



HYUNDAI
Technical Service Bulletin

GROUP AUTOMATIC TRANSMISSION	NUMBER 23-AT-012H
DATE AUGUST 2023	MODEL(S) SANTA FE (TMa) SONATA (DN8a) SANTA CRUZ (NXT)

SUBJECT: 8-SPEED WET DCT TCU UPGRADE – TOUCH POINT LEARNING IMPROVEMENT FOR 2.5T VEHICLES

Description: This bulletin provides information related to a Transmission Control Unit (TCU) software update for certain vehicles equipped with an 8-speed wet dual clutch transmissions (8WDCT) that improves the touch point learning variation. Certain 8WDCTs (indicated by a new part number) received an improved clutch spring. The correct TCU software update must be matched with the correct corresponding 8WDCT hardware, otherwise drivability concerns may occur.

Applicable Vehicles:

- 2021MY ~ Santa Fe (TMa) 2.5T (VINs starting with “5NM”)
- 2021MY ~ Sonata (DN8a) 2.5T N-Line Trim (VINs starting with “5NP”)
- 2022MY ~ Santa Cruz (NXT) 2.5T

Warranty Information:

MODEL	OP CODE	OPERATION	OP TIME	CAUSAL PART	NATURE CODE	CAUSE CODE
Santa Fe (TMa) Sonata (DN8a) with N Line Trim Santa Cruz (NXT)	954A0F02	TCU Upgrade (Before) + Vehicle Calibration	0.7 M/H	954A1-2N250 (TMa) 954A1-2N060 (DN8a) 954A1-2N460(NXT)	S21	ZZ3
Santa Fe (TMa) Sonata (DN8a) with N Line Trim Santa Cruz (NXT)	954A0F03	TCU Upgrade (After) + Vehicle Calibration	0.7 M/H	954A1-2N251 (TMa) 954A1-2N060 (DN8a) 954A1-2N460 (NXT)	S21	ZZ3

NOTE 1: Normal warranty applies.

NOTE 2: Submit claim on Claim Entry Screen as “Warranty” type.

NOTE 3: This TSB includes Repair validation photos. OP times including VIN, Mileage, and Repair validation photos as outlined in the Digital Documentation Policy.

NOTE 4: The incident parts are subject to callback through the normal Warranty Technical Center (WTC) parts return process. **Claim is subject to debit if the part is not returned.**

NOTE 5: If a part is found in need of replacement while performing this TSB and the affected part is still under warranty, submit a separate claim using the same repair order. If the affected part is out of warranty, submit a Prior Approval request for goodwill consideration prior to performing the work.

Parts Information:

Before-Improvement 8WDCT

MODEL	ENGINE	TYPE		T/M ASSY NO.	REMAN. PART	REMARK	LATEST TCU CAL ID (EVENT #)
Santa Fe (TMa)	Theta 2.5T	SBW	2WD	430F0-2N085	N/A	with TCU	VTMPT25XXX900NSA (#895)
				43000-2N034	43000-2N034RM	without TCU	
			4WD	430F0-2N086	N/A	with TCU	
				43000-2N035	43000-2N035RM	without TCU	
Sonata (DN8a) with N Line Trim	Theta 2.5T	SBW	2WD	430F0-2N034	N/A	with TCU	VDN8T25XXX900NSC (#896)
				43000-2N050	43000-2N050RM	without TCU	
Santa Cruz (NXT)	Theta 2.5T	SBC	4WD	430F0-2N081	N/A	with TCU	WNX4T25X4X900NS9 (#897)
				43000-2N022	43000-2N022RM	without TCU	

After-Improvement 8WDCT

MODEL	ENGINE	TYPE		T/M ASSY NO.	REMAN. PART	REMARK	LATEST TCU CAL ID (EVENT #)
Santa Fe (TMa)	Theta 2.5T	SBW	2WD	43000-2N036	43000-2N036RM	without TCU	VTMPT25XXW900NS1 (#920)
			4WD	43000-2N037	43000-2N037RM	without TCU	
Sonata (DN8a) with N Line Trim	Theta 2.5T	SBW	2WD	43000-2N052	43000-2N052RM	without TCU	VDN8T25XXW900NS1 (#921)
Santa Cruz (NXT)	Theta 2.5T	SBC	4WD	43000-2N029	N/A	without TCU	WNX4T25X4W900NS1 (#922)

