HYUNDAI NEW THINKING. NEW POSSIBILITIES.	GROUP	NUMBER
Technical Service Bulletin	**RECALL**	**15-01-048**
	DATE	MODEL(S)
	DECEMBER, 2015	**2011-2012MY SONATA (YF)**

SUBJECT: SONATA GDI ENGINE INSPECTION / REPLACEMENT (RECALL CAMPAIGN 132)

*** IMPORTANT**

***** Retail Vehicles Only *****

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

When a vehicle arrives at the Service Department, access Hyundai Motor America's "Warranty Vehicle Information" screen via WEBDCS to identify open Campaigns.

Description: Certain 2011-2012 model year Sonata (YF) vehicles equipped with 2.4L and 2.0T GDI engines will require an Engine Noise Inspection to confirm its normal operation. The inspection procedure will help indicate if the engine is operating normally or if an excessive connecting rod bearing wear condition in the engine crankcase may be present. If the vehicle continues to be driven with a worn connecting rod bearing, the bearing can fail, and the vehicle could stall while in motion, increasing the risk of a crash.

Follow the procedure outlined in this bulletin to perform the Engine Inspection.

- If the inspection results in a **PASS**, follow Service Procedure **(Inspection Results = PASS)** in Page 5 of this bulletin.
- If the inspection results in a **NO PASS**, follow Service Procedure **(Inspection Results = NO PASS)** in Page 6 of this bulletin.

Applicable Vehicles:
2011-2012MY Sonata (YF) vehicles produced from HMMA with 2.4L and 2.0T GDI engines

NOTICE

The inspection process will require the use of the Tablet-based GDS Mobile system.

At this time, the "Special Inspection" function within the GDS Mobile application is only compatible with the Samsung Galaxy Note 2014 Edition 10.1 model. This function will be disabled if any other tablet model versions are detected. PC-based GDS is not supported.

GDS Mobile Information:

Update Version	Comment
Perform latest GDS Mobile update	See above Notice and use the latest GDS Mobile update

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

SUBJECT: SONATA GDI ENGINE INSPECTION / REPLACEMENT (RECALL CAMPAIGN 132)

SST Information:

Description	Tool Part #	Comment
Torque Wrench Socket	09314-3Q100	Refer to TSB 10-FL-019 for the detailed usage instructions
Injector Combustion Seal Ring Installer	09353-2B000	

Parts Information:

Inspection Results and Required Procedure*	Part Name	Part Number	QTY*
PASS (Inspection with Oil Level Rod Replacement)	Rod Assembly-Oil Level	26611-2G050-QQH	1
NO PASS (Inspection and YF 2.4L Engine Replacement)	YF 2.4L Engine Assembly-Sub	21101-2GK50-QQH	1 each
	YF 2.4L Service Kit	21111-2GK50-QQH	
	Service Kit 2	21111-2GK70-QQH	
NO PASS (Inspection and YF 2.0T Engine Replacement)	YF 2.0T Engine Assembly-Sub	21101-2GK60-QQH	1 each
	YF 2.0T Service Kit	21111-2GK60-QQH	
	Service Kit 2	21111-2GK70-QQH	

NOTE*: Select the appropriate campaign parts for the corresponding inspection results and the applicable vehicle engine type.

Warranty Information:

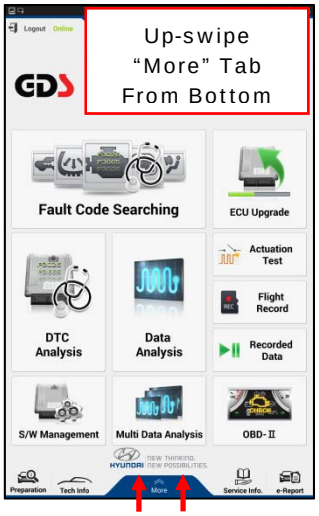
Model	Op. Code	Operation	Op Time
YF 2.4L and 2.0T	51CA21I0	Inspection with Oil Level Rod Replacement	0.6 M/H
YF 2.4L (non-Turbo)	51CA21R0	Inspection and YF 2.4L Engine Replacement	8.5 M/H
YF 2.0T (Turbo)	51CA21R1	Inspection and YF 2.0T Engine Replacement	8.8 M/H

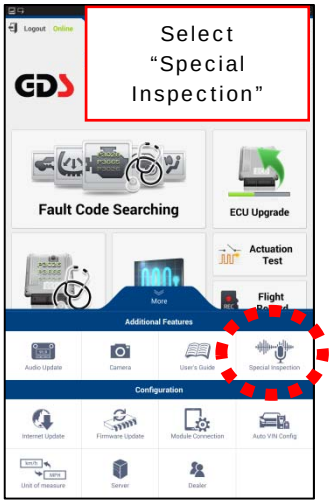
NOTE: Submit Claim on Campaign Claim Entry Screen.

