Check engine light active - Fault P3007F1, P3007F2, P300CA8, or P300CA9 present in CDI control unit

Topic number	LI14.30-N-075882
Version	6
Function group	14.30 - Secondary air injection
Date	6/20/25
Validity	Model 907 with engine 654
Reason for change	Remedy update

Complaint

Check engine warning light active.

The following fault codes may be present in the engine control unit:

- P3007F1 Leak detected in intake air system or
- P3007F2 Mass air flow malfunction in intake air system (cylinder bank 1) or
- P300CA8 Leak detected in intake air system or
- P300CA9 Mass air flow malfunction in intake air system (cylinder bank 1) or
- P300CA9 and P3007F1: Faults are present simultaneously in the quick test

Cause

Causes for FC P3007F1 or P300CA8:

Faults are set if:

- If there is a leakage upstream of the exhaust gas turbocharger (see "Dichtring_Sealant.jpg").
- If the housing intermediate flange at the high-pressure EGR valve (where the exhaust back pressure sensor connects) is carbonized or clogged, or if there is carbonization/incomplete sealing of the high-pressure or low-pressure EGR valves. (See “Gehaeusezwischenflansch_intermediate_flange.jpg” and “verstopfter_Gehaeuse-zwischenflansch_clogged_Intermediate_Flange.jpg.”)
- Note: Only relevant if correction value in load range 1 is less than -8%.
- If the intake manifold (charge air distribution line) or charge air cooler is carbonized (see "Saugrohr_intake_mani-fold.jpg").
- If engine timing is misadjusted.
- There is a defective hot film mass air flow sensor or a hot film mass air flow sensor that is affected by incorrect airflow (this can be due to a clogged or deformed air filter). Refer to the attached file "Luftfilter_air_filter."

Cause for FC P3007F2 or P300CA9:

Faults are set if:

- There is a leak downstream of the exhaust gas turbocharger.
- The charge air distribution line (intake manifold) is heavily carbonized (see "Saugrohr_intake_manifold.jpg").
- There is carbonization or incomplete closure of the high-pressure exhaust gas recirculation valve, especially in the housing intermediate flange at the EGR valve (linked to the exhaust back pressure sensor).

- There is a defective hot film mass air flow sensor, or it is affected by incorrect airflow due to a clogged or deformed air filter (see "Luftfilter_air_filter").

Cause of fault code combination P300CA9 AND P3007F1:

Faults are set if:

- There is carbonization or incomplete closure of the high-pressure exhaust gas recirculation valve, especially in the housing intermediate flange at the EGR valve (linked to the exhaust back pressure sensor).

Charleston Plant Identification – VIN 11th Digit “T”:

For vehicles produced at the Charleston Plant (identified by “T” in the 11th digit of the VIN) with a production date on or after 12/20/2023:

- If fault code P3007F1 or P300CA8 is set and the cause is identified as a loose or mis-installed Clean Air Line from the factory, open an Initial Field Quality (Info Only) case.
- Include the current Quick Test and photos showing the Clean Air Line issue.

For all other vehicles, continue diagnosis as per the standard instructions.

Remedy

In the case of fault code P3007F1 or P300CA8:

1) Check for Required ECU Software Update (Applies to P300CA8 only)

For vehicles with:

- Code MU6 (dual-stage turbocharger) and CDI control unit N3/40 with software release G090:
- Update the CDI Control Unit software to the latest version.
- If the CDI control unit software is already up to date, continue to the steps below.

2) Verify Clean Air Line & Intake System Assembly

- Inspect the clean air line between the air filter housing and the exhaust gas turbocharger for proper assembly.
- Reference WIS documents: AR09.10-S-8130EA, AR09.40-S-0500EA (dual-stage turbo), AR09.20-S-0010EA, and/or AR09.41-S-6817EA.
- Confirm correct assembly and all connections:
- Ensure proper seating and locking of all quick-release couplings (see provided images and WIS refs).
- For dual-stage turbochargers, confirm the cast lug aligns with the tab. (See picture 1c.)
- Note: Always replace the red sealing ring (see annex "Dichtring_Sealant_nok") during assembly/repairs.

