HYUNDAI Technical Service Bulletin	GROUP	NUMBER
	AUTOMATIC TRANSMISSION	**22-AT-010H**
	DATE	MODEL
	AUGUST, 2022	**SONATA HYBRID (DN8 HEV) SANTA FE HYBRID (TM HEV) SANTA FE PLUG-IN HYBRID (TM PHEV) TUCSON HYBRID (NX4 HEV/PHEV) TUCSON PLUG-IN HYBRID (NX4 PHEV)**

SUBJECT:	AUTOMATIC TRANSAXLE INPUT/OUTPUT SPEED SENSOR DTC P071700, P072100 & P072200

DESCRIPTION: If you are servicing an applicable vehicle with a “Check Engine” light on and one or more of the DTC listed below, follow the Service Procedure and replace the valve body internal harness and the input/output speed sensor.

APPLICABLE VEHICLES:

2020~ Sonata Hybrid (DN8 HEV)
2021~ Santa Fe Hybrid (TM HEV)
2022~ Santa Fe Plug-in Hybrid (TM PHEV)
2022~ Tucson Hybrid (NX4 HEV)
2022~ Tucson Plug-in Hybrid (NX4 PHEV)

DTC AND PARTS INFORMATION:

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

Model	DTC	Description	PNC	Part Number
2020~ Sonata Hybrid (DN8 HEV) 2021~ Santa Fe Hybrid (TM HEV) 2022~ Santa Fe Plug-in Hybrid (TM PHEV) 2022~ Tucson Hybrid (NX4 HEV) 2022~ Tucson Plug-in Hybrid (NX4 PHEV)	P071700	Input/Turbine speed sensor A no signal	46210A	42620-3B***
	P072100	Output speed sensor circuit range/performance		
	P072200	Output speed sensor circuit no signal		
	All	Main harness	46307	46307-3D***
	All	Valve body gasket	45282E	45283-3D***

WARRANTY INFORMATION:

Model	Op Code	Operation	Op Time	Causal Part	Nature Code	Cause Code
2020~ Sonata Hybrid (DN8 HEV)	45644R00	Input sensor	Refer to WEBLTS for current LTS time	See Parts Informa-tion table on Page 1	I3A	ZZ3
	46308R00	Harness				
	45644RH1	Hybrid				
2021~ Santa Fe Hybrid (TM HEV) 2022~ Tucson Hybrid (NX4 HEV)	45644R00	Input sensor				
	46308R00	Harness				
	45644RH1	Hybrid				
	45644RF1	4WD				
2022~ Santa Fe Plug-in Hybrid (TM PHEV) 2022~ Tucson Plug-in Hybrid (NX4 PHEV)	45644R6P	Input sensor				
	46308R6P	Harness				
	45644RH1	Hybrid				
	45644RF1	4WD				
All	45644RQ0	GDS Operation				

Note 1: Normal Warranty Applies
Note 2: Please note that Op Codes 45644R00 and 45644R6P are primary Op Codes. Op code 45644RH1 and 45644RF1 are additional to the primary Op Codes and must be used for the hybrid vehicles listed above. Op Code 45644RQ0 must be used for diagnosis using the GDS.

SAFETY PRECAUTION:

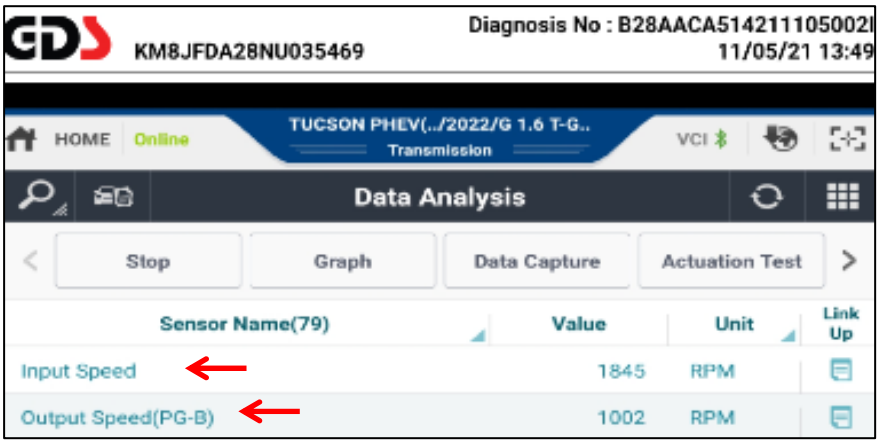
Refer to the related shop manual, **Hybrid Motor System, General Safety Information** and **Caution** warnings.

NOTE: Use only Rubber Insulating Gloves that meet or exceed ASTM D120 standards. (1000 volts AC/1500 volts DC).

Order from Hyundai.service-solutions.com, “EV Tools”
P/N J-48755-10H, J-48755-11H, J-48755-12H

SERVICE PROCEDURE:

1. Attach a GDS and select **DTC Analysis** and **A/T** menu. Record the DTC and description. Delete the DTC.
2. From the GDS home screen, select **Data Analysis** and **A/T** menu and the parameters shown below. If the parameters show:
   - Continuous and changing output while driving, the wiring **currently** has no open/short circuits. Go to Step 4.
   - No continuous and changing output, go to Step 3.

