

 HYUNDAI Technical Service Bulletin	GROUP FUEL CELL	NUMBER 20-FL-001H
	DATE January, 2021	MODEL(S) Tucson (LMFC)

SUBJECT: FUEL CELL CONDITION EVALUATION

Description: This bulletin describes the procedure to evaluate the condition of the Tucson fuel cell stack.

Applicable Vehicles: 2015 – 2017MY Tucson (LMFC) Fuel Cell Electric Vehicle

Procedure Overview:

- Set the vehicle to Park, and start the the engine.
- Idle the vehicle until operating temperature is reached.
- Monitor the vehicle for air blower shut off and spool down.
- Record the minimum cell voltage ten seconds after the Air Blower passes 1500 RPM on spool down.

Required Tools & Equipment:

- Tablet loaded with latest version of GDS-M software
- Tablet charger cable
- 12 volt power outlet charger adapter for tablet.
- VCI-II

Before Performing this Procedure:

- Ensure the GDS-M has the latest software update per **TSB 15-GI-001**, and is fully charged.
- Idle the Fuel Cell until operating temperature is reached.
- Stage vehicle where short distance start/stop driving can be performed if needed.

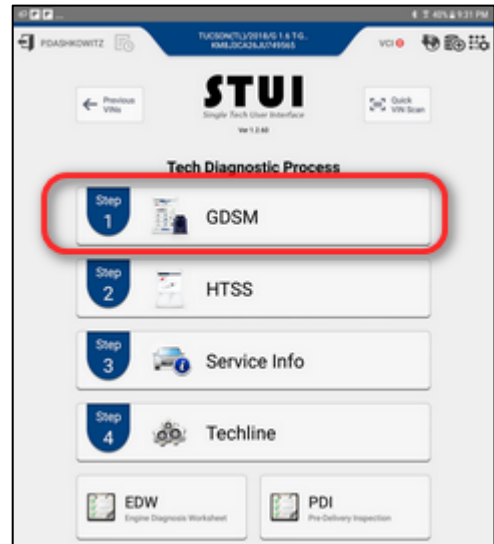
Warranty Information: Normal warranty applies.

Service Procedure:

1. Connect the VCI-II to the vehicle interface DLC connector located under the dash panel.



2. Launch the STUI app and select GDS-M.



3. From the GDS screen, select **Multi Data Analysis**.



4. Manually input the full VIN, and input Model and Model Year.

Auto-VIN function is not enabled for the Tucson (LMFC) vehicle.



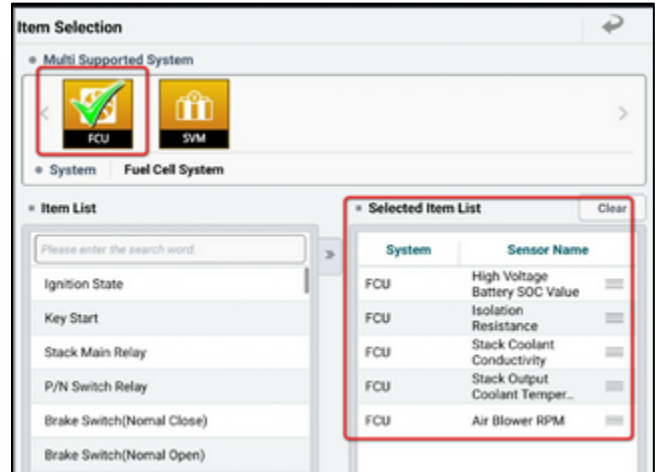
5. Select **FCU** and **SVM** In the System Selection (CAN Protocol) screen, then select **OK**.



6. At the **Item Selection** screen.

1. Select **FCU**, and then from the **Item List** select the following.

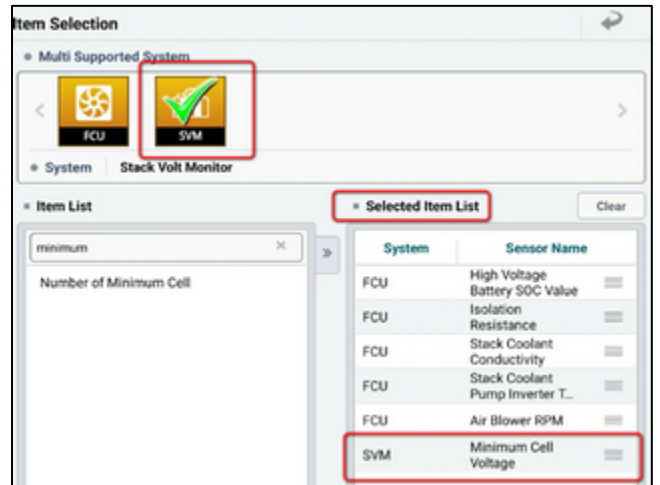
- High Voltage Battery SOC Value
- Isolation Resistance
- Stack Coolant Conductivity
- Stack Output Coolant Temperature Sensor Value
- Air Blower RPM



2. Select **SVM**, and then from the **Item List** select the following.

- SVM – Minimum Cell Voltage

After all data items are selected from the list, select **OK**.

