

Cylinder Deactivation (Active Fuel Management) System Diagnosis

Diagnostic Instructions

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

Circuit Description

To provide maximum fuel economy under light load driving conditions, the engine control module (ECM) will command the valve lifter oil manifold (VLOM) solenoids ON, to deactivate engine cylinders 1 and 7 on the left bank, and cylinders 4 and 6 on the right bank. The VLOM consists of 4 electrically operated normally closed solenoids, which directs pressurized engine oil to 8 deactivating valve lifters. All 4 VLOM solenoids are connected in parallel to a fused ignition circuit supplied by the powertrain relay. The control circuit for each solenoid is connected to an individual low side driver internal to the ECM. When enabling conditions for V4 mode are met, the ECM will command each low side driver to turn ON, in engine firing order sequence.

Diagnostic Aids

The VLOM solenoids are assigned to the following engine cylinders:

- Solenoid #1--Cylinder #1
- Solenoid #2--Cylinder #4
- Solenoid #3--Cylinder #6
- Solenoid #4--Cylinder #7

Reference Information

Schematic Reference

[Engine Controls Schematics](#)

Connector End View Reference

[Component Connector End Views](#)

Description and Operation

[Cylinder Deactivation \(Active Fuel Management\) System Description](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Connector Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Wiring Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

Circuit/System Verification

1. If any DTCs are set, then repair those DTC first. Refer to [Diagnostic System Check - Vehicle](#).
2. Start and idle the engine.
3. Allow the engine to reach normal engine operating temperature. The engine should idle smoothly without any misfires. If the engine misfires, refer to [DTC P0300-P0308](#).
4. Monitor the cylinder deactivation system data parameters with a scan tool.
5. Road test the vehicle under light throttle and load conditions that will allow the ECM to command V4 mode. If all enabling conditions are met for cylinder deactivation, and if no internal engine hydraulic/mechanical fault conditions are present, the ECM will continue operation in V4 mode.

If the vehicle passes the Circuit/System Verification test, then review the active fuel management driving information in the Features and Controls section of the owners manual with the vehicle operator, or instruct the vehicle operator in the proper driving techniques to obtain V4 mode.

If the vehicle does not pass the Circuit/System Verification test, then review the cylinder deactivation inhibit reasons listed on the scan tool.

Circuit/System Testing

Electrical System Testing

Ignition ON and the engine OFF, command each VLOM solenoid ON and OFF using the scan tool. Standing next to the engine compartment, you should be able to hear the solenoid energize and de-energize with each command.

If you cannot hear each solenoid energize and de-energize, then refer to [DTC P3401, P3425, P3441, or P3449](#).

Mechanical System Testing

1. Connect a vacuum gage to the EVAP vacuum tube fitting on the electronic throttle body. DO NOT use a compound pressure and vacuum gage. The vacuum gage on a hand held vacuum pump will work fine for this test.
2. Start the engine. Allow the engine to reach normal operation temperature.
3. With a scan tool, command each VLOM solenoid ON, one at a time. Each time a solenoid is command ON, you should observe a fluctuating drop of intake manifold vacuum, and a misfire on the cylinder that was deactivated.

If there is no fluctuating drop in engine vacuum, or the engine does not misfire, then refer to [Cylinder Deactivation \(Active Fuel Management\) System Diagnosis](#).

Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the diagnostic procedure.