ProDemand DTC P16A0 Sensor Communication Circuit Low Voltage Instruction Manual

PRODEMAND

YMMS: 2011 GMC Sierra 3500 HD
Engine: 6.6L Eng
VIN: 1GT424C8XBF124085
DTC P16A0-P16A2

Jan 17, 2023
License:
Odometer:

Contents

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 P16A0 Sensor Communication Circuit Low Voltage
DTC P16A1 Sensor Communication Circuit High Voltage
DTC P16A2 Sensor Communication Circuit Performance

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	I Short to Voltage	Signal Performance
15 V Reference	P0697, P16A0	P16A0	P0697, P16A0	P16A2, P2135
Throttle Position Sensor/Serial Data	P16A0	P16A1	P16A1	P16A2, P2135
Low Reference	–	P16A1	P16A0*	P16A2, P2135
1* Internal ECM or sensor damage may occur if the circuit is shorted to B+				

Typical Scan Tool Data

IAF Valve Pos. Sensor

Circuit	1 Short to Ground	Open I	Short to Voltage
Operating Conditions: Ignition ON or Engine idling Parameter Normal Range: 3.7-4.7 V			
5 V Reference	0 V	0 V	0-3 V
Throttle Position Sensor/Serial Data	0 V	5 V	4.5-5.5 V
Low Reference	–	4.5-5.5 V	–

Circuit/System Description

The throttle body is a normally open valve and is only operated during a DPF regeneration. The throttle body contains a digital position sensor. The position sensor is mounted within the throttle body and is not serviceable. The position sensor provides a signal voltage that changes relative to throttle body valve angle. The engine control module (ECM) supplies the throttle body with a 5 V reference circuit, a low reference circuit, and a serial data circuit or position sensor signal. The position sensor information is transmitted between the throttle body and the ECM on the serial data circuit.

Conditions For Running The DTCs

- The engine is operating for greater than 10 s.
- The engine speed is greater than 600 RPM.
- DTCs P16A0, P16A1, and P16A2 run continuously once the above conditions are met.

Conditions For Setting The DTC

P16A0
The ECM detects the position sensor signal voltage is less than 1.45 V for greater than 5 s.

P16A1
The ECM detects the position sensor signal voltage is greater than 3 V for greater than 5 s.

P16A2
The ECM detects noise on the position sensor signal circuit for greater than 8 s.

Action Taken When The DTC Sets
DTCs P16A0, P16A1, and P16A2 are Type B DTCs.

Conditions For Clearing The DTC
DTCs P16A0, P16A1, and P16A2 are Type B DTCs.

Reference Information

Schematic Reference
Engine Controls Schematics

Connector End View Reference
COMPONENT CONNECTOR END VIEWS – INDEX

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. Ignition ON, verify that DTC P0697 is not set.
    1. If a DTC is set, refer to DTC P0641, P0651, P0697, P06A3, P06D2, or P06D6 for further diagnosis.
2. Engine idling, observe the scan tool IAF Valve Pos. Sensor voltage parameter. The reading should be between 3.7-4.7 V.
3. Observe the DTC information with a scan tool. Verify DTC P16A0, P16A1, or P16A2 are not set.
4. 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 throttle body.
   NOTE: Disconnecting the throttle body harness connector causes additional DTCs to set.
2. Ignition OFF and all vehicle systems OFF. It may take up to 2 minutes for all vehicle systems to power down. Test for less than 5 Ω between the low reference circuit terminal 4 or D and ground.
   1. If greater than the specified range, test the low reference circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the K20 ECM.
3. Ignition ON, test for 4.8-5.2 V between the 5 V reference circuit terminal 5 or E and ground.
   1. If less than the specified range, test the 5 V reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K20 ECM.
   1. If greater than the specified range, test the 5 V reference circuit for a short to voltage. If the circuit tests normal, replace the K20 ECM.
4. Test for 3.1-4.1 V between the signal circuit terminal 3 or C and ground.
   1. If less than the specified range, test the signal circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the K20 ECM.
   2. If greater than the specified range, test the signal circuit for a short to voltage. If the circuits tests normal, replace the K20 ECM.
5. If all circuits test normal, test or replace the throttle body.

Repair Procedures

Perform the Diagnostic Repair Verification after completing the repair.

- Throttle Body Assembly Replacement
- Perform the scan tool Diesel Particulate Filter (DPF) Regeneration Enable procedure if the scan tool DPF Soot Mass is less than 30 g. If the scan tool DPF Soot Mass is 30 g or greater, perform the Diesel Particulate Filter (DPF) Service Regeneration procedure.
- Control Module References for ECM replacement, programming, and setup

The customer signature line above, authorizes the above quote to be performed.

Documents / Resources

	ProDemand DTC P16A0 Sensor Communication Circuit Low Voltage [pdf] Instruction Manual DTC P16A0, Sensor Communication Circuit Low Voltage, DTC P16A0 Sensor Communication Circuit Low Voltage, Communication Circuit Low Voltage, Circuit Low Voltage