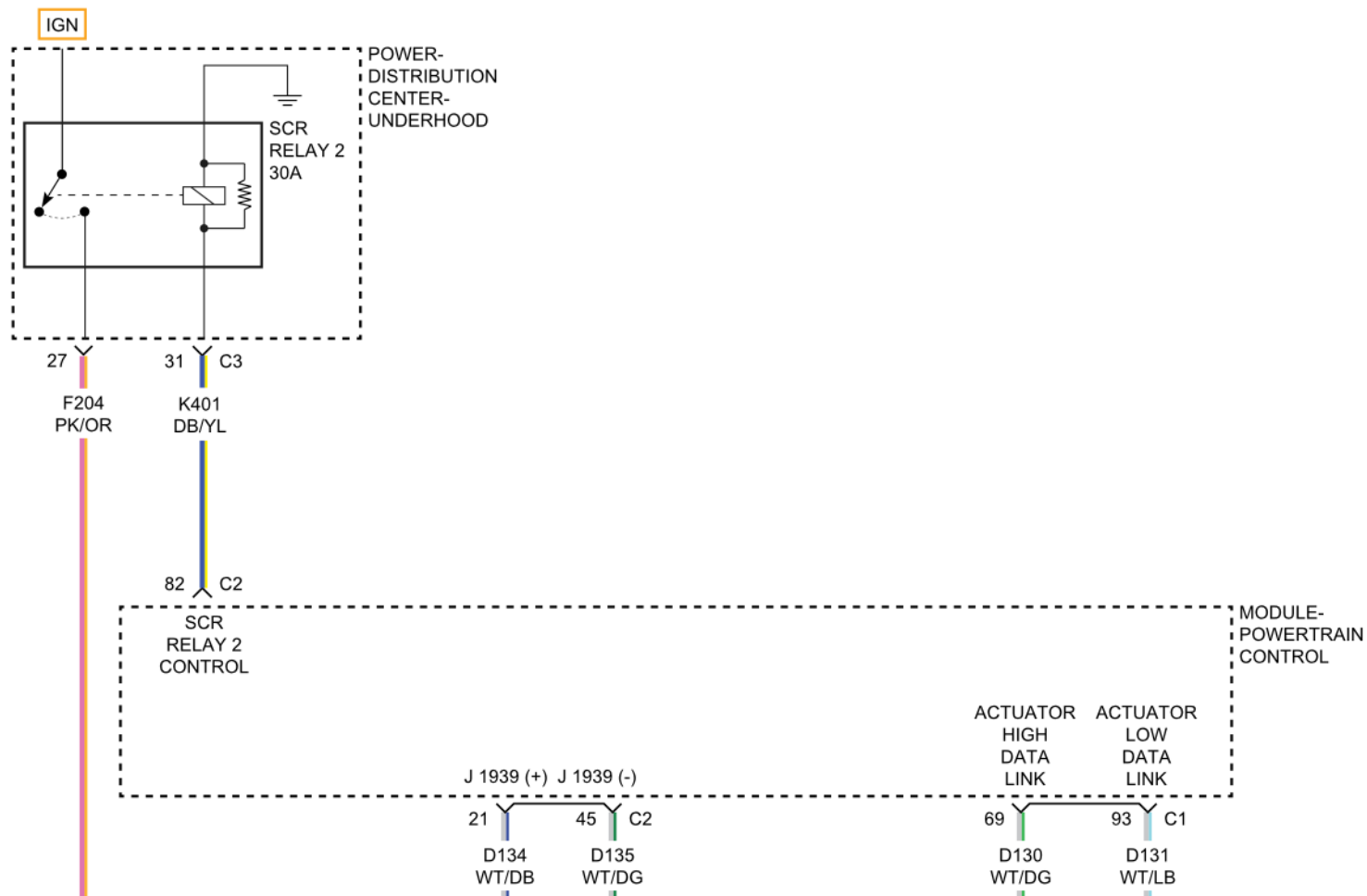
