DTC P0332

CIRCUIT DESCRIPTION
The knock sensors (KS) produce an AC signal under all engine operating conditions. When the engine is running, the powertrain control module (PCM) learns a minimum and maximum frequency of normal engine noise. The KS system monitors both knock sensors in order to determine if knock is present. If the KS system determines that excessive knock is present, the PCM retards the spark timing based on the signals from the KS. The PCM continues to retard timing until no knock is present. If the PCM detects that the frequency is out of the normal range, DTC P0327 or P0332 will set.

DTC DESCRIPTORS
This diagnostic procedure supports the following DTCs:

- DTC P0327 Knock Sensor (KS) 1 Circuit Low Frequency
- DTC P0332 Knock Sensor (KS) 2 Circuit Low Frequency

CONDITIONS FOR RUNNING THE DTC

- DTCs P0116, P0117, P0118, P0120, P0122, P0123, P0125, P0128, P0220, or P2135 are not set.
- The minimum noise level must be learned. The minimum noise level is learned when the following conditions are met:
- The engine coolant temperature (ECT) is more than **60°C (140°F)** .
- The engine RPM is between 475-975 for **10 seconds** .
- The engine speed is between **1,500-3,000 RPM** .
- The manifold absolute pressure (MAP) is less than **45 kPa** .
- The engine run time is more than **10 seconds** .
- The ignition voltage is more than **10 volts** .
- DTC P0327 or DTC P0332 runs continuously once the above conditions are met.

CONDITIONS FOR SETTING THE DTC
The PCM detects that the affected KS signal is less than the expected amount for more than **9 seconds** .

ACTION TAKEN WHEN THE DTC SETS

- The control module illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The control module records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

CONDITIONS FOR CLEARING THE MIL/DTC

- The control module turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the MIL and the DTC with a scan tool.

DIAGNOSTIC AIDS

- Inspect the KS for proper installation. A knock sensor that is loose or over torqued may cause the DTC to set.

IMPORTANT: If the KS is dropped, the sensor must be replaced.

- If DTCs P0327 and P0332 are set at the same time, inspect for poor connections at the KS harness jumper, located at the left rear side of the intake manifold.
- For an intermittent, refer to Intermittent Conditions. See: Initial Inspection and Diagnostic Overview\Diagnostic Strategies\Intermittent Conditions

TEST

Step	Action	Values	Yes	No
1	Did you perform the Diagnostic System Check – Vehicle?	—	Go to Step 2	Go to Diagnostic System Check - Vehicle in Vehicle DTC Information
2	**Important** **If an engine knock can be heard, repair the engine mechanical condition before proceeding with this diagnostic.** 1. Observe the Freeze Frame/Failure Records for this DTC. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the engine within the Conditions for Running the DTC. You may also operate the vehicle within the conditions that you observed from the Freeze Frame/Failure Records. Did the DTC fail this ignition?	—	Go to Step 3	Go to Diagnostic Aids
3	1. Turn OFF the ignition 2. Remove the intake manifold sight shield. 3. Disconnect the knock sensor (KS) inline harness connector. 4. Measure the resistance from the signal circuit of the affected KS to a good ground with a DMM. Is the resistance of the KS within the specified range?	93K–107K ohm	Go to Step 4	Go to Step 6
4	**Important** **Do not tap on any plastic engine components.** 1. Set the DMM to the 400 mV AC hertz scale. 2. Measure the AC voltage from the signal circuit of the affected KS to a good ground with a DMM. 3. Tap on the engine block near the affected KS while observing the DMM. Does the voltage change on the DMM while tapping on the engine block near the KS?	—	Go to Step 5	Go to Step 10
5	Test the affected KS signal circuit between the powertrain control module (PCM) and the KS inline harness connector for the following conditions: • An open or a high resistance • A short to voltage • A short to ground Did you find and correct the condition?	—	Go to Step 12	Go to Step 8
6	1. Remove the intake manifold. 2. Test the affected signal circuit between the KS inline harness connector and the affected KS connector for an open, high resistance, or short to ground. Did you find and correct the condition?	—	Go to Step 12	Go to Step 7

Steps 1-6

Step	Action	Values	Yes	No
7	Test for an intermittent and for a poor connection at the affected KS. Did you find and correct the condition?	—	Go to Step 12	Go to Step 10
8	Test for an intermittent and for a poor connection at the KS inline harness connector. Did you find and correct the condition?	—	Go to Step 12	Go to Step 9
9	Test for an intermittent and for a poor connection at the PCM. Did you find and correct the condition?	—	Go to Step 12	Go to Step 11
10	Replace the affected knock sensor. Did you complete the replacement?	—	Go to Step 12	—
11	Replace the PCM. Did you complete the replacement?	—	Go to Step 12	—
12	1. Clear the DTCs with a scan tool. 2. Turn OFF the ignition for 30 seconds. 3. Start the engine. 4. Operate the vehicle within the Conditions for Running the DTC as specified in the supporting text. You may also operate the vehicle within the Freeze Frame/Failure Records. Did the DTC fail this ignition?	—	Go to Step 2	Go to Step 13
13	Observe the Capture Info with a scan tool. Are there any DTCs that have not been diagnosed?	—	Go to Diagnostic Trouble Code (DTC) List - Vehicle in Vehicle DTC Information	System OK

Steps 7-13