



HYUNDAI

Technical Service Bulletin

GROUP CAMPAIGN	NUMBER 19-01-006H-2
DATE APRIL 2019	MODEL(S) APPLICABLE VEHICLES BELOW

SUBJECT: THETA GDI ENGINE DTC P1326 - WIRING INSPECTION /
INSTALLATION AND ENGINE INSPECTION / REPLACEMENT
(SERVICE CAMPAIGN T3G)

This TSB supersedes TSB# 19-01-006H-1 and modifies the SST and Parts Information and Service Procedure.

★ IMPORTANT

*** Retail Vehicles ***

Dealers must perform this Campaign on all affected vehicles whenever an affected vehicle is in the shop for any maintenance or repair.

Description: Applicable vehicles with 2.0L Turbo and 2.4L GDI engines may experience the Check Engine warning lamp illuminated with DTC P1326. Follow the procedure to inspect the vehicle and install a wire harness extension or replacement engine based on the inspection results.

Applicable Vehicles:

Certain 2011-2014 MY Sonata (YF) vehicles with 2.0L Turbo and 2.4L engines
 Certain 2015-2018 MY Sonata (LF) vehicles with 2.0L Turbo and 2.4L engines
 Certain 2013-2018 MY Santa Fe Sport (AN) vehicles with 2.0L Turbo and 2.4L engines
 Certain 2014-2015 MY Tucson (LM) vehicles with 2.4L engines
 Certain 2018 MY Tucson (TL) vehicles with 2.4L engines

SST Information:

Part Name	Part Number / Figure	Note
Torque Wrench Socket	09314-3Q100-01	Only needed if engine replacement is required.
Injector Combustion Seal Ring Installer	09353-2B000	Refer to TSB 19-FL-001H for the detailed usage instructions. Order replacements through Bosch at 1-866-539-4248.

SST Information (cont.)

Part Name	Part Number / Figure	Note
Pin Release Tool	 (color / appearance may vary) WRK0010P2R (WRK II), WRKA40RT04 (WRK III), G0KHNWR104 (WRK III), or J-38125-12A	These tools are included in Wire Harness Repair Kit II and III provided to dealers. Order replacements through Bosch at 1-866-539-4248. Part # J-38125-12A
Engine Noise Inspection Tool	 G1XTD-CP005	

Part Information:
Note: Order the required parts based on the vehicle inspection results. Refer to page 10.

Model	MY	Part Name	Part Number / Figure	Qty	Note
Sonata (YF)	11-13 MY	Wiring harness-knock sensor kit	 91400-C2100QQH	1	
		Engine Assembly-Sub (long block)	 2.4L: 21101-2GK50QQHRM 2.0T: 21101-2GK60QQHRM	1	
		Service Kit 1	2.4L: 21111-2GK50QQH 2.0T: 21111-2GK60QQH	1	
		Service Kit 2	2.4L / 2.0T: 21111-2GK70QQH	1	
		Oil cooler pipe & hose assy	2.4L: 25470-2G050QQH 2.0T: 25470-2G650QQH	1	

SUBJECT:

DTC P1326 – WIRING INSPECTION / INSTALL AND ENGINE R&R (SERVICE CAMPAIGN T3G)

Sonata (YF)	14MY	Wiring harness-knock sensor kit	91400-C2100QQH	1	
		Engine Assembly-Sub (long block)	2.4L: 21101-2GK70QQHRM or 21101-2GK70QQA (IF AVAILABLE) 2.0T: 21101-2GK80QQHRM	1	
		Service Kit 1	2.4L: 21111-2GK50QQH 2.0T: 21111-2GK60QQH	1	
		Service Kit 2	2.4L / 2.0T: 21111-2GK70QQH	1	
		Oil cooler pipe & hose assy	2.4L: 25470-2G050QQH 2.0T: 25470-2G650QQH	1	Not required if 21101-2GK70QQA engine is used.
		Bolt-Drive Plate	23311-25050	7	Required if 21101-2GK70QQA engine is used.
Sonata (LF)	15MY	Wiring harness-knock sensor kit	91400-C2010QQH	1	
		Engine Assembly-Sub (long block)	2.4L: 21101-2GK31QQH 2.0T: 21101-2GK32QQH	1	
		Service Kit 1	2.4L: 21111-2GK51QQH 2.0T: 21111-2GK52QQH	1	
		Service Kit 2	2.4L: 21111-2GK71QQH 2.0T: 21111-2GK72QQH	1	
Sonata (LF)	16-18 MY	Wiring harness-knock sensor kit	16-18MY 2.4L: 91400-C2010QQH 16-17MY 2.0T: 91400-C2010QQH 18MY 2.0T: 91400-C2050QQH	1	

SUBJECT:

DTC P1326 – WIRING INSPECTION / INSTALL AND ENGINE R&R (SERVICE CAMPAIGN T3G)

		Engine Assembly-Sub (long block)	16MY 2.4L: 21101-2GK33QQH 17MY 2.4L with production date BEFORE 5/13/2016: 21101-2GK33QQH 17MY 2.4L with production date AFTER 5/19/2016: 21101-2GK34QQH 17MY 2.4L with production date ON 5/13/2016 TO 5/19/2016: Check Table A below 18MY 2.4L: 21101-2GK34QQH 16-18MY 2.0T: 21101-2GK32QQH	1	
		Service Kit 1	2.4L: 21111-2GK51QQH 2.0T: 21111-2GK52QQH	1	
		Service Kit 2	2.4L: 21111-2GK71QQH 2.0T: 21111-2GK72QQH	1	
Santa Fe Sport (AN)	13MY	Wiring harness-knock sensor kit	91400-C2100QQH	1	
		Engine Assembly-Sub (long block)	2.4L: 21101-2GK01QQHRM 2.0T: 21101-2GK03QQHRM	1	
		Service Kit 1	2.4L: 21111-2GK50QQH 2.0T: 21111-2GK60QQH	1	
		Service Kit 2	2.4L: 21111-2GK70QQH 2.0T: 21111-2GK80QQH	1	
		Oil cooler pipe & hose assy	2.4L: 25470-2G050QQH 2.0T: 25470-2G650QQH	1	
Santa Fe Sport (AN)	14-16 MY	Wiring harness-knock sensor kit	91400-C2100QQH	1	
		Engine Assembly-Sub (long block)	2.4L: 21101-2GK02QQHRM 2.0T: 21101-2GK04QQHRM	1	
		Service Kit 1	2.4L: 21111-2GK50QQH 2.0T: 21111-2GK60QQH	1	
		Service Kit 2	2.4L: 21111-2GK70QQH 2.0T: 21111-2GK80QQH	1	
		Oil cooler pipe & hose assy	2.4L: 25470-2G050QQH 2.0T: 25470-2G650QQH	1	
Santa Fe Sport (AN)	17-18 MY	Wiring harness-knock sensor kit	91400-C2100QQH (BOSCH connector) or 91400-C2010QQH (KET connector)	1	Order "BOSCH" or "KET" part based on the connector type. See page 14.