Note: SBC = Shift By Cable, SBW = Shift By Wire

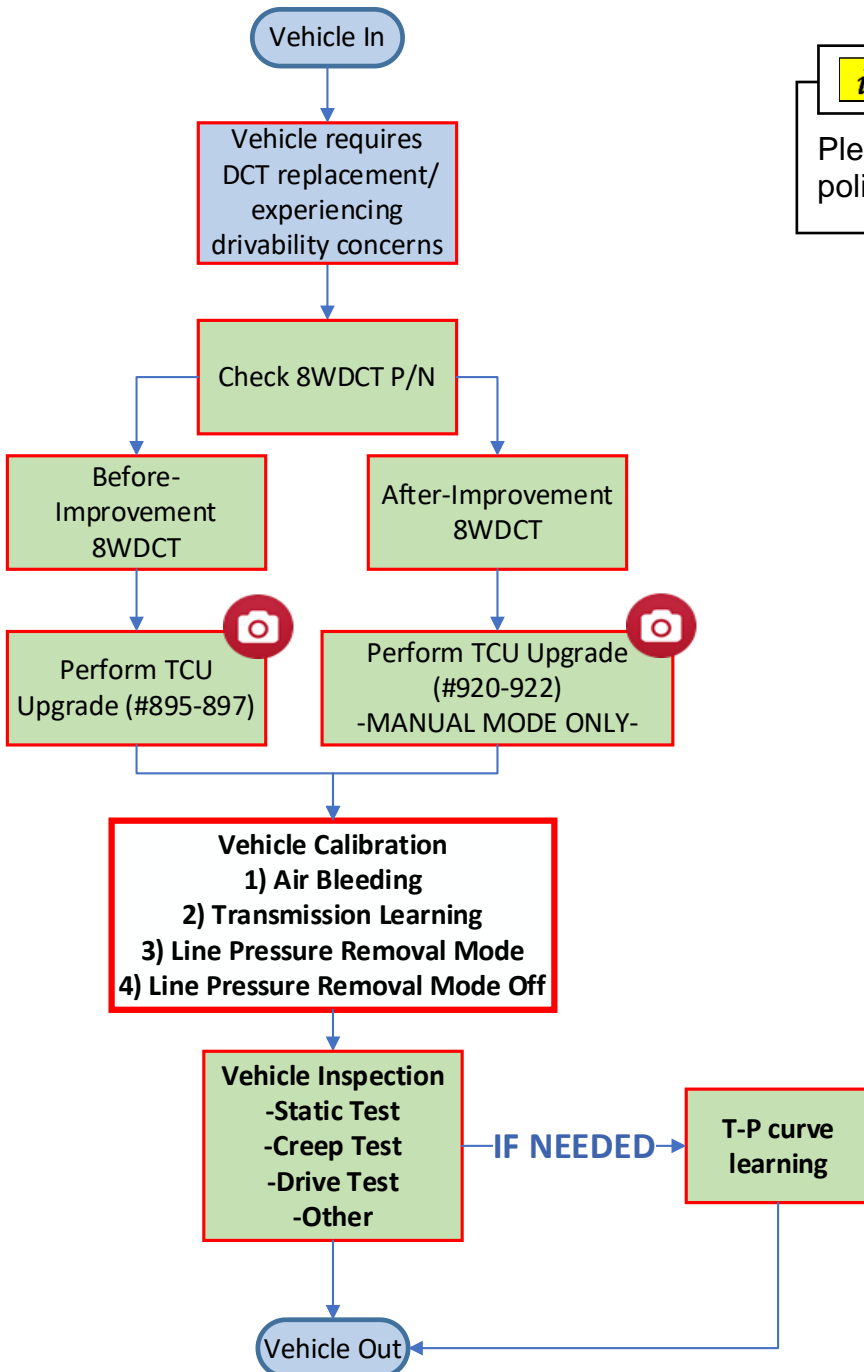
Service Procedure:

STUI



This TSB includes Repair validation photos. Refer to the latest Warranty Digital Documentation Policy for requirements.

1. Refer to the flowchart below for overall procedure.



i Information

Please refer to standard HMA warranty policy & procedures for DCT replacement.

NOTICE

Make sure that the TCU CAL ID is the latest and **matches the corresponding part number**, otherwise shift shock may occur.