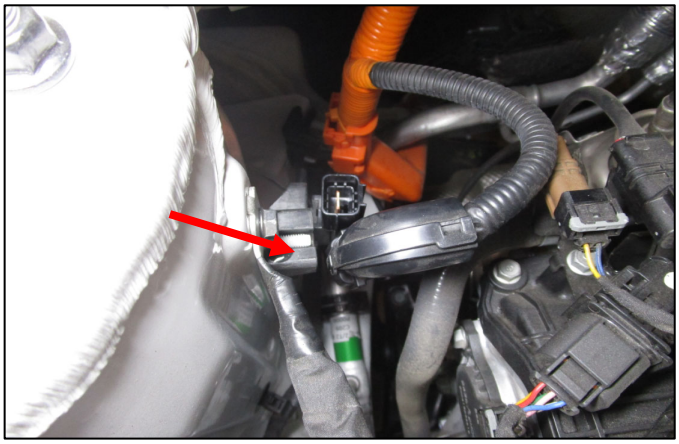


3. Visually check the wiring harness between the ECU or TCU and transmission for a damaged wire or open/short circuit. Check for a damaged pin or pin not fully inserted into the connector.
   - If damage exists, repair or replace the harness between the PCM or TCU and transmission. Drive the vehicle to confirm the repair.
   - If no damage or open/short circuit, go to Step 4.

NOTE: ECU and TCU information:

Models	Control Unit
Santa Fe Hybrid/Plug-in Hybrid (TM HEV/PHEV)	Separate ECU and TCU
Sonata Hybrid (DN8 HEV)	Combined ECU/TCU (PCM)
Tucson Hybrid/Plug-in Hybrid (NX4 HEV/PHEV)	Separate ECU and TCU

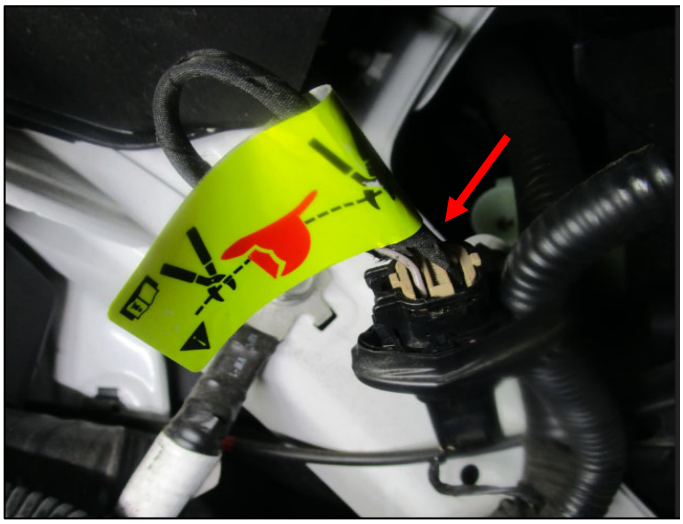
4. Record the preset radio stations.
5. Disconnect the service 12V interlock connector located on the passenger side of the engine bay.



6. Disconnect the service high-voltage interlock connector located on the driver side of the engine bay.

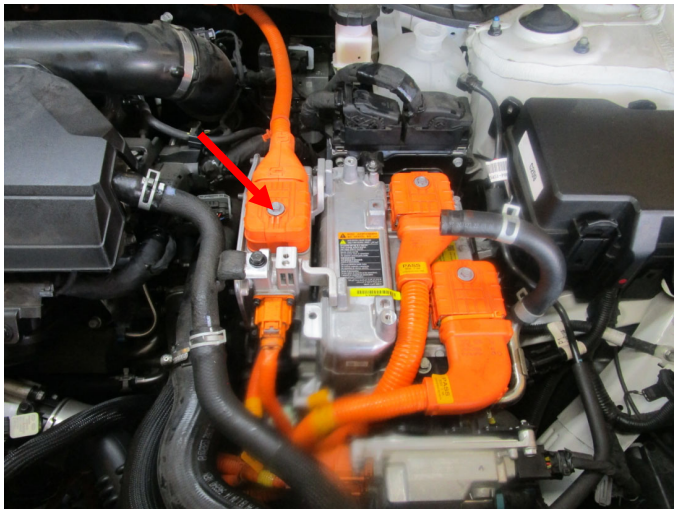
   Wait **3 minutes** for the capacitor in the high-voltage system to be fully discharged.

   Refer to the shop manual, **Automatic Transaxle System, High Voltage Shut-off Procedures.**



7. Remove the bolt and disconnect the high voltage power cable.

   Torque: 7~8 lb-ft (1.0~1.2 kgf.m, 10~12 N.m



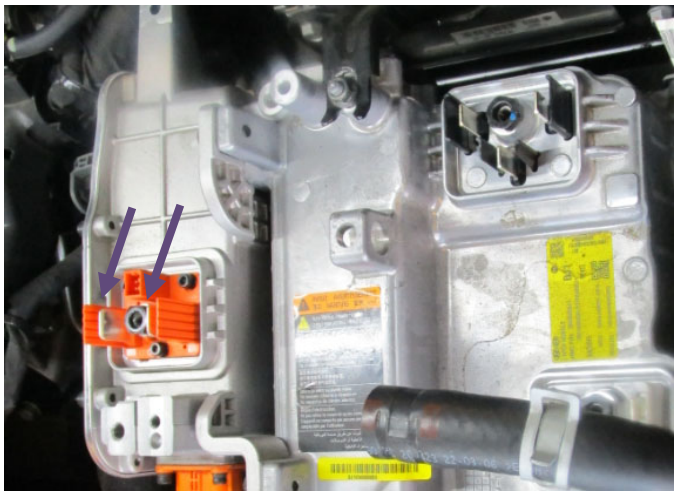
8. Wait more than **3 minutes** so the capacitor in the high voltage system can be discharged.

   Measure the voltage between the **inverter (+) terminal** and **(-) terminal**.

