Aftertreatment Hydrocarbon Injector (AHI) Troubleshooting Guide - US10+OBD13 And Newer Emissions

The Aftertreatment Hydrocarbon Injector (AHI) System is a component of the Emissions Aftertreatment System that monitors and controls fuel injection into the Diesel Oxidation Catalyst (DOC) to regenerate the Diesel Particulate Filter (DPF). The system is made up of 3 primary components: The AHI Module, Fuel and Air Lines, and the AHI Nozzle (7^{th} Injector).

In addition to this document, Service At A Glance should be consulted for approved service intervals for all fluids, filters, and other consumables. Note that the AHI Nozzle is a consumable component that should be replaced at 150,000 miles or 4500 engine hours.

AHI Module

The AHI Module for model year 2017 and newer trucks is built into the fuel filter housing. In older vehicles, it was mounted to the side of the engine block. Despite the different configuration, the functionality is the same and the module's primary job is to control the amount of fuel and air to the nozzle.

There are 3 primary failure modes of the AHI Module (Dosing Block):

- Contaminated Air Supply
- Contaminated Fuel Supply
- Electrical Circuit fault

Any AHI Module failure from air or fuel is primarily due to system contamination. The AHI module is susceptible to debris and oil from the upstream systems. It is imperative that when replacing the AHI Module that the fuel and air system are adequately evaluated.

Diagnosis And Repair

- Perform a DTC Readout using Premium Tech Tool.

- Locate any relevant codes in the fault tables below, then follow the ions listed below the charts to evaluate the relevant system(s).

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- **ONLY** Active codes or codes with DTC Status showing as "Confirmed" should be diagosed.

- If there are no Active or Status Confirmed DTCs and the vehicle will not successfully complete a regen, proceed to the AHI Nozzle Evaluation section.

Air And Fuel Supply Faults

DTC	Fault Description	System To Evaluate
P24F700	Exhaust Aftertreatment Fuel Air Purge Valve Stuck Closed	Air Supply & AHI Module
P24F600	Exhaust Aftertreatment Fuel Air Purge Valve Stuck Open	Air Supply, AHI Nozzle, & AHI Module
P20DC00	Exhaust Aftertreatment Fuel Supply Control Stuck Closed	Fuel Supply, AHI Module
P20CF7A	Exhaust Aftertreatment Fuel Injector "A" Stuck Open	Fuel Supply, AHI Module
P20D000	Exhaust Aftertreatment Fuel Injector "A" Stuck Closed	Fuel Supply, AHI Module
P20DE00	Exhaust Aftertreatment Fuel Pressure Sensor Circuit Range/Performance	Fuel Supply, AHI Module, AHI Pressure Sensor

Air System Evaluation

- Replace the following components:

  - Air Regulator
  - Air Dryer Cartridge/Filter (A proper oil coalescing filter/cartridge MUST be used)

- Ensure the air tanks are properly drained

- Clean the air supply line to the AHI module

Fuel System Evaluation

Live UI ıce the fuel filters with OEM or OEM approved parts

• Visually check the fuel condition and ensure there is no debris or contamination in the fuel tanks.

Electrical Faults

DTC	Fault Description	System To Evaluate
P269A00	Exhaust Aftertreatment Fuel Injector "A" Circuit High	AHI Module connection or wiring harness
P269900	Exhaust Aftertreatment Fuel Injector "A" Circuit Low	AHI Module connection or wiring harness
P269713	Exhaust Aftertreatment Fuel Injector "A"	AHI Module connection or wiring harness
P20DD00	Exhaust Aftertreatment Fuel Pressure Sensor	AHI Pressure Sensor Connector or wiring harness
P20E000	Exhaust Aftertreatment Fuel Pressure Sensor Circuit High	AHI Pressure Sensor Connector or wiring harness
P20D713	Exhaust Aftertreatment Fuel Supply Control	AHI Module connection or wiring harness
P20DA00	Exhaust Aftertreatment Fuel Supply Control Circuit High	AHI Module connection or wiring harness
P20D900	Exhaust Aftertreatment Fuel Supply Control Circuit Low	AHI Module connection or wiring harness
P24F813	Exhaust Aftertreatment Fuel Air Purge Valve Control Circuit	AHI Module connection or wiring harness
P24FA00	Exhaust Aftertreatment Fuel Air Purge Valve Control Circuit Low	AHI Module connection or wiring harness
P24FB00	Exhaust Aftertreatment Fuel Air Purge Valve Control Circuit High	AHI Module connection or wiring harness

AHI Nozzle

The AHI Nozzle (sometimes called the 7th injector) is mounted on the [Live UI] located directly on the outlet of the turbocharger turbine housing. The 7th injector atomizes fuel going into the exhaust stream.

