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Coding Information

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Title: Calculating MAF Value Difference for SPN 2659 With Calculator

Applies To: A26

CHANGE LOG

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

10/24/2018 - Initial Article Release
11/6/18 - Fixed links to 2659 FCAPs

DESCRIPTION

This document is supplemental for the A26 FCAP 2659 10, 16 and 18 and will guide the user through calculating the Mass Air Flow (MAF) decrease as percentage as outlined in Step 3 of the FCAP. Included are instructions, calculator and matrix of acceptable values for MAF decrease during Air Management Test (AMT) when comparing MAF value with EGR Valve Closed and EGR Valve Open.

SYMPTOM(s)

Diagnostic Trouble Code(s)

DTC	Description
SPN 2659-10	Engine Exhaust Gas Recirculation 1 Mass Flow Rate : Abnormal Update Rate
SPN 2659-16	Engine Exhaust Gas Recirculation 1 Mass Flow Rate : Data Valid But Above Normal Operating Range
SPN 2659-18	Engine Exhaust Gas Recirculation 1 Mass Flow Rate : Data Valid But Below Normal Operating Range

Customer Observations or Concerns:

MIL Lamp
Low power

SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
Navistar Engine Diagnostics (NED)			

[Tools Resource Center](#)

SERVICE PARTS INFORMATION

N/A follow FCAP

DIAGNOSTIC STEP(s)

This is supplemental diagnostics for FCAP 2659 - 10, 16 and 18 Step 3:

Step 3	Verify Mass Air Flow (MAF) changes when Exhaust Gas Recirculation Valve (EGRV) is commanded ON.	Decision
Perform Air Management Test .		Yes: End diagnostics, retest for SPN 2659 FMI 10.
Does MAF signal decrease when EGR valve is 100% during test?		No: Go to Step 4.

Below are instructions for determining the acceptable MAF Decrease percentage in Step 3.

1. Record the required Air Management Test as outlined in Step 3.
2. Be sure to stop the recording when the AMT has completed.

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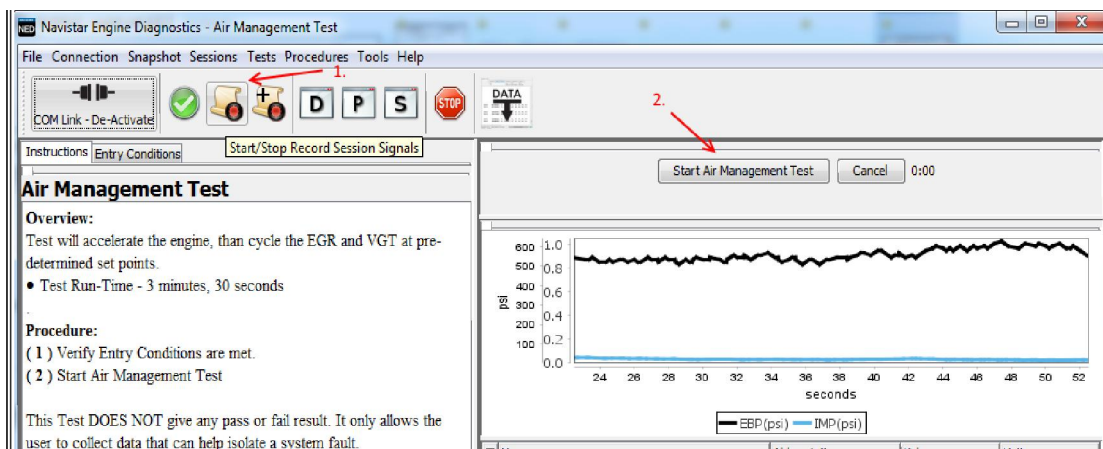


Figure 1: Air Management Test - NED

Item 1: Click the Record Button

Item 2: Click the Start Air Management Test Button

Analyzing the AMT Snapshot :

