STAR ONLINE PUBLICATION

Case Number: **S1625000003 REV. A**

Release Date: January 2023

Symptom/Vehicle Issue: Malfunction Indicator Lamp (MIL) Illumination. NOx Sensor Diagnostic Trouble Codes (DTCs) Diagnosis Information.

Discussion: There has been confusion in the field regarding NOx sensor DTCs due to the differences in component naming between the scan tool, service information, and the parts catalog. The following information is being provided to help clear up the confusion as well as provide some additional checks to perform when dealing with these DTCs.

The following DTCs all pertain to the Downstream NOx sensor located in the outlet side of the Selective Catalyst Reduction (SCR) Catalyst. The downstream sensor may also be referred to as the System Out NOx sensor, NOX B, Lower NOx, Bank 1 Sensor 2, NOx Sensor 1/2 or Post Catalytic Reduction NOx sensor.

- P229E –NOx Sensor Circuit – Bank 1 Sensor 2.
- P225E –NOx Sensor 1/2 Performance – Signal Stuck High.
- P225F –NOx Sensor Circuit 1/2 Performance – Signal Stuck Low.
- P22A7 –NOx Sensor Heater Circuit Performance – Bank 1 Sensor 2.
- U059F –Invalid Data Received From NOx Sensor “B”.
- P220B –NOx Sensor 1 Heater Sense Circuit Performance.
- P1C56 –NOx Sensor Intermittent – Bank 1 Sensor 2.
- P22FC –NOx Sensor Performance – Slow Response Low to High Bank 1 Sensor 2.
- U029E –Lost Communication With NOx Sensor “B”.
- P229F –Aftertreatment NOx Sensor Circuit Performance – Bank 1 Sensor 2.

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Contact STAR Center, or your Technical Assistance Center Via TechConnect, eCONTACT or Service Library entry if no solution is found.

The following DTCs all pertain to the Upstream NOx sensor located in the exhaust pipe towards the inlet of the Diesel Particulate Filter (DPF). The Upstream NOX sensor may also be referred to as the Engine Out NOx sensor, NOX A, Upper NOx, Bank 1 Sensor 1, NOx Sensor 1/1, or Pre-Catalytic Reduction NOx sensor.

- P2202 –NOx Sensor 1 Circuit Low.
- P1C55 –NOx Sensor Intermittent – Bank 1 Sensor 1.
- P2209 –NOx Sensor 1 Heater Sense Circuit Performance.
- P220A –NOx Sensor Supply Circuit Performance Bank 1 Sensor 1.
- P2201 –Aftertreatment NOx Sensor Circuit Performance Bank 1 Sensor 1.
- U029D –Lost Communication With NOx Sensor “A”.
- U059E –Invalid Data Received From NOx Sensor “B”.

Both upstream and downstream NOx Sensors (NOx A, and NOx B) on these vehicles consist of a sensor probe mounted in the exhaust stream. The sensor probe is permanently connected to a sensor module via pigtail. This pigtail connection **CANNOT** be removed, and no attempts should be made to do so. (**See Figure 1**)

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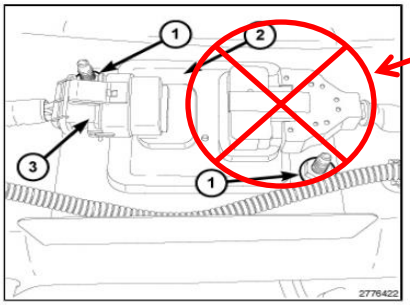
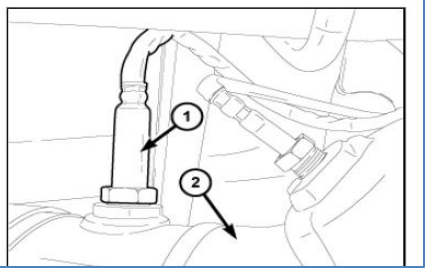
NOx SENSOR 1/2

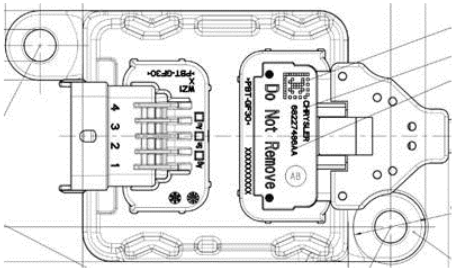
1. Disconnect and isolate both of the negative battery cables.
2. Disconnect the NOx sensor module wire harness connector (3).
3. Remove nuts (1) and the NOx module (2).



4. Disconnect the wire harness retainers.
5. Remove the NOx sensor 1/2 (1) from the Selective Catalytic Reduction (SCR) catalyst (2).



Do Not Attempt to disconnect the NOx Sensor from the NOx Module!



Note: The latest version of the NOx Sensor Assembly have a label on the Sensor Probe connection indicating "Do Not Remove" as shown.

Figure 1

Inspect the sensor probe to module connection for being compromised or damaged. If found, the entire module/sensor assembly must be replaced. (**See Figure 2**)

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Figure 2

If no connection issues are found, be sure to follow all current published diagnostics in DealerCONNECT/Service Library for the DTC that has set.

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