3) Charge Air System / Intake Leak Check

- Preferably, pressurize the system to 0.25 bar from the exhaust end pipe, with the intake air system sealed (see "Adapter_Reinluftleitung_Clean_Air_Line_Model_Type_907").
- Alternatively, use Xentry Diagnostics:
- CDI Control Unit N3/40 → Tests → Manual Leak Test of the Charge Air System.
- Optional: Use leak tester part number 000 588 18 21 00 (see WS09.00-P-0028B) to perform flue gas diagnosis for leaks in the intake air system with UltraTraceUV. For more information, see WIS/WSM: Contents → Model Series → Van → V-Class / Vito → 09 - Air Intake, Charging → AD - Flue Gas Diagnosis for Leaks with UltraTraceUV.
- If leaks are found, carry out necessary repairs.

4) Inspect Sealing Ring and Connections

- Inspect the sealing ring between the exhaust gas turbocharger and the clean air line for damage with an endoscope (see annex "Dichtring_Sealant_nok").
- Repair/replace as needed.

5) Visual Inspection for Carbonization/Damage

- Inspect the following for severe carbon build-up or other inconsistencies:
- Intake manifold (charge air distribution line) – see "Saugrohr_intake_manifold.jpg."
- Housing intermediate flange at the high-pressure EGR valve (exhaust back pressure sensor connection, use a flashlight).
- Only necessary if the air intake correction value in load range 1 is less than -8%.
- Charge air cooler.
- Initiate repairs/cleaning as needed.
- If issues are found in the intake manifold, also check the cylinder head intake ports.

6) Inspect Air Filter and MAF Sensor

- Visually inspect the air filter for blockages, severe soiling, deformation, or damage (see "Luftfilter_air_filter").
- The fault may be set if the hot film mass air flow sensor (MAF) element is oiled.
- Replace air filter/MAF as needed.

7) Engine Timing

- For vehicles with mileage over 90,000 km / 150,000 km, or with prior control assembly repairs:
- Check and adjust engine timing as needed.

8) EGR Valve and Cooler Functional Checks

- Actuate high-pressure and low-pressure exhaust gas recirculation (EGR) valves with Xentry Diagnostics.
- Check their functionality and visually inspect all related parts for carbonization.
- Replace any affected parts.
- If significant issues are found with the low-pressure EGR valve, also clean just downstream of the DPF and check/clean the low-pressure EGR cooler for carbon accumulation.

9) Finalize Repairs, Reset & Verification

1. Reset Correction Factors (Air Mass of Intake System):

- CDI Control Unit N3/40 → Adaptations → Teach-in Processes → Reset Learned Values → Intake Air System.

2. Quick Test and Clear Fault Memory:

- Conduct a system quick test and clear fault codes (see AD00.00-S-2000-04E).
- Important: Reset correction factors before clearing memory; otherwise, fault codes may recur.

3. Disconnect Diagnostic Device:

- As specified in AD00.00-S-2000-04E.

<u>In the case of fault code P3007F2 or P300CA9:</u>

1) Check for Required ECU Software Update (P300CA9 only)

For vehicles with:

- Code MU6 (dual-stage turbocharger) and CDI control unit N3/40 with software release G090:

- Update the CDI control unit software first.
- If the CDI control unit software is already up to date, continue to the steps below.
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2) Charge Air System / Intake Leak Check

- Preferably, pressurize the system to 0.25 bar from the exhaust end pipe, with the intake air system sealed (see "Adapter_Reinluftleitung_Clean_Air_Line_Model_Type_907").
- Alternatively, use Xentry Diagnostics:
- CDI Control Unit N3/40 → Tests → Manual Leak Test of the Charge Air System.
- Optional: Use leak tester part number 000 588 18 21 00 (see WS09.00-P-0028B) to perform flue gas diagnosis for leaks in the intake air system with UltraTraceUV. For more information, see WIS/WSM: Contents → Model Series → Van → V-Class / Vito → 09 - Air Intake, Charging → AD - Flue Gas Diagnosis for Leaks with UltraTraceUV.
- If leaks are found, carry out necessary repairs.