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		Engine Assembly-Sub (long block)	2.4L: 21101-2GK31QQH 2.0T: 21101-2GK32QQH	1	
		Service Kit 1	2.4L: 21111-2GK51QQH 2.0T: 21111-2GK52QQH	1	
		Service Kit 2	2.4L: 21111-2GK71QQH 2.0T: 21111-2GK73QQH	1	
Tucson (LM)	14-15 MY	Wiring harness- knock sensor kit	91400-C2100QQH	1	
		Engine Assembly-Sub (long block)	21101-2GK36QQH	1	
		Service Kit 1	21111-2GK50QQH	1	
		Service Kit 2	21111-2GK70QQH	1	
		Oil cooler pipe & hose assy	25470-2G050QQH	1	
Tucson (TL)	18MY	Wiring harness- knock sensor kit	91400-C2010QQH	1	
		Engine Assembly-Sub (long block)	21101-2GK52QQH	1	
		Service Kit 1	21111-2GK51QQH	1	
		Service Kit 2	21111-2GK71QQH	1	

Warranty Information:

Model/ MY	Engine/ Drive Type	Op. Code	Operation	Op. Time	Causal Part No.	Nature Code	Cause Code
11-14MY Sonata (YF)	2.4L / 2.0T	8P1326R6	WIRING INSPECT WIRING INSTALL	0.6 M/H	21101- 2GK50Q QH	Q75	ZZ1
	2.4L / 2.0T	8P1326C9	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT	0.8 M/H	21101- 2GK50Q QH	Q75	ZZ1
	2.4L	8P1326B2	WIRING INSPECT ENGINE NOISE INSPECT ENGINE REPLACEMENT	8.7 M/H	21101- 2GK50Q QH	Q75	ZZ1
	2.0T	8P1326B1		9.0 M/H	21101- 2GK60Q QH	Q75	ZZ1
	2.4L	8P1326D1	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT ENGINE REPLACEMENT	9.0 M/H	21101- 2GK50Q QH	Q75	ZZ1
	2.0T	8P1326D2		9.3 M/H	21101- 2GK60Q QH	Q75	ZZ1
15-18MY Sonata (LF)	2.4L / 2.0T	8P1326R1	WIRING INSPECT WIRING INSTALL	0.6 M/H	21101- 2GK31Q QH	Q75	ZZ1
	2.4L / 2.0T	8P1326C6	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT	0.8 M/H	21101- 2GK31Q QH	Q75	ZZ1
	2.4L	8P1326R2	WIRING INSPECT ENGINE NOISE INSPECT ENGINE REPLACEMENT	8.7 M/H	21101- 2GK31Q QH	Q75	ZZ1
	2.0T	8P1326R3		9.5 M/H	21101- 2GK32Q QH	Q75	ZZ1
	2.4L	8P1326C7	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT ENGINE REPLACEMENT	9.0 M/H	21101- 2GK31Q QH	Q75	ZZ1
	2.0T	8P1326C8		9.8 M/H	21101- 2GK32Q QH	Q75	ZZ1
13-18MY Santa Fe Sport (AN)	2.4L / 2.0T	8P1326R7	WIRING INSPECT WIRING INSTALL	0.6 M/H	21101- 2GK02Q QH	Q75	ZZ1

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	2.4L / 2.0T	8P1326C1	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT	0.8 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.4L (FWD)	8P1326R8	WIRING INSPECT ENGINE NOISE INSPECT ENGINE REPLACEMENT	8.7 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.0T (FWD)	8P1326R9		8.9 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.4L (AWD)	8P1326A0		9.1 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.0T (AWD)	8P1326A1		9.3 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.4L (FWD)	8P1326C2		9.0 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.0T (FWD)	8P1326C3	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT ENGINE REPLACEMENT	9.2 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.4L (AWD)	8P1326C4		9.4 M/H	21101- 2GK02Q QH	Q75	ZZ1
	2.0T (AWD)	8P1326C5		9.6 M/H	21101- 2GK02Q QH	Q75	ZZ1

14-15MY Tucson (LM)	2.4L	8P1326A3	WIRING INSPECT WIRING INSTALL	0.6 M/H	21101- 2GK36Q QH	Q75	ZZ1
	2.4L	8P1326D3	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT	0.8 M/H	21101- 2GK36Q QH	Q75	ZZ1
	2.4L (FWD)	8P1326A4	WIRING INSPECT ENGINE NOISE INSPECT ENGINE REPLACEMENT	8.1 M/H	21101- 2GK36Q QH	Q75	ZZ1
	2.4L (AWD)	8P1326B4		8.5 M/H	21101- 2GK36Q QH	Q75	ZZ1
	2.4L (FWD)	8P1326D4	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT ENGINE REPLACEMENT	8.4 M/H	21101- 2GK36Q QH	Q75	ZZ1
	2.4L (AWD)	8P1326D5		8.8 M/H	21101- 2GK36Q QH	Q75	ZZ1
18MY Tucson (TL)	2.4L	8P1326A8	WIRING INSPECT WIRING INSTALL	0.6 M/H	21101- 2GK52Q QH	Q75	ZZ1
	2.4L	8P1326D6	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT	0.8 M/H	21101- 2GK52Q QH	Q75	ZZ1
	2.4L (FWD)	8P1326A9	WIRING INSPECT ENGINE NOISE INSPECT ENGINE REPLACEMENT	8.8 M/H	21101- 2GK52Q QH	Q75	ZZ1
	2.4L (AWD)	8P1326B3		9.2 M/H	21101- 2GK52Q QH	Q75	ZZ1
	2.4L (FWD)	8P1326D7	WIRING INSPECT WIRING INSTALL ENGINE NOISE INSPECT ENGINE REPLACEMENT	9.1 M/H	21101- 2GK52Q QH	Q75	ZZ1
	2.4L (AWD)	8P1326D8		9.5 M/H	21101- 2GK52Q QH	Q75	ZZ1

Notes:

- 1) Submit Claim on Campaign Claim Entry Screen
- 2) If a part is found in need of replacement while performing this campaign and the affected part is still under warranty, submit a separate claim using the same Repair Order. If the affected part(s) are out of warranty, request a Prior Authorization # for goodwill consideration prior to completing the Campaign.
- 3) PA Approval **required** for OP Codes with engine replacement.
- 4) PA Approval **NOT required** for OP Codes with wiring inspection/installation.
- 5) If additional labor is required while performing Recall Campaign T3G, please submit a separate claim using the same Repair Order number. Submit for the additional labor time using the engine causal part number from Campaign T3G TSB with 21101NTT. Ensure punch times are accurate and that they match the labor performed along with the service manager's signature approving the TT time.

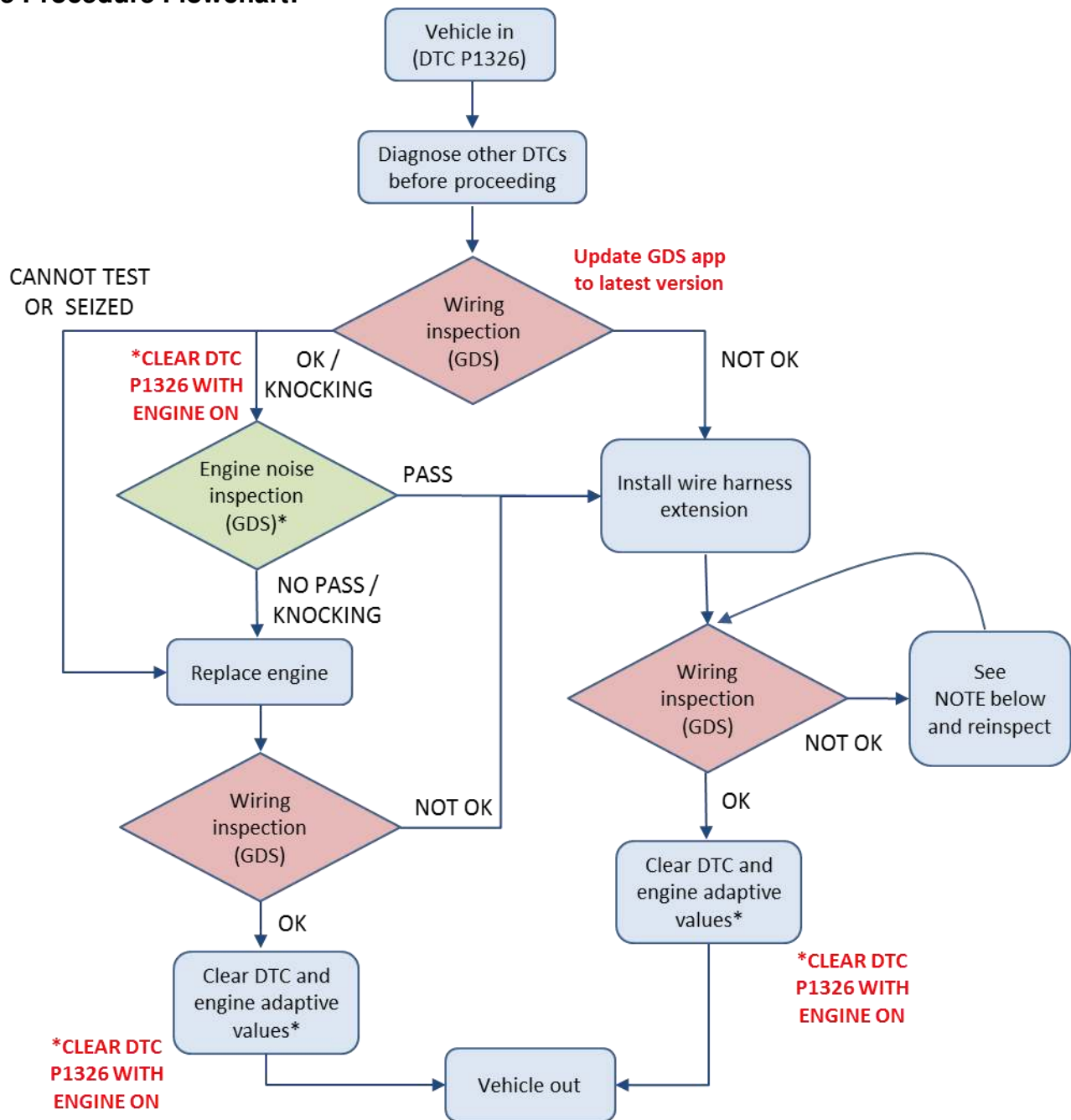
Table A

For 17MY Sonata 2.4L with production date on 5/13/2016 to 5/19/2016:

- If the last 6 digits of the VIN **are below**, order 21101-2GK33QQH.
- If the last 6 digits of the VIN are **not below**, order 21101-2GK34QQH.

443013	443094	443107	443124	443137	443148	443159	443173	443202
443026	443095	443109	443125	443138	443149	443160	443175	443206
443051	443097	443110	443127	443139	443150	443161	443178	443208
443069	443098	443113	443128	443140	443151	443162	443181	443210
443083	443099	443114	443131	443141	443152	443164	443185	
443086	443100	443116	443132	443142	443153	443165	443187	
443087	443102	443117	443133	443143	443154	443166	443195	
443089	443104	443119	443134	443145	443156	443167	443196	
443091	443105	443120	443135	443146	443157	443170	443197	
443093	443106	443123	443136	443147	443158	443171	443200	

Service Procedure Flowchart:



NOTE:

If the wiring inspection is still NOT OK after installing the harness extension, proceed with the following steps until an OK test result is achieved.

- 1) Confirm pins are properly installed and secured in engine ECM connector and **reinspect**
- 2) Remove knock sensor and reinstall **with torque wrench to 15 lb-ft** and **reinspect**
- 3) Install new knock sensor **with torque wrench to 15 lb-ft** and **reinspect**

PA Approval:

Required for engine replacement.

NOT required for wire harness extension installation.

Refer to the Warranty Information section regarding reimbursement and coverage out of warranty.

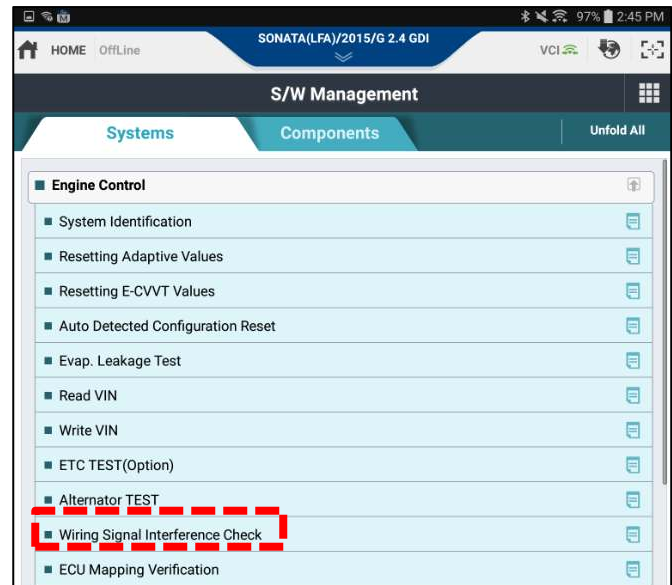
Wiring Signal Interference Inspection:

1. Check for DTCs and perform the appropriate diagnostic service. All DTCs other than P1326 should be resolved before performing the wiring inspection.
2. Warm the engine until the engine oil temperature is 176° F (80° C) or greater.
3. From the GDS main screen, navigate to **S/W Management > Engine Control** and select **Wiring Signal Interference Check**.

NOTICE

If the engine is seized or the inspection cannot be completed:

- Submit a PA request for engine replacement with a GDS screenshot showing the VIN # and DTC P1326. When approved, replace the engine with service kits.
- Perform the wiring inspection after engine replacement.



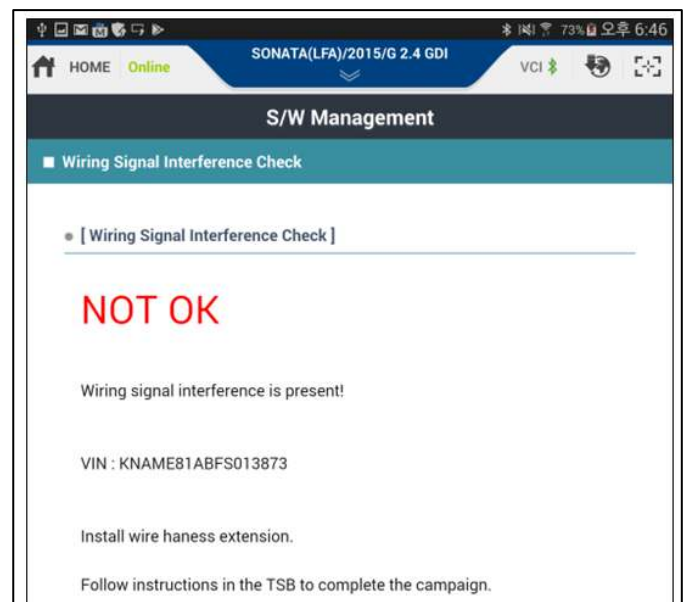
4. Follow the prompts on the GDS to complete the inspection. At the end of the inspection, take a screenshot of the results screen.

If the inspection result is OK:

- Perform the Engine Noise Inspection

If the inspection result is NOT OK:

- Install the new wire harness extension kit and perform the inspection again.
- If the test result is still NOT OK after installing the extension harness, follow the Service Procedure flowchart on Page 10 until an OK test result is achieved.



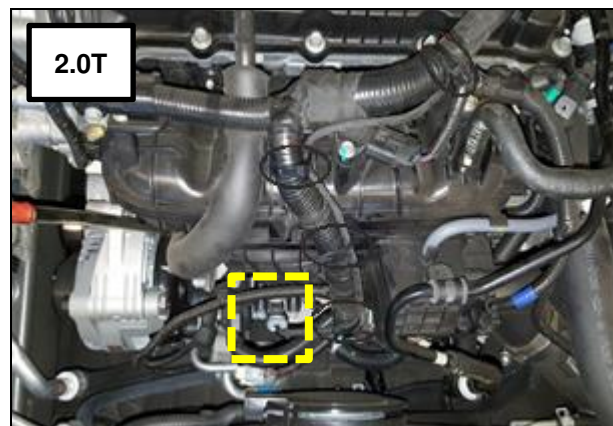
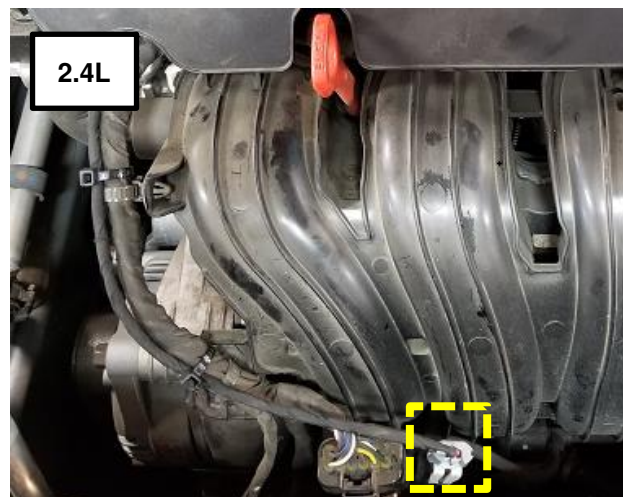
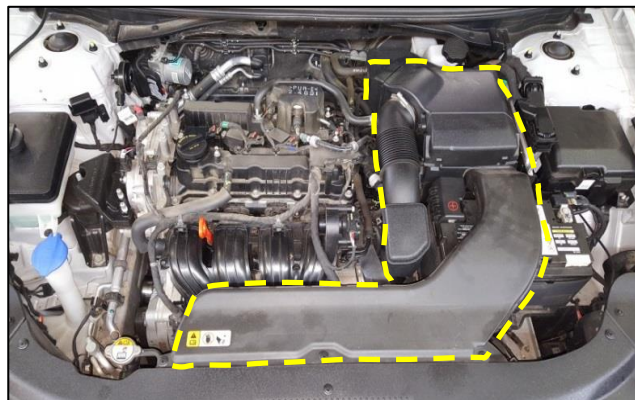
Wire Harness Extension Installation:

1. Remove the engine cover, air cleaner assembly, and negative battery terminal. Record vehicle's audio presets.

NOTICE

Proceed with wire harness extension installation ONLY if deemed necessary by the wiring signal inspection above.

