verify the ignition key is in the ON position.

verify the scan tool operation with a known good vehicle.

to diagnose no response from the PCM, REFER to: MODULE COMMUNICATIONS NETWORK .

7.

Carry out the network test.

If the scan tool responds with no communication for one or more modules, REFER to: MODULE COMMUNICATIONS NETWORK .

If the network test passes, retrieve and record continuous memory DTCs.

8.

Clear the continuous DTCs and carry out the self-test diagnostics for the PCM.

9.

If the DTCs retrieved are related to the concern, refer to the appropriate article.

10.

If no DTCs related to the concern are retrieved, GO to Symptom Chart - Engine Performance .

DIAGNOSIS AND TESTING > ENGINE > INSPECTION AND VERIFICATION - NVH

1.

NVH symptoms should be identified using the diagnostic tools and techniques that are available. For a list of these techniques, tools, an explanation of their uses and a glossary of common terms, REFER to: Noise, Vibration and Harshness (NVH) . Since it is possible that any one of multiple systems may be the cause of the symptom, it may be necessary to use a process of elimination type of diagnostic approach to pinpoint the responsible system.

2.

Verify the customer concern by operating the engine to duplicate the condition.

3.

Check the engine oil level and check the oil for contamination. Low engine oil level or contaminated oil are a common cause of engine noise. If the oil is contaminated, the source of the contamination must be identified and repaired as necessary.

4.

Visually inspect for obvious signs of mechanical damage.

5.

If the inspection reveals obvious concerns that can be readily identified, repair as necessary.

> *NOTE: Make sure to use the latest scan tool software release.*

6.
If the cause is not visually evident, connect the scan tool to the DLC.

> *NOTE: The VCM LED prove out confirms power and ground from the DLC are provided to the VCM.*

7.
If the scan tool does not communicate with the VCM:

check the VCM connection to the vehicle.

check the scan tool connection to the VCM.

check for No Power To The Scan Tool, to diagnose no power to the scan tool, REFER to: MODULE COMMUNICATIONS NETWORK .

8.

If the scan tool does not communicate with the vehicle:

verify the ignition key is in the ON position.

verify the scan tool operation with a known good vehicle.

to diagnose no response from the PCM, REFER to: MODULE COMMUNICATIONS NETWORK .

9.

Carry out the network test.

If the scan tool responds with no communication for one or more modules, REFER to: MODULE COMMUNICATIONS NETWORK .

If the network test passes, retrieve and record continuous memory DTCs.

10.

Clear the continuous DTCs and carry out the self-test diagnostics for the PCM.

11.

If the DTCs retrieved are related to the concern, go to the appropriate article.

12.

If no DTCs related to the concern are retrieved, continue the inspection and verification if a noise concern is related to the engine. For vibration concerns and noise concerns such as powertrain mounts, air intake system and starter GO to Symptom Chart - NVH .

In some cases, a noise may be a normal characteristic of that engine type. In other cases the noise may require further investigation. Comparing the noise to a similar year/model vehicle equipped with the same engine will aid in determining if the noise is normal or abnormal.

Once a customer concern has been identified as an abnormal engine noise, it is critical to determine the location of the specific noise. Use the EngineEAR/ChassisEAR or stethoscope (the noise will always be louder closer to the noise source) to isolate the location of the noise to one of the following areas.

- Fuel injector(s)
- Upper end of engine
- Lower end of engine
- Front of engine
- Rear of engine

Fuel injector noise

A common source of an engine ticking noise can be related to the fuel injection pump Gasoline Turbocharged Direct Injection (GTDI) engine or fuel injector(s). This is normal engine noise that can be verified by listening to another vehicle. If the injector noise is excessive or irregular, use the EngineEAR/ChassisEAR or stethoscope to isolate the noise to a specific fuel injector.

Upper end engine noise

A common source of upper end engine noise (ticking, knocking or rattle) include the camshaft(s) and valve train. Upper end engine noise can be determined using the EngineEAR/ChassisEAR or stethoscope on the valve cover bolts. If the noise is loudest from the valve cover bolts, then the noise is upper end. The EngineEAR/ChassisEAR or stethoscope can be used to further isolate the noise to the specific cylinder bank and cylinder. Removal of the valve covers will be required to pinpoint the source of the noise.

Lower end engine noise

A common source of lower end engine noise (ticking or knocking) include the crankshaft, connecting rod(s) and bearings. Lower end noises can be determined by using the oil pan or lower cylinder block. If the noise is loudest from these areas, then the noise is lower end. If an engine noise is isolated to the lower end, some disassembly of the engine may be required to inspect for damage or wear.

Front of engine noise

A common source of noise from the front of the engine (squeal, chirp, whine or hoot) is the FEAD components. To isolate FEAD noise, carry out the Engine Accessory Test, REFER to: Noise, Vibration and Harshness (NVH) .

Some other noises from the front of the engine (ticking, tapping or rattle) may be internal to the engine. Use the EngineEAR/ChassisEAR or stethoscope on the engine front cover to determine if the noise is internal to the engine. Removal of the engine front cover may be necessary to inspect internal engine components.

Rear of engine noise

A common source of noise from the rear of the engine (knocking) is the flywheel/flexplate. Inspection of the flywheel/flexplate will be necessary.