If vehicle experiences hesitation/jerking during inspection, perform T-P curve learning.

i Information

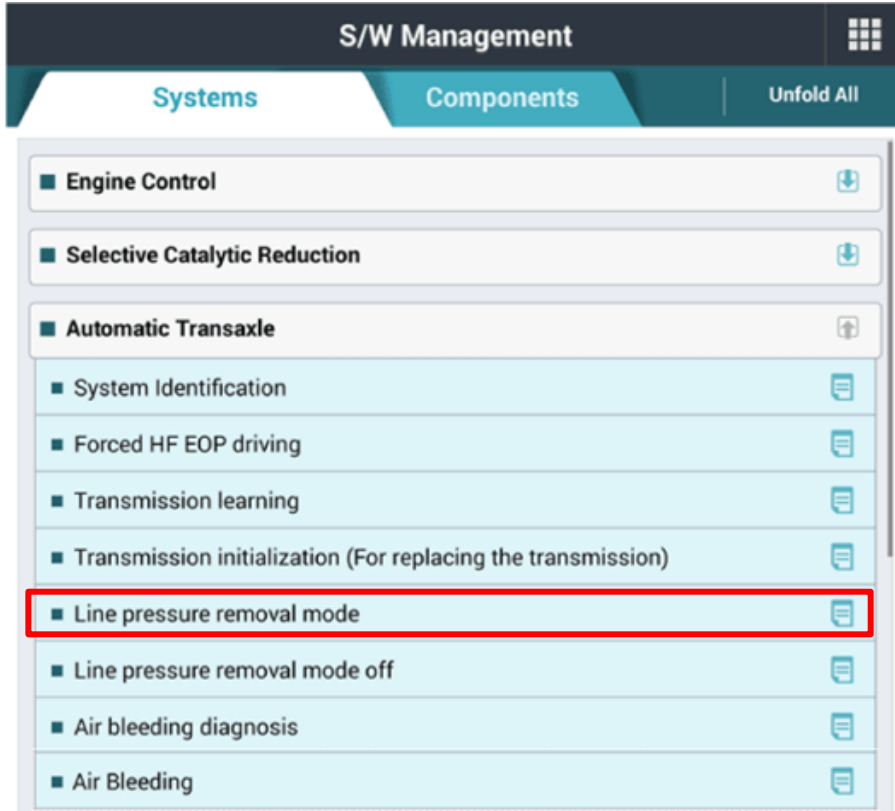
T-P curve learning

- 1) From a standstill, start driving with ~10% accelerator input, slowly increasing to ~30%.
- 2) From a standstill, start driving with ~30% accelerator input, slowly increasing to ~50%.

*** Learning will be more successful when accelerator input is slowly and continuously increased while driving.**

DCT/TCU Replacement Procedure: Only necessary if replacing entire 8WDCT

1. Prior to replacing a DCT/TCU, it is necessary to perform the “Line Pressure Removal” mode in GDS.



NOTICE

If the “Line pressure removal mode” is not performed, drivability concerns and warning lights/DTCs can occur (P193B79, P0868, rattling/shift shock, unable to drive forward/reverse).