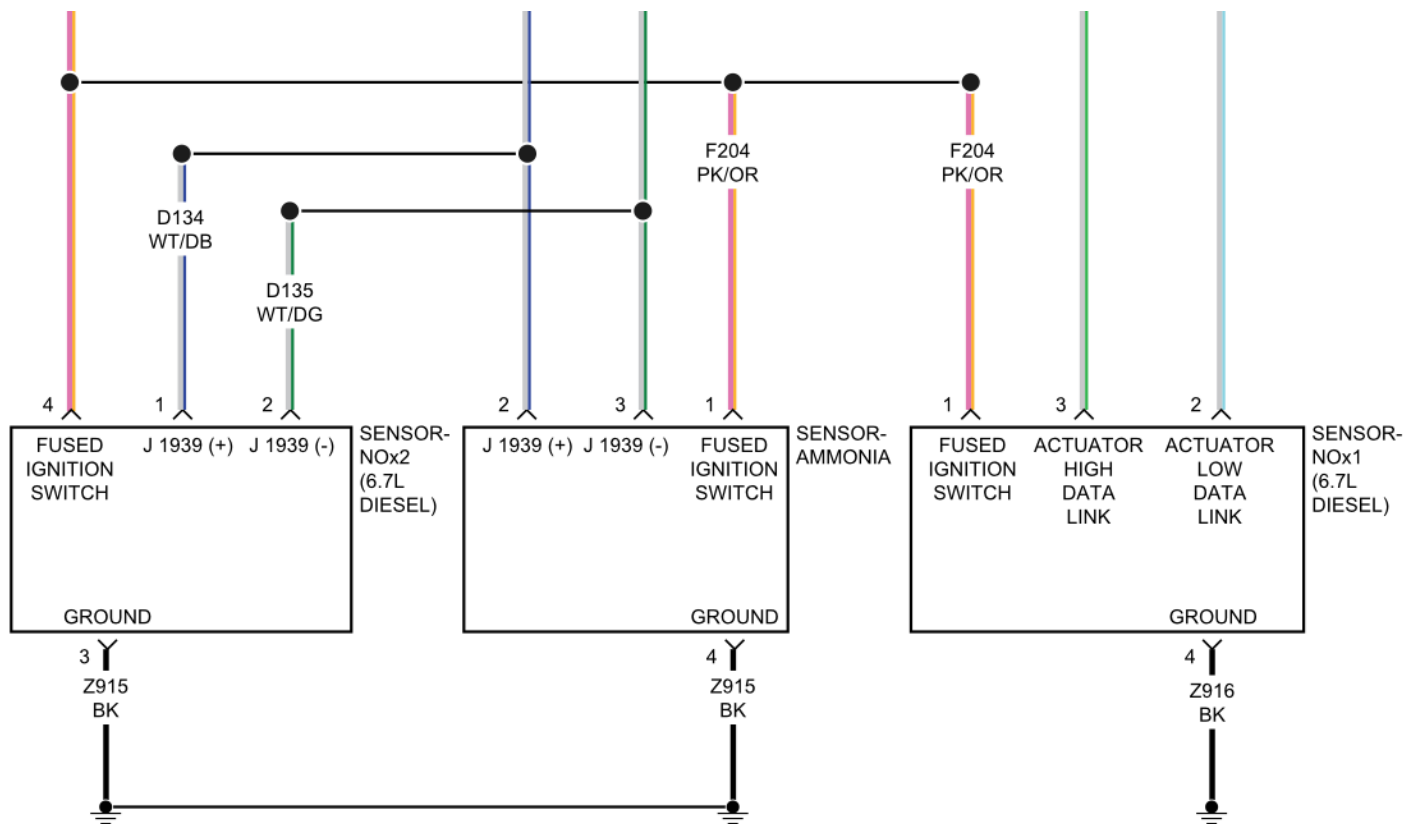