The 4th injector atomizes fuel going into the exhaust stream. Some versions of the nozzle also regulate the amount of fuel being injected.

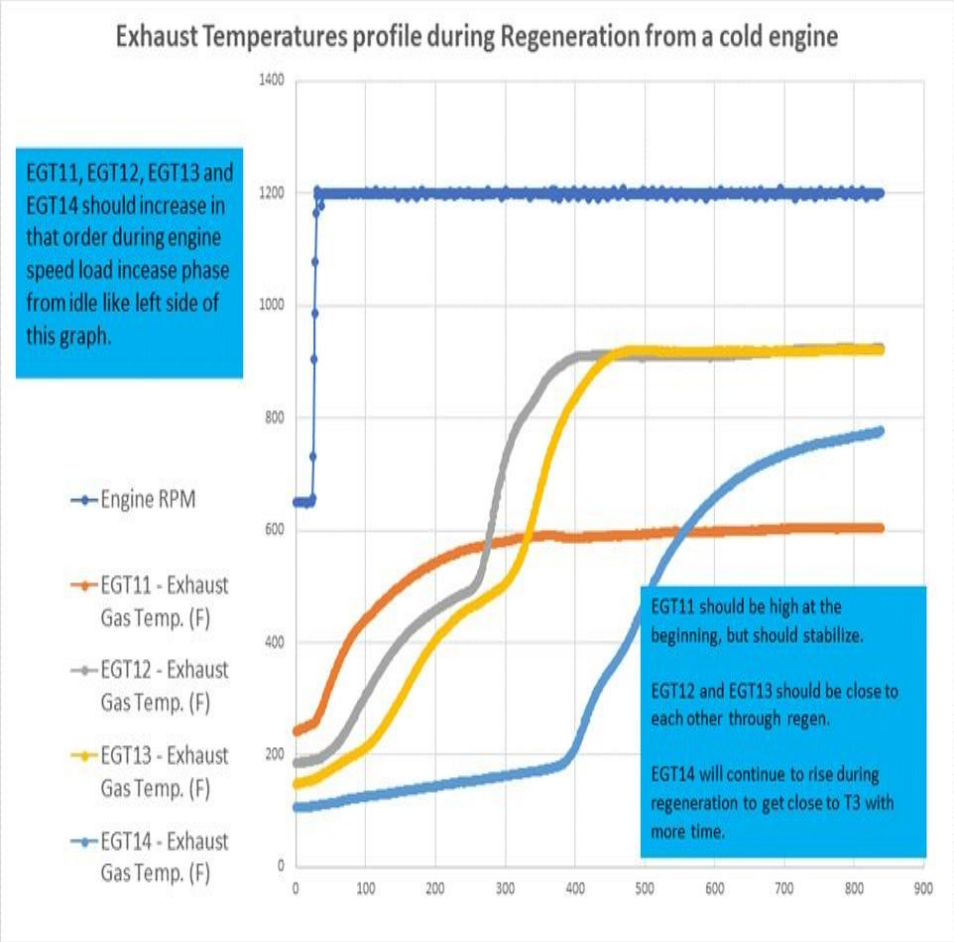
The primary failure mode of the AHI Nozzle is a clogged/plugged nozzle tip. A complaint of failed regens or constant request of regen is a common associated complaint. If the AHI Nozzle is clogged, it will either not inject a sufficient amount of fuel into the exhaust, or it will not properly atomize the fuel to distribute it evenly throughout the DOC. Both of these conditions will not produce the required temperatures for a successful regen.

AHI Nozzle Evaluation

• Check the Adaptive Factor for the AHI system by using operation 2545-08-03-02 Exhaust Aftertreatment Diagnostics, Options C in Premium Tech Tool.

