Temperature Sensor Troubleshooting Guide -US10+OBD13 And Newer

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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 corollate 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.

https://volvo-trkna-prod1.pegacloud.net/prweb/PRAuth/app/VolvoKM_/iNPUIKpeinqPJi2G0hH930k43USdE1gb*/!TABTHREAD1?pyActivity=%40basec... 1/5

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DTC	Description		
	Exhaust Gas Temperature Sensor Circuit		
	Range/Performance Bank 1 Sensor 4		
P246F-64	NOTE: OBD19 & 20 Vehicle only, 1-Box SCR Follow TSB		
	DEF Crystallization, dosing valve, clean.		
D2004 64	Exhaust Gas Temperature Sensor Circuit		
P2084-64	Range/Performance (Bank 1 Sensor 2)		
D2000 64	Exhaust Gas Temperature Sensor Circuit		
P2080-64	Range/Performance Bank 1 Sensor 1		
P242B-64	Exhaust Gas Temperature Sensor Circuit		
FZ42B-04	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.

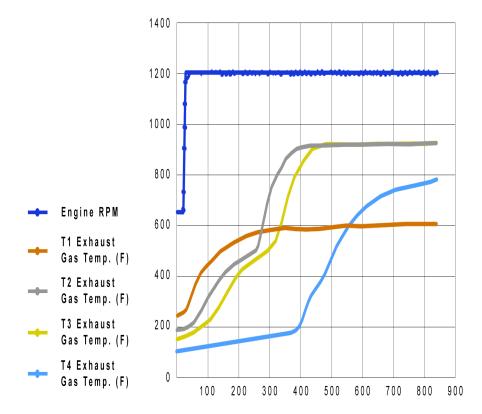
DPF Regeneration activation (Soot)	Alow the operation to continue until it is complete. When the process is complete the engine speed will return to normal ide speed. At his point, the engine should be alowed to on until the spetian has couled down 2-3 minute(s). $\dot{\psi}$ The progress bar may not start immediately when the engine speed increases; it can take several minutes due to the exhaust alterimetment system is not hot enough
Percentage completed (0 - 100 %)	± =
05	▲ Exhaust gas temperatures
 Ethatist gas temperatures	75 'F T1 Exhaust temperature (Exhaust Gas Temperature (EG T) Sensor) 72 'F T2 Exhaust temperature (Aftertreatment Diesel Particulate Filter (DPF) Intake Te 78 'F T3 Exhaust temperature (Aftertreatment Diesel Particulate Filter (DPF) Outlet Te 75 'F T4 Exhaust temperature (Aftertreatment SCR outlet temperature sensor)
05 65 -	
8 6 6 7	Exhaust Attentineatinent - Group 1
	Exhaust Aftertreatment - Group 2
	Exhaust Afterfraalment - Group 3
	v Engine-Group 1
	v Engine - Group 2
6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	• Engine - Group 3
0 25 50 75 100 125 150 175 200 225 250 275 300 325 310 375 400 425 450 475 500 525 500 575 500 [5]	• Engine - Group 4
	± ±
Exhaust Aftertreatment - Group 1	Restart the operation
	Contrue >

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.

Article



Exhaust Temperatures profile during Regenration from a cold engine

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

DTC	DESCRIPTION		
P242A-	Exhaust Cas Tomporaturo Sonsor Bank 1 Sonsor 3		
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-	Exhaust Gas Temperature Sensor Circuit Low (Bank 1 Sensor		
00	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		

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 - 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	a-15	p2031-15
p0544-15	p2032-00	p242c	-00	unloc	king 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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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	
0 ECM	request active	
© ECM ro	equest inactive	
A - 2545-08-03-03 Diesel Particulate Filter Service Regeneration B - 2589-08-03-15 Aftertreatment Selective Catalytic Reduction (SCR), Regeneration		

Chassis ID: M748 37585 VIN: 1M2AX07C9JM037585 Work Order: 9999



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^{*} C - 2585-11-03-03 SCR, Diesel Exhaust Fluid, Crystal Sublimation