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Author: Caleb Iverson

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Coding Information

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Title: 2659-10 EGR Slow Response Diagnostics

Applies To: EPA 10 N13B Engines

CHANGE LOG

Please refer to the change log text box below for recent changes to this article:

02/09/2017 - Updated Step 2, added calibration identification information.
 08/16/2016 - Updated Step 2 to perform calibration update.
 03/29/2016 - Updated SRTs
 03/09/2016 - Updated Diagnostics Step Error
 03/04/2016 - Updated SRT section

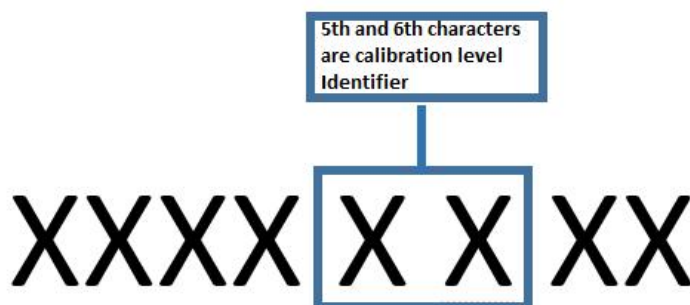
N13B Visual Identification (see image below)

N13B Identification by ESN 4400001 and up



DESCRIPTION

This document is intended to provide updated diagnostics for fault code SPN 2659 FMI 10 in N13B engines. This document will also guide through decoding the calibration level and identifying if the calibration is up to date.



This document temporarily replaces : 2659-10 Diagnostics in Diagnostic Manual 0000004601.

SYMPTOM(s)

Diagnostic Trouble Code(s) & Dashboard Indicator Light(s):

DTC/Light	Description
SPN 2659 FMI 10 (link to FCAP)	EGR Slow Response

Customer Observations or Concerns:

Malfunction Indicator Lamp (MIL) and inactive, active or pending fault SPN 2659 FMI 10.

SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
Electronic Service Tool		Any EST with ServiceMaxx Software	

DIAGNOSTIC STEP(s)

Fault Overview

Fault code sets when Engine Control Module (ECM) detects feedback from Oxygen Sensor (O2S) indicating oxygen levels in exhaust are responding too slow to Exhaust Gas Recirculation Valve (EGRV) movement commands.

Lamp Reaction

Malfunction Indicator Lamp (MIL) will illuminate when this fault is detected during two consecutive drive cycles.

Associated Faults

SPN 27 (EGR) ; SPN 724 (02S) ; SPN 2659 FMI 20 and 21 (AMS), SPN 2791 (EGR).

Fault Facts

None

Drive Cycle to Determine Fault Status

Road Test

Possible Causes

- Soot build-up on EGRV
- Failed EGRV
- Soot build-up in EGR Cooler

 WARNING:	
To prevent property damage, personal injury, and / or death, ensure key is in the ON position, and the engine OFF position during testing.	

 WARNING:	
To prevent personal injury and / or death, read all safety instructions in the "Safety Information" section of the Service / Diagnostic Manual prior to performing procedures.	

CAUTION:	
To prevent property damage, engine / component damage, ensure key is in the ON position, and the engine OFF position during testing.	

Step	Action	Decision
	DIAGNOSTIC: Use Electronic Service Tool (EST) with ServiceMaxx™ software, check Diagnostic Trouble Codes (DTC) list for Associated Faults .	Yes. Go to Step 2.
1	Is EST DTC list free of Associated Faults?	No. Repair Associated Faults. After repairs are complete, retest for SPN 2659 FMI 10.

Step	Action	Decision
2	DIAGNOSTIC: Check to see if Calibration is up-to-date. Current Calibration for: 250K = KE - has 2659-10 fix 500K = KF - has 2659-10 fix Is the ECM Calibration up-to-date? 5th and 6th characters are calibration level Identifier XXXXX X X XX 250K Example: OSEA K MC = OUT OF DATE OSEA K EMB = UP TO DATE 500K Example: OUAX K DMA = OUT OF DATE OUAX K FMB = UP TO DATE	Yes. Go to step 3.
		No. Reprogram ECM and retest.

Step	Action	Decision
3	DIAGNOSTIC: 1. Key off. 2. Disconnect EGR Valve connector 3. Check EGR Valve and connector terminals for: damage or pinched wires; moisture or corroded terminals; loose, bent or broken pins; or broken connector housing. Are EGRV connector, harness, and terminals clean and undamaged?	Yes. Go to Step 4.
		No. Repair connector, harness, or terminal. After repairs are complete, retest for SPN 2659 FMI 10.