3) Visual Inspection of Intake Manifold and System Components

- Inspect the charge air distribution line (intake manifold) for carbon buildup.
- Inspect the following (especially for P300CA9, but advisable for thoroughness):
- High-pressure EGR valve
- High-pressure EGR cooler (A6541409000)
- EGR pipe (A6541400702)
- Charge air mixing pipe (A6540902000) and intake manifold (charge air distribution line)
- Housing intermediate flange (A6541407000)
- Exhaust back pressure sensor area
- Check all for carbonization, consistency, and proper installation. If any significant issues are found, perform necessary cleaning or repair measures.

4) Inspect Air Filter and MAF Sensor

- Visually inspect the air filter for blockages, severe soiling, deformation, or damage (see "Luftfilter_air_filter").
- The fault may be set if the hot film mass air flow sensor (MAF) element is oiled.
- Replace air filter/MAF as needed.

5) Finalize Repairs, Reset & Verification

1. Reset Correction Factors (Air Mass of Intake System):

- CDI Control Unit N3/40 → Adaptations → Teach-in Processes → Reset Learned Values → Intake Air System.

2. Quick Test and Clear Fault Memory:

- Conduct a system quick test and clear fault codes (see AD00.00-S-2000-04E).
- Important: Reset correction factors before clearing memory; otherwise, fault codes may recur.

3. Disconnect Diagnostic Device:

- As specified in AD00.00-S-2000-04E.

<u>In the case of fault code combination P300CA9 and P3007F1:</u>

1)Inspect the housing intermediate flange on the high-pressure exhaust gas recirculation (EGR) valve, specifically at the connection for the exhaust back pressure sensor. Use a flashlight to check for any inconsistencies or carbon buildup.

2) Finalize Repairs, Reset & Verification

1. Reset Correction Factors (Air Mass of Intake System):

- CDI Control Unit N3/40 → Adaptations → Teach-in Processes → Reset Learned Values → Intake Air System.

2. Quick Test and Clear Fault Memory:

- Conduct a system quick test and clear fault codes (see AD00.00-S-2000-04E).
- Important: Reset correction factors before clearing memory; otherwise, fault codes may recur.

3. Disconnect Diagnostic Device:

- As specified in AD00.00-S-2000-04E.

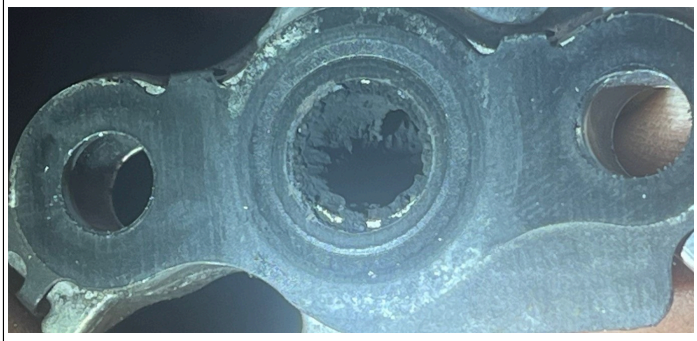
References:

- WIS documents as above
- Visual aids and annexed images as referenced in the procedure
- For details, consult vehicle-specific service documents and Xentry updates

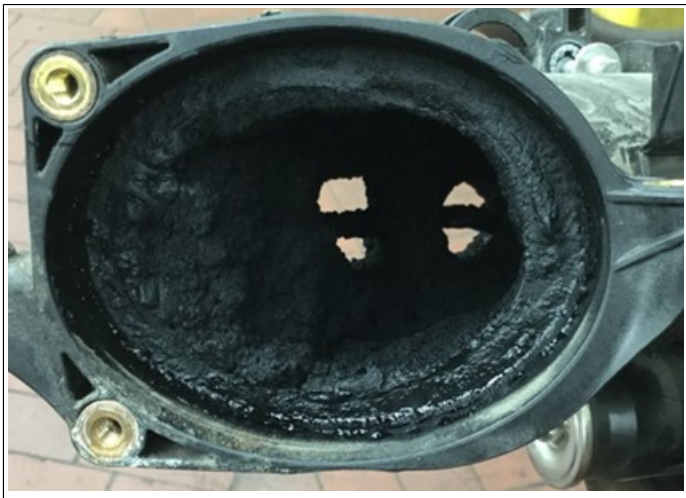
Attachments	
File	Description
Dichtring_Sealant.jpg 	
Gehaeusezwischenflansch_Intermedidate_Flange.jpg 	
Luftfilter_air_filter.jpg	

