Service Bulletin

Bulletin No.: 25-NA-032
Date: February, 2025

INFORMATION

Subject: Information on Malfunction Indicator Lamp (MIL) Illuminated - DTC P11CC, P22FB, and/or P2297 Set

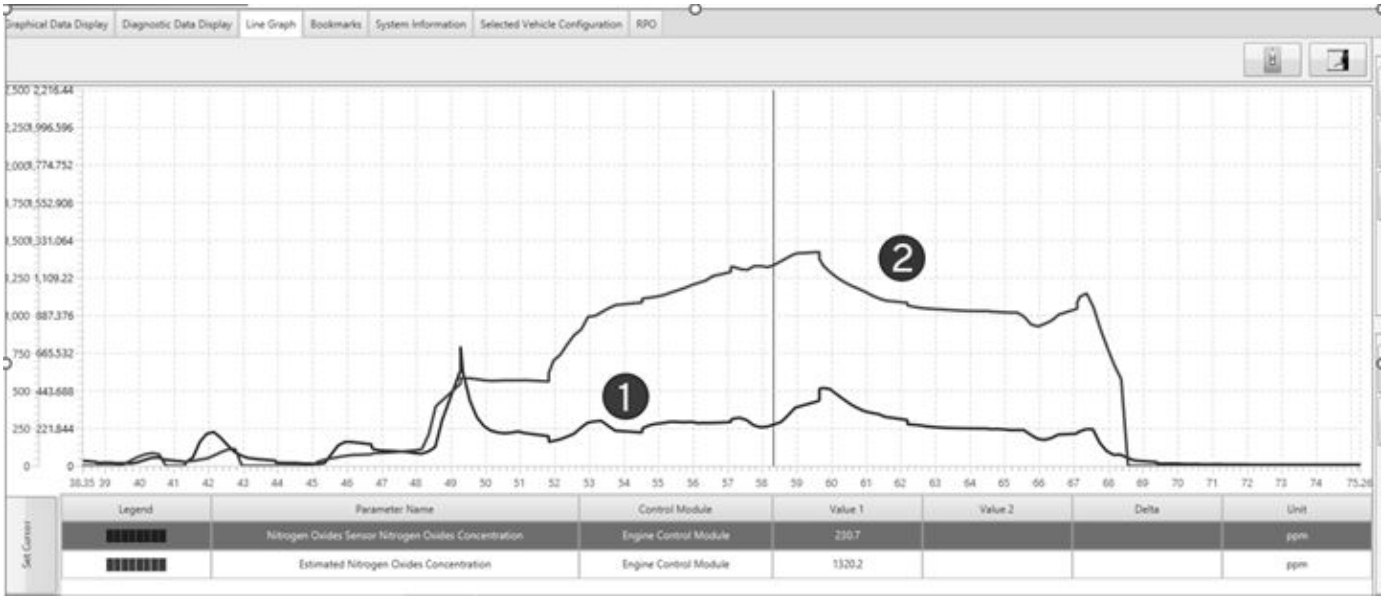
Brand:	Model:	Model Year:		Build Date:		Engine:	Transmission:
		from	to	from	to		
Cadillac	Escalade Models	2021	2024			LM2	
Chevrolet	Silverado 1500	2020	2021				
	Silverado 1500 LTD (RPO J21, VIN Digit 5 = W/Y)	2022	2022				
	Silverado 1500 New (RPO J22, VIN Digit 5 = A/D)						
	Silverado 1500	2023	2023				
	Suburban	2021	2024				
	Tahoe						
GMC	Sierra 1500	2020	2021				
	Sierra 1500 Limited (RPO J21, VIN Digit 5 = 8/9)	2022	2022				
	Sierra 1500 New (RPO J22, VIN Digit 5 = H/U)						
	Sierra 1500	2023	2023				
	Yukon Models	2021	2024				

