



Temperature Sensor Troubleshooting Guide - US10+OBD13 And Newer



Component Overview

The Exhaust Gas Temperature Sensors are utilized in the Exhaust Aftertreatment System for temperature readings at specific locations in different stages of the system. These are two-wire sensors which correlate resistance to temperature. The sensors are commonly referred to as T1, T2, T3 & T4 respective to their place in the exhaust stream. T4 was added for OBD19 and newer emissions. These sensors report to the Aftertreatment Control Module (ACM) and play an important part in the EATS strategy and diagnostics.

The primary failure mode Temperature Sensors is internal failure.

Diagnosis and Repair

Perform a DTC Readout. Review the tables below to determine which category the DTC currently being diagnosed falls under. Proceed according to the directions for the appropriate section.

NOTE: Active Temperature Sensor DTCs will cause Regens to abort.

High Exhaust Temperature DTCs

DTC	Description
P1151-00	Aftertreatment System Over Temperature
P2428-00	Exhaust Gas Temperature Too High

Directions: The above DTCs commonly fault in correlation to an upstream component failure that causes high temperature readings in the EATS. If other system DTCs are present prioritize the system DTCs first. If no other DTCs or upstream faults observed, proceed with the directions below.

Exhaust Temp Plausibility DTCs

Live UI these codes should only be diagnosed if they are Active or have a DTC Confirmed status of True.

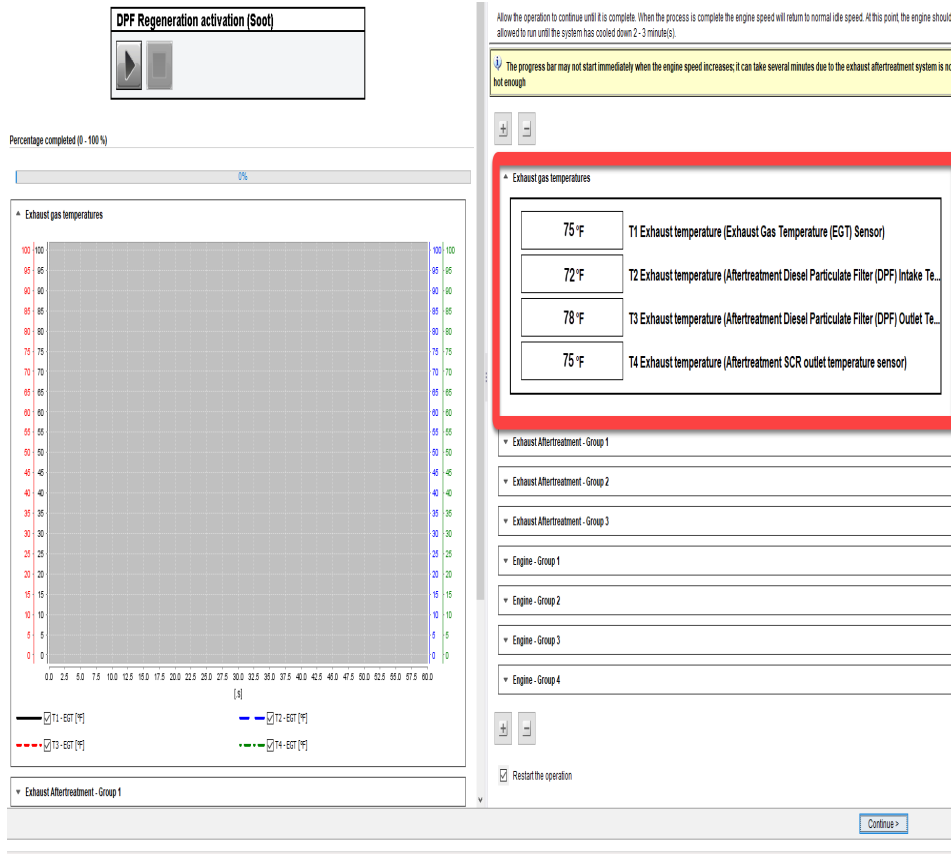
DTC	Description
P246F-64	Exhaust Gas Temperature Sensor Circuit Range/Performance Bank 1 Sensor 4 NOTE: OBD19 & 20 Vehicle only, 1-Box SCR Follow TSB <i>DEF Crystallization, dosing valve, clean.</i>
P2084-64	Exhaust Gas Temperature Sensor Circuit Range/Performance (Bank 1 Sensor 2)
P2080-64	Exhaust Gas Temperature Sensor Circuit Range/Performance Bank 1 Sensor 1
P242B-64	Exhaust Gas Temperature Sensor Circuit Range/Performance (Bank 1 Sensor 3)

Directions: Confirm the Temperature Sensor Values at Ambient and/or during a Heating Cycle (Regen). Any sensors that are out of expected range should be replaced using the Impact operations below:

Operation	Title
2581-03-02-05	Exhaust Temperature Sensor, Replacement. T1
2581-03-02-06	Exhaust Temperature Sensor, Replacement. T2
2581-03-02-07	Exhaust Temperature Sensor, Replacement. T3

If no fault is found, ensure software is up to date on the Engine ECU (EMS), as some diagnostics improvements have been released.

Ambient Temperature Evaluation - Using PTT 2589-08-03-02 Subtest A, Select Soot Regeneration, **DO NOT START THE ENGINE** (this is a manual condition that can be bypassed); rather use key on, engine off. Before starting the regen using the drop down menu view temperature sensors readings. When engine/exhaust is at ambient temperature, all Temperature Sensors should read close (approx. within 10 Degree F) to the same value.