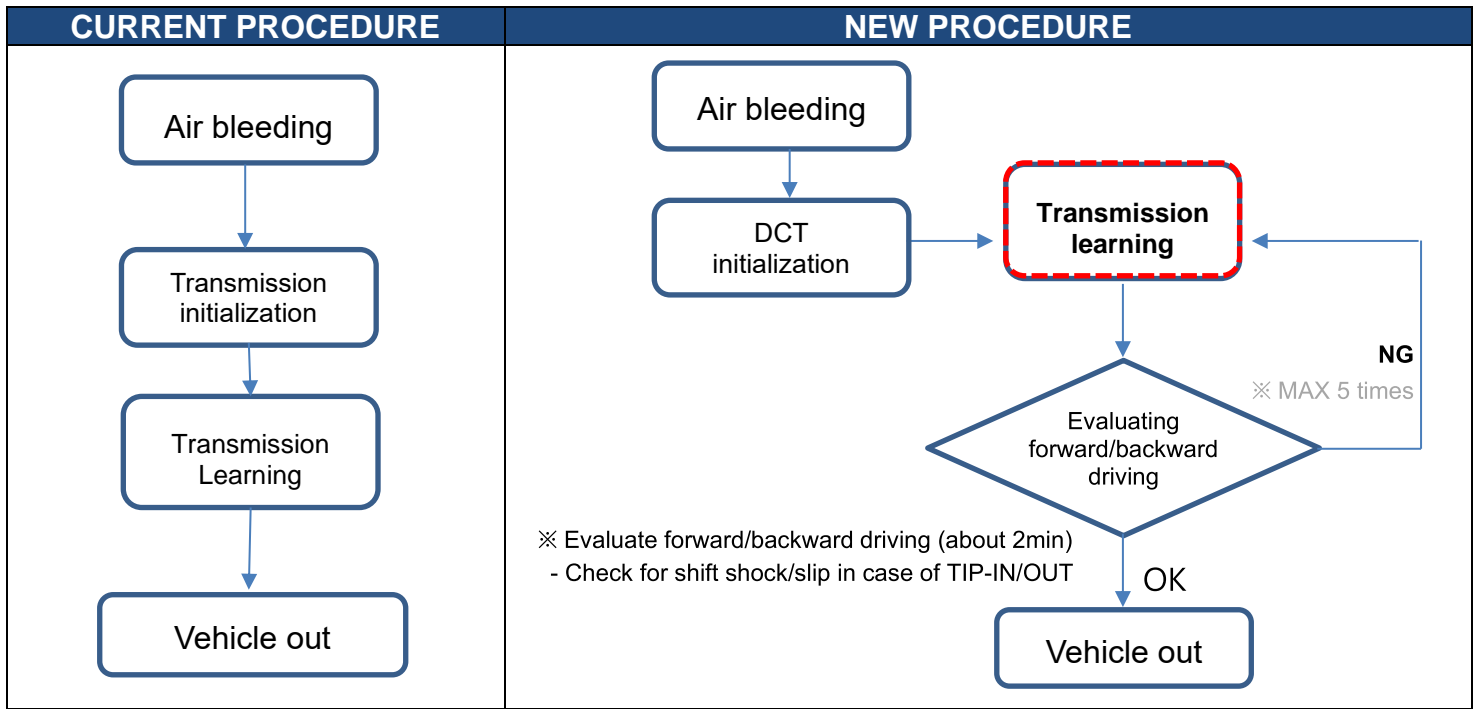
2. Continue removal of the DCT/TCU according to the vehicle shop manual.

i Information

See instructions on pages 6-7 regarding TCU removal/installation.

3. After replacing the DCT/TCU, perform the air bleeding/DCT initialization/DCT Learning according to the flow chart on page 5. See the table below regarding if DCT learning is required.

DCT TYPE	TCU INCLUDED?	DCT LEARNING REQUIRED?
DCT (NEW)	YES	NO, not required
	NO	YES, required
DCT (Remanufactured)	YES	
	NO	

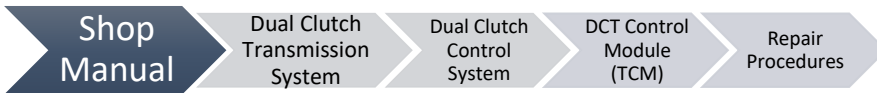


i Information

When receiving a new or remanufactured DCT assembly, it may not include a TCU (refer to the table on page 2). In this case, it may be required to transfer the TCU from the old DCT unit to the new part. Follow the instructions below regarding the transfer of the TCU.

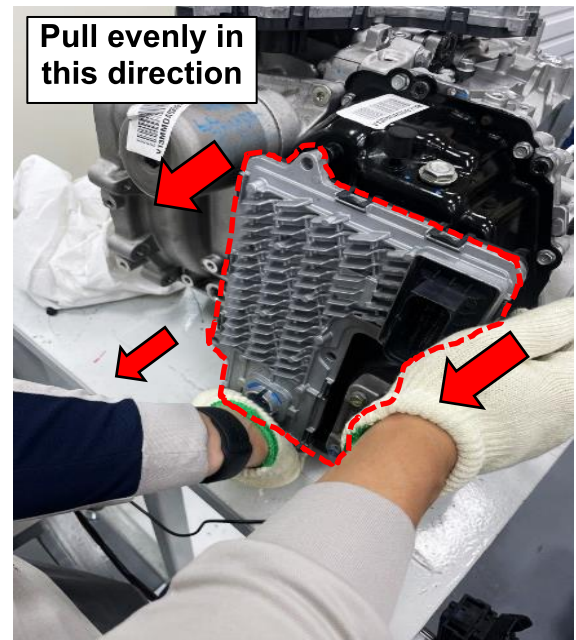
TCU Removal/Installation Procedure:

1. Remove the DCT TCU according to the vehicle shop manual.



NOTICE

Make sure the TCU 24-pin terminal is aligned properly during removal/installation, otherwise the pins may get damaged.