Involved Region or Country	North America, Europe, Kazakhstan, Uzbekistan, Russia, Middle East, Israel, Palestine, Argentina (Mercosur), Brazil (Mercosur), Bolivia (West), Chile (West), Colombia (West), Ecuador (West), Paraguay (West), Peru (West), Uruguay (West), Japan, S. Korea, Thailand (ASEAN), Philippines, Australia/New Zealand, Other Africa
Condition	Some customers may comment that the MIL is illuminated. Some technicians may comment on one or more of the following DTCs set in the Engine Control Module: • P11CC • P22FB • P2297 Some technicians may also find additional NOx related DTCs set.
Cause	This condition may be caused by one or more of the following: • The EGR differential pressure sensor. • EGR cooler contamination. • The engine consuming coolant. • The engine consuming excessive oil.
Information	In the ECM, there is a set of calculations that estimate what the NOx sensor 1 should be reading. This estimation is used in case there is a fault with the NOx sensor reading. This estimate is shown in GDS2 as the Estimated Nitrogen Oxide Concentration. GDS2 also has a Nitrogen Oxides Concentration Delta. This value represents the difference between the measured NOx sensor concentration and the Estimated Nitrogen Oxide Concentration. They are both located in Nitrogen Oxides Sensor Data. The DTCs above set when the ECM detects NOx sensor 1 and the Estimated Nitrogen Oxide Concentration are too far apart. The most significant parameters used to calculate the Estimated Nitrogen Oxide Concentration are: • EGR Differential pressure sensor data • Engine load • EGR2 position • Exhaust back pressure valve

Important: Service agents must comply with all International, Federal, State, Provincial, and/or Local laws applicable to the activities it performs under this bulletin, including but not limited to handling, deploying, preparing, classifying, packaging, marking, labeling, and shipping dangerous goods. In the event of a conflict between the procedures set forth in this bulletin and the laws that apply to your dealership, you must follow those applicable laws.

How to use this data

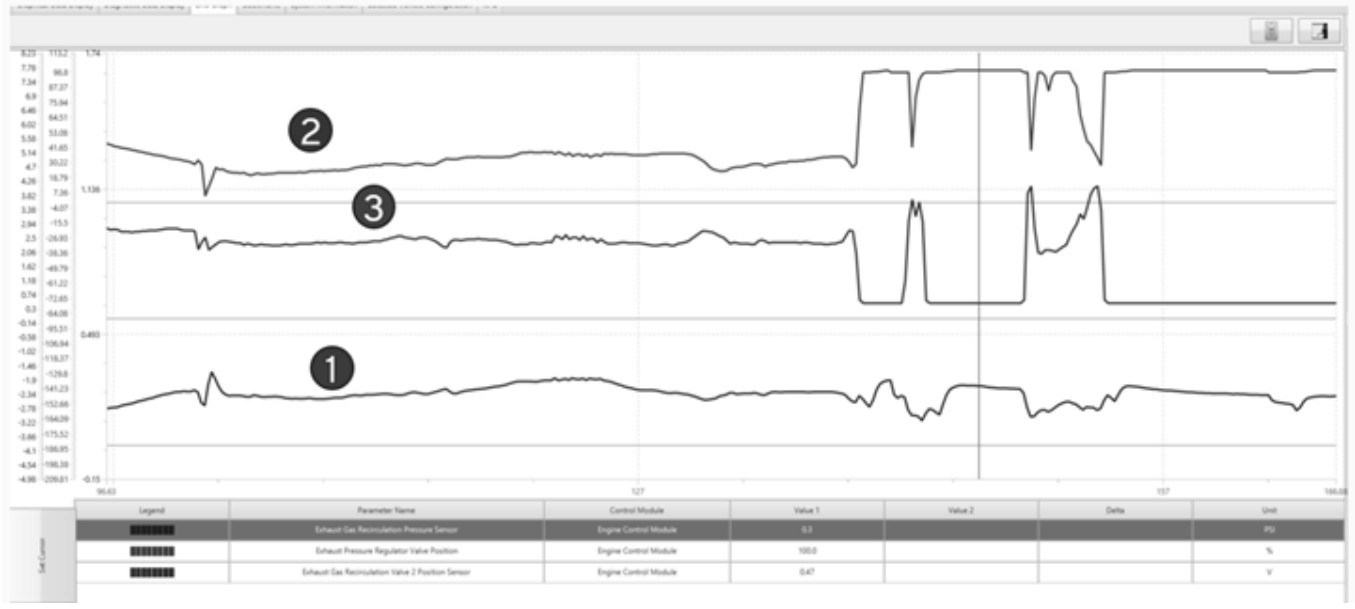
If you are working on a vehicle with one of the codes listed above, road test the vehicle and collect Nitrogen Oxides Sensor Data. Review the data to see if Estimated Nitrogen Oxide Concentration is significantly higher for extended periods compared to actual NOx levels measured at sensor 1.



6847661

1. Nitrogen Oxides Sensor Nitrogen Oxides Concentration - 230.7 ppm
2. Estimated Nitrogen Oxides Concentration - 1320.2 ppm

In this example you can see that the Estimated Nitrogen Oxide Concentration and the NOx value measured from the NOx sensor are far apart. It is easy to see why the code set and that the Estimated Nitrogen Oxide Concentration is skewed (1320.0 ppm), not the NOx sensor value.



