
BlueTec 4/5 - "AdBlue pressure drop in run-on too low" (MR 0 6770 or 1 6770)

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| Topic number | G14.40-N-040707 |
| Version | 14 |
| Design group | 14.40 Exhaust-gas Aftertreatment, AdBlue |
| Date | 03-24-2011 |
| Validity | Only vehicles with code (MS4) BlueTec 4 or code (MS5) BlueTec 5 |
| Reason for change | Document number for "Flush metering device of exhaust aftertreatment system" changed/corrected |
| Reason for block | |

Complaint:

The MIL lamp in the Instrument lights up. The fault memory of the engine control (MR) control unit contains the fault code 0 6770 or 1 6770, depending on the software version.

Cause:

Fault code 1 67 70 is set if, after the engine is switched off, the pressure of the AdBlue fluid repeatedly does not drop below the limit pressure (absolute) within a given time period.

Limit pressure with engine software V05/V07 (without NOx sensor): 2.0 bar - Time: 12 s; the fault code is set if the pressure cannot be reduced 6 times.

Limit pressure with engine software V08/V09/V10/V11 (with NOx sensor): 2.5 bar - Time: 14 s; the fault code is set if the pressure cannot be reduced 30 times.

The following causes are possible:

1. Incorrect medium in AdBlue tank. A fluid containing mineral oil has been filled into the AdBlue tank (gasoline, diesel, cold cleaning solvent). This fluid causes swelling of the plastic or rubber parts in the pump module. The pneumatic switching valve is stuck.

2. Metering unit, metering line or nozzle blocked.

When the vehicle is switched off, the compressed air at the pneumatic switching valve cannot be reduced. The pneumatic switching valve in the pump module cannot switch to the return position.

3. AdBlue pressure sensor in metering device defective.

The pressure sensor always indicates a pressure of approx. 5 bar.

4. The AdBlue lines between pump module and AdBlue tank or between pump module and metering device are nicked or kinked, preventing the AdBlue pressure from being reduced quickly enough when the vehicle is switched off.

5. Compressed air line to pump module kinked. Because of this, the compressed air at the pneumatic switching valve cannot be reduced quickly enough. The pneumatic switching valve switches too slowly or not at all.

6. Vehicle with production date <07/2009: Pneumatic switching cylinder in pump module has excessive resistance or is stuck.

Vehicles with production date >06/2009: Internal diaphragm valve is defective. See SI14.40-W-0011A.

Note for vehicles without battery disconnect switch (as per GGVSE): When a BlueTec vehicle is switched off, the SCR compressed air limiting solenoid valve (Y106) is actuated cyclically (30 s on, 15 s off), see attachment 2. When the solenoid valve is not actuated, the compressed air at the pneumatic switching valve of the pump module dissipates via the metering unit. The switching valve in the pump module is pressed back by a spring and returns to its rest position. This switches the system over from the AdBlue feed line (to the metering device) to the AdBlue return line (to the AdBlue tank) and the AdBlue pressure at the metering unit dissipates.

Note for vehicles with battery disconnect switch (as per GGVSE): These vehicles have an additional tank and an additional solenoid valve, see attachment 3. The SCR blow-out solenoid valve (Y128) is not actuated while the engine is running, and carries air in this state. The SCR compressed air limiting solenoid valve (Y106) is actuated while the engine is running, and also carries air. The pulsed post-injection after "engine OFF" is performed by the SCR blow-out solenoid valve (Y128) (30 s on / 15 s off). If the EMERGENCY OFF switch is operated, only a simplified post-injection procedure is performed by emptying the additional tank.

Note: As of engine software V08 (vehicles with NOx sensor) there is a change in the post-injection function. If the vehicle does not enter a state in which AdBlue is injected, the post-injection function is performed only after every eleventh engine shutoff. Otherwise the compressed air is shut off immediately when the engine is switched off.

Remedy:

Note: AdBlue fluid may escape during the following tests. Wear safety glasses when handling AdBlue. Do not reuse any AdBlue fluid that escapes.

The test steps must be performed in the specified sequence.

1. Check pump module for fuel/oil residues. (AR14.40-W-2047A)
2. Check nozzle, metering line and metering unit for blockage.

With the engine running, check actual value 69 (air pressure in the metering unit) in the engine control (MR).

If actual value 69 is between 1230 and 2000 mbar, continue with step 4).

If actual value 69 is below 1230 mbar, continue with step 3a).

If actual value 69 is above 2000 mbar, continue with step 3b).

