# Check engine light with reduced power with fault codes P300A6D, P300974, P300DFB, or P300DE8

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|---|---|
| Topic number | LI09.40-N-079144 |
| Version | 10 |
| Function group | 09.40 - Turbocharger |
| Date | 10/29/26 |
| Validity | Model 907 with OM654 |
| Reason for change | Remedy Update |

## Complaint

The check engine light is activated, accompanied by one or more of the following fault codes related to the boost pressure positioner:

• P300A6D: The boost pressure is too low. Charge air cooler.

• P300A6F: The boost pressure is too low. (High-pressure turbocharger)

• P300A71: The boost pressure is too low. (Low-pressure turbocharger)

• P300974: Component 'Boost pressure positioner' has a malfunction. The boost pressure is too low.

• P300DFB: Component 'Boost pressure positioner' has a malfunction.

• P300DE8: Boost pressure control A has a malfunction after a cold start.

## Cause

The potential causes for these fault codes are:

A. **Leak or Blockage in the Intake or Charge Air System:** This can prevent proper airflow, affecting boost pressure.

B. **Insufficient Source Vacuum, Vacuum Leak, or Sticking/Weak Vacuum Component:** These issues can prevent the boost pressure positioner from functioning correctly.

• For Model Year 2023-Current vehicles operating at approximately 4,000 ft elevation or above, reduced ambient pressure and/or high brake demand may contribute to reduced available vacuum differential and underboost complaints, even when no discrete vacuum component failure is identified.

C. **Internal Malfunction of the Boost Pressure Positioner:** The component itself may be faulty.

D. **Internal Defect with the Variable Turbine Geometry (VTG) System Inside the Turbocharger:** Issues within the turbocharger can affect boost pressure control.


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## Remedy

**A. Leak or Blockage in the Intake or Charge Air System**

1. Perform a Pressurized Smoke Test:

• Conduct a smoke test on the intake, charge air system, and exhaust to identify any leaks.

• Apply pressure, not exceeding 26 psi, from the exhaust pipe end while sealing the system at the clean air line near the air filter housing.

• Manipulate all components during the smoke test to ensure accurate results.

• **If a leak is identified**, repair it and retest.

2. Inspect for Debris or Blockages:

• Check the outlet of the turbocharger (high-pressure side), the charge air pipe at the back of the engine, and the charge air cooler inlet near the firewall for any debris or blockages.

• If oil, debris, or sludge is found in the charge air system, turbocharger outlet, or charge air cooler inlet, follow LI09.41-N-080666 for the required repair procedure.

**NOTE:** If it is determined that the charge air cooler is obstructed by debris, use damage code 50301 B2 when submitting the warranty repair claim.

**B. Insufficient Source Vacuum, Vacuum Leak, or Sticking/Weak Vacuum Component**

1. Check for Software Updates:

• **For Model Year 2023-Current vehicles** operating at approximately 4,000 ft elevation or above, if no obvious vacuum line damage or disconnected components are found, check whether an updated software version is available for the N3/40 - Motor electronics 'MRD1' for combustion engine 'OM654' (CDI).

• If an updated software version is available, update the N3/40 - Motor electronics 'MRD1' for combustion engine 'OM654' (CDI) and perform a test drive to verify whether the fault returns.

• If the fault returns, proceed to Step 2.

2. Check the Vacuum

a. Check Source Vacuum

• Measure and record the source vacuum at main vacuum line A6540703132 from the vacuum pump.

• At sea level, expected vacuum is approximately 25-27 inHg. For every 1,000 ft increase in elevation, an approximate 1 inHg reduction in vacuum is expected. Account for vehicle elevation when evaluating the measured vacuum.


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b. Check Vacuum at the T-Piece

• Measure and record the vacuum at the T-piece on vacuum line A6540703132 that supplies the main vacuum-operated components.

• Compare the vacuum measured at the T-piece with the source vacuum measurement.