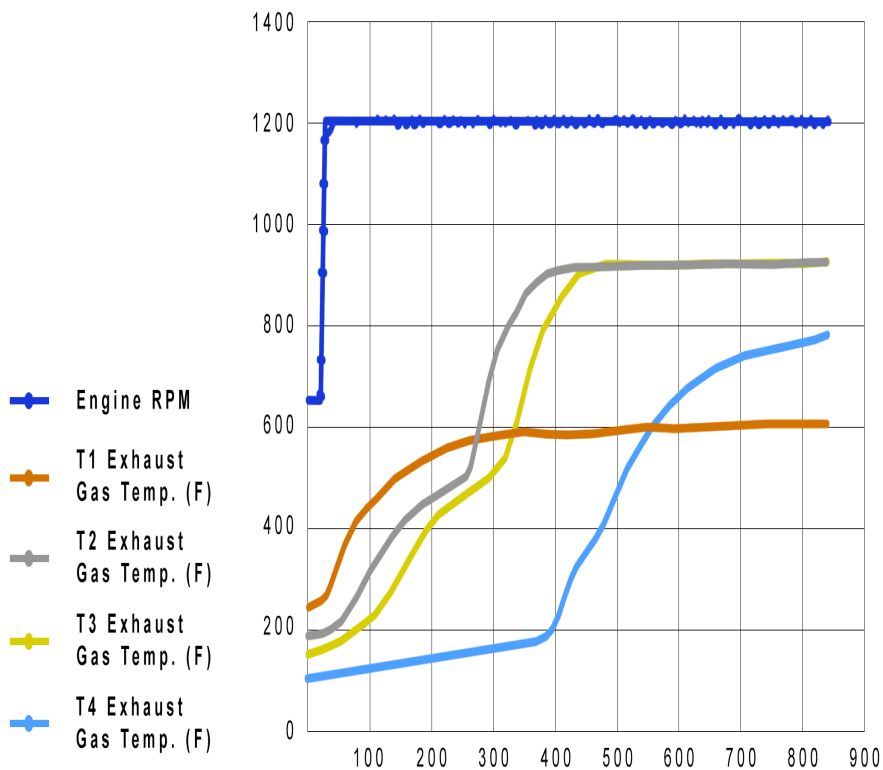


Heating Cycle Evaluation - Using PTT 2589-08-03-02 Subtest A, perform a Soot Regen. View/graph the temperature sensors. Make sure the values rise in the respective order shown in the graph below.

Note: PTT will abort regen for active Temp Sensor DTCs, it may be necessary to clear DTC in order to perform the follow evaluation.

Note: PTT will provide expected value under the information tab during the regeneration.

Exhaust Temperatures profile during Regeneration from a cold engine



Electrical DTCs - Only diagnose active and/or confirmed DTCs.

DTC	DESCRIPTION
P242A-15	Exhaust Gas Temperature Sensor Bank 1 Sensor 3
P2031-15	Exhaust Gas Temperature Sensor Bank 1 Sensor 2
P0544-15	Exhaust Gas Temperature Sensor Bank 1 Sensor 1
P2032-00	Engine Exhaust Gas Temperature Circuit Low (Bank 1 Sensor 2)
P242C-00	Exhaust Gas Temperature Sensor Circuit Low (Bank 1 Sensor 3)
P0545-00	Exhaust Gas Temperature Short Circuit Low
P2471-00	Exhaust Gas Temperature Sensor Circuit High Bank 1 Sensor 4
P2470-00	Exhaust Gas Temperature Sensor Circuit Low Bank 1 Sensor 4

Live UI ons:

1 Visual inspection wiring harness for damage

1. Visual inspection wiring harness for damage.
2. Follow PTT Diagnostic to perform harness and sensor checks.

Rules For Replacement

- Warranty will only cover replacement of a temperature sensor if one of the DTCs in Yellow sections above is present.
- Standard Diagnostic Time for a Temperature Sensor 1.4 hrs.

Review the video link below

[EXHAUST GAS TEMP SENSOR](#)

 Tags

[p1151-00](#)

[p2428-00](#)

[p246f-64](#)

[p2084-64](#)

[p2080-64](#)

[p242b-64](#)

[p0545-00](#)

[p2471-00](#)

[p2470-00](#)

[mack](#)

[volvo](#)

[p242a-15](#)

[p2031-15](#)

[p0544-15](#)

[p2032-00](#)

[p242c-00](#)

[unlocking uptime](#)

Related links and attachments

[KC-2171 2581-03-02-06 REDUCED](#)

[KC-2171 2581-03-02-05 REDUCED](#)

[KC-2171 2581-03-02-07 REDUCED](#)



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 Live UI

A

DPF - Soot



B

SCR - Sulfur



C

Crystal Sublimation



2589-08-03-02 Exhaust Aftertreatment System, Service Regeneration

Simulation

Information >> Conditions >> Execution

Purpose

- Perform a service regeneration
- Check that the regeneration functions properly
- Prepare particulate filter for ash cleaning

Description

The regeneration selection is determined by an ECM request that determines which regeneration option that should be performed based on system conditions. If there is no request for regeneration from the Engine Control Module (ECM), regeneration can still be performed by manual selection.

Selections

Select the recommended regeneration type. If there is no recommended regeneration request from the Engine control module (ECM), select any of the regeneration types to be performed.

Reference	Status
	ECM request active
	ECM request inactive

- A - 2545-08-03-03 Diesel Particulate Filter Service Regeneration
- B - 2589-08-03-15 Aftertreatment Selective Catalytic Reduction (SCR), Regeneration
- C - 2585-11-03-03 SCR, Diesel Exhaust Fluid, Crystal Sublimation