2. Disconnect the knock sensor connector and connect the connector from the new wire harness extension.

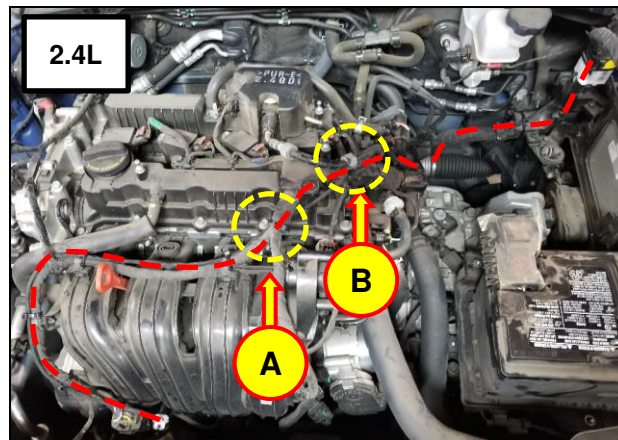


3. Route the new wire harness extension from the knock sensor connector to the engine ECM along the existing path of the engine control wire harness.

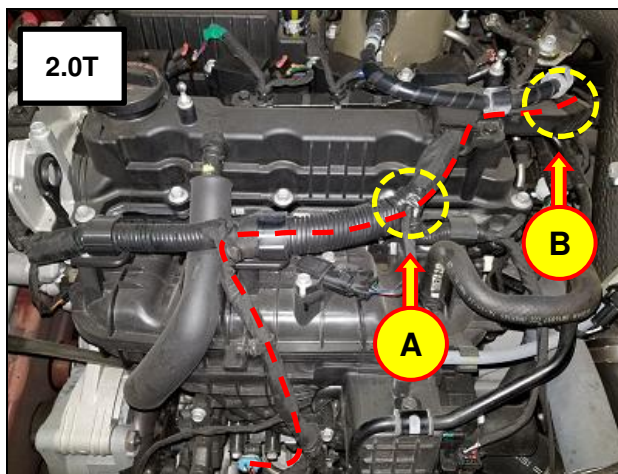
NOTICE

Ensure the new wire harness extension is:

- Underneath the original engine control wire harness at (A).
- On top the original engine control wire harness plastic protector at (B).

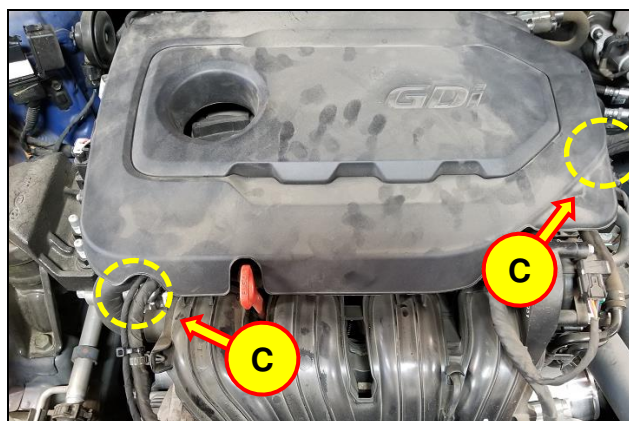
**NOTICE**

15MY Sonata (LF) vehicle is pictured for reference. Routing of the harness on other models is similar.



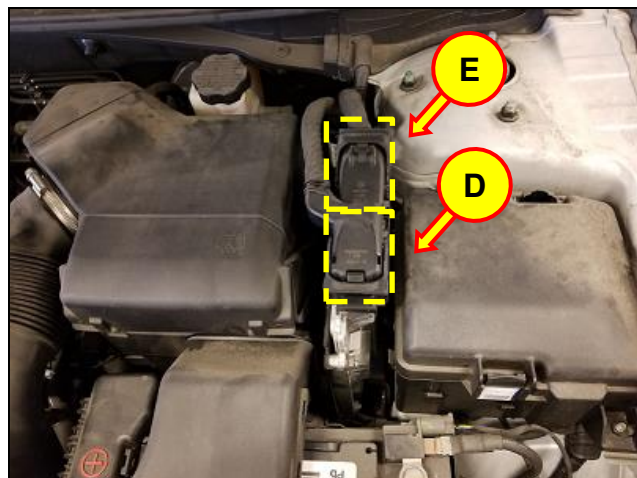
4. Secure the new wire harness extension along the existing control wire harness with zip ties and existing clips.

5. Reinstall the engine cover and ensure the new wire harness extension does not contact the engine cover at (C) and any other areas.



6. Identify the Engine ECM connector (D) or (E) to modify based on vehicle model and MY. Then check the connector's manufacturer as shown (BOSCH or KET).

Model / MY	ECM Connector
11-14MY Sonata (YF) 13-16MY Santa Fe Sport (AN) 14-15MY Tucson (LM)	D
15-18MY Sonata (LF) 17-18MY Santa Fe Sport (AN) 18MY Tucson (TL)	E

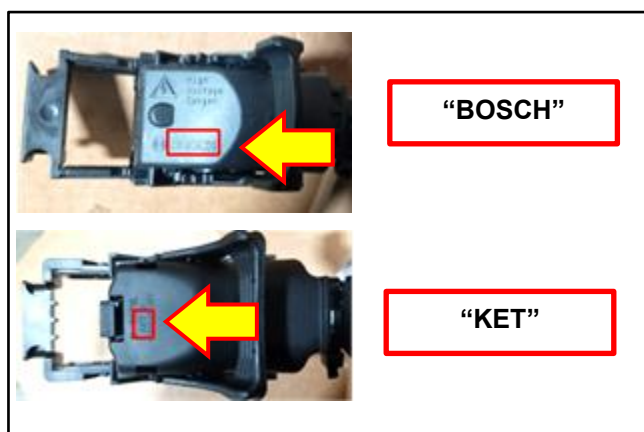


To Remove Connector (D):

Remove ECM connector (D) and top cover by gently prying at (F1) or pressing on (F2) based on connector type using a flat head screwdriver.

