How to use the NOx sensor emulator NOXEM

1. Replace the existing NOx sensor to NOx emulator
2. Encode replacement of NOx sensor, using ISTA D
3. Encode replacement of NOx catalytic converter, using ISTA D
4. Delete error messages, using ISTA D
5. Create new adaptations

Notes.

- After installing and coding procedure of NOXEM, the positive effect is not reached immediately – it takes some time. First driving sessions after replacing the sensor will be with increased engine unevenness – the engine will measure the performance of each cylinder in different driving conditions: it will restore correct adaptations.
- Some specific adaptations are performed only in conditions of even load and RPM. That’s why it is so important (after installing and coding of NOXEM), in first driving sessions (also after creating the initial adaptations, as described below) to allow the engine warm up in idle, drive as smooth as possible and with longer driving sessions. In such way, the engine will reach even performance as quickly as possible.
- Immediate symptom, that the installation of NOXEM was successful: the engine (again) runs in Stratified charge when driving evenly – fuel consumption is decreasing.
- In the initial stage, after installing NOXEM the engine will intensively create adaptations for exact driving conditions: most often it will switch to Homogeneous mode. It is normal and very typical for this engine – adaptations (also smoothness measurements of cylinders) are performed for each mode – Homogeneous, Homogeneous lean, Stratified charge – separately.
- If in any of performance modes the engine runs with increased vibration (it feels like a diesel engine) – allow the engine run in this mode for some time (5 .. 10 min). MSD80 will identify unevenness and will immediately start to eliminate it.
Replacement of NOx sensor

1. Take off the plastic shields in the middle area of passenger side floor (for E6X) or exhaust heat protection cover (for E9X);
2. Disconnect the NOx sensor data cable;
3. Unscrew two M6 screws;
4. Unscrew the probe of NOx sensor, using 22 mm tool;
5. Screw in the probe of NOx emulator;
6. Fix NOx emulator, using two M6 screws;
7. Draw the NOx emulator probe, using 22 mm tool with force 10 .. 30 Nm;
8. Connect the NOx emulator data cable;
9. Secure the plastic shields (protection cover) back in place.
Encoding of NOx sensor replacement, using ISTA D

1. Start new session in ISTA D, perform the identification of vehicle and a test:

2. Open menu Vehicle management:
3. Open menu *Service function*:

![Service function menu](image1)

4. Open sub-menu *Power train*, press *Start search*:

![Power train menu](image2)
5. Open sub-menu *Engine Electronics*:

6. Open sub-menu *Nitrogen oxide catalytic converter*:
7. Choose the option *Exchange nitrogen oxide catalytic converter*, press *Start Search*:
8. Choose the option *Nitrogen oxide catalytic converter: Replacement*, press **Display**:
9. Choose **Replacing the nitrogen oxide sensor**, press Next, follow the instructions (confirm deleting of adaptations and encoding of new NOx sensor):
Important!
Follow the instructions very carefully! ISTA D don't display any notifications if the adaptations are not finished successfully. If deleting of adaptations was successful, you will see notice "adaptation process is finished". If ISTA D does not displays notice "adaptation process is finished" after the attempt to delete the adaptations, repeat the procedure once again.
Replacement of NOx catalytic converter, using ISTA D

1. open sub-menu *Replacing the nitrogen oxide catalytic converter*:

2. Choose the option *Replacing the nitrogen oxide catalytic converter*, follow the directions of ISTA D (confirm deleting of adaptations and encoding of new NOx catalytic converter):
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Delete error messages, using ISTA D

From main menu select *Display Fault memory*, then press *Delete Fault memory*.

After clearing error message memory Engine Management System (MSD80) will start to create new adaptations (STFT, LTFT, ignition and knock sensors, throttle valve, Lambda sensors adaptations, etc.).

Create new adaptations

a) Car must be at operating temperature/warm;
b) Drive vehicle 50 .. 60 mph (80 .. 100 km/h) with 2000 .. 2500 RPM for at least 15 min (use manual shift, if needed);
c) Let vehicle idle for 5 min;
d) Perform at least 2 .. 3 drive/idle cycles if possible;
e) Recheck mixture adaptation values.

**Note:** when adaptations are cleared, following error messages* can appear immediately:

- Error messages relating DSC. Solution: drive 10 .. 15 min, switch off/on ignition;
- Error messages relating throttle. Solution: turn on ignition, press and release accelerator pedal for 3 times, then start engine.

During adaptation process (after old adaptations have been cleared) some error messages* can appear:

- Error messages relating fuel trim (bank and/or cylinders individually);
- Insufficient performance of CO catalytic converters;
- Lambda probes (trim and/or signal);
- Uneven run (Stratified charge and/or Homogeneous injection).

*these error messages in the exact situation do not indicate any problems with the engine performance.

After new adaptations are completed (after 5 .. 8 driving sessions for cold/warm engine, at least 200 .. 300 km), check the new adaptations and clear error message memory, if necessary.