3. a) If the pressure is below 1230 mbar, there may be various causes:
 - I) Air line to metering device kinked ==> Repair air line.
 - II) Inlet screen at air connection clogged ==> Unscrew inlet screen using a screwdriver and replace.
 - III) Diffusor in metering device blocked ==> Replace diffusor and inlet screen at air connection.
- b) If the pressure > 2000 mbar, remove metering line and recheck actual value 69 with the engine running:
 - I) If actual value 69 > 1300 mbar: Flush metering unit as per AR14.40-W-2031 and check actual value 69 again.

If, after flushing twice, the pressure does not drop below 1300 mbar
(with removed metering line):
Replace metering device.

II) If actual value 69 < 1300 mbar: Replace metering line and nozzle.

4. Check AdBlue pressure sensor.

Note: The AdBlue line may be under pressure. Make sure that escaping AdBlue is collected.

Switch off engine. Wait for the post-injection of the SCR system to finish. Disconnect AdBlue supply hose from metering unit and check actual value 64 (AdBlue pressure).

If the actual value drops to approx. 1 bar, continue with step 5).

If actual value 64 does not drop to approx. 1 bar, the pressure sensor is defective: Replace pressure sensor (AR14.40-W-2003A).

5. Check AdBlue lines (see attachment 2) for kinks and nicks. Replace the lines if necessary.

6. Check compressed air line to pump module.

Connect test adapter between compressed air supply and pump module as shown in attachment 5. Connect pressure gauge to test adapter. Switch off ignition.

When the vehicle is switched off, air is blown through the metering unit for a further 30 seconds. Then the SCR compressed air limiting solenoid valve (Y106) is shut off for 15 seconds. This process is repeated several times. The pressure displayed on the pressure gauge must drop immediately after the compressed air is shut off for the first time. If the pressure on the pressure gauge drops within 2 seconds, continue with step 7.

If the pressure does not drop, the air line between the pump module and the air supply T-piece is kinked.

Note: We are aware of some cases where the air lines in the vicinity of the crossmember have been kinked by a body manufacturer (see attachment 4).

7. If the test steps 1 to 6 fail to reveal any complaint, repair pump module in accordance with SI14.40-W-0011A.

Note: If the piston cannot be removed from the pump module, screw a long M4 bolt (> 50 mm) into the piston. Pliers and a hammer (see attachment 12) can then be used to remove the stuck piston from the pump module.

Note: In vehicles with production date >06/2009 the piston has been replaced by a diaphragm valve. The replacement of the diaphragm valve is also described in SI14.40-W-0011A.

| Attachments | |
|--------------|---|
| File | Designation |
| Anlage 2.pdf | AdBlue line diagram (without battery disconnect switch) Legend: 7.03 Overflow valve or check valve 30.03 Pressure limiting valve (with vent) Y106 SCR compressed air limiting solenoid valve (33.01) Y107 SCR tank heater solenoid valve A Coolant feed (from engine) B Coolant return (to engine) C AdBlue feed D AdBlue return E Compressed air F Aerosol (AdBlue/air mixture) |

| | |
|--|--|
| Anlage 4.pdf | Kinked air line in vicinity of crossmember |
| Anlage 5.pdf | Adapter line for measuring compressed air at AdBlue pump module |
| Anlage 6 Teststreifen-Box.jpg | 100 test strips in pack |
| Anlage 7 Teststreifen-Beispiel.jpg | 1: No contamination by diesel/oil 2: Slight residues of diesel/oil 3 : Heavy residues of diesel/oil |
| Anlage 8 OI-Testpapier D-GB-F.pdf | Pack leaflet |
| Anlage 9 OI-Testpapier NL-I-E.pdf | Pack leaflet |
| Anlage 10 Prufung mittels Teststreifen am Hauptfilter.pdf | Check for residues of diesel and oil |
| Anlage 11 Externes pneumatisches Schaltventil.jpg | 1 Pump module 2 External pneumatic switching valve 3 AdBlue return connection 4 Screw plug |
| Anlage 3 Luftversorgung bei GGVSE.pdf | Diagram of air supply with battery disconnect switch installed 5.01 Single-chamber compressed air reservoir 8.01 Check valve 30.03 Pressure limiting valve with vent 33.01 3/2-way valve (or Y106), electrically actuated when engine is running (closed when de-energized) 33.08 3/2-way valve (or Y128), not electrically actuated when engine is running (open when de-energized) 38.02 Test connection M16x1.5 a To metering unit b To supply unit |
| Anlage 12 Demontage festsitzender Kolben.jpg | Tip for stuck pistons. Bolt M4x80 |
| Checkliste - FC 6770 Druckabfall im Nachlauf zu gering.pdf | Checklist - German version |
| Checklist - FC 6770 - AdBlue pressure drop too low.pdf | Checklist - English version |