- Op Code 51CA21I0 includes material allowance reimbursement for 00232-OILCON.
- Op Codes 51CA21R0/51CA21R1 includes material allowance reimbursement for 00232-OILSYN.
- If any part(s) are found in need of replacement while performing Recall Campaign 132, please submit a separate claim using the same Repair Order used for the Recall Campaign 132.

Inspection Procedure:

1. The Inspection Procedure will consist of preparing the vehicle and then performing an Engine Noise Inspection using the "**Special Inspection**" function of the GDS Mobile application.



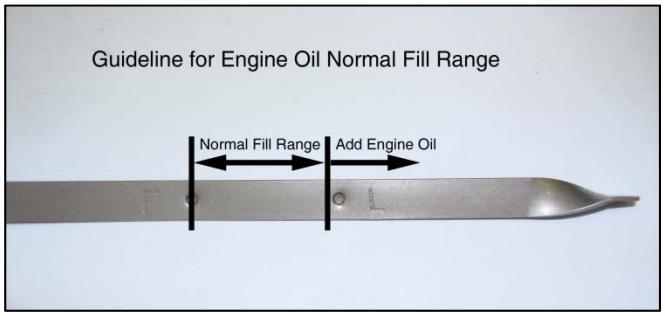


   - Obtain the latest GDS Mobile update.
   - Connect the GDS VCI to vehicle DLC.
   - Open the GDS Mobile App.
   - Swipe up the "More" tab at the bottom.
   - Select the "Special Inspection" function.

2. The Inspection Procedure must be done at a reasonably quiet location. Determine a suitable place to perform the inspection.
   - The location should have minimal background noise from shop tools, loud machinery, ventilation fans, car wash machine/spray booth, vehicle traffic, pouring rain, PA speakers, or people talking nearby.
   - Find a quiet place where cabin noise level (doors and windows closed) with the Engine OFF does not exceed 37 dB(A).

Select any indoor or outdoor (as shown) location that satisfies the max inside cabin noise pre-check.

3. 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 conventional type engine oil to adjust the oil level if necessary.
   - Engine idle condition should be normal and can maintain an RPM hold test.



If the engine's running condition is poor, follow any related diagnosis and repair prior to performing this inspection procedure.

4. Prior to beginning the inspection, the vehicle must be prepared as follows:
   - Engine upper cover is intact and securely installed on top of valve cover.
   - Engine under cover is intact and installed under the engine compartment.
   - Hood is fully closed. All doors, windows, and sunroof are closed.
     - Check if the hood and all door closed position switches function properly.
   - All accessories off, including the audio system.
   - A/C must be off, with blower off, and intake set to RECIRC mode.
   - Engine coolant temperature above minimum temperature 85°C (185°F).
     - If the engine is cold, then warm the engine before testing.

5. Position the GDS Mobile Tablet for inspection:
   - Rotate the GDS Mobile Tablet, so that the microphone (installed at the bottom of the GDS Mobile Tablet) points up towards the windshield and headliner.
   - Align the GDS Mobile Tablet so that it is centered to the steering wheel, but not touching it.

NOTICE

Inspect the GDS Mobile Tablet to verify that the microphone location is not partially shrouded by the cover due to misalignment.

If necessary, remove the cover from the GDS Mobile Tablet and then enlarge the hole with a 3mm drill to prevent the microphone from being shrouded.

6. Follow the selection menus and on-screen prompts of the “Special Inspection” function to complete the Inspection Procedure.
   - During the 2,000 RPM Engine Noise Inspection steps, do not talk or make additional noise inside the vehicle cabin.

NOTICE

For quality assurance purposes, the audio file of the noise recordings with the results data will be sent to HMA.

