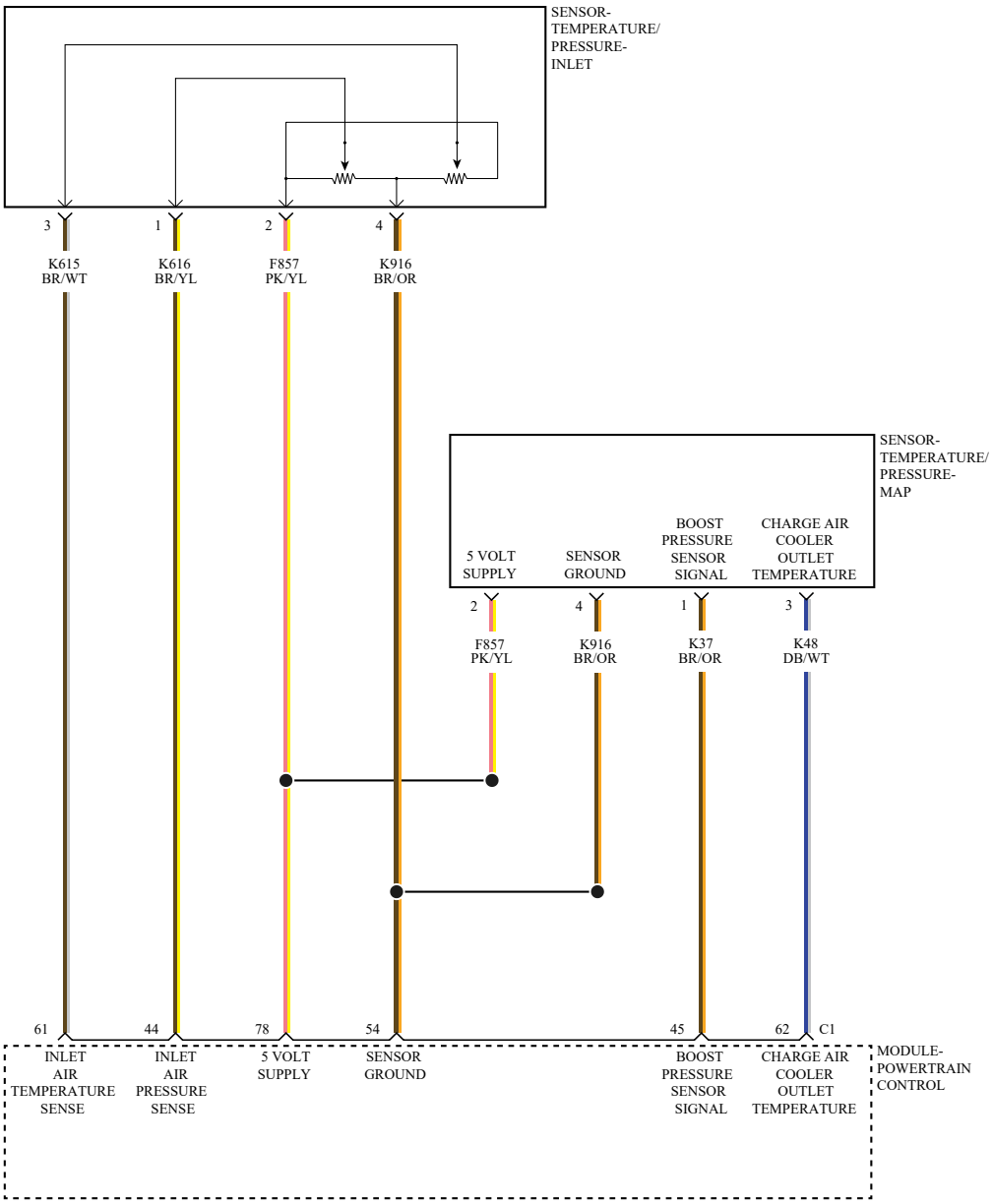
28 - DTC-Based Diagnostics / MODULE, Powertrain Control (PCM), 6.7L Diesel / Diagnosis and Testing

P0106-MANIFOLD ABSOLUTE PRESSURE SENSOR PERFORMANCE


SENSOR-
TEMPERATURE/
PRESSURE-
INLET
3
1
2
4
K615
BR/WT
K616
BR/YL
F857
PK/YL
K916
BR/OR
SENSOR-
TEMPERATURE/
PRESSURE-
MAP
5 VOLT
SUPPLY
SENSOR
GROUND
BOOST
PRESSURE
SENSOR
SIGNAL
CHARGE AIR
COOLER
OUTLET
TEMPERATURE
2
4
1
3
F857
PK/YL
K916
BR/OR
K37
BR/OR
K48
DB/WT
61
44
78
54
45
62
C1
INLET
AIR
TEMPERATURE
SENSE
INLET
AIR
PRESSURE
SENSE
5 VOLT
SUPPLY
SENSOR
GROUND
BOOST
PRESSURE
SENSOR
SIGNAL
CHARGE AIR
COOLER
OUTLET
TEMPERATURE
MODULE-
POWERTRAIN
CONTROL

