		GROUP ENGINE	NUMBER 22-EM-004H	
	ΗΥυπαρι	DATE	MODEL(S)	
Techni	cal Service Bulletin	JANUARY 2022	Santa Fe Sport (AN) Santa Fe (TM) Sonata (LF/YF) Veloster N (JSN)	
SUBJECT: THETA-II 2.0T TURBOCHARGER EWGA DIAGNOSIS AND SERVICE PART REPLACEMENT GUIDELINES			iosis Nes	

This bulletin supersedes TSB 21-EM-009H to update turbocharger part number information.

Description: This bulletin provides additional service diagnostic information and repair procedures related to Electric Waste Gate Actuator (EWGA) equipped vehicles listed below.

Refer to the applicable Engine Control / Fuel System sections in the Shop Manual, and then follow the procedures outlined in this bulletin whenever a vehicle with the following symptom(s) are being diagnosed:

- > Check Engine Light illumination with EWGA related DTC.
- Intermittently high/low turbocharger boost pressures.
- Abnormal noise from the turbocharger.
- Reduced engine power.

Component Overview:



- The EWG Motor/Actuator is connected to an actuation shaft that controls a swing valve, releasing excess exhaust gases from the turbocharger.
- Diversion of exhaust gases regulates the rotating speed of the turbocharger compressor turbine.

(Figure Example: JSN Turbocharger – Exhaust Manifold)

Applicable Vehicles:

- Certain 2015-2019MY Sonata (LF) vehicles with 2.0L Turbo engines.
- Certain 2011-2014MY Sonata (YF) vehicles with 2.0L Turbo engines.
- Certain 2013-2018MY Santa Fe Sport (AN) vehicles with 2.0L Turbo engines.
- Certain 2019-2020MY Santa Fe (TM) vehicles with 2.0L Turbo.
- Certain 2019-2022MY Veloster N (JSN) vehicles with 2.0L Turbo engines.

Circulate To: General Manager, Service Manager, Parts Manager, Warranty Manager, Service Advisors, Technicians, Body Shop Manager, Fleet Repair

DTC Information:						
DTC	DESCRIPTION					
P2562	Turbocharger Boost Control Position Sensor Circuit					
P2563	Turbocharger Boost Control Position Sensor Circuit Range/Performance					
P2565	Turbocharger Boost Control Position Sensor Circuit High					

Parts Information:

MODELS	PART NAME	PART NUMBER	FIGURE	NOTES
<u>2.0T</u>	EWGA	39400-2G700	Refer to page 3	
13-16MY Santa Fe Sport (AN)	Snap ring	28231-2G411	3	
Sonata (YÉ)	Stud	28233-2GTA1	ſ	
<u>2.0T</u> 17-18MY Santa Fe	EWGA	39400-2GTA0	Refer to page 3	Replace According to
Sport (AN) Santa Fe (TM) Sonata (LF)	Snap ring	28231-2G411	3	Inspection Results
<u>2.0T</u>	EWGA	39400-2GTA0	Refer to page 3	
Veloster N (JSN)	Snap ring	28231-2C601	\$	

Warranty Information:

MODEL	OP CODE	OPERATION	OP TIME	CAUSAL PART	NATURE CODE	CAUSE CODE
Sonata (YF)	28248R1A	EWGA Replacement	Pofor to	Please see		
Sonata (LF)			WEBLTS for current LTS time	applicable EWGA part number above for applicable	ІЗТ	ZZ5
Veloster N (JSN)	28248R00	EWGA				
Santa Fe Sport (AN)	202 101100	Replacement				
Santa Fe (TM)						
All Models Above	28248RQ0	Diagnostic Tool Operation	0.3	model		

NOTE: Normal Warranty Applies.