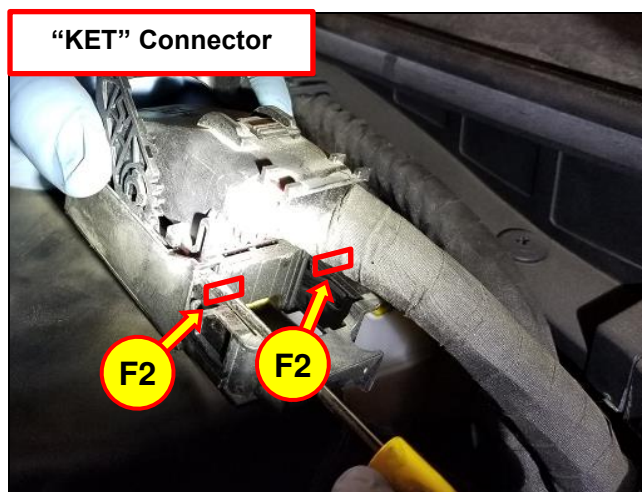
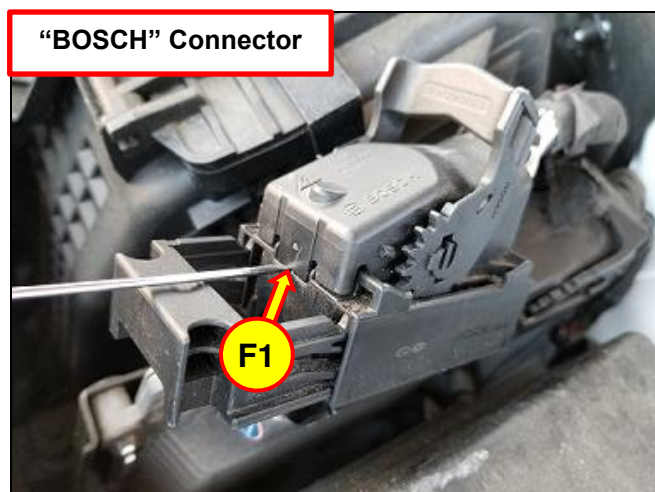
To Remove Connector (E):

First remove ECM connector (D) to release ECM connector (E). Then remove ECM connector (E) and top cover by gently prying at (F1) or pressing on (F2) based on connector type using a flat head screwdriver.

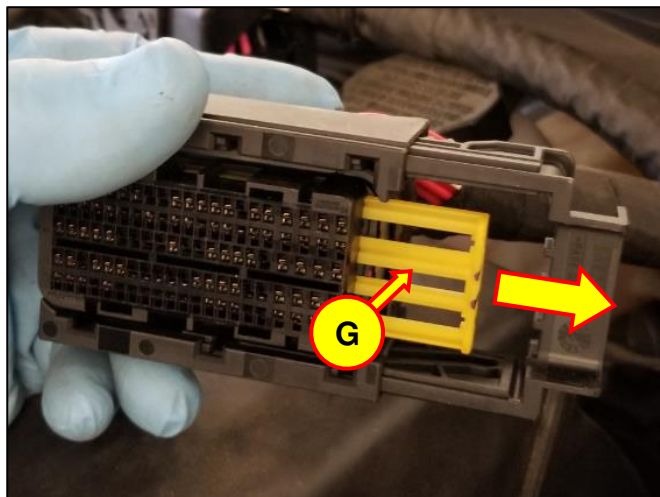


⚠ CAUTION

DO NOT use excessive force when removing the ECM connector cover. The cover comes off with minimal effort when using the release tab(s) F1 or F2.



7. Fully remove the connector retaining clip from the connector by gently prying at (G) using a small flat head screwdriver.



8. Locate the knock sensor pins on the ECM connector (D) or (E) based on vehicle model and MY table above.

Connector (D)

91	90	89	88	87	86	85	84	83	82	81	80	79	78	77	76	75		
74	73	72	71	70	69	68	67	66	65	64	63	62	61	60	59	58	6	5
																	4	3
57	56	55	54	53	52	51	50	49	48	47	46	45	44	43	42	41		
																	2	1
40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24		
23	22	21	20	19	18	17	16	15	14	13	12	11	10	9	8	7		

- PIN 44 - shield ground
- PIN 45 - knock sensor ground
- PIN 62 - knock sensor interface

Connector (E)

103	104	103	102	101	100	99	98	97	96	95	94	93	92	91	90	89	88	87	86	85
84	83	82	81	80	79	78	77	76	75	74	73	72	71	70	69	68	67	66	65	64
63	62	61	60	59	58	57	56	55	54	53	52	51	50	49	48	47	46	45	44	43
42	41	40	39	38	37	36	35	34	33	32	31	30	29	28	27	26	25	24	23	22
21	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1

- PIN 63 - knock sensor interface
- PIN 62 - knock sensor ground
- PIN 61 - shield ground
(No PIN 61 for 18MY Sonata 2.0T)

NOTICE

For 17-18MY Santa Fe Sport (AN):

Install the appropriate wire harness extension (BOSCH or KET) based on the existing Engine ECM connector manufacturer. Refer to the Parts Information table for part numbers.

9. Carefully remove the pins for the knock sensor from the ECM connector using the SST. Insert the SST perpendicular (90°) to the surface of the connector at (H) to release each pin (I) and gently pull the wire to remove each pin from the connector.

NOTICE

Note the orientation of each pin in the connector. The new pins will be installed in the same orientation in the next step.

The vehicle's factory wire color(s) may not match the wire color(s) of the new wire harness extension.

CAUTION

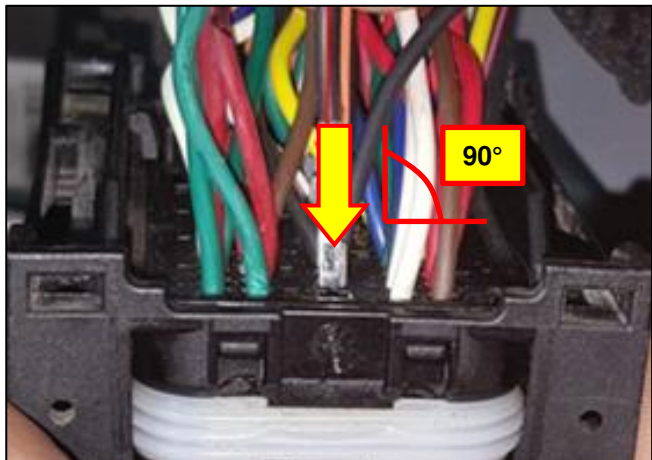
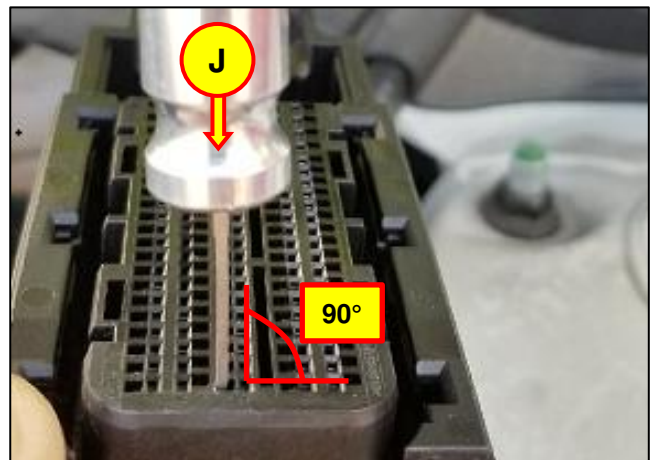
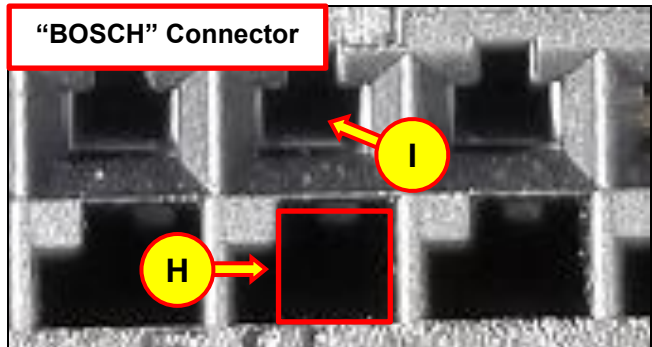
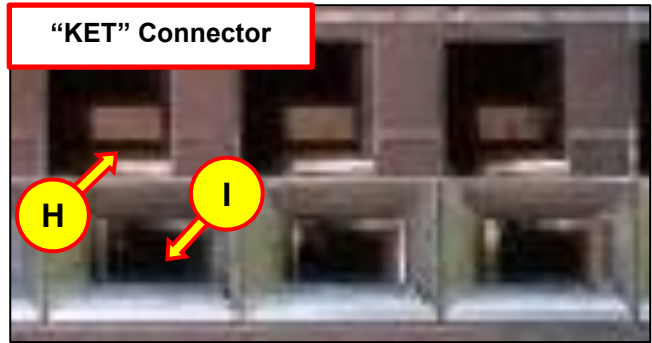
Take caution when removing the pins from the ECM connector. Slowly insert the SST perpendicular (J) to the surface of the connector to release the pins. Do not pry using the SST.