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1. Exhaust Gas Recirculation Pressure Sensor – 0.3 PSI
2. Exhaust Pressure Regulator Valve Position - 100%
3. Exhaust Gas Recirculation Valve 2 Position Sensor - 0.47V

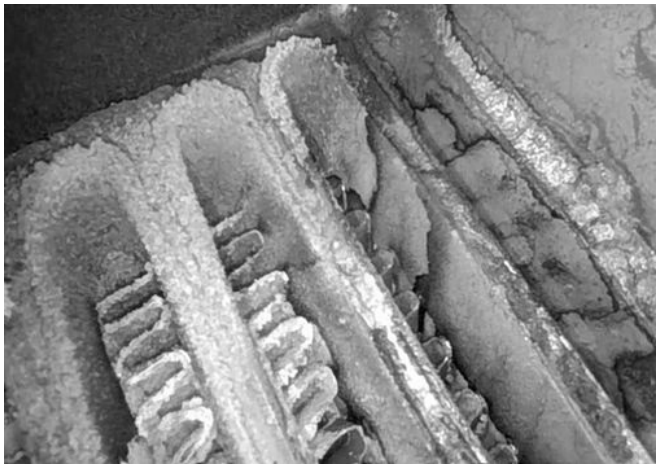
This is an example of normal operation. As flow through the EGR cooler changes, the pressure sensor value should change as well. If the pressure sensor never changes while under different driving situations, verify the connector is pinned out correctly as per SI, and that there aren't circuit issues between the EGR differential pressure sensor and the ECM. Also verify the hoses to the sensor are not pinched, twisted, or restricted.

Wiggle the EGR differential sensor connector to see if the GDS read value changes. If the reading drops out or notably changes while wiggling the connector, suspect there is an issue with the terminals in the connector, or possibly in the sensor itself.

6847664

1. Estimated Nitrogen Oxides Concentration - 133.9 ppm
2. NOx Sensor 1 NOx Concentration - 321.3 ppm
3. Engine Load - 57.3%
4. Nitrogen Oxides Concentration Delta -187.4 ppm

Next, during a period of consistent engine load driving, 1-2 minutes, if the actual NOx 1 value is 100-250 ppm above the Estimated Nitrogen Oxide Concentration value, there may be an issue with a restricted EGR cooler.



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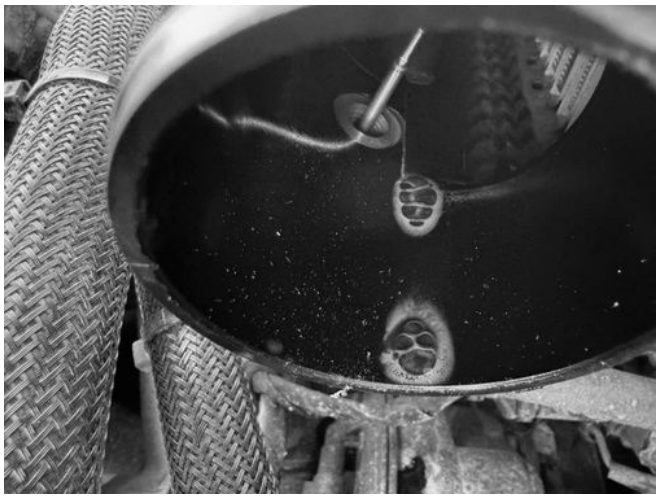
- External EGR Cooler Restriction

6847667

- Internal EGR Cooler Restriction

Sometimes the restriction will be evident when inspecting the EGR cooler.



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Additionally, we have found that if the engine ingests anything that could be used as fuel while the code is running, you can set this code. One example is if the vehicle suffers from oil consumption. Much like the L5P diesel, some oil in the intercooler system is expected. Here is an example of a CAC that has a normal amount of oil in the outlet.

There may be a little condensation also, which can be normal depending on ambient conditions and vehicle usage. If there is a lot of condensation/fluid in the CAC, make sure that the secondary coolant system bottle is not low. A charge air cooler leaking coolant into the engine could cause this code to set.

6847671

Looking into the cooler, next to the fins, this photo shows oil puddling in the CAC outlet. This much oil in the induction could cause this code to set.

If this condition is noted, while monitoring the EGR Differential pressure sensor data, see if the sensor reading changes with different engine loads, EGR 2 positions and Exhaust back pressure valve positions. The EGR differential pressure sensor value is part of how the ECM calculates the Estimated Nitrogen Oxide Concentration engine output level.

Version	1
Modified	Released February 17, 2025