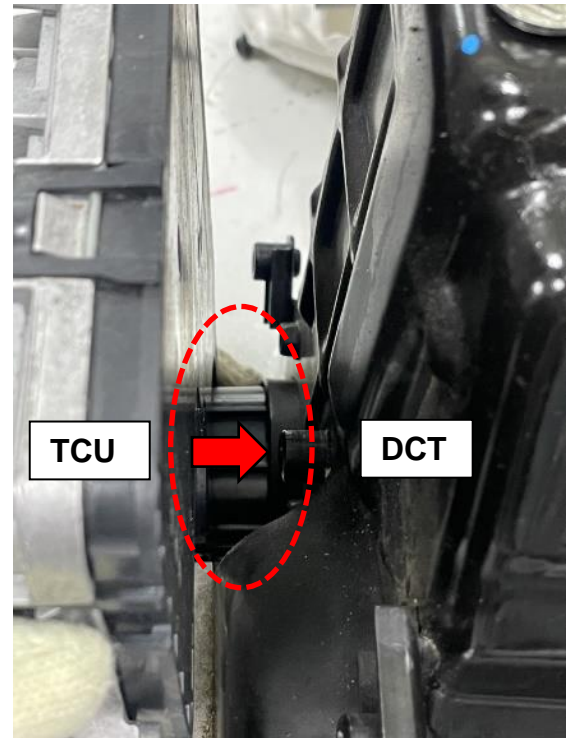
2. When reinstalling the TCU, make sure to align the connector on the TCU to the E-module on the DCT.



Male terminal of TCU



Female terminal of E-module (on DCT)



3. Finish reinstalling the TCU according to the vehicle shop manual.

**TCU Update and ROM Information Table:
Before-Improvement 8WDCT**

EVENT	MODEL	ENGINE	TCU P/N	ROM ID		REMARK
				OLD	NEW	
#895	Santa Fe (TMa)	Theta 2.5T	954A0-2N250	VTMPT25XXX720NS0	VTMPT25XXX900NSA	SBW
				VTMPT25XXX720NS1		
				VTMPT25XXX730NS2		
				VTMPT25XXX800NS3		
				VTMPT25XXX800NS4		
				VTMPT25XXX800NS5		
				VTMPT25XXX832NS6		
				VTMPT25XXX900NS8		
#896	Sonata (DN8a) with N Line Trim	Theta 2.5T	954A0-2N060	VDN8T25XXX700NS0	VDN8T25XXX900NSC	SBW
				VDN8T25XXX700NS1		
				VDN8T25XXX720NS2		
				VDN8T25XXX720NS3		
				VDN8T25XXX720NS4		
				VDN8T25XXX730NS5		
				VDN8T25XXX800NS6		
				VDN8T25XXX832NS7		
				VDN8T25XXX832NS8		
				VDN8T25XXX900NSA		
#897	Santa Cruz (NXT)	Theta 2.5T	954A0-2N460	WNX4T25X4X730NS0	WNX4T25X4X900NS9	SBC
				WNX4T25X4X800NS1		
				WNX4T25X4X800NS2		
				WNX4T25X4X800NS3		
				WNX4T25X4X800NS4		
				WNX4T25X4X832NS5		
				WNX4T25X4X900NS7		

