 HYUNDAI Technical Service Bulletin	GROUP AUTOMATIC TRANSMISSION	NUMBER 22-AT-001H
	DATE JANUARY, 2022	MODEL PALISADE (LX2) SANTA FE (TMA) SANTA FE HYBRID (TM HEV) SONATA (DN8A) SONATA HYBRID (DN8 HEV) TUCSON (NX4/NX4A) TUCSON HYBRID (NX4 HEV)
SUBJECT: AUTOMATIC TRANSAXLE PUSH-BUTTON SHIFTER DIAGNOSIS		

This TSB supersedes TSB 21-AT-009H to add Symptoms, DTC and add Steps 7~9.

DESCRIPTION: This TSB provides a procedure to diagnose the push button shifter operation. If you are servicing a vehicle with any symptoms or DTC listed below, follow the Service Procedure, Page 2.

APPLICABLE MODELS:

2020~ Palisade (LX2)	2020~ Sonata Hybrid (DN8 HEV) 2.0L
2021~ Santa Fe (TMA) 2.5L	2022~ Tucson (NX4/NX4A) 2.5L
2021~ Santa Fe Hybrid (TM HEV) 1.6T	2022~ Tucson Hybrid (NX4 HEV) 1.6T
2020~ Sonata (DN8/DN8A) 1.6T/2.5L	



SYMPTOMS:

- “Shifter System Malfunction” displayed in the cluster
- Won’t shift into or out of gear or won’t shift out of Park
- Incorrect gear display in cluster and/or won’t start

DTC PARTIAL LIST: (Refer to **SBW Control Unit** or **E-Shifter** section for additional DTC)

DTC	Description
P060148	Functional Safety Level 2 SW failure (See TSB 21-AT-008H-1)
P065713	SBW actuator power relay error
P07FF00	SBW system Error - Abnormal power voltage
P0705**	Transmission range circuit
P106D00	SBW actuator stuck (See TSB 21-AT-008H-1)
P106D13	SBW actuator stuck - open/short
P106D14	SBW system Error - UVW open/short
P106D71	SBW actuator stuck (See TSB 21-AT-008H-1)
P28E214	Shift motor UVW circuit - open
P28E577	SBW actuator commanded position not reached - Short
P28E592	SBW motor performance
P28EA71	SBW actuator stuck
P28EA77	SBW actuator commanded position not reached
U110382	Lost communication with TGS lever (See TSB 21-AT-008H-1)
U110400	Lost communication with TGS lever

PARTS INFORMATION:

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

MODEL		DESCRIPTION	PNC	PART NUMBER
2020~	Palisade (LX2)	SBW Lever	46700	467W0-*****
2021~	Santa Fe (TMA) 2.5L	SBW Control Unit (SCU)	42950	42950-*****
2021~	Santa Fe Hybrid (TM HEV) 1.6T		42951	42951-*****
2020~	Sonata (DN8/DN8A) 1.6L/2.5L	SBW Actuator	42910	42910-*****
2020~	Sonata Hybrid (DN8 HEV) 2.0L	Position sensor	42700	42700-*****
2022~	Tucson (NX4/NX4A) 2.5L	ECU (Unified ECU/TCU) TCU	39110	Parts catalog
2022~	Tucson Hybrid (NX4 HEV) 1.6T		95440	

NOTE: Refer to TSB 21-AT-007H to replace the position sensor or SBW actuator.

WARRANTY INFORMATION:

Model		Op Code	Operation	Op Time	Causal	Nature Code	Cause Code
2020~ 2021~ 2021~ 2020~ 2020~ 2022~ 2022~	Palisade (LX2) Santa Fe (TMA) 2.5L Santa Fe Hybrid (TM HEV) Sonata (DN8/DN8A) Sonata Hybrid (DN8 HEV) Tucson (NX4/NX4A) 2.5L Tucson Hybrid (NX4 HEV)	42700R00	Range switch	Refer to WEBLTS for current LTS time	See Parts Information table on Page 1	I3A	ZZ3
		46700R00	Electronic lever				
		42910R00	Parking Actuator				
		42950R00	SBW Control Unit				
		39110R00	Engine control unit				
		95440R00	Transmission control unit				
		2021~ 2020~ 2022~	Santa Fe (TM HEV) Sonata (DN8 HEV) Tucson (NX4 HEV)				
All		42700RQ0	GDS				

NOTE: Normal Warranty Applies

SERVICE PROCEDURE:

1. Attach a GDS and select **Fault Code searching, All** and **OK**. Record the DTC and description. Delete the DTC.
2. If DTC are found, refer to DTC list on Page 1 or the related shop manual, **E-Shifter** or **SBW Control Unit** section for repair guidance.
If no DTC are found, go to Step 3.

3. Start the engine. From the GDS home screen, select **Data Analysis** and **A/T** menu and the parameters shown below. Push the shift buttons to change gears P, R, N and D. If the cluster and the GDS data shows:
- Correct gear, the TCU received the correct signals from the SBW lever. The SBW lever is currently functioning correctly and the related harness currently does not have an open/short. Go to Step 4.
 - Does not show the correct lever position, the SBW lever or related harness may have a fault. If no damage or loose pins are found with the related harness, replace the SBW lever.