Adapter_Reinluftleitung_Clean_Air_Line_Model_Type_907.jpg

verstopfter_Gehaeusezwischenflansch_clogged_Intermediate_Flange.jpg



Saugrohr_Intake_manifold_II.jpg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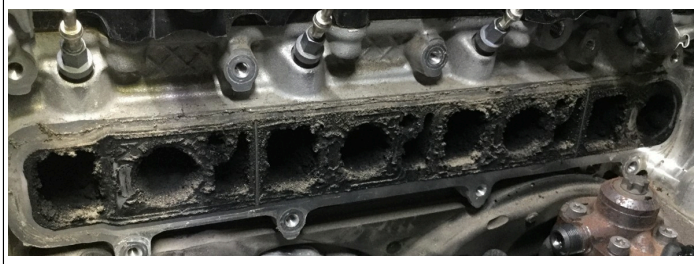
Einlasskanaele_ZK_inlet_ports_CH.jpg 	
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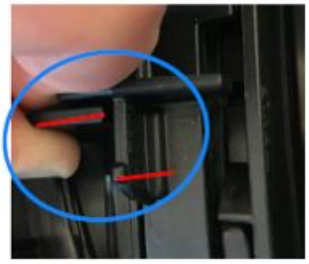
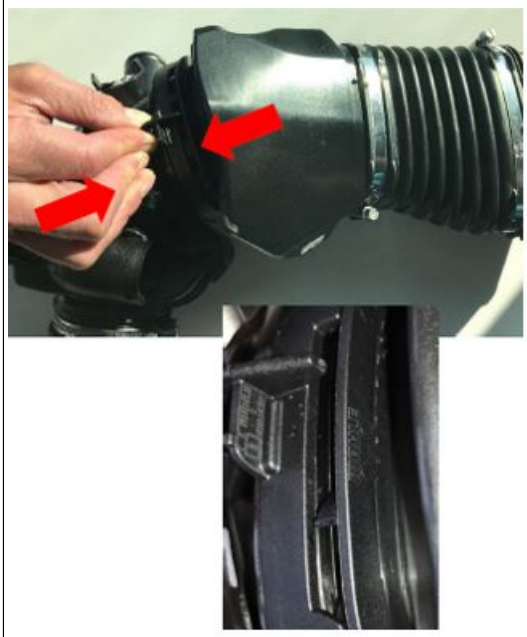
 	
2c.JPG 	
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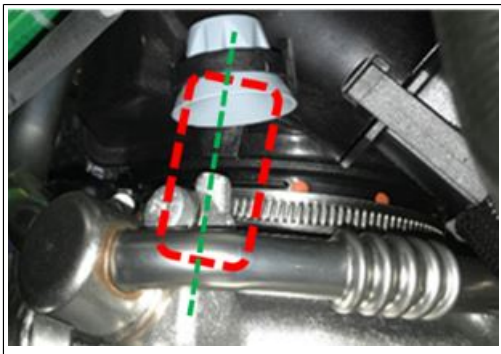

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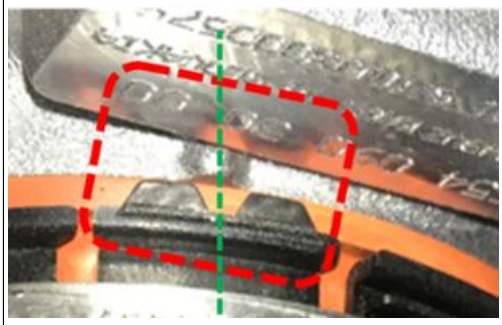