P2201-AFTERTREATMENT NOX SENS...

P2201-AFTERTREATMENT NO_x SENSOR CIRCUIT PERFORMANCE - BANK 1 SENSOR 1

For a complete wiring diagram, refer to the **Wiring Information**.





2830002144

Theory of Operation

The aftertreatment system is equipped with two Nox Sensors and modules. The upstream NOx Sensor 1/1 is located on the Turbocharger elbow downpipe and is permanently connected to a corresponding Nox Sensor Module mounted to the hot side of the engine block. The downstream NOx Sensor 1/2 is located at the outlet of the SCR Catalyst and is permanently connected to a corresponding Nox Sensor Module which is mounted on the right frame rail. The NOx

Sensors and NOx Sensor Modules are calibrated to each other and must be replaced as an assembly. The two NOx Sensor and Module assemblies are not interchangeable. The NOx Sensor Modules are smart devices and communicate with the Powertrain Control Module (PCM) over the J1939 Data Link. The NOx Sensor Modules perform their own internal diagnostics and report malfunctions back to the PCM. The NOx Sensors are used to monitor the efficiency of the SCR Catalyst and dosing system. The PCM will illuminate the MIL lamp immediately after the monitor runs and fails. The PCM will turn off the MIL Lamp immediately after the monitor runs and passes.

- **When Monitored:** This diagnostic monitor consists of two separate checks. The first check occurs when the engine exhaust temperature at NOx Sensor 1/1 is above 150°C (302°F), and the engine is in a decel condition with zero fueling. The second check occurs when the engine exhaust temperature at NOx Sensor 1/1 is above 150°C (302°F), and the calculated NOx value is changing.
- **Set Condition:** The Powertrain Control Module detects that the NOx Sensor 1/1 reading is not reading zero during decel condition with zero fueling for two consecutive trips or the PCM has detected that the NOx Sensor 1/1 reading is not changing with engine conditions for two consecutive trips.

Possible Causes
EXCESSIVE FUEL OR OIL INTRODUCED INTO THE EXHAUST SYSTEM
NOx SENSOR 1/1 DRIFTED OUT OF RANGE

Always perform the Pre-Diagnostic Troubleshooting procedure before proceeding. ([Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control \(PCM\) - Standard Procedure](#)).

Diagnostic Test

1. ACTIVE DTC

NOTE: If DTCs **P2202**, **P229E**, or **P2209** are present, perform the diagnostic for those DTCs before continuing with this test procedure.

1. Start the engine, monitor Exhaust Gas Temperature Sensor 4 until it reaches 150°C (302°F).

2. Drive the vehicle at 50 MPH, ensure that it is not in DPF Regeneration mode.
3. Perform a zero fueling event (decel condition for 10 seconds, with foot off of accelerator pedal).
4. Repeat this condition three to five times.
5. With the scan tool check active DTCs.

Is the DTC active?

Yes

- Go To [2](#)

No

- Perform the INTERMITTENT CONDITION - 6.7L diagnostic procedure. ([Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control \(PCM\) - Standard Procedure](#)).

2.CHECK FOR EXCESSIVE ENGINE OIL BEING INTRODUCED INTO THE AFTERTREATMENT SYSTEM

1. Turn the ignition off.
2. Remove the turbocharger outlet and inspect for signs of oil, fuel or moisture being introduced into the aftertreatment system from the engine.

Was engine oil, fuel or moisture found in the turbocharger exhaust outlet?

Yes

- Locate the cause of possible diesel fuel or engine oil being carried from the engine into the exhaust system. Inspect the SCR Catalyst for possible damage.
- Perform the POWERTRAIN VERIFICATION TEST - 6.7L. ([Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control \(PCM\) - Standard Procedure](#)).

No

- Replace the NOx Sensor 1/1 in accordance with the service information.
 - Perform the POWERTRAIN VERIFICATION TEST - 6.7L. ([Refer to 28 - DTC-Based Diagnostics/MODULE, Powertrain Control \(PCM\) - Standard Procedure](#)).
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