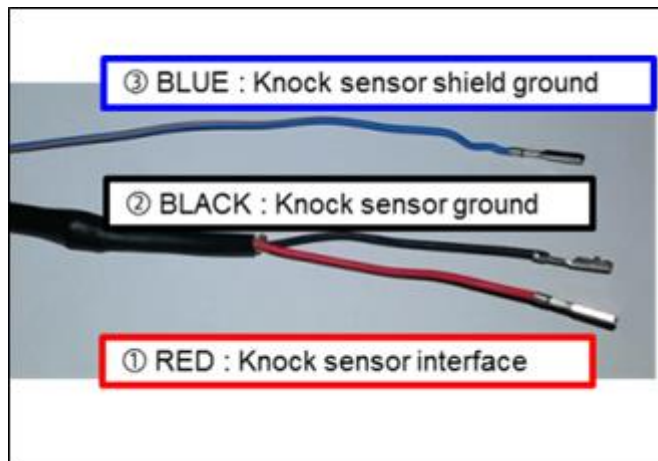
10. Insert each of the pins from the new wire harness extension into the ECM connector until fully seated. A slight click sensation and sound indicates the terminal is fully seated.

- Red – knock sensor interface
 - Black – knock sensor ground
 - Blue – shield ground
- (Not for 18MY Sonata 2.0T)

NOTICE

Ensure the new pins are installed in the same orientation as they were removed.




11. For 18MY Sonata 2.0T only:

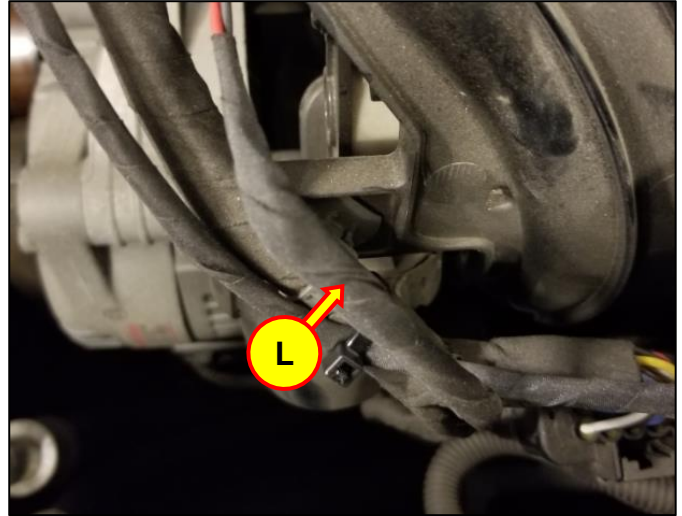
- Loosen the ground bolt on the chassis.
- Connect the new extension wiring's ground terminal to the existing ground terminal. Rotate the new ground terminal clockwise as shown.
- Tighten the ground terminal to the chassis.



12. Cut off and discard the original terminals from the ECM connector and fold the original wires (K) back onto the original engine control wire harness and secure with tape. Secure any excess wire from the new wire harness extension onto the original engine control wire harness with tape.



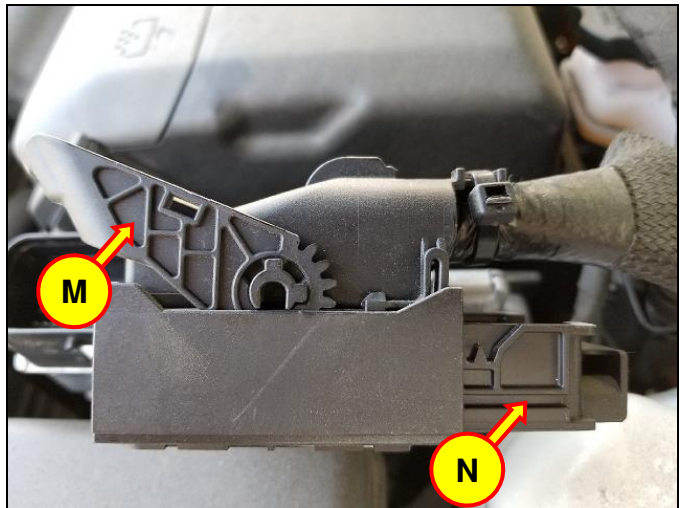
13. Cut off and discard the original knock sensor connector and fold the (2) original wires (L) from the original knock sensor connector back onto the original engine control wire harness and secure with tape.



14. Reinstall all removed parts in reverse order of removal. Restore audio presets.

⚠ CAUTION

DO NOT use excessive force when reinstalling the ECM connector cover. The cover will easily snap onto the connector with minimal effort when properly aligned. Refer to original orientation of the lever (M) and slider (N) and slightly move slider (N) as necessary until the cover easily snaps onto the connector.



15. Reset the engine adaptive values using the GDS and clear DTC P1326 while the engine is ON.

NOTICE

- Clear DTC P1326 with engine ON
- Reset engine adaptive values

16. Perform the Wiring Signal Interference Inspection again.

If the inspection result is OK:

- Proceed to the next step.

If the inspection result is NOT OK:

- Follow the Service Procedure flowchart on Page 10 until an OK test result is achieved.

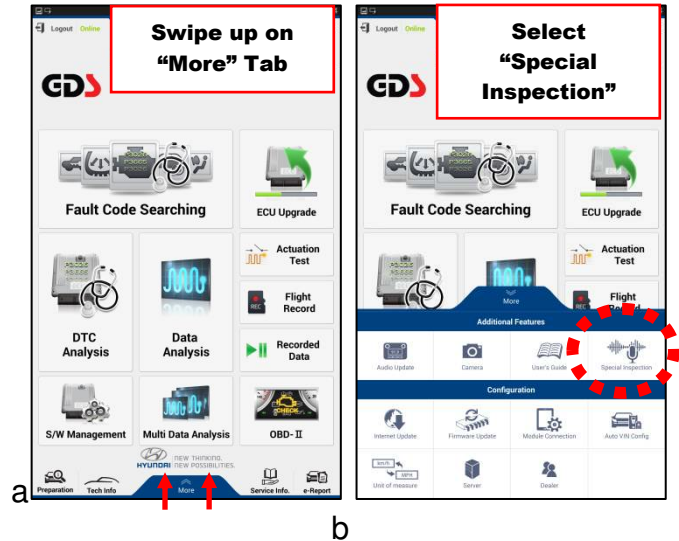
17. Check for DTCs and perform the appropriate diagnostic service. Ensure no warning lights are present to complete the procedure.

Engine Noise Inspection:

- The inspection procedure will consist of preparing the vehicle and then performing an inspection using the **“Special Inspection”** function of the GDS Mobile application.

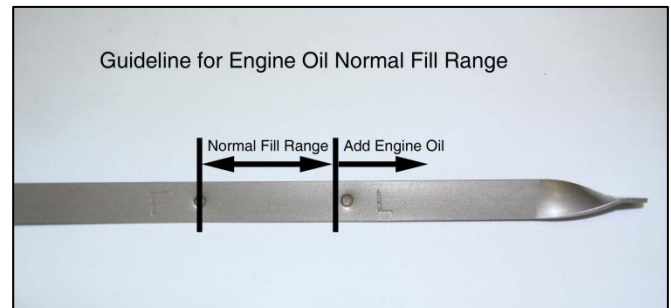
- Obtain the latest GDS Mobile update daily. The GDS Mobile must be connected to the internet via WiFi daily to confirm the latest software update is installed or the application will not function.
- Connect the GDS VCI to vehicle DLC.
- VCI should be updated with latest version and paired with GDS Mobile.
- Open the GDS Mobile App.
- Swipe up on the “More” tab at the bottom of the screen.

Select the “Special Inspection” function.



- Prior to inspection, the engine should be in a satisfactory running condition.

- Engine oil level should be in the normal range (shown at right).
 - Use Quaker State 5W-30 viscosity engine oil or other brand if not available (conventional type with API SM / ILSAC GF-4 or higher service grade) to adjust the oil level if necessary.
- Engine should idle normally.
- Clear all DTCs
- If P1326 sets while performing the noise inspection, unplug the knock sensor and perform the test again.



If the engine is running poorly, follow any related diagnosis and repair prior to performing this inspection procedure.