NOTICE

If the EWGA has an internal issue that requires replacement, replace with applicable service part listed in parts information. **Do not replace the entire turbocharger assembly.**

Turbocharger Component Reference Information:							
MODEL	PART NUMBER	FIGURE					
<u>2.0T</u> Sonata (YF) 13-16MY Santa Fe Sport (AN)	28231-2G410	39400-2G700 39400-2G700 Control of the second sec					
<u>2.0T</u> Sonata (LF) Santa Fe (TM) 17-18MY Santa Fe Sport (AN)	28231-2GTA1	joint state					
<u>2.0T</u> Veloster N (JSN)	28231-2GTB1	39400-2GTAD					

NOTE: Do not replace the entire turbocharger for an EWGA out of spec / inoperative condition.

EWG Motor Inspection Procedure:

- 1. Turn ignition switch OFF.
- 2. Disconnect the EWGA connector (A).



- 3. Check that there are no obstructions preventing EWGA motor movement.
- 4. Measure resistance between the (+) and (-) terminals of the motor and check that it is within specification.

;	Models	Resistance (Ω)		
	Sonata (YF)	1 49 1 05 (at CO 8°F)		
	13-16MY Santa Fe Sport (AN)	1.48 - 1.95 (at 69.8 F)		
	17-18MY Santa Fe Sport (AN)			
	Santa Fe (TM)	1.44 - 1.96 (at 69.8°F)		
	Veloster N (JSN)			

5. If the EWGA motor resistance is not within specification, replace the EWGA with the service procedure on page 7.

EWGA Position Sensor Inspection Procedure:

- 1. Prepare the GDS to begin the EWGA Position Sensor inspection and adjustment.
 - a) Ensure ignition switch is OFF.
 - b) Connect the 16-pin DLC cable from the VCI into the vehicle's 16-pin connector under the driver side instrument panel.
 - c) Turn on the VCI and diagnostic terminal with the ignition key in the ON position.

NOTICE

Do NOT start the engine. <u>The turbocharger and its actuation mechanism should be cold</u> to allow proper inspection and adjustment procedures.

- d) Choose VIN or Vehicle on the initial screen.
- e) Enter vehicle information by pressing the VIN Auto Detect button; entering the VIN or selecting the vehicle model, model year, engine type, and Engine Control as the system, and then click OK.
- 2. Choose Current Data, and then select Battery Voltage after Ignition Key and Voltage Value for Boost Pressure Actuator Position Control.

GD	Preparation	Diagnosis	ehicle S/W Management	imas	Repair	0
Vetado > SONATA(YF)/2012/G 2.0 T-GDI	System	Engine/Engine Cor	ntrol		D
Diagnosis	Current Data		HAT PORTE CONTRACT	SHARE	Entrol	
Basic Inspection	Selective Display 2 Full I	List 🗘 Graph 🗧 Itam	s List 2 Repet Min Max	Record	Stop :	Croup-1 VSS
DTC Analysis	Sensor Name Battery Voltage after 16 F Voltage Value for Boost	Key Pressure Actuator Position C	ontrol	Value 12.0 4.33	Unit V V	
Understand Roomston Monitor Standol Data 留hspectionRepair 留Verification of Vehicle	Adaption Value for the L Value Temperature Ambient Air Temperature Internet Standfold Pressure Marter Temperature Marter Temperature Intake Air Temperature Engline Oil Temperature Fred Tank Pressure Value O 25 Sensor Binav Type B Vehicle Speed Purge Centrol Valve Purge Centrol Valve	ower Mechanical Stop of Bo 399 For Voltage 600 Galage ankl Downste am(Option) ankl Upstream(Option)	ost Pressur	4,59 67.1 49.5 2.5 4.1 3.0 49.5 65.8 0 4.4 2.0 0.4 2.0 0.0 0.0 3.0 YES	V 下 下 Psl V V V 下 下 F psl V V H 橋 湾 、 、 、	
Data Analysis Flight Record	Ignition Switch Malfunction Indicator Lar Fuel Pump ON Main Relay ON Throttle Position Closed (Clutch Pedal Switch/MT8	np(MIL) Idlej ACC Onlyj		ON OFF ON OFF		

- 3. Choose the **Graph** and check the voltage.
 - Turn ignition ON/OFF three times, and then check the Max voltage value just as ignition ON state is about to change to ignition OFF state and vice versa. Refer to specified voltages on the following page.
 - If the EWGA position sensor is not within specified voltage, perform the following EWGA ADJUSTMENT PROCEDURE, and check that the same fault code is detected again before replacing the EWGA.