Symptoms

Communication/information / Information display / Displays fault code / Multifunction display / Multifunction display / Displays /

Control unit/fault code

| Control unit | Fault code | Fault text |
|--|------------|--|
| MR engine control, MR engine control (PLD) (MRSKR) (Eco-nic,Actros 2,3,Atego II,Axor II) | 6770 | AdBlue pressure drop is too low during run-on. |

Parts

| Part number | ES1 | ES2 | Designation | Quantity | Note | EPC | Non-EPC |
|-------------|-----|-----|-------------|----------|------|-----|---------|
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|-------------|--|--|-----|--|---|
| A0049970989 | | Straight connector | 2 | for test line in attachment 4 | X |
| A0009975034 | | Union nut | 2 | for test line in attachment 4 | X |
| A0004294237 | | Distributor | 1 | for test line in attachment 4 | X |
| A0019978171 | | Connector | 1 | for test line in attachment 4 | X |
| A0014311931 | | Test connection | 1 | for test line in attachment 4 | X |
| A0009872627 | | PA line 6 mm | 2 m | for test line in attachment 4 | X |
| A0005850202 | | Test strips | 1 | Test strips for verifying oil and diesel in the AdBlue fluid. Pack of 100 test strips. | X |
| A9305842438 | | AdBlue information label | 1 | New information label for Ad-Blue tanks | X |
| A0001420319 | | External pneumatic pressure reduction valve | 1 | Only for pump module A0001400478. Observe SI14. 40-W-0011A! | X |
| A9414751720 | | Chafe protection | 1 | Only for pump module A0001400478. Observe SI14. 40-W-0011A! Chafe protection for external pneumatic pressure reduction valve | X |
| A0001400594 | | Filter screen for air inlet of metering device | 1 | Can be unscrewed using a screwdriver | X |
| A0001400030 | | Diffusor | 1 | Order O-rings at the same time | X |
| A0189979245 | | O-ring for diffusor | 2 | | X |
| A0001420019 | | Internal diaphragm valve | 1 | Only for pump module A0001400578 (production date > 06/2009) | X |
| A0061537528 | | AdBlue pressure sensor | 1 | | X |
| A0001420519 | | External pneumatic pressure reduction valve | 1 | Only for pump module A0001400278, A0001400378; production date < 08/2006 | X |

| Work units | | | | |
|------------|----------------|------|-------------|---|
| Op. no. | Operation text | Time | Damage code | Note |
| | | | 14471 B2 | AdBlue pump module |
| | | | 14473 B2 | if metering device was blocked |
| | | | 14479 B2 | if nozzle was clogged |
| | | | 14475 B2 | if metering line was blocked |
| | | | 43389 C6 | if air line to pump module was kinked |
| | | | 14486 73 | if pressure sensor of metering unit was defective |
| | | | 14471 B2 | if external pneumatic pressure reduction valve is retrofitted |

| WIS-References | | | |
|------------------|--|---|------------|
| Document number | Title | Note | Allocation |
| AP14.40-W-1481A | Replace AdBlue filter | Select appropriate document in WIS according to model. | Remedy |
| SI14.40-W-0006A | Incorrect filling of AdBlue tank | Select appropriate document in WIS according to model. | Remedy |
| GI14.40-N-043665 | Incorrect filling of AdBlue tank with diesel fuel | TIPS document with useful information on incorrect filling | Remedy |
| SI14.40-W-0011A | Description of various repair options for AdBlue pump module | Revised version published in 03/2010. First published on 16.01.2009. | Remedy |
| AR14.40-W-2009A | Remove/install pressure filter at pump module of exhaust aftertreatment system | Select appropriate document in WIS according to model. | Remedy |
| AR14.40-W-2003A | Remove/install SCR AdBlue pressure sensor | Select appropriate document in WIS according to model. | Remedy |
| AR14.40-W-2047A | Check pump module of exhaust aftertreatment system for fuel/oil residues | Select appropriate document in WIS according to model. | Remedy |
| AR14.40-W-2031A | Flush metering device of exhaust aftertreatment system | Select appropriate document in WIS according to model. | Remedy |