Note: SBC = Shift By Cable, SBW = Shift By Wire

***i* Information**

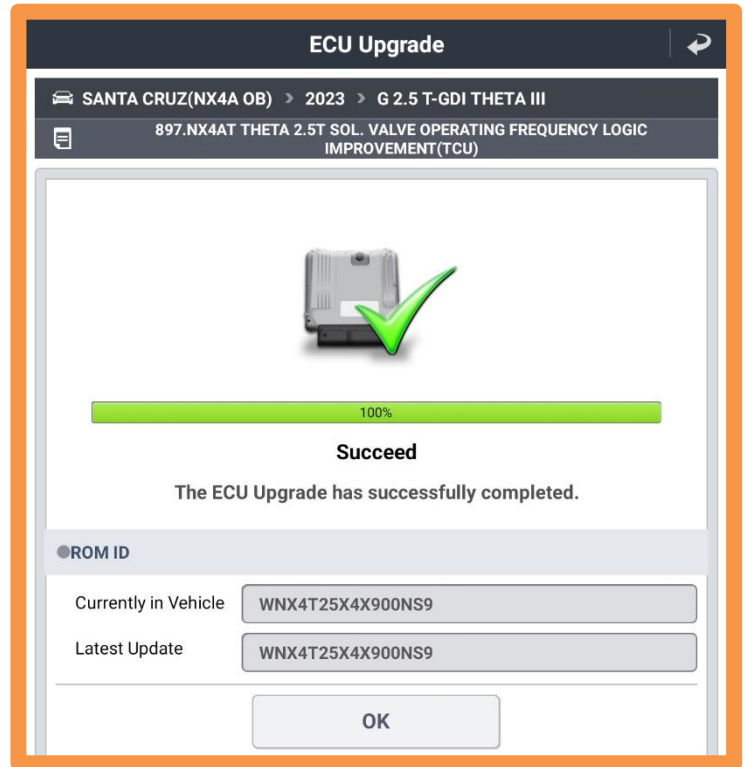
You must initially perform GDS DCT TCU Updates #895-897 in Auto Mode.

If the TCU Update starts but then fails in Auto Mode, perform the update in Manual Mode to recover.

STUI



Take a screenshot of the ECU Update Complete screen using your particular tablet's screenshot save method and upload to STUI.



After-Improvement 8WDCT: MANUAL MODE ONLY

EVENT	MODEL	ENGINE	TCU P/N	ROM ID		REMARK
				OLD	NEW	
#920	Santa Fe (TMa)	Theta 2.5T	954A0-2N251	VTMPT25XXX720NS9	VTMPT25XXXW900NS1	SBW
				VTMPT25XXXW720NS0		
				VTMPT25XXX730NSA		
#921	Sonata (DN8a) with N Line Trim	Theta 2.5T	954A0-2N061	VDN8T25XXX900NSB	VDN8T25XXW900NS1	SBW
				VDN8T25XXW900NS0		
				VDN8T25XXX900NSC		
#922	Santa Cruz (NXT)	Theta 2.5T	954A0-2N461	WNX4T25X4X900NS8	WNX4T25X4W900NS1	SBC
				WNX4T25X4W900NS0		
				WNX4T25X4X900NS9		

Note: SBC = Shift By Cable, SBW= Shift By Wire

i Information

You must initially perform GDS DCT TCU Updates #920-922 in Manual Mode.

Updates meant for after-improvement 8WDCT (Event # 920, 921, & 922) will only work in manual mode.

i Information

1. Verify the vehicle battery has reasonable charge.
2. Turn off all lamps (Do not leave head lamp switch in auto mode.), and all accessories.
3. Perform update with the ignition switch in the **ON** position.
4. Do not disconnect any cables connected to the vehicle or scan tool during update.
5. Do not start the engine during update.
6. Do not turn off the ignition switch during update.

NOTICE

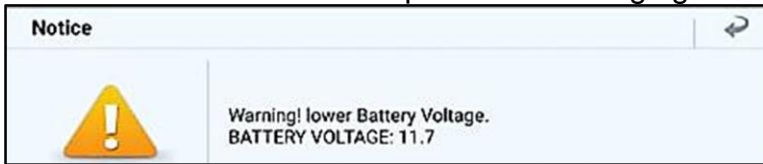
GDS-M Vehicle Battery Low Voltage Warning:

When the vehicle battery is lower than 12 volts, the GDS-M will trigger a Low Battery Voltage Warning. If this Warning occurs,

A. Connect the battery to a fully charged battery jump pack or GR8 charger using “Power Supply Mode” to continue the software update.

OR

B. Select “BACK” to exit the SW update. Then, start the engine and idle with the headlights on for 20 minutes. Return to the SW update after charging the battery.

