

## POWERTRAIN CONTROL MODULE (PCM) - TURBOCHARGER BOOST CONTROL MODULE POSITION EXCEEDED LEARNING LIMIT

### P003A-TURBOCHARGER BOOST CONTROL MODULE POSITION EXCEEDED LEARNING LIMIT

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#### Theory of Operation

The Variable Geometry Turbocharger (VGT) is electronically controlled by the Electronic Turbo Actuator. The Electronic Turbo Actuator is a smart device; it communicates information with the Powertrain Control Module (PCM) over the private Data Link. The Electronic Turbo Actuator performs its own internal diagnostics and reports failures back to the PCM. The PCM then decodes the error message and converts it to a fault code.

#### 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 that the VGT Actuator calibrated end-stops were not detected.

**Default Actions:**

- The MIL will illuminate.

Possible Causes
ELECTRONIC TURBO ACTUATOR
ELECTRONIC TURBO ACTUATOR MISCALIBRATED
TURBOCHARGER

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

#### Diagnostic Test

##### 1. ACTIVE DTC

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**NOTE:** If DTCs P006E or U010C are present, perform the Diagnostics for those DTCs before continuing with this one.

**NOTE: If the Electronic Turbo Actuator Calibration procedure was recently performed, it could set this DTC.**

1. Turn ignition on, engine not running.
2. With the scan tool, read DTCs

**Is P003A active or pending?**

**Yes**

- Go To 2

**No**

- Perform the INTERMITTENT CONDITION - 6.7L diagnostic procedure. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

**2. ELECTRONIC TURBO ACTUATOR CALIBRATION INTERRUPTED**

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**NOTE: This DTC can set if the Electronic Turbo Actuator Calibration Re-learn procedure is interrupted on scan tool before it is completed.**

**Did this DTC occur after Electronic Turbo Actuator Calibration Re-learn procedure was interrupted?**

**Yes**

- Go To 4

**No**

- Go To 3

**3. ELECTRONIC TURBO ACTUATOR HISTORY**

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**NOTE: This DTC could set if the Electronic Turbo Actuator was removed and installed without performing the Electronic Turbo Actuator Calibration Re-learn procedure.**

1. Check vehicle history to see if the Electronic Turbo Actuator was removed and reinstalled at any point.

**Was the Electronic Turbo Actuator removed?**

**Yes**

- Go To 4

**No**

- Go To 5

#### 4. ELECTRONIC TURBO ACTUATOR CALIBRATION

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1. Remove the Electronic Turbo Actuator according to the Service Information.(Refer to 09 - Engine, 6.7L Diesel/Turbocharger System/ACTUATOR, Turbocharger/Removal)
2. Recalibrate and re-install the Electronic Turbo Actuator according to the Service Information.(Refer to 09 - Engine, 6.7L Diesel/Turbocharger System/ACTUATOR, Turbocharger/Installation)
3. With the scan tool, erase all DTCs
4. Turn the ignition off, wait 75 seconds.
5. Turn the ignition on.
6. With the scan tool, read DTCs

##### **Is this DTC active?**

###### **Yes**

- Go To 5

###### **No**

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

#### 5. ELECTRONIC TURBO ACTUATOR AND CONNECTOR PINS

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1. Inspect the harness and electronic turbo actuator connector pins for the following:
  - Loose connector
  - Corroded pins
  - Bent or broken pins
  - Pushed back or expanded pins
  - Moisture in (or on) the connector pins
  - Connector shell broken
  - Wire insulation damage
  - damaged connector locking tab

##### **Is damage present to the pins or harness?**

###### **Yes**

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

###### **No**

- Go To 6

## 6. ELECTRONIC TURBO ACTUATOR

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**NOTE: It is important to drain engine coolant before Electronic Turbo Actuator removal.**

1. Remove the Electronic Turbo Actuator from the turbocharger. (Refer to 09 - Engine, 6.7L Diesel/Turbocharger System/ACTUATOR, Turbocharger/Removal)
2. Inspect Electronic Turbo Actuator for a broken or otherwise damaged drive gear.

**Is the Electronic Turbo Actuator drive gear broken or damaged in any other way?**

**Yes**

- Replace the Electronic Turbo Actuator in accordance with the Service Information. (Refer to 09 - Engine, 6.7L Diesel/Turbocharger System/ACTUATOR, Turbocharger/Removal)
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

**No**

- Go To 7

## 7. TURBOCHARGER

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

**NOTE: There will be an initial friction force that must be overcome before the actuator lever will move. Once movement is started, the actuator lever must move to the other marked position by hand.**

2. Move the sector gear lever on the turbocharger bearing housing up and down from mark to mark.
3. Check for smooth movement between the marks.

**Does the nozzle slide evenly from mark to mark and are the gear teeth undamaged?**

**Yes**

- Go To 8

**No**

- Replace the Turbocharger assembly in accordance with the Service Information. (Refer to 09 - Engine/Turbocharger System/TURBOCHARGER/Removal)
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

## 8. ELECTRONIC TURBO ACTUATOR CALIBRATION

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1. Remove the Electronic Turbo Actuator according to the Service Information.(Refer to 09 - Engine, 6.7L Diesel/Turbocharger System/ACTUATOR, Turbocharger/Removal)
2. Recalibrate and re-install the Electronic Turbo Actuator according to the Service Information.(Refer to 09 - Engine, 6.7L Diesel/Turbocharger System/ACTUATOR, Turbocharger/Installation)
3. With the scan tool, erase all DTCs
4. Turn the ignition off, wait 75 seconds.
5. Turn the ignition on.
6. With the scan tool, read DTCs

**Is this DTC active?**

**Yes**

- Replace the Electronic Turbo Actuator in accordance with the Service Information.(Refer to 09 - Engine, 6.7L Diesel/Turbocharger System/ACTUATOR, Turbocharger/Removal)
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. (Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control (PCM) - Standard Procedure).

**No**

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