   If the voltage is below **30V**, the high voltage circuit has been disconnected.

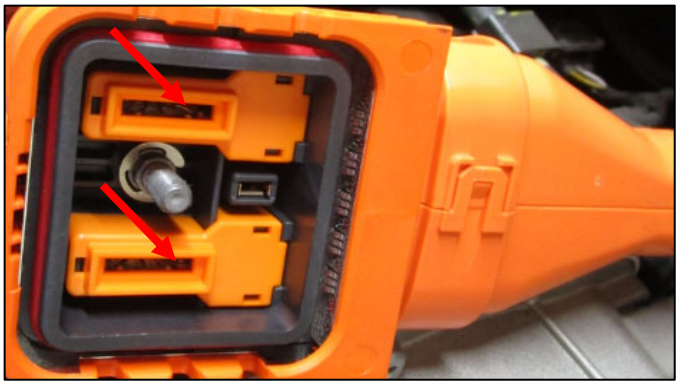
⚠ WARNING

If more than 30V, there is a fault on the high voltage circuit and the vehicle is not safe to work on.



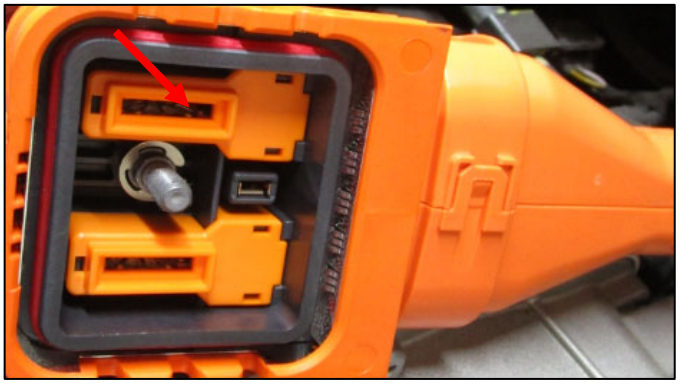
9. Measure the voltage between the power cable **(+) terminal** and **(-) terminal.**

   If the voltage is below 30V, the high voltage circuit has been disconnected.



10. Measure the voltage between the power cable **(+) terminal** and **chassis ground.**

    If the voltage is below 30V, the high voltage circuit has been disconnected.



11. Measure the voltage between the power cable **(-) terminal** and **chassis ground.**

    If the voltage is below 30V, the high voltage circuit has been disconnected.

> **⚠ WARNING**
>
> **If more than 30V, there is a fault on the high voltage circuit and the vehicle is not safe to work on.**

12. Drain the engine coolant at the radiator.

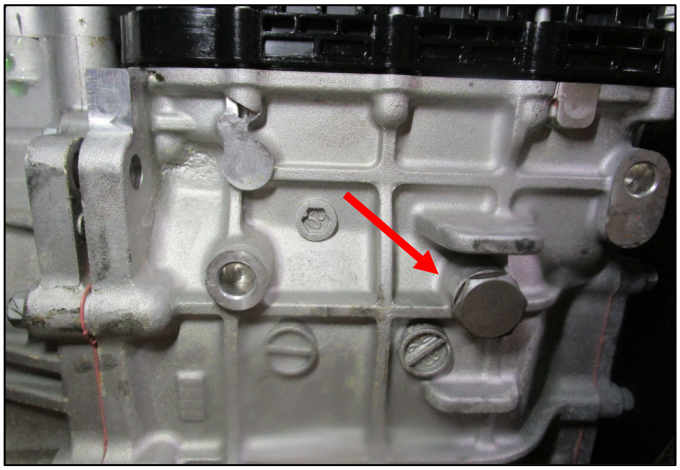
    Refer to the shop manual, **Engine Mechanical System, Cooling System, Coolant**, **Repair Procedures.**

13. Remove the plastic under cover.

    Remove the drain plug and drain the ATF.

    Reinstall the drain plug.

    Torque: 25~31 lb-ft (3~4 kg.m, 33~43 N.m)

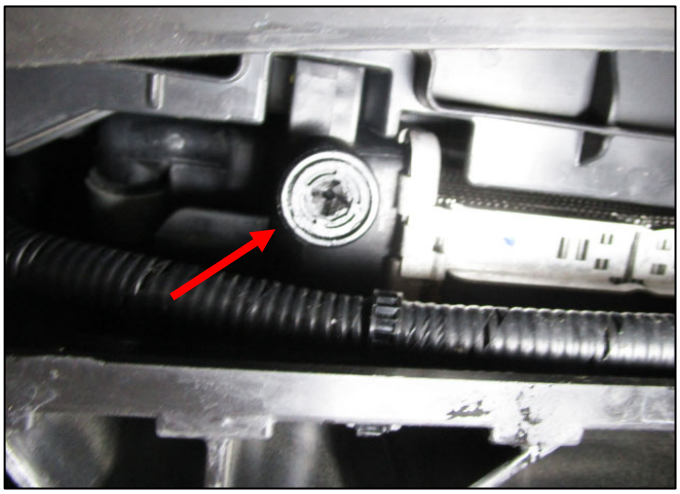


14. Remove the hybrid cooling system drain plug and drain the coolant.

    Refer to the shop manual, **Hybrid Motor System**, **Hybrid Motor Cooling System – Coolant, Repair Procedures.**

    Reinstall the hybrid cooling system drain plug.

    Optional procedure: Disconnect the lower hose from the hybrid radiator.

