



HYUNDAI

Technical Service Bulletin

GROUP HYBRID CONTROL	NUMBER 19-HC-001H
DATE APRIL 2019	MODEL SONATA HYBRID/ PLUG-IN HYBRID (LF HEV/PHEV)

SUBJECT: AUTOMATIC TRANSAXLE
DTC P1990, P1B76, P1B77 & P0A0D

Description: If you are servicing a Sonata Hybrid with the symptoms and DTC listed below, follow the Service Procedure on Page 2.

Applicable Vehicles: 2016~ Sonata Hybrid (LF HEV)
2016~ Sonata Plug-in Hybrid (LF PHEV)

Symptoms:

- Check Engine light on
- “Check Hybrid System” warning message on cluster
- EV Ready mode cannot be activated.
- Engine will not start in EV Ready mode.

DTC Information:

DTC	DESCRIPTION	REPAIR
P1990	OPU Input high voltage wiring line	Go to Service Procedure
P1B76	High Voltage Relay Fault	Power relay assembly (PRA)
P1B77	High Voltage Pre-charging Fault	Power relay assembly (PRA)
P0A0D	High Voltage System Interlock Circuit High	HEV safety plug

Parts Information:

Refer to the PNC in the parts catalog to order the correct part number.

MODEL	PART	PNC	PART NUMBER
2016~ Sonata Hybrid (LF HEV) 2016~ Sonata Plug-in Hybrid (LF PHEV)	Power Relay Assembly (PRA)	37514	37514-****
	Oil pump control unit (OPU)	46150A	46190-3D***
	HEV safety plug	37586 37586A	37586-E6*** 37586-E6***

Warranty Information:

MODEL	OP CODE	OPERATION	OP TIME	CAUSAL PART	NATURE CODE	CAUSE CODE
Sonata Hybrid (LF HEV) Sonata Plug-in Hybrid (LF PHEV)	37514R1H	PRA (HEV)	Refer to WEBLTS for current LTS time	See part number list above	13A	ZZ3
	37514RA1	PRA (PHEV additional)				
	46150R00	OPU				
	37586R1H	HEV safety plug				
	37514RQ0	GDS				

Service Procedure:

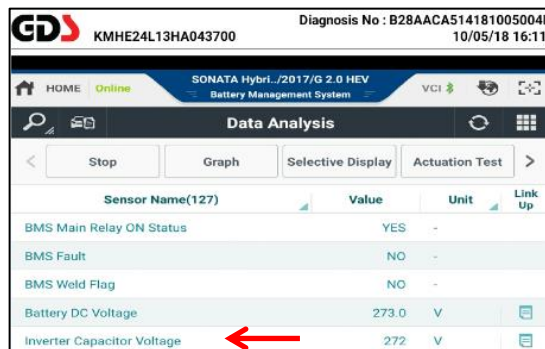
- Attach a GDS and select **DTC Analysis** and **BMS** menu.
 - If P1990 is found, go to Step 2 and follow the diagnosis.
 - If DTC P1B76, P1B77 or P0A0D are found, inspect the related part according the related shop manual and replace, if necessary. Go to Step 3.
- Press the Start-Stop Button (SSB) one time with the brake pedal depressed to activate EV Ready.

Attach a GDS and select **Data Analysis** and **BMS** menu and the parameters shown below.

All the parameters should indicate as shown below.

If the **Inverter Capacitor Voltage** is:

- 200v~310v: the voltage is currently within specification. Go to Step 3 and replace the PRA.
- Less than 200v. Go to Step 3. Follow the diagnosis for the PRA fuse in Step 7.

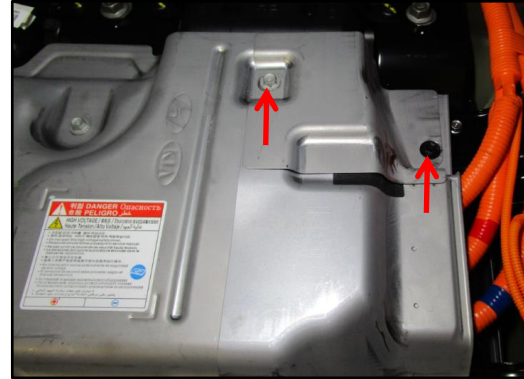


- Open the trunk and remove the luggage mat and cover board.

4. Remove two bolts and remove the access cover to the safety plug.

CAUTION

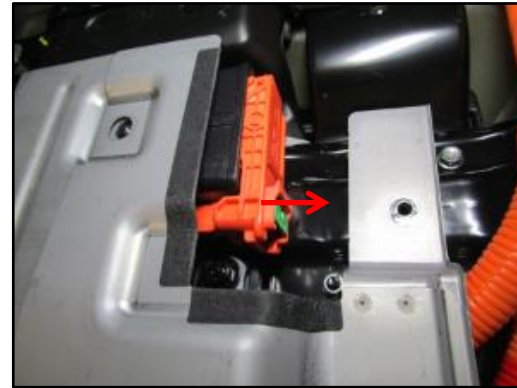
Wear insulated safety gloves and safety glasses. Failure to follow the safety guidelines may result in serious injury.



5. Pull the green tab outward and pull out the orange lever. Pull out the safety plug.

CAUTION

Wait 5 minutes for the inverter capacitor voltage to discharge.



6. Remove 5 bolts and 2 nuts and remove the steel cover for the PRA.



7. Lift up the orange cover.

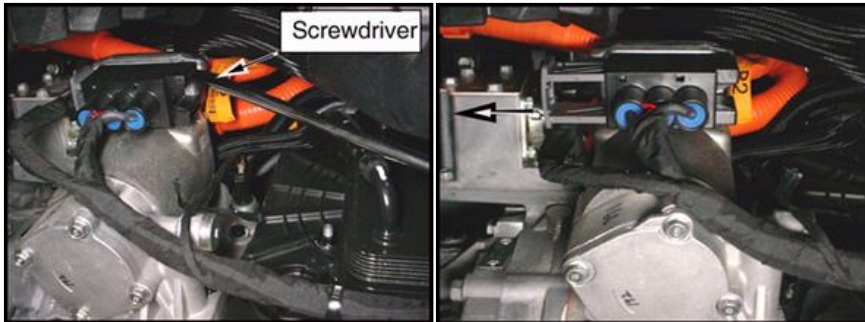
Use an ohmmeter to measure the resistance between the two mounting bolts of the PRA fuse.

- If the fuse shows less than 1 ohm, the fuse is good. Replace the PRA.
- If the fuse is open (high ohms), replace the fuse and go to Step 8 and check the OPU connector and wiring for an open circuit.



8. Use a flat screwdriver to push the gray tab to the left and remove the connector. Inspect the pins for corrosion or damage and repair if necessary.

If the connector has no corrosion or damage and was secured properly, diagnose the OPU according to the Sonata Hybrid Shop Manual. Replace the OPU if necessary.



9. Reassemble all parts in the order removed.
10. Clear the DTC and test drive the vehicle for two key-on/key-off driving cycles. If the DTC returns, check the high voltage cables according to the Sonata Hybrid Shop Manual.
11. Clear the DTC in the Blue Link system per instructions of TSB 12-BE-005-2.