Mechanical fault in NOx sensors with fault codes stored-current in engine control unit

Complaint:
Mechanical fault in NOx sensors with fault codes stored current in engine control unit.

Cause:
Spray condensation can penetrate inside the NOx sensors and damage the sensor elements (water damage).

Remedy:
1. Complete the questionnaire together with the customer (See picture: 01.jpg).
2. Create a PTSS case.
   - **Important:** The completed questionnaire must be attached to the case.
   - **Important:** The safety information in the repair instructions must be complied with.
4. Parts must be specified by VIN and complete engine number
5. When possible prior to scheduling the vehicle repair verify the parts are available.

**Attachments**

<table>
<thead>
<tr>
<th>File</th>
<th>Designation</th>
</tr>
</thead>
<tbody>
<tr>
<td>01.jpg</td>
<td>Questionnaire</td>
</tr>
</tbody>
</table>

**Symptoms**

<table>
<thead>
<tr>
<th>Power generation / Engine management / Engine management indicator lamp / Engine diagnosis / lit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power generation / Exhaust system / AdBlue / AdBlue consumption / Too high</td>
</tr>
<tr>
<td>Power generation / Exhaust system / AdBlue / AdBlue consumption / Too low</td>
</tr>
</tbody>
</table>

**Control unit/fault code**

<table>
<thead>
<tr>
<th>Control unit</th>
<th>Fault code</th>
<th>Fault text</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDI60Common Rail Diesel Injection (CR60NFZ)</td>
<td>177800</td>
<td>CAN communication with component 'A97/1 (NOx sensor control unit upstream of SCR catalytic converter)' has a malfunction.</td>
</tr>
</tbody>
</table>
**CDI60 Common Rail Diesel Injection (CR60NFZ)**

18D200 Monitoring function-Fault in function 'Test of NOx sensors'

135300 Component NOx sensor upstream of SCR catalytic converter has an open circuit.

177700 CAN communication with component 'A97/2 (NOx sensor control unit downstream of SCR catalytic converter)' has a malfunction.

18B800 The variation between the measured signal and the calculated signal of the NOx sensor downstream of the SCR catalytic converter is too high.

18BC00 The upper limit value for long-term adaptation of the SCR exhaust aftertreatment system was exceeded.

147700 Component A97/2 (NOx sensor control unit downstream of SCR catalytic converter) has a short circuit to positive.

18B900 The variation between the measured signal and the calculated signal of the NOx sensor upstream of the SCR catalytic converter is too high.

147600 Component NOx sensor downstream of SCR catalytic converter has an open circuit.

135300 Component NOx sensor upstream of SCR catalytic converter has an open circuit.

147700 Component A97/2 (NOx sensor control unit downstream of SCR catalytic converter) has a short circuit to positive.

135400 Component NOx sensor upstream of SCR catalytic converter has a short circuit to positive.

147600 Component NOx sensor downstream of SCR catalytic converter has an open circuit.

135400 Component NOx sensor upstream of SCR catalytic converter has a short circuit to positive.

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**Work units**

<table>
<thead>
<tr>
<th>Op. no.</th>
<th>Operation text</th>
<th>Time</th>
<th>Damage code</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>14-8138</td>
<td>REPLACE NOX SENSOR DOWNSTREAM OF SCR CATALYTIC CONVERTER (AFTER CHECK)</td>
<td>14502 73</td>
<td>NOx sensor downstream of catalytic converter - Electrical fault</td>
<td></td>
</tr>
<tr>
<td>14-8137</td>
<td>REPLACE NOX SENSOR UPSTREAM OF SCR CATALYTIC CONVERTER, VEH. WITH ENGINE 642.89 (AFTER CHECK)</td>
<td>14501 73</td>
<td>NOx sensor upstream of catalytic converter - Electrical fault</td>
<td></td>
</tr>
</tbody>
</table>

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**WIS-References**

<table>
<thead>
<tr>
<th>Document number</th>
<th>Title</th>
<th>Note</th>
<th>Allocation</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR14.40-D-2059M</td>
<td>Remove/install NOx sensor upstream of SCR catalytic converter</td>
<td>Remedy</td>
<td></td>
</tr>
</tbody>
</table>
### AR14.40-D-2060M

<table>
<thead>
<tr>
<th>Remove/install NOx sensor downstream of SCR catalytic converter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remedy</td>
</tr>
</tbody>
</table>

### Validity

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>Engine</th>
<th>Transmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sprinter III</td>
<td>642</td>
<td>*</td>
</tr>
</tbody>
</table>

### Attachments
1. How many stops (engine turned off) are in average being done per day?
   - Up to 5 stops
   - 5-10
   - 10-20
   - more than 20 stops

2. What time in average is the engine turned off during the stops?
   - up to 5 min.
   - 5-15 min.
   - 15-30 min.
   - 30-60 min.
   - more than 60 min.

3. Is the vehicle being driven on a city route, how many miles or hours in average per day?
   - up to 10 mls
   - 10-20 mls
   - 20-40 mls
   - more than 40 mls
   - up to 1 hr
   - 1-3 hours
   - 3-6 hours
   - more than 6 hours

3.1 Does the city route contain speed limits of 45mph?
   - No
   - Yes: majority or minority?

4. Is your vehicle idling for a longer time during operation?
   - No
   - Yes: up to 1 hour
   - 1-3 hours
   - more than 3 hours

4.1 Did the engine reach the operating temperature of 185°F (85°C) when set to idle?
   - No
   - Yes

5. Would you describe the environment you operate in as a high humidity area?
   - No
   - Yes: Medium humidity
   - High humidity

6. Is your vehicle primarily parked on even ground?
   - Yes

   If No: Is the vehicle primarily parked on an incline/decline?
   - parked facing uphill
   - parked facing downhill
   - both