- **If the Adaptive Factor is higher than 1.2:**
  - Replace the AHI Nozzle
  - Reset the Adaptive Factor using the option in PTT
  - Run a Service Regeneration. Ensure that the temperature graph looks similar to the one in the image below.
- **If the Adaptive Factor is lower that 1.2:**
  - The AHI nozzle is NOT the likely cause of the failed regeneration. Symptom Based Diagnostics in PTT should be followed from this point.

Live UI



Tags

mack p24f700 p20dc00 p20de00 p20e000 p20d713 p24fb00 p24f600 p20cf7a p20d000 p269a00 p269900 p269713 p20dd00 p20da00 p20d900 p24f813 p24fa00 volvo ahi module

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Related links and attachments

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Tech Tool

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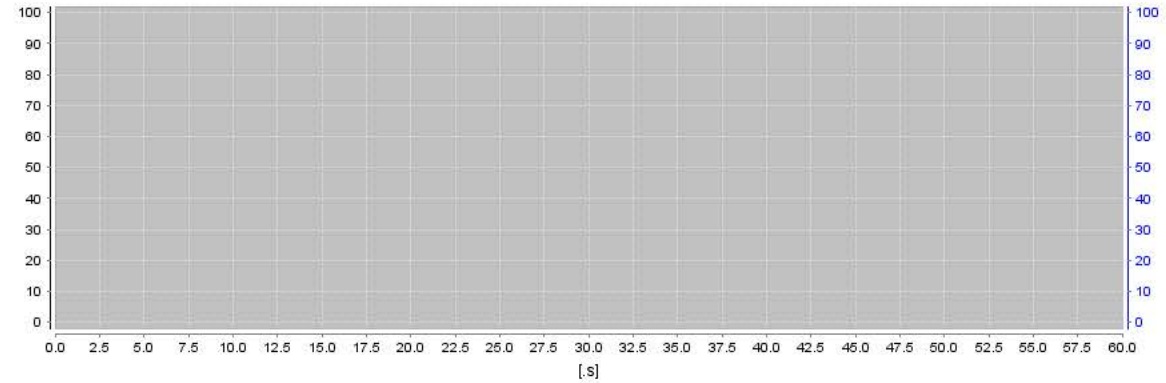
Product | **Product History** | **Diagnose** | **Test** | **Calibrate** | **Program** | **Impact**

Pressure sensor



Exhaust gas temperature sensor

Other sensors

2545-08-03-02 Exhaust Aftertreatment Diagnostics

Simulation

Information >> Conditions >> **Execution**

Service information can be found at the following link(s):

Intake and exhaust system, Function description

Action

- Ignition Key ON and Engine OFF
- Read out the status of the operating conditions
- Start the engine
- Check that all signals and values are stable and without abnormal deviations
- Check that all signals are displaying realistic values according to the actual conditions

Pressure sensor

0 psi	**Aftertreatment Fuel Pressure**
0.7 psi	**DPF Differential pressure**

Exhaust gas temperature sensor

Other sensors

Test result

Select one of the following alternatives

Continue >

Chassis ID: M763 19305 VIN: 1M2AV07C0JM019305 Work Order: 0000

Product Online

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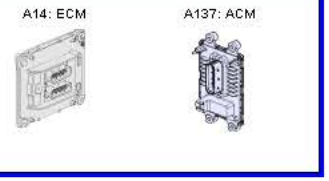
A



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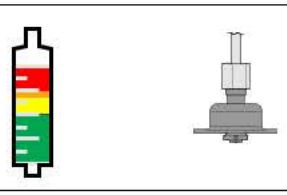

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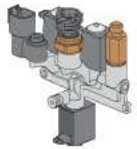

2545-08-03-02 Exhaust Aftertreatment Diagnostics

Simulation

Information >> Conditions >> Execution

Purpose

Check the function of the exhaust aftertreatment system (DPF)

Ash and soot level reset

Description

This operation allows monitoring of system conditions, activation of components and reset of system values

Selections

Select the illustration corresponding to the method or test to be performed

A

Sensor Values, Monitoring

B

Aftertreatment hydrocarbon doser air flow test

C

DPF System Reset

- AHD Adaptive Factor
- Soot Level

D

Active Diagnostics Test

- The "Active Diagnostics Test" is self-test of the dosing control system
- Aftertreatment Hydrocarbon Dosing Module

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