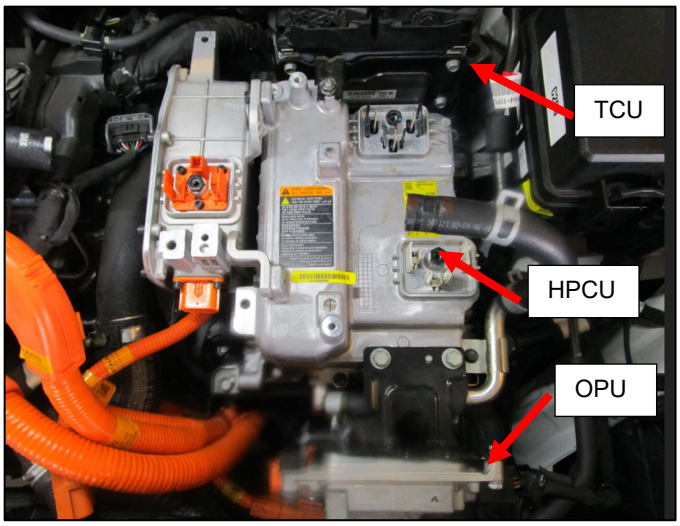


15. Disconnect the TCU connector and remove the TCU.

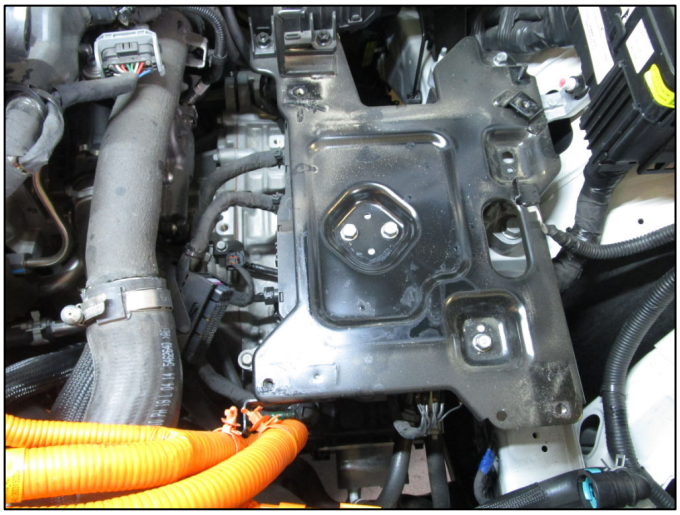
    Remove the hybrid power control unit (HPCU).

    Refer to the shop manual, **Hybrid Control System, Hybrid Control System, HPCU, Repair Procedures.**

    Disconnect the OPU connector and remove the OPU.

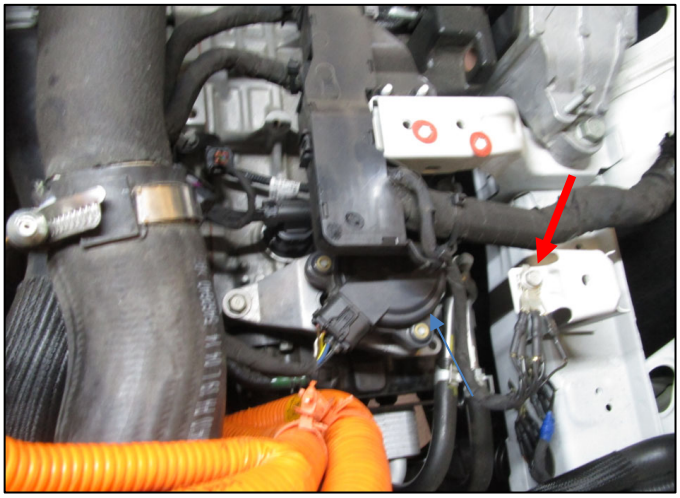


16. Remove the HPCU tray.

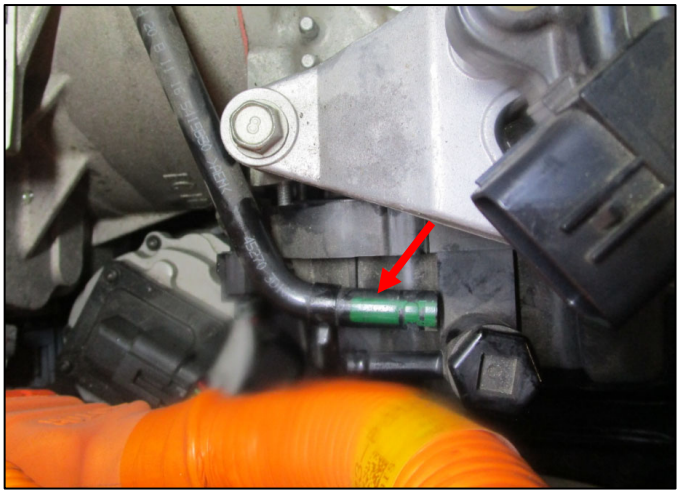


17. Remove the ground bolt.

    Move the harness aside for access to the transmission.