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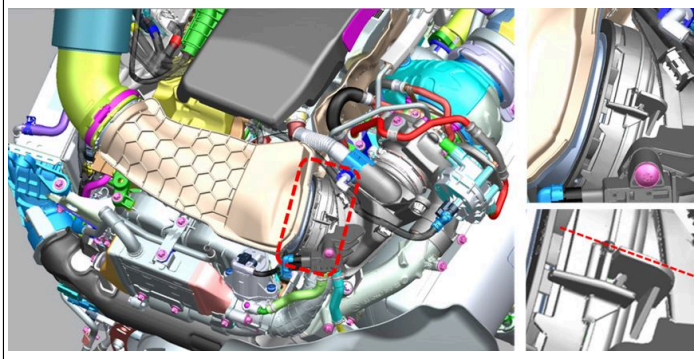

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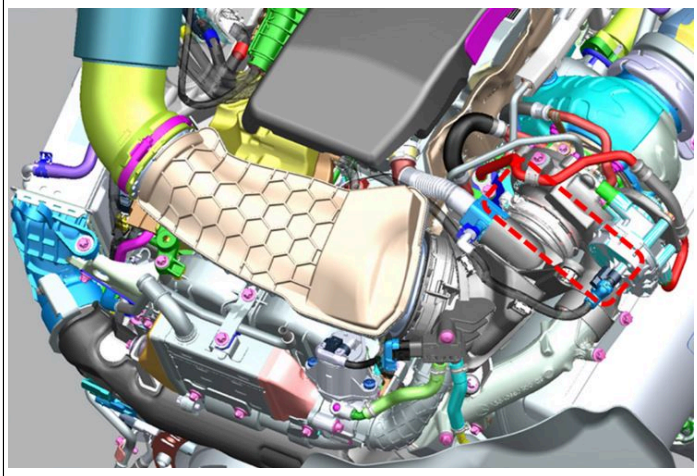

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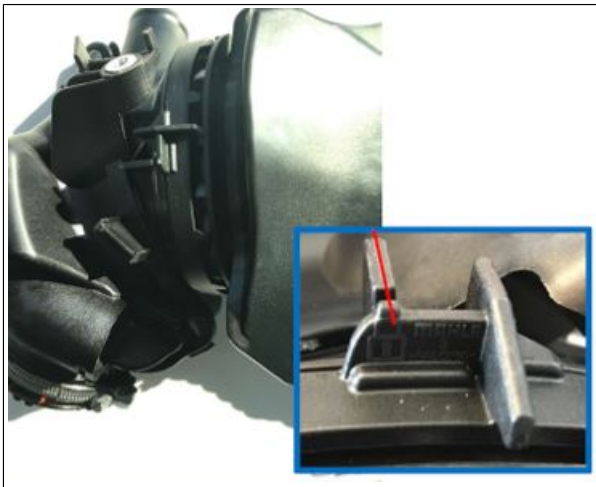

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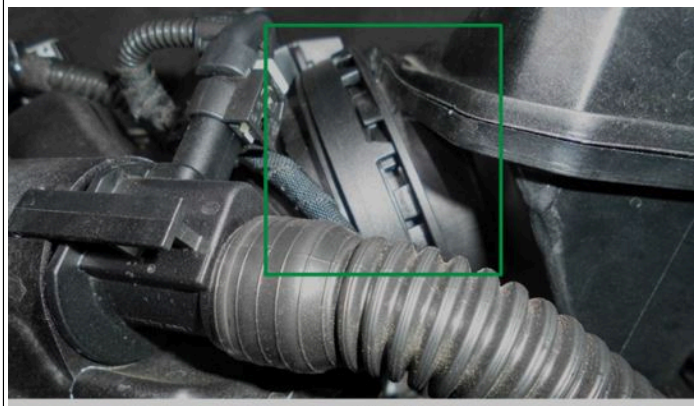

