DTC P0191, P0192, OR P0193

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 P0191

Fuel Rail Pressure (FRP) Sensor Performance

DTC P0192

Fuel Rail Pressure (FRP) Sensor Circuit Low Voltage

DTC P0193

Fuel Rail Pressure (FRP) Sensor Circuit High Voltage

DIAGNOSTIC FAULT INFORMATION

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
5 V Reference Voltage	P0107, P0193, P0237, P0642	P0193	P0193, P0643, P0236	P0191
FRP Sensor Signal	P0192	P0193	P0193	P0191
Low Reference	-	P0193	P0193, P0236, P0643	P0191

CIRCUIT/SYSTEM DESCRIPTION

The fuel rail pressure (FRP) sensor detects fuel pressure within the fuel rail. The engine control module (ECM) provides a 5-volt reference voltage on the 5-volt reference circuit and ground on the reference ground circuit. The ECM receives a varying signal voltage on the signal circuit. The ECM monitors the voltage on the FRP sensor circuits. When the fuel pressure is high, the signal voltage is high. When the fuel pressure is low, the signal voltage is low.

CONDITIONS FOR RUNNING THE DTC

DTCs P0097, P0098, P0099, P0117, P0118, P0128, P0192, P0193, P0627, P0628, P0692 are not set.

P0191 Low Rationality Test

- The engine speed is greater than 25 RPM for greater than 0.5 second.
- The engine run time is greater than 30 seconds.
- DTC P0191 runs the low rationality test during engine start only.

P0191 High Rationality Test

- The engine speed is greater than 25 RPM for greater than 30 seconds.
- The engine block heater is not active.
- The engine coolant temperature (ECT), at shut down, is warmer than 72°C (161.6°F).
- The ECT, at start-up, is colder than 54.8°C (130.6°F).
- At start-up, if the ECT is warmer than the intake air temperature (IAT), the difference must be colder than 35°C (95°F).
- At start-up, if the IAT is warmer than the ECT, the difference must be colder than 10°C (50°F).
- The engine OFF time during soak is greater than 4 hours 27 minutes.
- DTC P0191 runs the high rationality test during engine start only.

P0192 and P0193

- The ignition is ON or the engine is running.
- The DTCs run continuously within the enabling conditions.

CONDITIONS FOR SETTING THE DTC

P0191 Low Rationality Test

The fuel pressure during engine cranking is less than 120 kPa (17.4 psi), then the engine continues to run for 30 seconds after the start occurred and DTC P0087, or P2178, or P2188 is set.

P0191 High Rationality Test

- The fuel pressure during the initial power up is greater than 1,500 kPa (218 psi), and P0088, or P2177, or P2187 is set.

  OR

- The fuel pressure during the initial power up is greater than 1,500 kPa (218 psi), and the fuel pressure increase during fuel pump prime is greater than 385 kPa (56 psi). The condition exists for more than 4 seconds or a cumulative of 50 seconds.

P0192

The ECM detects that the signal circuit voltage is less than 0.3 volt for greater than 4 seconds.

P0193

The ECM detects that the signal circuit voltage is greater than 4.7 volts for greater than 4 seconds.

ACTION TAKEN WHEN THE DTC SETS

- DTC P0191 is a Type B DTC.
- DTCs P0192 and P0193 are Type A DTCs.
- A message center or an indicator displays Reduced Engine Power when DTC P0192 or P0193 sets.

CONDITIONS FOR CLEARING THE DTC

- DTC P0191 is a Type B DTC.
- DTCs P0192 and P0193 are Type A DTCs.

DIAGNOSTIC AIDS

A poor connection, improper terminal contact, or improper terminal retention at the X162 multi-way harness connector may set DTC P0191 or P0193.

REFERENCE INFORMATION

Schematic Reference

Engine Controls Schematics

Connector End View Reference

- **Component Connector End Views**
- **Inline Harness Connector End Views**

Description and Operation

Fuel System Description

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

CIRCUIT/SYSTEM VERIFICATION

1. Engine idling, observe the Actual Fuel Rail Pressure parameter with a scan tool. The pressure should be approximately 3.5-5.5 Mpa (508-798 psi).
2. Command an increase and decrease in fuel pressure with a scan tool. Observe the scan tool Desired Fuel Rail Pressure and the Actual Fuel Rail Pressure parameters. The Desired Fuel Rail Pressure and the Actual Fuel Rail Pressure should closely match in all the commanded states.
3. Operate the vehicle within the Conditions for Running the DTC to verify the DTC does not reset. 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 FRP Sensor.
2. Ignition OFF, test for less than 2 ohms between the low reference circuit terminal 1 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. Install a 3A fused jumper wire at the signal circuit terminal 2. Toggle the jumper wire between the low reference circuit terminal 1 and the 5-volt reference circuit terminal 3. Verify the scan tool Actual Fuel Rail Pressure toggles between 0.1 MPa and 20.1 MPa.
    - If the specified parameter does not toggle between the minimum and maximum values, test the signal circuit for a short to voltage, short to ground, or an open/high resistance. If the circuit tests normal, replace the ECM.
5. If all circuits test normal, replace the FRP sensor.

REPAIR PROCEDURES

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

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

