

DTC P2563

DTC DESCRIPTOR

DTC P2563

[Turbocharger](#) Boost Control Position Sensor Performance

DIAGNOSTIC FAULT INFORMATION

Circuit	Short to Ground	High Resistance	Open	Short to Voltage	Signal Performance
Turbocharger Vane Position Sensor 5-Volt Reference	P0107, P0698, P2564	P2563	P2564	P0106, P0699, P2565	P2563
Turbocharger Vane Position Sensor Signal Circuit	P2564	P2563	P2564	P2565	P2563
Turbocharger Vane Position Sensor Low Reference Circuit	—	P2563	P2565	—	P2563

IMPORTANT: Always perform the Diagnostic System Check - Vehicle prior to using this diagnostic procedure. [See: Testing and Inspection\Diagnostic Trouble Code Tests and Associated Procedures](#)

TYPICAL SCAN TOOL DATA

TC Vane Position Sensor				
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Circuit	Normal Range	Short to Ground	Open	Short to Voltage
Turbocharger Vane Position Sensor 5-Volt Reference	—	0%	—	100%
Turbocharger Vane Position Sensor Signal	Varies ¹	0%	0%	100%
Turbocharger Vane Position Sensor Low Reference Circuit	—	—	100%	—
¹ Actual TC Vane Position matches Desired TC Vane Position				

CIRCUIT/SYSTEM DESCRIPTION

The position of the [turbocharger](#) vanes is controlled by the engine control module (ECM). The [ECM](#) utilizes a turbocharger vane control solenoid valve and a turbocharger vane position sensor to control the turbocharger vanes. The ECM will vary the boost dependant upon the load requirements of the engine. Movement of the sensor from the closed position to the open position provides the ECM with a signal voltage through the position sensor signal circuit.

The vane position sensor uses the following 3 circuits:

- A **5-volt** reference circuit
- A low reference circuit
- A signal circuit

The [ECM](#) provides the sensor with **5 volts** on the **5-volt** reference circuit and a ground on the low reference circuit.

CONDITIONS FOR RUNNING THE DTC

- DTC P0045, P2564, or P2565 are not set.
- The engine has been running for more than **30 seconds**.
- DTC P2563 run continuously when the above conditions are met.

CONDITIONS FOR RUNNING THE DTC

The [ECM](#) detects that the difference between [turbocharger](#) vane position actual and desired is more than **15 percent** for more than **5 seconds**

ACTION TAKEN WHEN THE DTC SETS

- The [control module](#) illuminates the malfunction indicator lamp (MIL) on the second consecutive ignition cycle that the diagnostic runs and fails.
- The [control module](#) records the operating conditions at the time the diagnostic fails. The first time the diagnostic fails, the control module stores this information in the Failure Records. If the diagnostic reports a failure on the second consecutive ignition cycle, the control module records the operating conditions at the time of the failure. The control module writes the operating conditions to the Freeze Frame and updates the Failure Records.

CONDITIONS FOR CLEARING THE [MIL](#)/DTC

- The [control module](#) turns OFF the malfunction indicator lamp (MIL) after 3 consecutive ignition cycles that the diagnostic runs and does not fail.
- A current DTC, Last Test Failed, clears when the diagnostic runs and passes.
- A history DTC clears after 40 consecutive warm-up cycles, if no failures are reported by this or any other emission related diagnostic.
- Clear the [MIL](#) and the DTC with a scan tool.

DIAGNOSTIC AIDS

- Verify that any electrical aftermarket devices are properly connected and grounded. Refer to Checking Aftermarket Accessories. [See: Diagrams\Diagnostic Aids](#)
- If the condition is intermittent, refer to Testing for Intermittent Conditions and Poor Connections and Inducing Intermittent Fault Conditions. [See: Diagrams\Diagnostic Aids](#)
- If any service has been performed on the [turbocharger](#) or on the turbocharger components, a turbocharger relearn must be performed. Failure to perform the turbocharger learn procedure may cause this DTC to set. Refer to Turbocharger Learn Procedure.

CIRCUIT/SYSTEM VERIFICATION

1. If DTC P0698, P0699, P2564, P2565 are set, refer to Diagnostic Trouble Code (DTC) List -

Vehicle for further information. [See: Diagnostic Trouble Code Descriptions](#)

2. With the engine running, command the TC vane position sensor with a scan tool in **5 percent** increments, from **0-100 percent** . Observe that the TC Vane Position Sensor parameter and the Desired TC Vane Position parameter remain near the commanded TC vane position. **IMPORTANT:** If you cannot duplicate the condition, 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.

CIRCUIT/SYSTEM TESTING

IMPORTANT: The DMM and test leads must be calibrated to **0 ohms** in order to prevent misdiagnosis. Use the DMM to perform this test. Refer to the DMM User Manual for calibration procedure.

1. With the ignition OFF, disconnect the TC vane position sensor and the [ECM](#). Measure for a resistance of less than **10 ohms** between the TC vane position sensor signal, a **5-volt** reference and low reference circuits, and the ECM.
 - If the resistance is over **10 ohms** , repair the high resistance or poor connection in the faulty circuit.
 - If the resistance is less than **10 ohms** , test the TC sensor.
2. With the ignition OFF, remove the turbocharger vane position sensor. Connect the vane position connector and turn ON the ignition. With a scan tool, observe the TC Vane Position parameter while slowly depressing the button on the end of sensor. Verify a smooth decreasing percent value from **100-0 percent** .
 - If the parameter does not decrease smoothly, replace the turbocharger vane position sensor.
3. Inspect the [turbocharger](#) for debris, damage, or stuck.
 - If all circuits, the [turbocharger](#), and the TC vane position sensor test OK, replace the [ECM](#).

REPAIR INSTRUCTIONS

IMPORTANT:

- Always perform the Diagnostic Repair Verification after completing the diagnostic procedure.
- Always perform the [Turbocharger](#) Learn Procedure , then review the DTC information with a scan tool.
- Turbocharger Vane Position Sensor Replacement
- [Turbocharger](#) Removal
- [Control Module](#) References for [ECM](#) replacement, setup, and programming

REPAIR VERIFICATION

1. With the engine at idle, observe the TC vane position sensor and the desired TC vane position in the TC data list. Slowly increase the engine speed from idle to **2,500 RPM** , and slowly return the engine speed back to idle.
2. The TC vane position parameter should remain near or equal to the desired TC vane

position parameter.