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Theory of Operation

The Charge Air Cooler Temperature Sensor (CAC) and the Boost Pressure Sensor are combined in one sensor. This combination sensor is called the Temperature/Pressure MAP Sensor. It is located on the EGR Airflow Throttle Control Valve on the Regular Cab. For the Cab and Chassis, it is located on the Intake Manifold. The Cab and Chassis version also receives the Intake Manifold Temperature signal. The Regular Cab still has a separate Intake Manifold Temperature Sensor. The Boost Pressure Sensor is used to measure pressure in the intake manifold. The Powertrain Control Module (PCM) provides a 5-Volt supply and sensor ground for the Boost Pressure Sensor. The Boost Pressure Sensor provides a signal back to the PCM on the Boost Pressure Sensor Signal circuit. The PCM will detect a low signal voltage at operating conditions such as during an idle or a deceleration. The PCM will detect a high signal voltage during high engine load operating conditions. At key on, the readings for the Boost Pressure Sensor, Exhaust Gas Pressure Sensor, and Barometric Pressure Sensor are compared. This fault code occurs if the boost pressure reading is different from the others. During normal engine operation, the PCM estimates the Boost Pressure Sensor value using other fuel system related inputs. The PCM compares the actual Boost Pressure Sensor reading to this estimated value. If the two values are out of range for a calibrated period of time, an error is recorded.

When Monitored and Set Conditions

When Monitored: This diagnostic runs continuously when the following conditions are met:

- With the Engine running.

Set Conditions:

- The Powertrain Control Module (PCM) has detected the Inlet Air Pressure Sensor value or the boost pressure reading is not within a calibrated threshold.

Default Actions:

- The MIL is illuminated.

Possible Causes
INTAKE AIR SYSTEM LEAK
EGR AIRFLOW THROTTLE CONTROL VALVE
PLUGGED AIR FILTER
TEMPERATURE/PRESSURE MAP SENSOR

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. **(Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).**

1. **ACTIVE DTC**

NOTE: If DTCs P0107 or P0108 are present, repair those DTCs before proceeding.

NOTE: If there are any EGR Valve or EGR Airflow Control Valve DTCs present, repair those DTCs before proceeding.

NOTE: If customer states that there was an EVIC message "Service Air Filter", or if Freeze Frame Data shows "Air Filter Plugged Error equals ON", replace the Air Filter before continuing.

1. Turn the ignition on.
2. With the scan tool, record all Freeze frame data.
3. With the scan tool, erase DTCs.
4. Turn the ignition on for 75 seconds.
5. Start the engine and let idle.
6. With the scan tool, read DTCs.

Did the DTC return?

Yes

- Go To **2**

No

- Perform the INTERMITTENT CONDITION diagnostic procedure. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

2. CHECK FOR AN INTAKE AIR SYSTEM LEAK

1. Perform the INTAKE AIR SYSTEM PRESSURE TEST. (Refer to 29 - Non-DTC Diagnostics/Drivability - Diesel - Diagnosis and Testing)

Where any leaks found?

Yes

- Repair the leak and perform a Mobile Desoot of the aftertreatment system.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Leave the Air Inlet Tube disconnected. Go To **3**

3. TURBOCHARGER

1. Inspect the impeller gear on the turbocharger for damage or broken teeth.

Was there any damage found?

Yes

- Replace the Turbocharger assembly in accordance with the service information.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Go To **4**

4. CHECK THE EGR AIRFLOW THROTTLE CONTROL VALVE

1. Remove the boot from the EGR Airflow Throttle Control Valve.
2. Using a mirror, look at the butterfly valve on the inside of the EGR Airflow Throttle Control Valve.
3. Start the vehicle, let idle for 10 seconds.
4. Turn the ignition off.

NOTE: If functioning properly the EGR Airflow Throttle Control Valve will cycle closed immediately after the engine is shut down.

Did the EGR Airflow Throttle Control Valve cycle closed immediately after the engine was shut down?

Yes

- Go To **5**

No

- Replace the EGR Airflow Throttle Control Valve in accordance with the Service Information.(Refer to 25 - Emissions Control/Exhaust Gas Recirculation, Diesel/VALVE, Exhaust Gas Recirculation (EGR) Airflow Control/Removal)
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

5. TEMPERATURE/PRESSURE MAP SENSOR

1. Turn ignition switch on. Wait five seconds after ignition switch is turned on.
2. Using the scan tool, read DTCs

Is P0106 stored?

Yes

- Go To **6**

No

- Replace the Temperature/Pressure MAP Sensor in accordance with the Service Information.(Refer to 14 - Fuel System/Fuel Injection/SENSOR, TMAP-Intake Manifold/Removal)
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

6. TEMPERATURE/PRESSURE MAP SENSOR

1. Erase the DTC with the scan tool.
2. Start the engine and let it idle for one minute.
3. With the scan tool, monitor the boost pressure reading.

Does the Boost Pressure Sensor fluctuate slightly, indicating the sensor is not stuck?

Yes

- Repair complete.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

No

- Replace the Temperature/Pressure MAP Sensor in accordance with the Service Information.(Refer to 14 - Fuel System/Fuel Injection/SENSOR, TMAP-Intake Manifold/Removal)
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).