7. After the Inspection Procedure is complete, the application will auto generate a PASS or NO PASS result information.
   - This information will be sent to HMA when the GDS Mobile Tablet is synced to the Wi-Fi network.

Proceed to the appropriate **Service Procedure** in the following pages that corresponds to the **Inspection Results**.

Service Procedure (Inspection Results = PASS):

1. If the inspection results in a **PASS**, then an engine replacement is <u>not</u> required.

   To complete the inspection process for the PASS results, the following must be done:
   - Replace the oil level rod assembly (engine oil dipstick) with the new campaign part.
   - Adjust the engine oil level to near FULL mark.

NEW Oil Level Rod Assembly

Handle Color Differences

OLD: Yellow
NEW: Orange

2. Replace the current Oil Level Rod Assembly with the new campaign part.
   - Remove and discard the existing Oil Level Rod Assembly.
   - Install new ORANGE handle Oil Level Rod Assembly (P/N 26611-2G050-QQH)

3. Adjust the engine oil level to near the "F" mark as shown in the picture.
   - Use Quaker State 5W-30 conventional type engine oil to complete this step.
   - Add 0.42 quarts or more, as required.
   - Do not overfill.

4. The Service Procedure for **Inspection Results = PASS** is now complete at this point.

Service Procedure (Inspection Results = NO PASS):

1. If the inspection results in a **NO PASS**, then some confirmation checks should be considered before determining that an engine replacement is required.

   The following verification steps should be taken to confirm the NO PASS engine condition:

   a) Is the cabin noise level still not exceeding 37 dB(A) with all doors/windows closed and engine OFF?
      - If cabin noise is louder than 37 dB(A) with the engine OFF, then relocate to a quieter ambient area.

   b) Is there any abnormal noise which does not always follow engine RPM and is intermittent?
      - If so, then check for the source of the noise from other components such as the exhaust system, engine mounting points, items from the vehicle interior, lines and harnesses. Adjust or correct as necessary.
      - For 11MY YF 2.4L vehicles built before September 1, 2010, check for fuel delivery tube vibration noise by referring to **TSB 10-BD-007** (ENGINE COMPARTMENT RATTLE DURING ACCELERATION - FUEL TUBE HOLDER). Perform TSB Service Procedure if necessary.

   c) Are there any abnormal noises that may be from engine driven accessories?
      - If necessary to confirm, remove the serpentine belt to isolate all belt driven accessories to the engine assembly. Limit engine run time during any inspection. Correct as necessary.

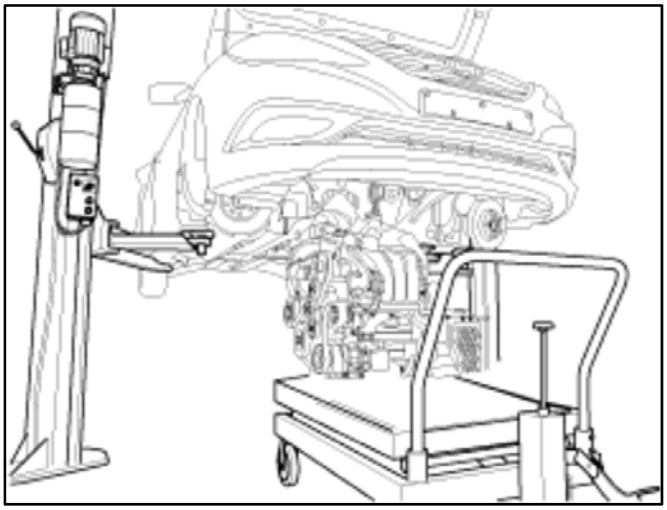
NOTICE

Perform the Inspection Procedure again to confirm if a PASS result can be achieved after any noise contributing issues found during the verification steps have been corrected.