Sensor Name(29)	Value	Unit	Link Up
Current Gear	1	-	
Shift Lever Switch	D	-	

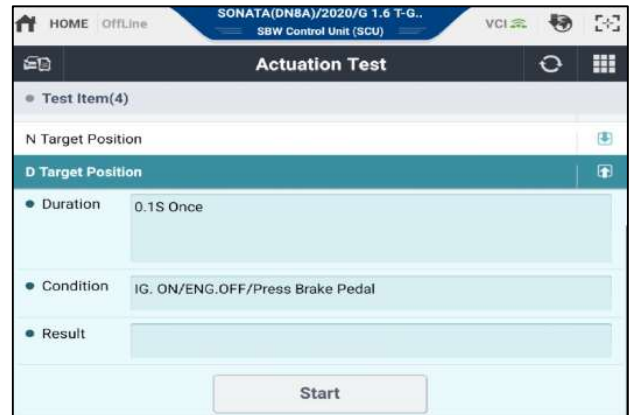
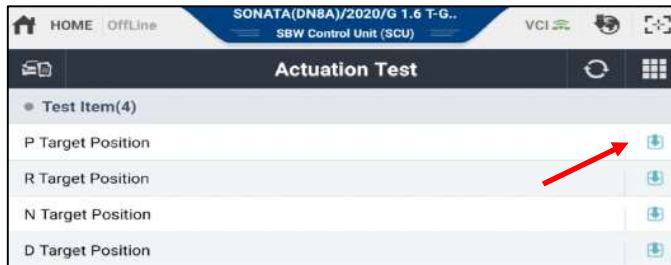
4. Start the engine. From the GDS home screen, select **Data Analysis**, **SCU** menu and the parameters shown below. Push the shift buttons to change gears. If the GDS data shows:
- Correct **Target Lever Position** and **Actual Lever Position**: The SCU commanded the SBW actuator to shift to the requested gear. The SBW actuator and position sensors 1 and 2 are functioning correctly and the related harness currently does not have an open/short. Go to Step 5.
 - Does not show the correct **Target Lever Position**: The SCU did not command the SBW actuator to shift to the requested gear. The SCU or related harness may have a fault.
 - Does not show the correct **Actual Lever Position**: The SBW actuator did not select the requested gear. The SBW actuator or related harness may have a fault.

NOTE: The **Motor Feedback Current** should briefly show electrical current when a shift button is pressed, indicating the SCU sent current to the SBW actuator. If no amps is shown, the SCU or related harness may have a fault.

NOTE: The sum of Position sensor 1 and 2 should be approximately 100%.

Sensor Name(15)	Value	Unit	Link Up
Target Lever Position	D	-	
Actual Lever Position	D	-	
A/T Main Relay Voltage	14.3	V	
Motor Feedback Current	0.0	A	
Non-inhibit sw position sensor 1	80.7	%	
Non-inhibit sw position sensor 2	19.4	%	

5. Turn the engine off and push the SSB 2 times to turn the ignition **ON**. Press the brake pedal. From the GDS home screen, select **Actuation Test** and **SCU** menu. Test the Target position for P, R, N and D. Press the arrow to change the selection. If the GDS and cluster show:
 - Correct **Target Position** for P, R, N and D: The SCU sent electrical current to the SBW actuator, the SCU and SBW actuator are currently operating correctly and the related harness currently does not have an open/short circuit. Go to Step 6.
 - Does not show the correct **Target Position** for P, R, N and D: The SCU, SBW actuator or related harness may have a fault.



6. If Steps 3~5 do not show a fault, visually check the wiring harness between the PCM 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 related harness.
 - If no damage or open/short circuit is found, go to Step 7.

7. FOR Santa Fe (TMA) only:

If the customer comment was either comment listed below, go to Step 9. If not, go to Step 8.

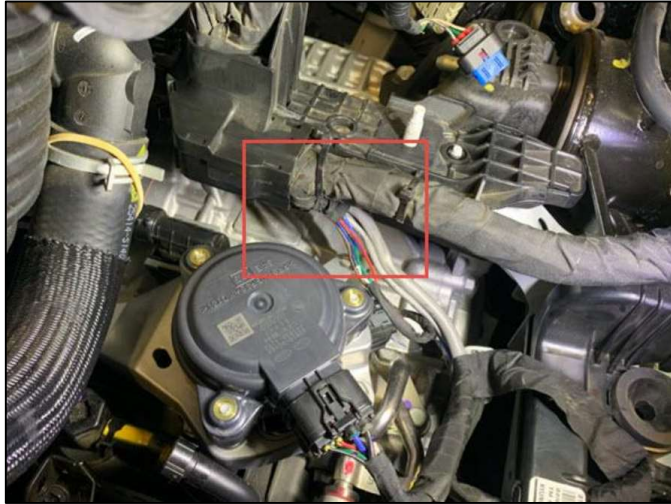
- “Shifter System Malfunction” displayed on the cluster
- DTC P28E214, Shift motor phase UVW circuit open

8. If Steps 3~5 did not find any faults and the issue cannot be duplicated, the issue may be intermittent. **Refer to HTSS “Fix it Right” under symptom “ATM – Gearshift Control”.**

9. Record the customers radio presets.
Remove the air cleaner, battery and battery tray.
Check if the harness is in contact with the battery tray. If so, go to Step 10.



- If the harness to the SBW actuator is in contact with the battery tray, carefully unwrap the harness protector in the area shown below. Check the insulation on the wires to see if the insulation has been damaged by contact with the battery tray. If so, repair or replace the control harness.



APPENDIX: SBW OPERATION

4 components are required to shift to P, R, N and D.

In addition, the PCM or TCU are required to select the correct transmission solenoids.