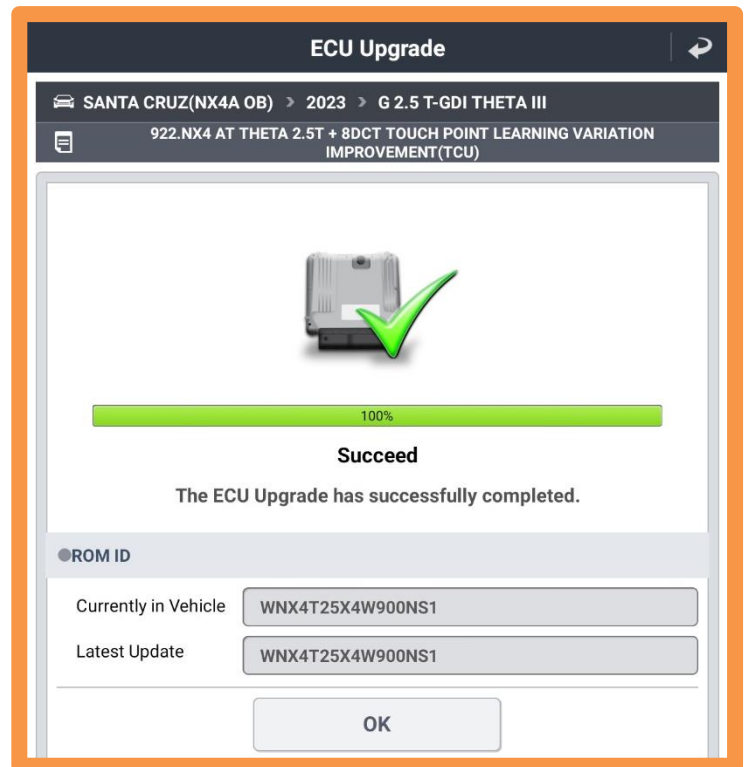


Failure to do either one of these steps can cause the vehicle battery to die during the update, causing the vehicle to become inoperable.

STUI



Take a screenshot of the ECU Update Complete screen using your particular tablet’s screenshot save method and upload to STUI.



SUBJECT:

8-SPEED WET DCT TOUCH-POINT LEARNING IMPROVEMENT – 2.5T VEHICLES

GDS Information:

System Selection: A/T

*Event #	Description
895	TM PE THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)
896	DN8 N THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)
897	NX4AT THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)

* or use a later available event as listed in the GDS update screen, if one is available.

Manual Update: If the DCT TCU Update starts but then fails in auto mode, perform the update in Manual Mode to recover.

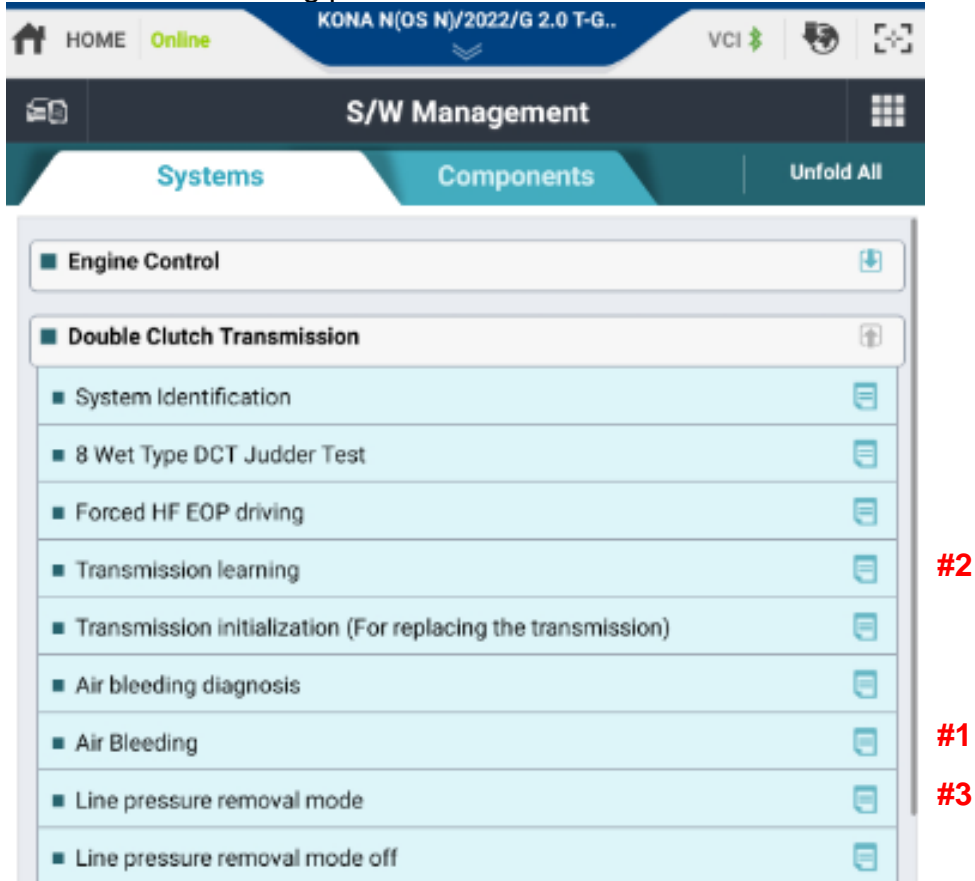
Event #	MENU	Password
895	TM PE THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)	2250
896	DN8 N THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)	2060
897	NX4AT THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)	2460