• Vacuum at the T-piece should be within 3 inHg of the source vacuum.

• Regardless of the vacuum measurement obtained at the T-piece, perform the T-piece restrictor passage check below.

c. Check the T-Piece Restrictor Passage

Perform this check on every vehicle regardless of the vacuum measurement obtained at the T-piece.

• Use a 1 mm drill bit as a measuring gauge only. Do not rotate the drill bit or use it to enlarge or modify the restrictor passage.

• Measure 35 mm from the tip of the 1 mm drill bit and mark this location with tape. See Figure 1.

• Carefully insert the 1 mm drill bit into the T-piece restrictor passage on vacuum line A6540703132. Do not use excessive force on the drill bit.

NOTE: The internal passage contains a step and is not a smooth, straight transition. While applying light inward pressure, gently move the drill bit side to side as needed to guide the tip past the internal step. Do not rotate the drill bit. See Figure 4.

• PASS: The 1 mm drill bit must pass through the restrictor passage to the 35 mm mark. See Figure 2.

• FAIL: If the 1 mm drill bit stops before reaching the 35 mm mark after gently repositioning the drill bit to guide it past the internal step, the restrictor passage is undersized. See Figure 3. Replace vacuum line A6540703132 and retest the vacuum system.

NOTE: Before installing replacement vacuum line A6540703132, perform the same 1 mm x 35 mm check on the T-piece restrictor passage of the replacement line.

NOTE: If an undersized T-piece restrictor passage is identified on a vehicle produced after April 17, 2025, open a TIPS case directed to the Powertrain inbox. Attach photos of the T-piece restrictor check, the initial Quick Test, and the results of the diagnostic checks performed according to this LI.

d. Check Vacuum at the Individual Components

If the T-piece restrictor passage passes the 1 mm x 35 mm check, measure and record vacuum at each applicable vacuum-operated component:

• Boost pressure control

•Wastegate

• Y77 and Y100/2

• High-pressure EGR switchover valve Y85


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Compare the vacuum measured at each component with the vacuum measured at the T-piece.

If reduced vacuum is identified at an individual component, proceed to step e and check the applicable vacuum line for a restriction.

e. Check the Individual Vacuum Lines for Restrictions

Inspect the applicable vacuum lines and connections for damage, kinks, restrictions, or disconnected connections.

Verify airflow through the applicable vacuum lines by blowing air through each line to confirm there is no dirt, debris, or other internal restriction:

• A6540705832

• A6540703232

• A6540704532

If a vacuum line is restricted or damaged, replace the affected vacuum line and retest the vacuum system.

After completing the vacuum-line checks, verify that each applicable vacuum-operated component holds vacuum when actuated. If a component does not hold vacuum, replace the affected component and retest the vacuum system.

**C. Internal Malfunction of the Boost Pressure Positioner**

1. Complete Guided Tests:

• Perform the guided tests for the Boost Pressure Positioner, ensuring the linkage moves smoothly during actuation.

•**If the test passes** up to this point, replace the Boost Pressure Positioner.

•**If the linkage fails to move**, proceed to step D.

**D. Internal Defect with the Variable Turbine Geometry (VTG) System inside the Turbocharger**

1. Check VTG System:

•Remove the Linkage Arm from the Y77/1 Boost Pressure Actuator and manually manipulate the Turbocharger VTG rod to ensure free movement.

•**If the VTG Rod does not move freely**, replace the entire Turbocharger.

**TIPS Case Requirements:**


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**NOTE: All applicable diagnostic steps in this LI must be completed from start to finish before opening a TIPS case.**

If a physical issue is identified, such as a vacuum leak, damaged vacuum line, restricted vacuum line, or a vacuum component that does not hold vacuum, repair the identified physical issue according to the applicable instructions. A TIPS case is not required for an identified physical issue unless otherwise specified in this LI.