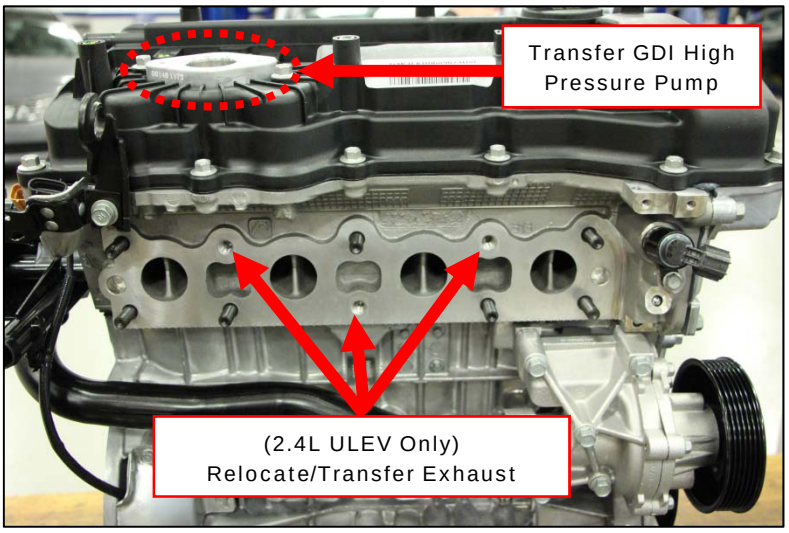
- **If re-inspection results in a PASS:**
  - **Perform Service Procedure (Inspection Results = PASS) on Page 5.**
- **If re-inspection still results in a NO PASS:**
  - **Proceed to following steps below to replace the engine.**

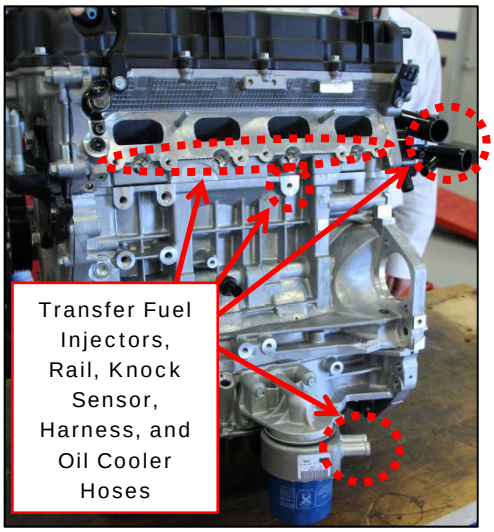
2. Follow the published Service Information from the applicable **Shop Manual** to remove the Sub Engine Assembly from the vehicle.

Shop Manual Section Location:
Engine Mechanical >
Engine And Transaxle Assembly >
Engine And Transaxle Assembly >
Repair Procedures



3. The shipped contents of the service replacement "QQH" Sub Engine Assemblies differ from traditional service replacement engines and must be specially prepared prior to installation.





NOTICE

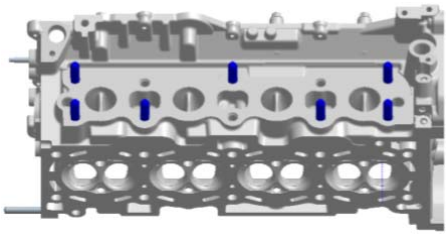
Some components from the existing engine must be transferred to the new engine. Install all of the newly supplied contents of the applicable Service Kits.

4. **(YF 2.4L with ULEV / FED emissions only)**
All 21101-2GK50-QQH engines are produced with the exhaust manifold studs configured for SULEV / CAL emissions package.

YF 2.4L vehicles with ULEV / FED emissions package require 2 exhaust studs to be relocated on the new engine and 1 exhaust stud transferred over from the old engine.

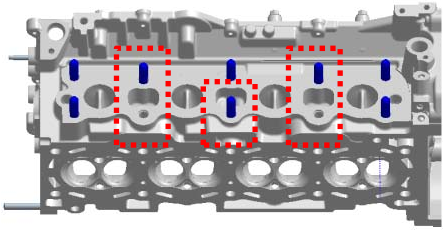
- Use a commercially available stud removal tool or use the double-nut technique to complete this step.

SULEV / CAL Spec



Exhaust Stud Position Relocation Information

ULEV / FED Spec



5. Remove and reinstall the engine Knock Sensor from the existing engine to the new engine.

(Knock Sensor Fastener)
Tightening torque: 21Nm (15.5lb-ft)

6. Follow the published procedure outlined in **TSB 10-FL-019** 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 Delivery (Rail) Pipe

The corresponding Service Kit 2 will supply the required new parts per TSB 10-FL-019 to complete the transfer of the above existing parts.