Manual Update: The following DCT TCU Updates must be performed in Manual Mode (no auto mode available).

Event #	MENU	Password
920	TM PE THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)	0291
921	DN8 N THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)	1291
922	NX4AT THETA 2.5T SOL. VALVE OPERATING FREQUENCY LOGIC IMPROVEMENT(TCU)	2291

Vehicle Calibration

1. After performing the TCU Upgrade, select **S/W Management** and **Double Clutch Transmission** within the GDS. Perform the following procedures in the order shown.



2. After performing “Line pressure removal mode,” leave IG on and wait for 1 minute.

3. Turn the **engine on** and let the engine idle for **1 minute**.

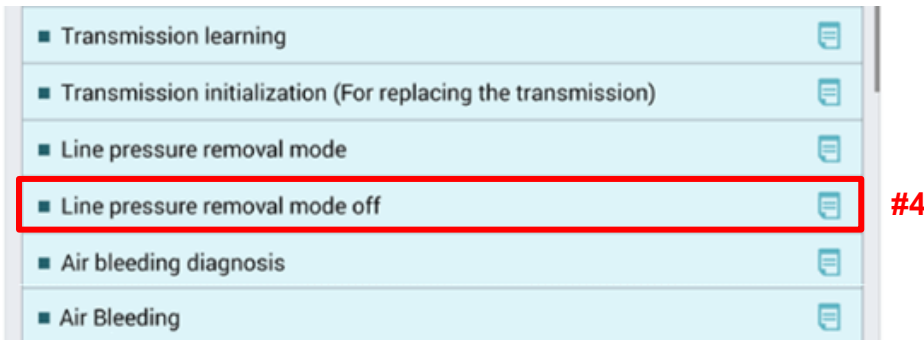
4. Turn the engine **off**. After 3 seconds, turn the **engine on again**.

5. With the engine running, scan the vehicle for DTCs.

5a. If DTC P086800 **is detected** – check and replace the control fluid according to the shop manual.

5b. If DTC P086800 **is not detected** – proceed to the next step.

6. Perform the “Line pressure removal mode off” within the GDS.



NOTICE

If the “Line pressure removal mode off” is not performed, drivability concerns can occur (shift shock).

A. Vehicle Static Test

1. Turn the vehicle engine on.
2. While depressing the brake pedal, shift the vehicle into gear(N↔D/N↔R/P↔D/P↔R/D↔R).
3. Vehicle should not experience any abnormal shift shock while stationary.

B. Vehicle Creep Test

1. Turn the vehicle engine on.
2. Shift the vehicle from Park to Drive – do not press the accelerator pedal, allow vehicle to creep forward (for 30 seconds).
3. Shift the vehicle from Park to Reverse – do not press the accelerator pedal, allow vehicle to creep backwards (for 30 seconds).
4. Vehicle should start moving within 1-2 seconds, without hesitation or juddering.

C. Vehicle Driving Test

1. Turn the vehicle engine on.
2. Perform a short test drive with the vehicle, applying 20-30% accelerator input (APS).
3. Vehicle should launch without hesitation and upshifts should have no issue.

D. Other Inspection

1. If any issues were found during Sections A-C above, check for DTCs/perform diagnosis.
2. Replace the transmission assembly if issues are still present after detailed diagnosis.
Repeat Sections A-C.