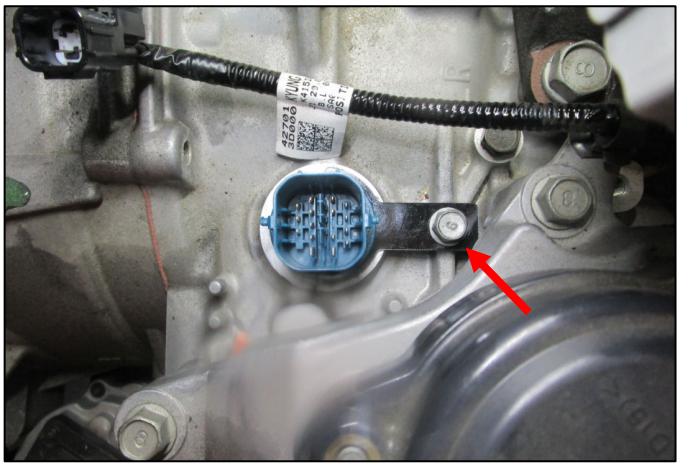


18. Disconnect the air bleeder hose.

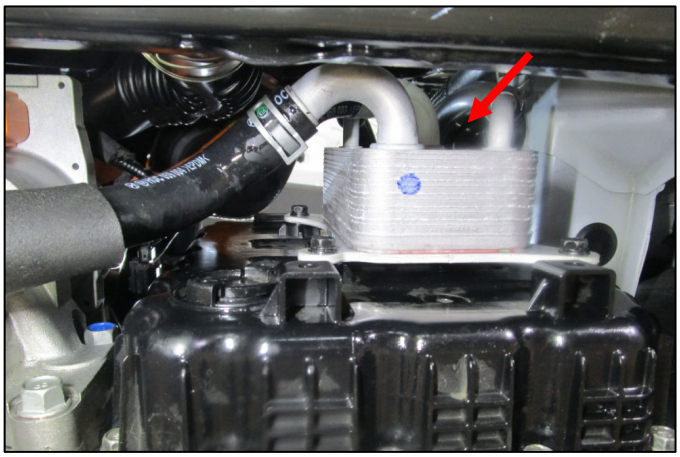


19. Disconnect the harness from the connector.

    Remove the bolt and clip. Push the connector into the transmission case.



20. Remove the ATF warmer, located on the valve body cover.



21. **<u>For Tucson Plug-in Hybrid (NX4 PHEV):</u>** Refer to the shop manual, **Automatic Transaxle System, Automatic Transaxle System, Automatic Transaxle, Repair Procedures** and remove the transmission. Go to Step 22.

    <u>For all other HEV/PHEV:</u> Continue with Step 22.

22. Remove the valve body cover.

CAUTION

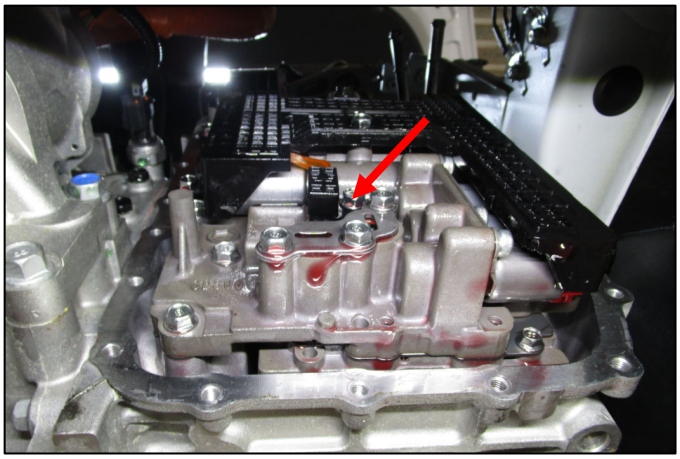
Use a rubber hammer to tap the cover on a corner until the cover is loose.

23. Remove the bolts for the harness and oil temperature sensor.

    Move the main harness up and out of the way so the valve body can be removed.

    Remove the bolts on the valve body, beginning with the outer bolts and moving to the inner bolts.

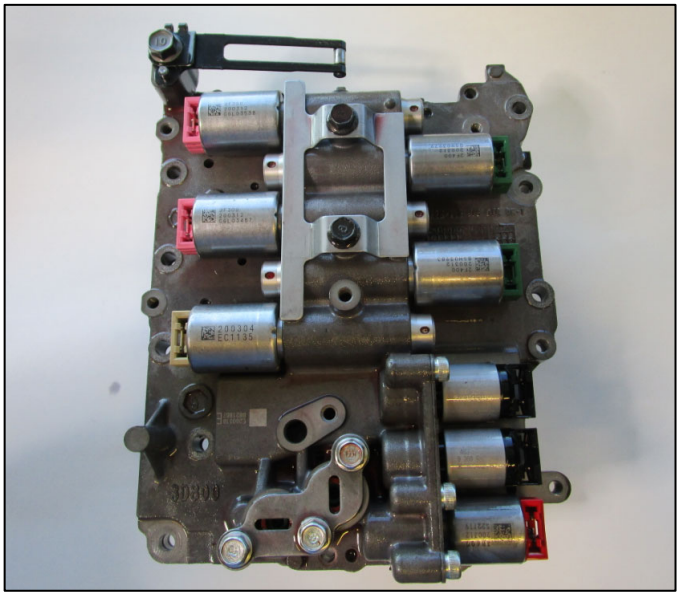
    Remove the valve body.



24. Lay the valve body on a clean paper towel.

NOTICE

Do not lay the valve body on a rag because a rag may have lint that can contaminate the valve body.



25. Disconnect the harness from the input and output speed sensors.

    Remove the harness.