Step	Action	Decision
4	DIAGNOSTIC: Remove EGR cooler bellow tubes (see <i>Engine Service manual</i>). Perform EGR Valve Position Test and inspect for shaft and bore for soot build-up blocking EGRV movement. Verify EGRV can meet commanded position.	Yes. Clear codes and release the vehicle.
	Perform EGR Valve Position Test . (see below)	No. Replace EGRV. After repairs are complete, retest for SPN 2659 FMI 10.
	Does EGRV meet expected outcome of test?	

2 ENGINE SYSTEM TESTS AND INSPECTIONS

2027

EGR Valve Position Test

Overview

Determine if Exhaust Gas Recirculation Valve (EGRV) can meet commanded position and if it is sticking due to debris or carbon build-up.

Tools Required

- Electronic Service Tool (EST) with ServiceMaxx™ software
- Interface cable (RP1210B-compliant supporting J1939 and J1708)

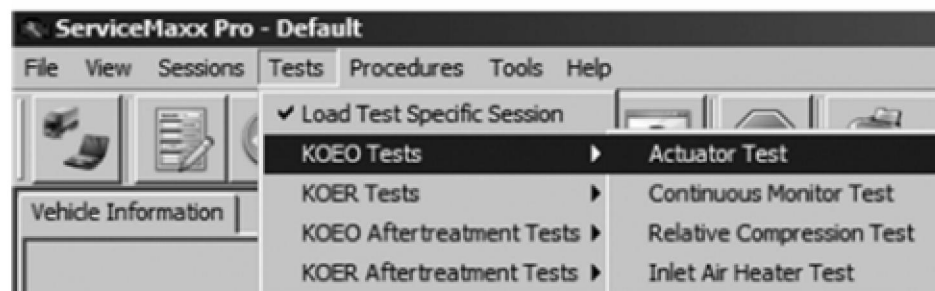
Equipment Condition

1. EGRV heat protection shield removed (see *Engine Service Manual*).
2. Front EGR bellows (between EGR cooler and EGRV) removed (see *Engine Service Manual*).

Test Setup

1. Key-On Engine-Off (KOEO)
2. Connect Electronic Service Tool (EST) to Vehicle Diagnostic Connector and launch ServiceMaxx™ software. (page 2010).

Test Procedure



0000358121

Figure 811 Selecting Actuator Test

1. Select Tests: KOEO Tests > Actuator Test. Follow on-screen instructions.



2. From the actuator control panel (Figure 812) select EGR Position and set duty cycle to 95%.
3. Press the Start Test button and monitor the EGR Position (EGRP) signal to see if EGRV can meet commanded position.
4. After monitoring EGRP signal, set desired delay time to run actuator test again and visually monitor EGRV movement.
5. Verify duty cycle is at 95% and press the Start Test button.
6. With front EGR bellows (between EGR cooler and EGRV) removed, monitor EGRV movement. Check for debris and carbon build-up in EGRV.
7. Repeat steps 2–6 with duty cycle set to 15% in steps 2 and 5.

EGRV position will meet ServiceMaxx™ commanded position, movement of EGRV can be seen, and no debris or carbon build-up restricting EGRV movement.

None

Not Applicable

INSTALLATION PROCEDURE:**Not Applicable****WARRANTY INFORMATION****Warranty Claim Coding:**

Group:	12000 - Engines
Noun:	893 - Valve, EGR

Claim SRT Example:**Claim Comment Suggestion:****Special Requirement(s):****OTHER RESOURCES**[Master Service Information Site](#)

 Hide Details		Feedback Information	
		Viewed:	6221
		Helpful:	26
		Not Helpful:	2
Staff ID	Client ID	Comments	Created Date
	DY21044	You received the following feedback From: dy21044 - Gordon Skiffington Email Address: gordon.skiffington@eastcoastint.com Job Classification: SE008, Service Technician Dealer: EAST COAST INTL TRKS INC Feedback: I regularly see 2 issues not addressed in the FCAP / Diagnostics with respect to EGRV slow or not meeting commanded - First is that I'll often get a truck in with the code inactive, run the EGR actuator test repeatedly and it responds every time at whatever percent I choose, but the freeze-frame of the event, when viewed, shows that the problem happened on the highway when the engine was up to temp and running max load/power - the difference is big between EGRV commanded and position - and so I put a new valve in due to "binding when hot"....visual inspection on removal often is inconclusive. The other issue is that sometimes when running the actuator test, even on a new valve with no circuit issues (tested just for comparison), ServiceMaxx doesn't report the response but no code is set.....I'll see commanded but no or slow response....and this doesn't inspire confidence in the test - Is the new valve bad or is it a glitch in ServiceMaxx etc?	2/10/2017 11:34:55 AM

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