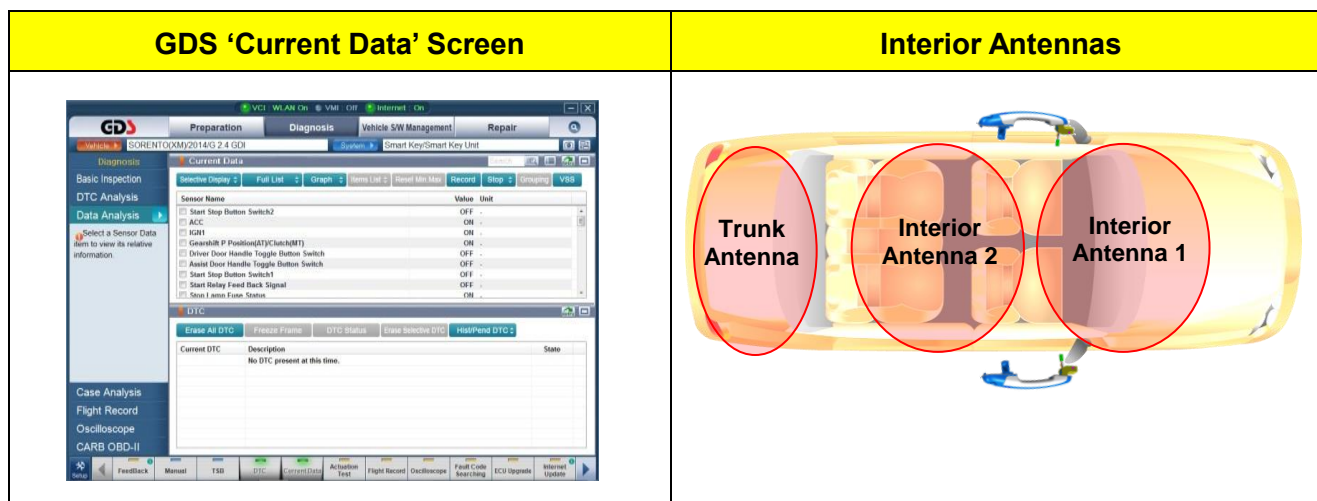
Checking the SSB connection

- Connect GDS and enter **Current Data**.
- Check 'SSB SW1' and 'SSB SW2' are ON when pressing SSB.

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Checking the operation of the Internal Antennas

- Connect GDS and enter the **Actuation Test** screen.
- Set the parameters for the actuation test to either Interior Antenna 1 or Interior Antenna 2.
- Place the Smart Key Fob close to the selected antenna while performing the actuation test.
- The LED on Smart Key Fob will blink.



Checking the P/N switch







- Connect GDS and enter **Current Data**
- Check 'P position switch' is ON when the shifter is in "P"

Checking the Brake switch

- Connect GDS and enter **Current Data**
- Check 'Brake switch' is ON when depressing the brake pedal

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Smart Key Warning Messages

Message	Warning Parameters	What to Check
<p>Key not present Warning</p>  <p>Key is not in vehicle</p> <p>ODO 987654 mi.</p>	<ul style="list-style-type: none"> Fob is not in the vehicle Terminal State is ACC, IG1 or engine running Door Open/Closed 	<p>If you see this warning, refer to “How to checking the operation of the Internal Antennas” on Page 9.</p>
<p>Low Battery Warning</p>  <p>Low Key Battery</p> <p>ODO 987654 mi.</p>	<ul style="list-style-type: none"> Place fob with low battery inside the vehicle Press SSB to change the terminal state to OFF 	<p>If you see this warning, replace the batteries on the Smart Key fob.</p>
<p>SSB Warning</p>  <p>Press start button again</p> <p>ODO 987654 mi.</p>	<p>Press SSB and one of SSB connections is disconnected</p>	<p>If you see this warning, refer to “Checking the SSB connection” on Page 8.</p>
<p>Engine Start Operation Warning</p>  <p>Press brake pedal to start engine</p> <p>ODO 987654 mi.</p>	<p>Press SSB several times without pressing the brake pedal. (OFF→ACC→IG1→OFF→ACC)</p>	<p>If you see this warning at ACC, follow the steps below:</p> <ul style="list-style-type: none"> Connect GDS and enter ‘Current Data’ Check ‘Brake SW’ is ON whenever the brake pedal is pressed.
<p>Vehicle not in Park Warning</p>  <p>Shift to “P” position</p> <p>SHIFT</p> <p>ODO 987654 mi.</p>	<ul style="list-style-type: none"> Shift into any gear. Press SSB several times and terminal changes between ACC and IG. 	<p>If you see this warning, follow the steps below:</p> <ul style="list-style-type: none"> Connect GDS and enter ‘Current Data’ Check ‘P position switch’ is ON when the shifter is in “P”
<p>Shift to “Park or Neutral” Warning</p>  <p>Shift to “P” or “N” to start engine</p> <p>ODO 987654 mi.</p>	<p>Shift to “D” or “R”</p> <p>Press SSB while depressing the brake pedal to start the Engine.</p>	<p>If you see this warning, follow the steps below:</p> <ul style="list-style-type: none"> Connect GDS and enter ‘Current Data’ Check ‘Start Relay Feedback’ is ON when pressing SSB and depressing the brake pedal.

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Shift Lock System

On automatic transaxles, the shift lock system is the mechanism that will prevent the shift lever from moving (**P** → **R/N/D**) unless the vehicle ignition is ON and the brake pedal is depressed.

Troubleshooting the Shift Lever

Symptom	Shift Lever Status	Cause	Check points	Remarks
Improper shift lever operation <Power status> ON	Shift Lever will not move	Poor input signal from stop lamp switch	Stop lamp switch	Check the stop lamp switch for signal. If normal, do NOT replace
			Wiring 1. Power ~ Stop lamp switch, 2. Stop lamp switch ~ Shift lock controller	
		Poor feedback input signal of shift range	1. Inhibitor switch 2. Wiring 3. Inhibitor ~ Shift lock controller	Do NOT replace the stop lamp switch.
Shift lock (shift lever malfunction)	Wiring 1. Power ~ Shift lever 2. Shift lock controller ~ Shift lever			

* NOTICE

For vehicles with an intermittent malfunction, shift lever operation problems and shift range display problems, replace the stop lamp switch for improper shift and the inhibitor switch for poor shift range display, respectively.