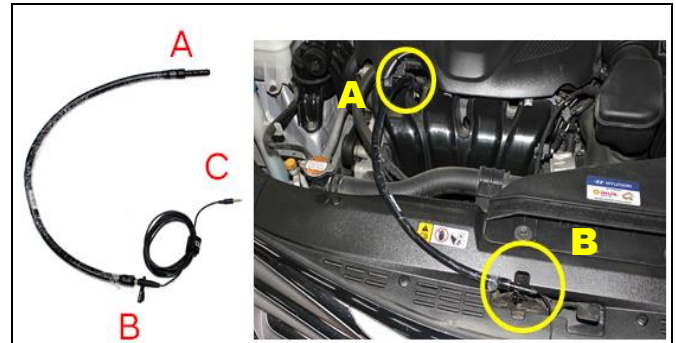
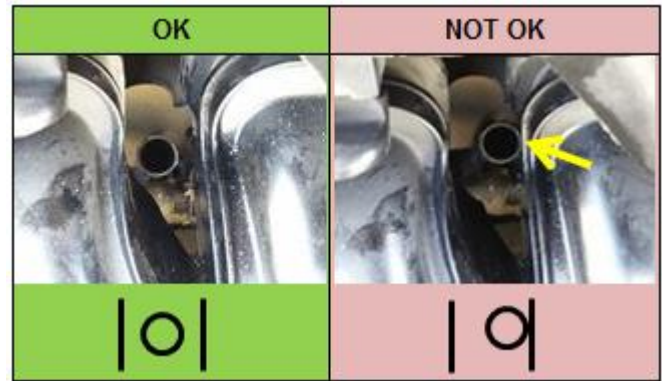
- Prepare the vehicle as follows before beginning the inspection:

- All accessories off, including the audio system.
- A/C must be off.
- Engine coolant temperature above minimum temperature 85°C (185°F).
 - If the engine is cold, then warm the engine before testing.
- Open the driver’s front window.

4. Prepare the vehicle and Engine Noise Inspection Tool as follows:
- Remove the oil level rod assy (engine oil dipstick).
 - Insert the adapter (A) into the oil level gauge tube (dipstick tube).
 - Check for interference between the dipstick tube and the intake manifold.

Adjust the dipstick tube to create clearance between the tube and manifold if necessary.

- Attach the clip (B) to the hood latch.
- Connect the stereo jack (C) to the GDS Mobile headphone jack.
- Feed the inspection tool through the open driver's front window.



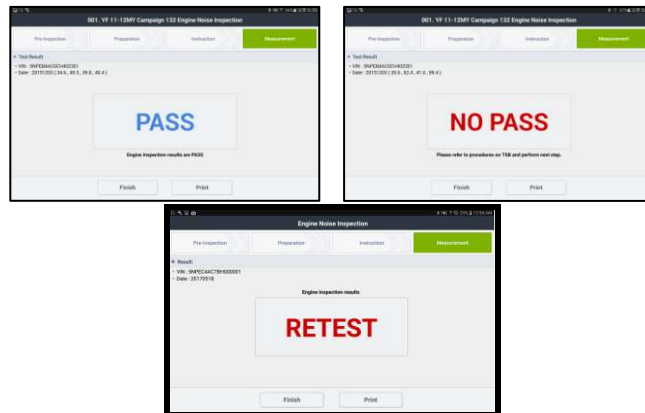
5. Follow the selection menus and on-screen prompts of the “Special Inspection” function to complete the Inspection Procedure.
- Do not tap, pinch or kink the Engine Noise Inspection Tool during the test.

NOTICE

For quality assurance purposes, an audio file of the engine noise and the inspection results will be sent to HMA.

6. After the Engine Noise Inspection is complete, the application will display **PASS**, **NO PASS**, or **RETEST**.

- This information will be sent to HMA when the GDS Mobile Tablet is connected to a WiFi network.



For PASS:

- Install the new wire harness extension kit and perform the Wiring Signal Interference Inspection.
- If the Wiring Signal Interference Inspection test result is still NOT OK after installing the extension harness, follow the Service Procedure flowchart on Page 10 until the Wiring Signal Interference Inspection test result is OK.

For NO PASS or RETEST:

- Continue to the next page

NOTICE

The GDS can store a maximum of 5 tests while the device is offline (disconnected from Wi-Fi). In order to perform further tests, connect the GDS to Wi-Fi and select the “Send All Pending” button to send the pending test results to HMA.

Engine Replacement:

1. **Continue if DTC P1326 is detected, the wiring signal interference inspection is OK, and the engine noise inspection result is NO PASS or RETEST.**

Perform the following steps to **remove any sources of interfering noise** and then **retest the vehicle**.

- a) Is there any abnormal noise that's intermittent or does not follow engine RPM?
 - Check for noise from other components such as the exhaust system, engine mounting points, lines and harnesses. Adjust as necessary.
- b) Is there any abnormal noise that could be from engine-driven accessories?
 - Remove the serpentine belt to isolate all belt-driven accessories to the engine assembly. Limit engine run time during any inspection. Adjust as necessary.

NOTICE

After completing steps a) and b) above to remove any sources of interfering noise, perform the Engine Noise Inspection again.

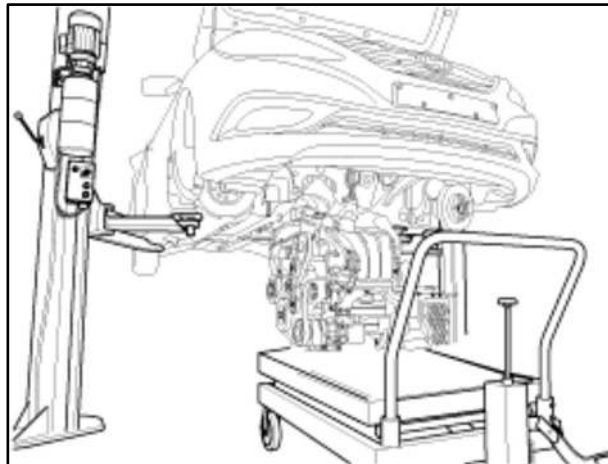
- **If re-inspection results in a PASS:**
 - Install the new wire harness extension kit and perform the Wiring Signal Interference Inspection.
 - Follow the Service Procedure flowchart on Page 10 until the Wiring Signal Interference Inspection test result is OK.
- **If re-inspection results in a RETEST:**
 - Perform Step 1 again.
- **If re-inspection results in a NO PASS:**
 - Follow the procedures in step c) below to request a Prior Authorization #.

- c) If the re-inspection still results in a **NO PASS** after retesting the vehicle:
 - **Do not inform the customer that they will need a new engine until approved by Warranty Prior Approval (PA).**
 - **Do not order the engine until approved by Warranty Prior Approval (PA).**
 - Immediately upload the test results for PA review.
 - If the tablet is not connected to a Wi-Fi network at the time of the test, the result will not be automatically uploaded. Please ensure test results are uploaded as inspections are performed to avoid any delay in PA review.
 - Go to the WebDCS PA Request screen. The PA request will be auto-created and saved. Submit the PA request with the following attachments:
 - 1) GDS screenshot showing the VIN # and DTC P1326
 - 2) GDS Wiring Inspection results screen showing OK test result and date
 - 3) Engine Diagnosis Worksheet
 - The PA agent will review the PA request and advise the dealer to proceed with the engine replacement when approved.

2. Follow the published Service Information from the applicable **Shop Manual** to remove the Sub Engine Assembly from the vehicle.