⚠ CAUTION

Follow TSB 10-FL-019 carefully and replace the following newly supplied parts from the Service Kit 2:
- **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 Delivery Pipe)**

In addition, Service Kit 2 includes (1) Exhaust Pipe Gasket. Install this new gasket when attaching the front and center muffler assemblies together during the engine installation.

7. Reconnect and reinstall the engine front harness as shown.

   - Be sure to properly route the opposite end of the harness end down towards the front of the engine.

8. Install newly supplied Oil Level Guide and Oil Level Rod Assemblies to the new engine.

   - Be sure to install the NEW Oil Level Guide (Dipstick Tube) to the NEW engine.
   - Install the NEW Oil Level Rod Assembly (Dipstick) to the NEW engine.

NOTICE

Engine is shipped without oil, so the engine oil must be added at a later step.

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

Shop Manual Section Location:
Engine Mechanical >
Engine And Transaxle Assembly >
Engine And Transaxle Assembly >
Repair Procedures

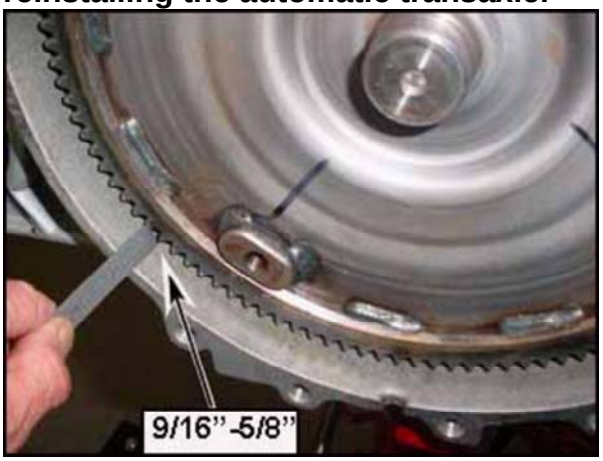
NOTICE

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

- **Oil Level Rod & Oil Level Guide Assy.**
- **Intake Manifold Gaskets (4)**
- **Exhaust Manifold Gasket**
- **Fuel Tube 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.



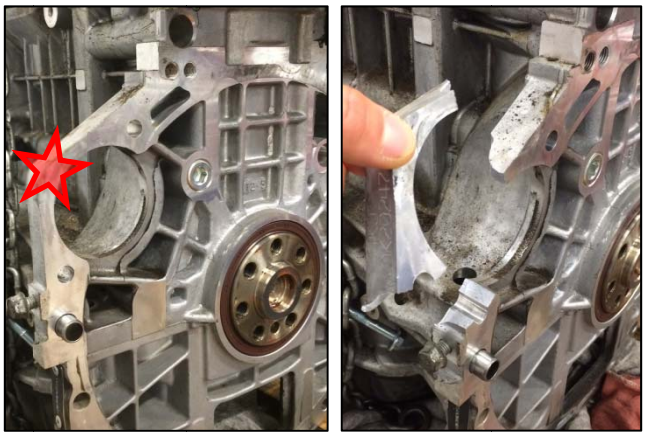
10. Connect the (2) oil coolant hoses between the oil cooler and the water temperature control assembly.
    - Fill the cooling system with 50/50 ~ 70/30 (Water/Anti-Freeze) coolant mixture.

11. Use Quaker State 5W-30 **full synthetic** type engine oil to fill the engine crankcase.
    - Add 5.75 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.

12. Start the engine to warm up the engine and begin the cooling system air bleed process.
    - During this time, check for any leaks.
    - After the engine has warmed up to normal operating temperature, wait a few minutes after turning the engine OFF, then adjust the engine oil level to near the “F” mark as shown in the picture.

13. When all fluids have been fully filled and all work quality checks are complete:
    - Relearn the Steering Angle Sensor using the GDS.
    - Reset the engine adaptive values using the GDS.
    - Perform a short road test to relearn the initial adaptive values.
    - Verify normal vehicle drivability.

14. Prior to discarding the removed engine, disable the short block casting to prevent reuse by performing the following:
    - Locate the starter motor mounting tab.
    - With a large mallet, strike firmly at the center of the tab (as shown in **RED**) to break off the mounting tab.



⚠ CAUTION

Always wear eye protection and perform this step in an open area with ample free space.

15. The Service Procedure for Inspection Results = **NO PASS** is now complete at this point.