NOTICE

If the EWGA has an internal issue that requires replacement, replace with applicable service part listed in parts information. **Do not replace the entire turbocharger assembly.**

EWGA Adjustment Procedure:

1. Open the hood and securely support it.



Check that the engine is cool enough to work on.

Loosen the turbocharger upper cover bolt (B) and remove cover.

 Loosen the shaft end lock nut (C) and remove the retaining clip (D). Save the retaining clip for later use.



When loosening lock nut (C) securely hold the waste gate arm to prevent shaft bending.



 Adjust the shaft end by rotating it clockwise or counterclockwise in ½ turn increments until voltage is within specification range.

Then temporarily install the shaft end and tighten the shaft end lock nut. Check the **Voltage Value for Boost Pressure Actuator Position Control** by using the inspection procedure with the GDS.

The EWGA must be in the fully closed position while applying pressure on the EWGA lever to accurately measure the output voltage <u>while the engine is</u> <u>cold</u>.

- If output voltage > Max. specified Voltage: Turn shaft ends clockwise (to shorten the ends)
- If output voltage < Min. specified Voltage: Turn shaft ends counterclockwise (to lengthen the ends).

If unable to achieve proper voltage specification when the engine is cold, it may be necessary to rotate both EWGA shaft ends (E) to achieve proper voltage.



Models	Specified Voltage (V)
Sonata (YF)	20 4 1
13-16MY Santa Fe Sport (AN)	3.9-4.1
17-18MY Santa Fe Sport (AN)	
Santa Fe (TM)	3.7 - 3.9
Veloster N (JSN)	

- 4. If the output voltage is not within specification, repeat step 3 in EWGA adjustment procedure until voltage is within specification range.
- 5. If output voltage is still not within specification after EWGA adjustment, replace EWGA with the service procedure on the following page.
- 6. If output voltage is within specification, reinstall all the removed parts in reverse order of removal.

Start engine and let run for a few minutes while cycling the throttle, then shut off engine.

Recheck voltage while applying pressure on the EWGA lever to accurately measure output voltage as indicated in the photo on the right.

A CAUTION

Engine components are hot and can cause burns.



Service Procedure:

1. Turn off the engine and remove the negative terminal from the battery.

NOTICE

- > Be sure to record the radio presets prior to battery disconnection.
- For service on 2011-2014MY Sonata (YF) Vehicles, proceed to service procedure step 4 and steps 6-10.
- 2. Remove the air cleaner (F).

Refer to the shop manual section for complete service procedure on pertaining vehicle: Engine Mechanical System > Intake And Exhaust System > Air Cleaner

NOTICE

Location and components of air cleaner will vary depending on engine specifications.

3. Remove the intercooler inlet pipe and hose assembly.

Refer to the shop manual section for complete service procedure on pertaining vehicle: Engine Mechanical System > Intake And Exhaust System > Intercooler

4. Disconnect the EWGA connector (G).

Refer to the shop manual section for complete service procedure on pertaining vehicle: Engine Control / Fuel System > Intake Engine Control System > Electric WGT Control Actuator





5. Remove the exhaust manifold heat shield installation bolt (H).

6. Remove the snap-ring (I) and remove the shaft linkage assembly (J).

NOTICE

Do not reuse snap-ring from EWGA assembly.

7. Remove EWGA mounting bolts (K) and replace EWGA.

A CAUTION

Do not carry EWGA by the actuation shaft as permanent deformation can occur.

NOTICE

Tightening Torque: 9.4 lb-ft (12.75 Nm)

8. Reinstall parts in reverse order of disassembly.

NOTICE

Reprogram the radio presets recorded from service procedure step #1 on page 7.

- 9. Perform the EWGA shaft adjustment procedure on page 5 until EWGA voltage is within acceptable range.
- 10. The service procedure is now complete.