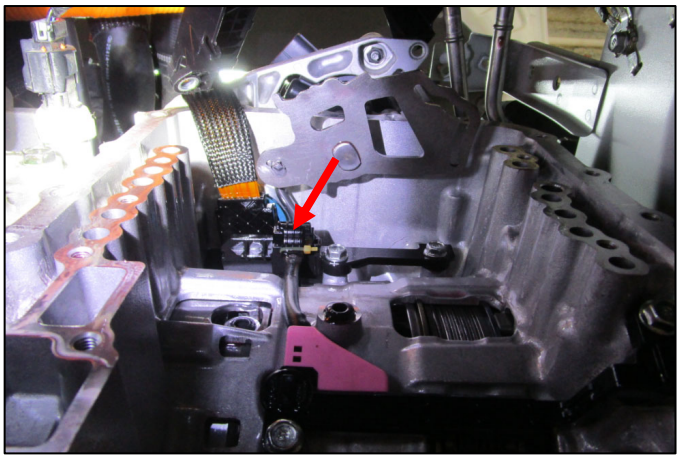
    Install a new harness and push the connector firmly into the transmission case.

    Remove the input/output speed sensors.

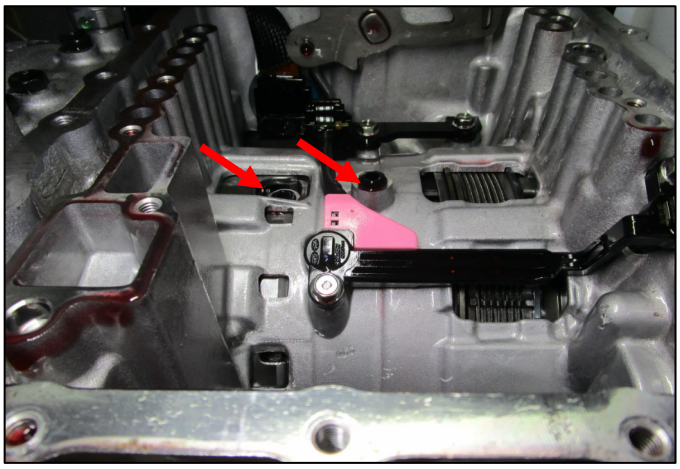
    Install new input/output speed sensor and torque to specification.

    Torque: 7~9 lb-ft (1.0~1.2 kgf-m, 10~12 N.m)

    Reconnect the harness to the input and output speed sensors.



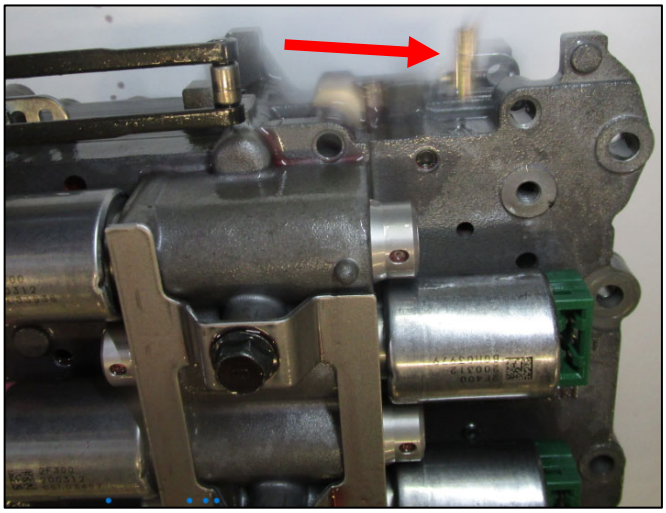
26. Confirm 2 O-rings are installed in the transmission case.

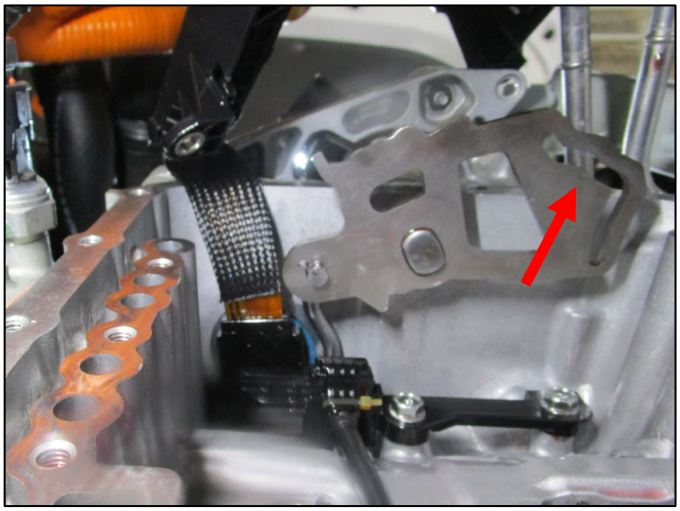


27. Move the harness up and out of the way so the valve body can be reinstalled.

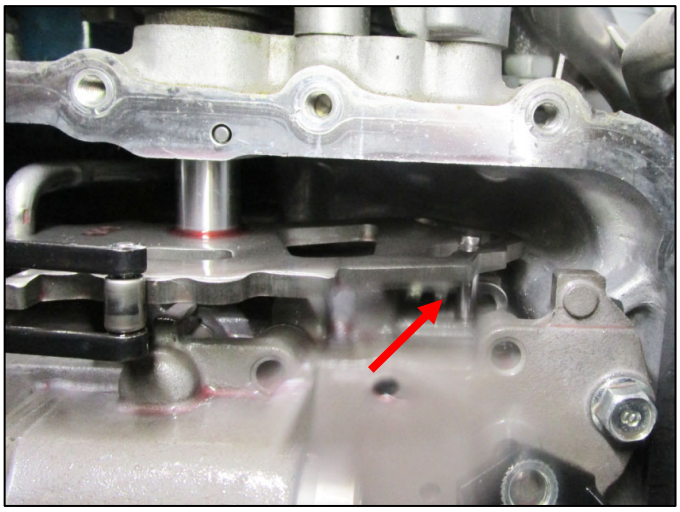
    Align the manual shaft on the valve body to the slot in the manual lever and install the valve body.

