DTC P0451-P0454

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.

DTC DESCRIPTORS

DTC P0451

Fuel Tank Pressure (FTP) Sensor Performance

DTC P0452

Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage

DTC P0453

Fuel Tank Pressure (FTP) Sensor Circuit High Voltage

DTC P0454

Fuel Tank Pressure (FTP) Sensor Intermittent

DIAGNOSTIC FAULT INFORMATION

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
FTP Sensor Low Reference	-	P0446, P0451	P0446	-	P0451
FTP Sensor Signal	P0452	-	P0452	P0453	P0451, P0454
FTP Sensor 5-Volt Reference	P0452, P0530, P0641	P0451	P0446, P0452	P0453, P0530, P0641	-

TYPICAL SCAN TOOL DATA

FTP Sensor Voltage

Circuit	Short to Ground	Open	Short to Voltage
Operating Conditions: With EVAP system vented to atmosphere **Parameter Normal Range:** 1.3-1.7 V			
FTP Sensor Low Reference	1.5 V	4.6 V	-
FTP Sensor Signal	0 V	0 V	5 V
FTP Sensor 5-Volt Reference	0 V	0 V	5 V

CIRCUIT/SYSTEM DESCRIPTION

The fuel tank pressure (FTP) sensor measures air pressure or vacuum in the evaporative emission (EVAP) system. The engine control module (ECM) supplies a 5-volt reference and a low reference circuit to the FTP sensor. The FTP sensor signal voltage varies

depending on EVAP system pressure or vacuum. The ECM also uses this FTP signal to determine atmospheric pressure for use in the engine-off small leak test, DTC P0442. Before using this signal as an atmospheric reference it must first be re-zeroed.

CONDITIONS FOR RUNNING THE DTC

P0451

- DTC P0451 runs only when the engine-off natural vacuum small leak test, P0442, executes.
- The number of times this test runs can range from 0-2 per engine-off period. The length of the test can be up to 10 minutes.

P0452 and P0453

DTC P0452 and P0453 run continuously when the ignition is ON.

P0454

- DTC P0454 runs only when the engine-off natural vacuum small leak test, P0442, executes.
- This test can run once per engine-off period. The length of the test can be up to 10 minutes.
- A refueling event is not detected.

CONDITIONS FOR SETTING THE DTC

P0451

This DTC will set if the ECM is unable to re-zero the FTP sensor voltage within a calibrated range during the engine-off small leak test, P0442.

P0452

The FTP sensor voltage is less than 0.1 volt for more than 10 seconds.

P0453

The FTP sensor voltage is more than 4.9 volts for more than 10 seconds.

P0454

If, during the engine-off natural vacuum small leak test, P0442, the ECM detects an abrupt FTP signal change, other than a refueling event, this DTC will set. An abrupt change is defined as a change of 1 inch H2O in the span of 1 second.

ACTION TAKEN WHEN THE DTC SETS

- DTCs P0451 and P0454 are Type A DTCs.
- DTCs P0452 and P0453 are Type B DTCs.

CONDITIONS FOR CLEARING THE MIL/DTC

- DTCs P0451 and P0454 are Type A DTCs.
- DTCs P0452 and P0453 are Type B DTCs.

DIAGNOSTIC AIDS

P0451 and P0454

- A restriction in the EVAP canister or vent lines could prevent fuel vapor pressure from bleeding off fast enough. If the vent system cannot bleed off pressure fast enough, the re-zero procedure may not complete successfully, which could cause this code to set.
- Ensure that the reference port on the FTP sensor is unobstructed.
- An FTP sensor that is skewed or does not have a linear transition from low to high may cause this code to set. Scan tool output controls, snapshot, and plot functions can help detect erratic sensor response. To test the sensor signal under vacuum conditions, use the Quick Snapshot and the Purge/Seal functions to capture data while commanding purge to 20 percent, then plot the data to look for erratic sensor operation. A similar test can be done for the pressure side of the sensor operation by applying pressure with the **J 41413-200** while taking a snapshot.

REFERENCE INFORMATION

Schematic Reference

Engine Controls Schematics

Connector End View Reference

Component Connector End Views

Electrical Information Reference

- **Circuit Testing**
- **Connector Repairs**
- **Testing for Intermittent Conditions and Poor Connections**
- **Wiring Repairs**

DTC Type Reference

Powertrain Diagnostic Trouble Code (DTC) Type Definitions

Scan Tool Reference

Control Module References for scan tool information

Special Tools

J 41413-200 Evaporative Emission System Tester (EEST)

CIRCUIT/SYSTEM VERIFICATION

1. Ignition ON, observe the scan tool fuel tank pressure (FTP) sensor parameter. The reading should be between 1.3-1.7 volts with the fuel cap removed, and change with fuel tank pressure.
2. Operate the vehicle 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 data.

CIRCUIT/SYSTEM TESTING

1. Ignition OFF, disconnect the harness connector at the FTP sensor.
2. Ignition OFF, test for less than 5 ohms between the low reference circuit terminal 2 and ground.
    - If greater than the specified range, test the low reference circuit for an open/high resistance. If the circuit tests normal, replace the ECM.
3. Ignition ON, test for 4.8-5.2 volts between the 5-volt reference circuit terminal 3 and ground.
    - If less than the specified range, test the 5-volt reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the ECM.
    - If greater than the specified range, test the 5-volt reference circuit for a short to voltage. If the circuit tests normal, replace the ECM.
4. Verify the scan tool FTP sensor parameter is less than 0.1 volt.
    - If greater than the specified range, test the signal circuit terminal 1 for a short to voltage. If the circuit tests normal, replace the ECM.
5. Install a 3A fused jumper wire between the signal circuit terminal 1 and the 5-volt reference circuit terminal 3. Verify the scan tool FTP sensor parameter is greater than 4.7 volts.
    - If less than the specified range, test the signal circuit for short to ground or an open/high resistance. If the circuit tests normal, replace the ECM.
6. If all circuits test normal, test or replace the FTP sensor.

REPAIR PROCEDURES

Perform the **Diagnostic Repair Verification** after completing the diagnostic procedure.

- **Fuel Tank Pressure Sensor Replacement**
- **Control Module References** for ECM replacement, setup, and programming