**Exception:** If an undersized T-piece restrictor passage is identified on vacuum line A6540703132 on a vehicle produced after April 17, 2025, a TIPS case is required. Follow the TIPS case requirements in Remedy B, Step 2c.

For Model Year 2023-Current vehicles operating at approximately 4,000 ft elevation or above, a TIPS case MUST be opened for fault codes P300A6D, P300974, P300DFB, P300A71, P300A6F, or P300DE8 if all applicable diagnostic steps in this LI have been completed and no physical issue or failed component has been identified.

For vehicles operating below approximately 4,000 ft elevation, complete all applicable diagnostic and repair steps in this LI. A TIPS case is only required if the issue remains unresolved and additional technical support is needed after completing all applicable steps in this LI.

**Additional Suggestions**

1. Test Boost Pressure Sensor:

• Verify the functionality of the boost pressure sensor, as a faulty sensor can result in incorrect fault codes.

2. Check for Exhaust Restrictions:

•Inspect the exhaust system for any restrictions or blockages that could affect turbocharger performance.

3. Visual Aids:

•Please review the attached photos for previously identified causes of these fault codes.

## Attachments

| File | Description |
|---|---|
| OM654 Vacuum Diagram.pdf | OM654 Vacuum Diagram |
| Melted line.jpg | Vacuum Line melted under Low Pressure EGR Cooler |
| Vacuum Line A654 070 23 32.jpeg | Vacuum Line at High Pressure EGR Cooler Bypass Valve |
| Inlet Side Of Charge Air Cooler.jpeg | Debris within the Charge Air Cooler |
| Charge Air Pipe.png | Debris within the Charge Air Pipe |
| Figure 1.jpg | Mark 35 mm from the tip of the 1 mm drill bit. |
| Figure 2.jpg | PASS. Drill bit reaches the 35 mm mark. |
| Figure 3.jpg | FAIL. Drill bit does not reach the 35 mm mark. |


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| Figure 4.png | Cross-section showing the internal step in the T-piece restrictor passage. |

## Disclaimer

NOTE: The information contained in this document is intended for use by trained, professional technicians with the knowledge to properly and safely perform diagnosis and repairs on Mercedes-Benz vehicles, using Mercedes-Benz approved tools and equipment. It informs service technicians about conditions that could occur in certain vehicles and provides information that could assist in proper vehicle diagnosis, service, or repair. It does not indicate that a defect is present in any vehicle referenced in this document nor does it imply warranty coverage. DO NOT assume that a symptom or condition, or a described cause of a symptom or condition, affects any particular vehicle or groups of vehicles, or that a described repair applies to any particular vehicle or groups of vehicles. There can be multiple causes resulting in the same or similar symptoms or conditions described in this document, and trained professional service technicians must use their diagnostic skills to make evaluations on a case-by-case basis. The information contained in this document does not guarantee warranty coverage nor does it extend the vehicle's warranty in any way.

## Symptoms

Power generation **>** Engine management **>** Indicator lamp **>** Engine diagnosis **>** lit

Power generation **>** Engine management **>** Engine performance **>** No/poor output

Power generation **>** Engine management **>** Boost effect **>** Malfunction

## Control unit/fault code

| Control unit | Fault text |
|---|---|
| N3/40 - Motor electronics 'MRD1' for combustion engine 'OM654' (CDI) / (MRD1NFZ) | **P300A6D** - The boost pressure is too low.<br><br>**P300DE8** - Boost pressure control A has a malfunction after the cold start.<br><br>**P300DFB** - Component 'Boost pressure positioner' has a malfunction.<br><br>**P300974** - Component 'Boost pressure positioner' has a malfunction. The target position was not reached. |

## Operation numbers/damage codes

| Op. no. | Operation text | Time | Damage code | Note |
|---|---|---|---|---|
| | | H | 50301B2 | During your inspection, if it is determined that the Charge Air Cooler is obstructed by debris, please use damage code 50301 B2 when submitting your warranty repair claims. |


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