    Reinstall the valve body bolts, beginning with the inner bolts and moving outward. Torque the bolts to specification.
    Torque: 7~9 lb.ft (1.0~1.2 kgf.m, 10~12 N.m)





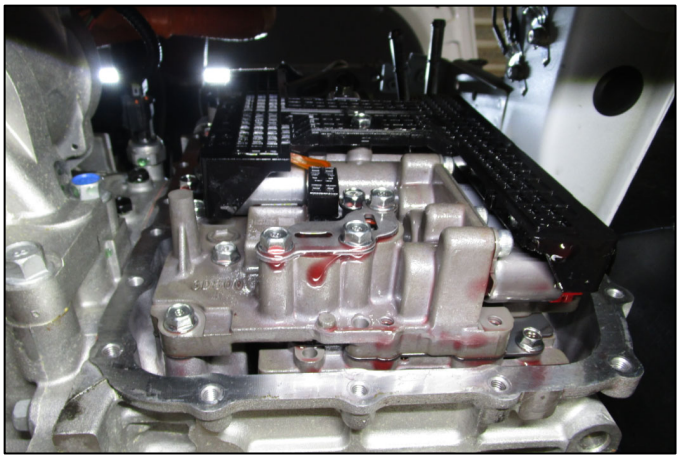
28. Confirm the manual shaft is inserted in the slot in manual lever.



29. Confirm the harness connector is pushed firmly into the case.

    Install the new main harness.

    Install the bolts and torque to specification.
    Torque: 7~9 lb-ft (1.0~1.2 kgf-m, 10~12 N.m)



30. Install a new valve body cover gasket.
    P/N 45283-3D100.

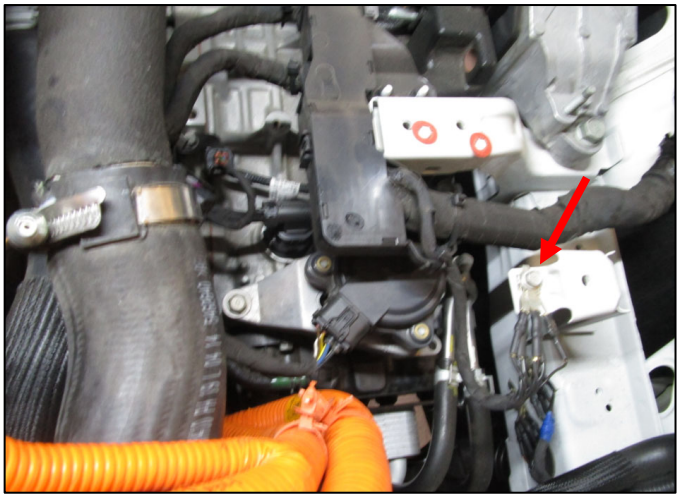
    Reinstall the valve body cover and torque the bolts to specification.
    Torque: 9~10 lb.ft (1.2~1.4 kgf.m, 12~13 N.m)

    Reconnect the ATF hoses.

31. Reinstall the harness and install the ground bolt.

    Reinstall the HPCU tray.

    Reinstall the OPU, HPCU and TCU.
    Refer to the shop manual**, Hybrid Control System, Hybrid Control System, HPCU.**

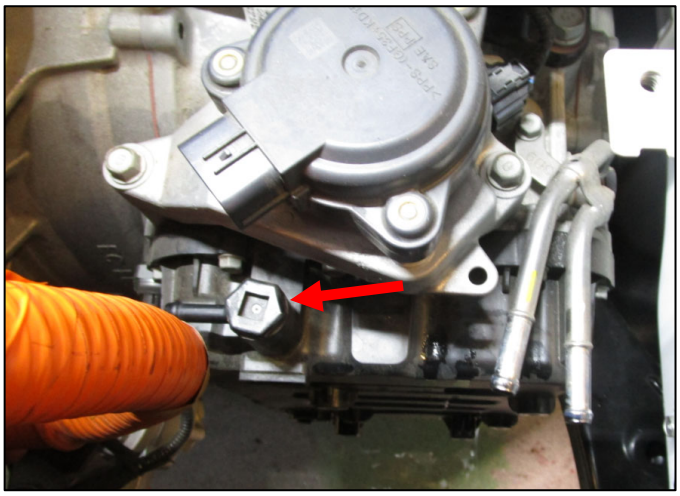


32. Remove the fill plug.

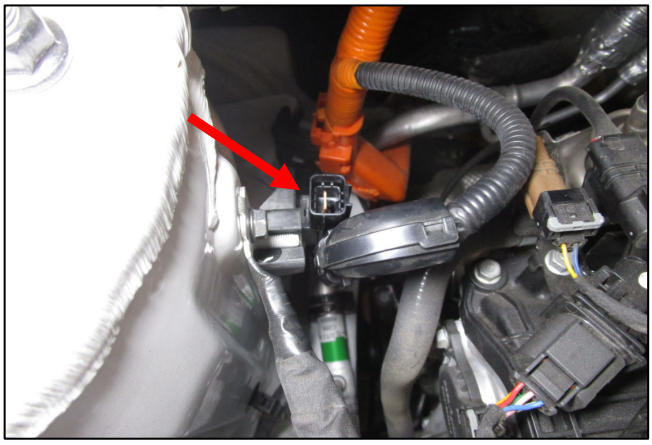
    Add approximately 4 quarts of **SP4-M1 ATF**, **P/N 00232-19107** through the fill plug.

    Reinstall the fill plug and torque to specification.