Shop Manual Section Location:

Engine Mechanical >
Engine And Transaxle Assembly >
Engine And Transaxle Assembly >
Repair Procedures



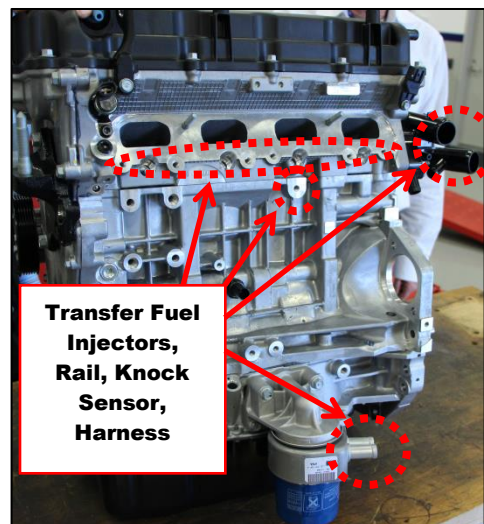
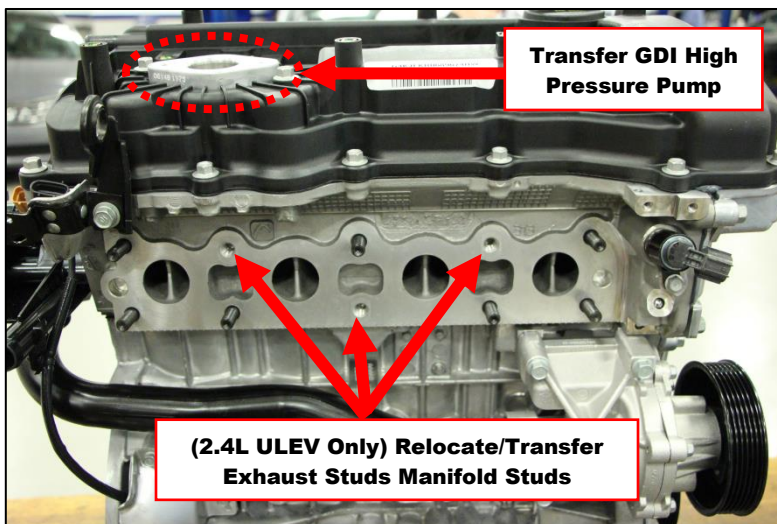
NOTICE

Record the audio station presets (XM, AM, FM, etc) prior to disconnecting the battery.

3. Replacement engines must be prepared prior to installation. Some components from the existing engine must be transferred to the new engine.

NOTICE

Be careful to reserve the vehicle's original parts for reinstallation on the replacement engine.

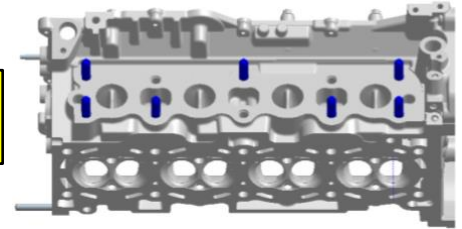


4. **For 2.4L with ULEV / FED emissions only**
2.4L replacement engines are produced with the exhaust manifold studs configured for SULEV / CAL emissions package.

Two exhaust studs must be relocated on the new engine and 1 exhaust stud must be transferred from the old engine.

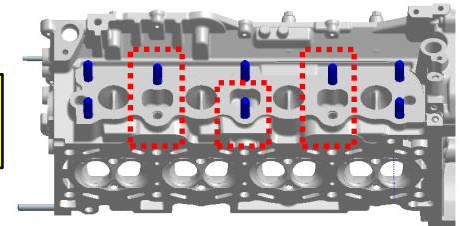
- Use a commercially available stud removal tool or use the double-nut technique to complete this step.

**SULEV /
CAL Spec**



Exhaust Stud Position Relocation Information

**ULEV /
FED Spec**



5. Remove and reinstall the engine knock sensor from the old engine to the new engine.

Knock Sensor Fastener

Tightening torque: 21Nm (15.5lb-ft)

NOTICE

Ensure the knock sensor is torqued to specification using a torque wrench. Improper installation can result in DTC codes.



6. **If 21101-2GK70QQA engine is used:**

- Install the oil filler cap from the old engine to the new one.
- Install the drive plate/flywheel on the new engine using new bolts (QTY 7).

Drive Plate Tightening torque :

111.7 ~ 127.5 Nm (86.8 ~ 94.1 lb-ft)



7. Follow the published procedure outlined in **TSB 19-FL-001H** to remove and reinstall the following GDI high pressure fuel system components from the existing engine to the new engine:

- GDI High Pressure Pump
- Fuel Injectors (4)
- Fuel Rail

The corresponding Service Kits will supply the required new parts per TSB 19-FL-001H to complete the transfer of the above existing parts.

⚠ CAUTION

Follow TSB 19-FL-001H carefully and replace the following newly supplied parts from the Service Kits:

- Mounting flange O-ring (for High Pressure Pump)
- O-rings, Backup Rings, Washer Seals, Combustion Seal Rings, and clips (for Fuel Injectors)
- Fuel Pipe (between High Pressure Pump and Fuel Rail)

In addition, the Service Kits include (1) Exhaust Pipe Gasket. Install this new gasket when attaching the front and center muffler assemblies together during the engine installation.

8. Install the new oil cooler hoses if applicable.
9. Reconnect and reinstall the engine front harness.
10. Follow the published Service Information from the applicable **Shop Manual** to reinstall the Sub Engine Assembly.

Shop Manual Section Location:

Engine Mechanical >
Engine And Transaxle Assembly >
Engine And Transaxle Assembly >
Repair Procedures

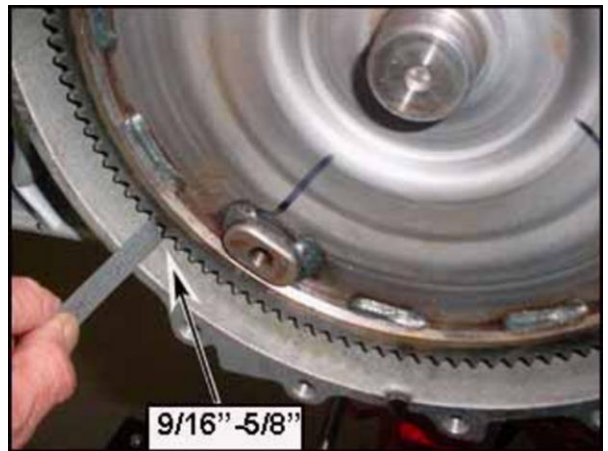
NOTICE

Be sure to replace the following newly supplied parts from the Service Kit:

- Oil Level Rod & Oil Level Guide Assy.
- Intake Manifold Gaskets (4)
- Exhaust Manifold Gasket
- Fuel Pipe Assembly
- (2.0T Only) Turbo Oil Feed Hose & Pipe
- (2.0T Only) Turbo Oil Drain Gasket (2)
- (2.0T Only) Oil Drain Gasket
- (2.0T Only) Gasket (2)

NOTICE

If the torque converter has moved from the fully inserted position, carefully push inward and rotate the torque converter until the converter is recessed approximately 9/16 - 5/8" (14 -16 mm) into the transaxle case when reinstalling the automatic transaxle.



11. Connect the (2) oil coolant hoses between the oil cooler and the water temperature control assembly.
 - Fill the cooling system with 50/50 ~ 70/30 (Water/Anti-Freeze) coolant mixture.
12. Use Quaker State 5W-30 engine oil or other brand if not available (conventional, synthetic blend, or full synthetic type with API SM / ILSAC GF-4 or higher service grade) to fill the engine crankcase.
 - Add 5.8 quarts for the **initial dry fill** of the engine.
 - With the fuel system disabled temporarily, crank the engine for several seconds to prime the lubrication system prior to starting the engine.
13. Start the engine to warm it up and begin the cooling system air bleeding process.
 - Check for any leaks during this time.
 - After the engine has warmed up to normal operating temperature, turn the engine off, wait a few minutes, and then **adjust the engine oil level to near the “F” mark as shown.**
14. Perform the Wiring Signal Interference Inspection.

If the inspection result is OK:

 - Proceed to the next step.

If the inspection result is NOT OK:

 - Follow the Service Procedure flowchart on Page 10 until an OK test result is achieved.
15. When all fluids have been fully filled and all work quality checks are completed:
 - Set the customer’s audio station presets.
 - Relearn the Steering Angle Sensor using the GDS.
 - **Reset the engine adaptive values** using the GDS.
 - **Clear DTC P1326 with engine ON.** Then check for other DTCs and perform the appropriate diagnostic service. Ensure no warning lights are present.
 - Perform a short road test to confirm normal vehicle drivability.

**NOTICE**

- Clear DTC P1326 with engine ON
- Reset engine adaptive values

NOTICE

DO NOT damage the short block casting / starter motor mounting tab.

Engine blocks for vehicles affected by this TSB should not be damaged.