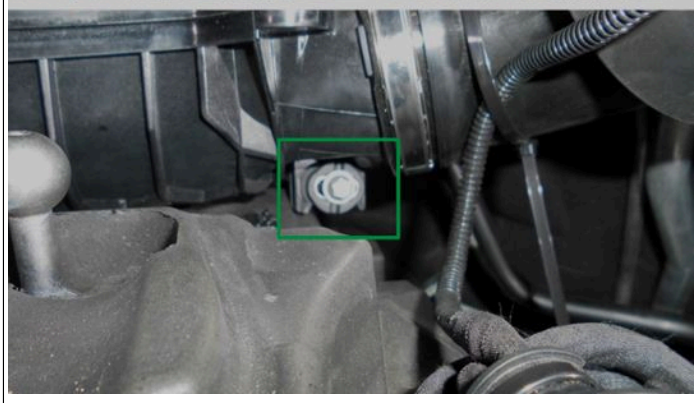

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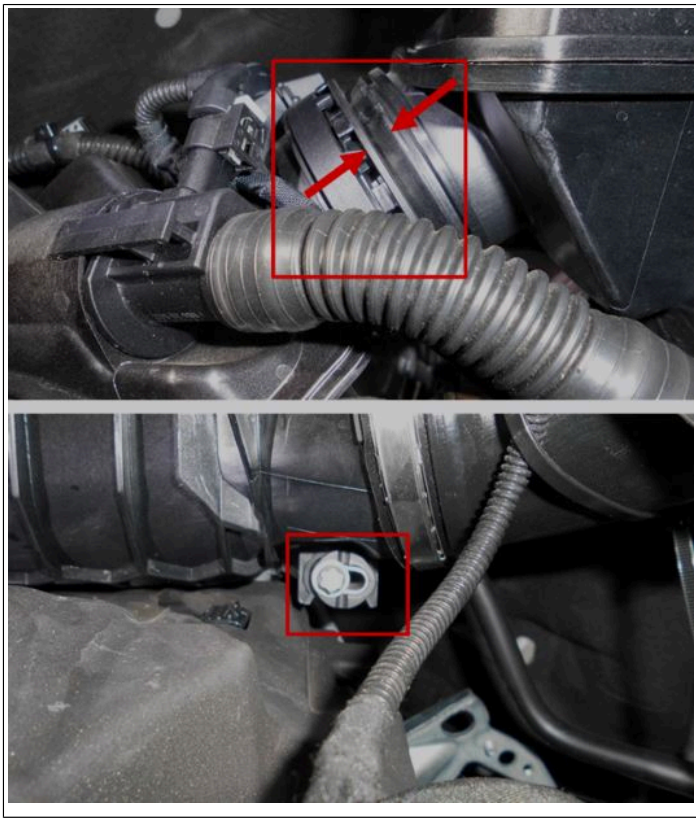

WIS-References		
Document number	Title	Note
AR09.10-S-8130EA	Remove/install engine intake air duct downstream of air filter	26.03.2024
AR09.40-S-0500EA	Remove/install air intake duct upstream of turbocharger	26.03.2024
AR09.20-S-0010EA	Remove/install resonance chamber	01.08.2023
AR09.41-S-6817EA	Remove/install charge air cooler	26.03.2024
AR09.10-D-8130TSM	Remove/install engine intake air duct downstream of air filter	27.07.2022
AR09.40-D-0500TSM	Remove/install air intake duct upstream of turbocharger	29.07.2022
AD00.00-S-2000-04E	Connect STAR DIAGNOSIS and read out fault memory	
WS09.00-P-0028B	000 588 18 21 00 Leak tester	20.02.2023

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

Control unit/fault code	
Control unit	Fault text
N3/40 - Motor electronics 'MRD1' for combustion engine 'OM654' (CDI) (MRD1NFZ)	P3007F2 - The air mass flow in the intake air system (cylinder bank 1) has a malfunction. P3007F1 - A leak was detected in the intake air system. P300CA9 - The air mass flow in the intake air system (cylinder bank 1) has a malfunction. P300CA8 - A leak was detected in the intake air system.

Operation numbers/damage codes				
Op. no.	Operation text	Time	Damage code	Note