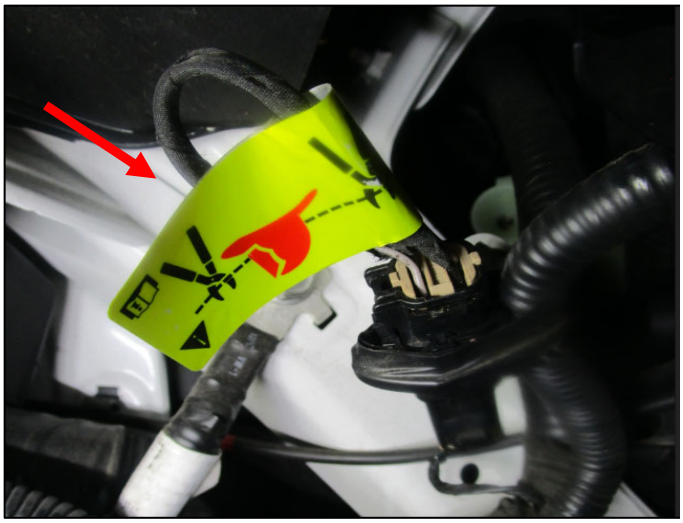
    Torque: 25~31 lb-ft (3~4 kgf.m, 34~43 N.m)



33. Reconnect the 12V safety plug located on the passenger side of the engine bay.



34. Reconnect the high voltage plug, located on the driver's side near the radiator.

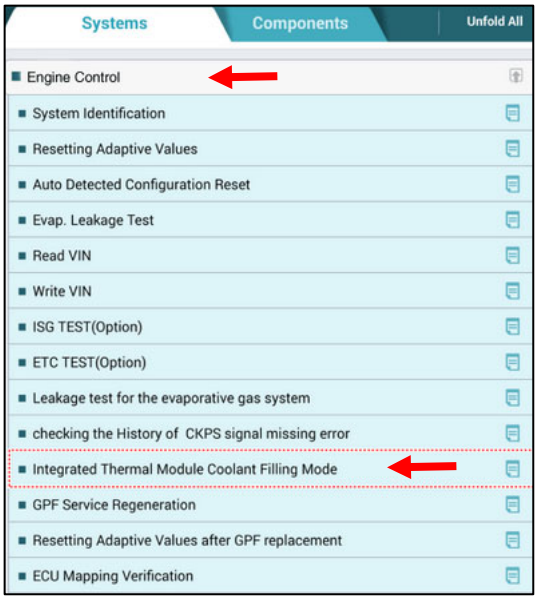


35. Attach the radiator hoses.

    Refill the engine coolant.

    Refer to the related shop manual, **Engine Mechanical System, Cooling System, Coolant** and **Repair Procedures.**

    Attach a GDS and select **S/W Management, Engine Control** and **Integrated Thermal Module Coolant Filling Mode.** Follow the GDS prompts.



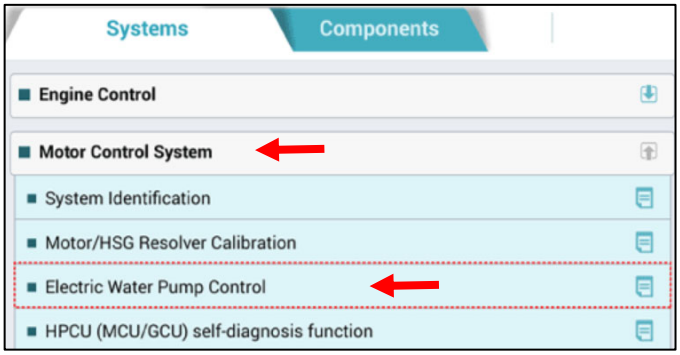
36. Reinstall the hybrid coolant drain plug.

    Add hybrid coolant through the reservoir.

    NOTE: Use **00232-19091** Electric Vehicle Battery System Coolant (BSC-1).

    Refer to the related shop manual, **Hybrid Motor System, Hybrid Motor Cooling System, Coolant** and **Repair procedure**.

    Attach a GDS and perform the hybrid coolant refill procedure. Select **S/W Management, Motor Control System, Electric Water Pump Control.** Follow the GDS prompts.



37. Attach the GDS and select **Data Analysis, A/T** menu and **Oil Temperature Sensor**.

    Start the engine and shift to R, D and Park.

    When the ATF is **122°F~140°F (50~60°C),** remove the level checking plug. The level is correct when ATF flows out of the level checking plug in a thin steady stream.

    If ATF does not flow out of the level checking plug, use a fluid pump to add additional **SP4-M1 ATF**, **P/N 00232-19107** through the level checking plug.

    Collect and dispose of any excess fluid in accordance with local regulations.

38. Input the radio stations recorded in Step 5.

39. Clear the DTC and test drive the vehicle for two key-on/key-off driving cycles, including 1-2-3-4-5-6 upshifts and 6-5-4-3-2-1 downshifts. If the DTC returns, perform the following repairs:

REPAIR PROCEDURE
• Repair or replace the control wiring harness between the PCM or TCU and transmission. • If the DTC does not return, return the vehicle to the customer. • If the DTC returns again, replace the PCM or TCU.

NOTE: ECU and TCU information:

Models	Control Unit
Santa Fe Hybrid/Plug-in Hybrid (TM HEV/PHEV)	Separate ECU and TCU
Sonata Hybrid (DN8 HEV)	Combined ECU/TCU (PCM)
Tucson Hybrid/Plug-in Hybrid (NX4 HEV/PHEV)	Separate ECU and TCU

40. Drive the vehicle to confirm the transmission is operating as designed.