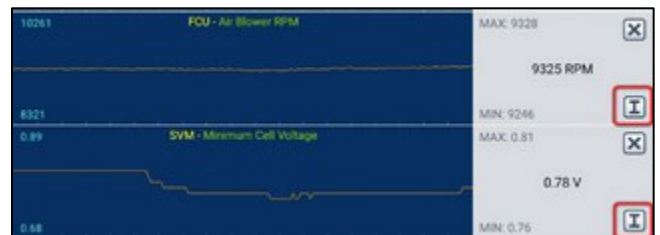


7. At the Multi Data Analysis screen, select **Graph**.

Expand the graph for easier viewing of

- FCU- Air Blower RPM
- SVM – Minimum Cell Voltage.

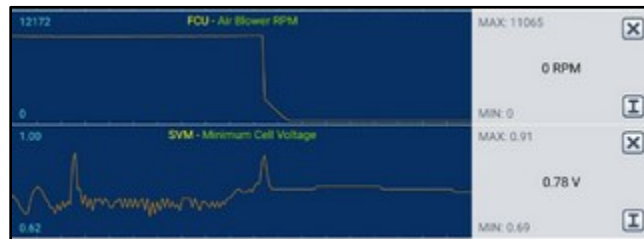
System	Sensor Name(s)	Value	Unit	Link Up
FCU	High Voltage Battery SOC Value	59.0	%	
FCU	Isolation Resistance	242	kOhm	
FCU	Stack Coolant Conductivity	1.0	uS/cm	
FCU	Stack Coolant Pump Inverter Temperature Value	34	°C	
FCU	Air Blower RPM	9403	RPM	
SVM	Minimum Cell Voltage	0.85	V	



- Monitor the FCU- Air Blower RPM. Watch for the blower to shut off, and RPM will drop to zero. Allow data collection to run 30 seconds after the air blower has shut off.

NOTICE

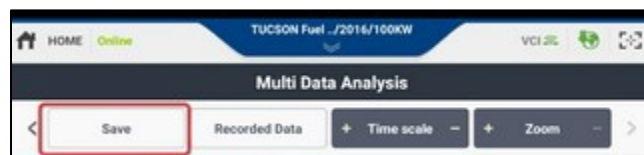
Generally the air blower will shut off when the high voltage battery reaches approximately 60% battery State Of Charge (SOC), and/or when driving the vehicle for short distances.



- Select **Stop**.



- Select **Save**.



- Write a note in the comments section: **ODT Evaluation VIN xxxxxxxx (Last 8 of VIN)**.

Select **Save**.

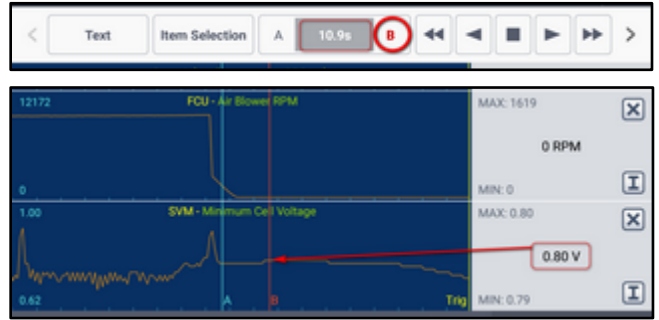
- Select marker **A**, and place the marker line as close as possible to 1500 RPM on the FCU- Air Blower RPM graph.



13. Select marker **B**, and place the marker line as close as possible to ten seconds (10s) after marker line A.

NOTICE

Select the **B** marker line so the GDSM displays the SVM- Minimum Cell Voltage where the **B** marker line crosses the voltage line in the graph.



14. SVC- **Minimum Cell Voltage** inference.
- a. At or above 0.75 volts - Fuel cell output is OK.
 - b. Below 0.75 volts – Fuel cell may have some degradation. However, driveability may be acceptable depending on driver expectation of fuel cell output.

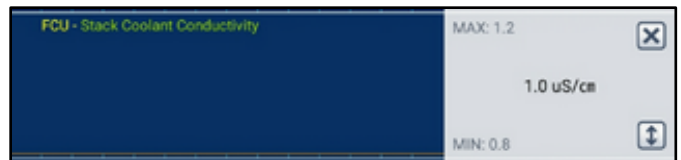


15. If isolation resistance is less than 100kΩ, then see **Step 16**.
If coolant conductivity in Step 16 is within specification, then low isolation resistance may be due to another cause. Refer to the service manual.



16. If Stack Coolant Conductivity is not within specification, this generally indicates the need for replacement of the stack coolant ion filter.

The electric conductivity of the stack coolant must be maintained below 4.2 μs/cm@ 25°C (77°F) or below 15 μs/cm @ 85°C (185°F). (The electric conductivity rises in proportion to the increase in temperature.)



17. The service procedure is now complete.