3. Open the recorded AMT snapshot using NED - Top Menu > Snapshot > Playback Snapshot Recording : Figure 2

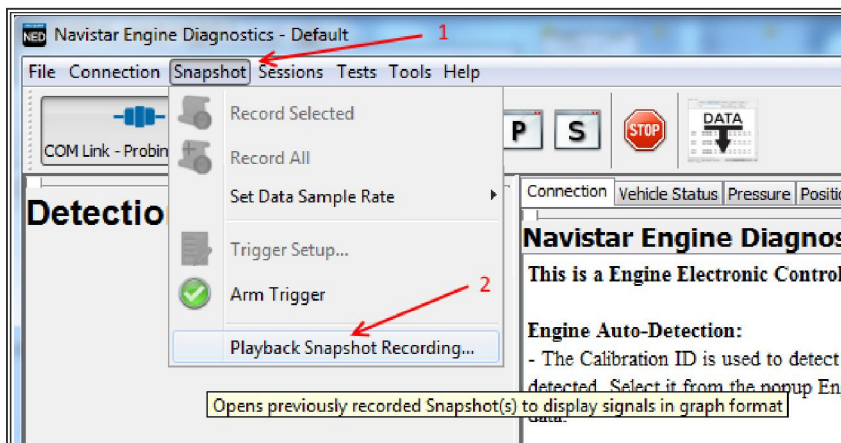


Figure 2: Playback AMT Snapshot using NED

Item 1: Top Menu - Snapshot

Item 2: Playback Snapshot Recording

4. Select the AMT snapshot recording: Figure 3



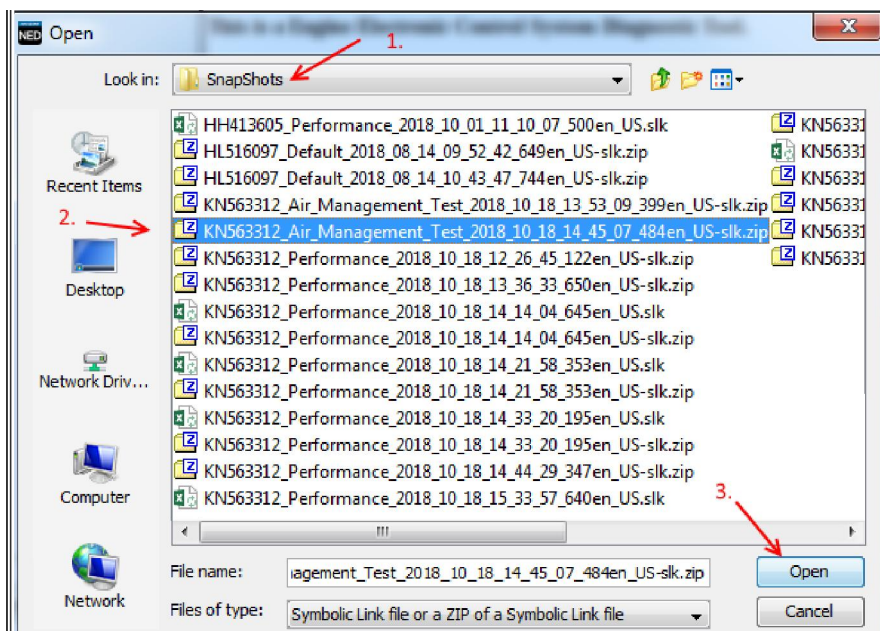


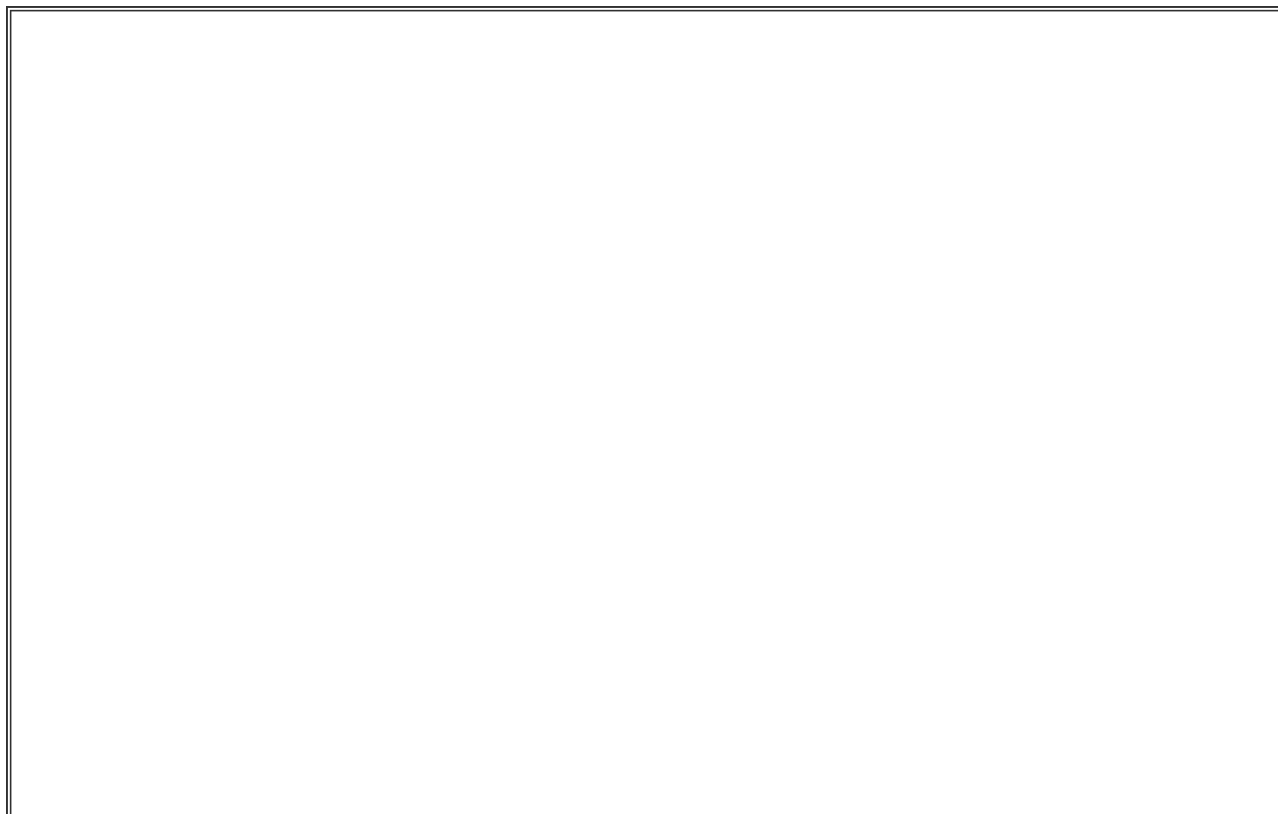
Figure 3: Select AMT Snapshot

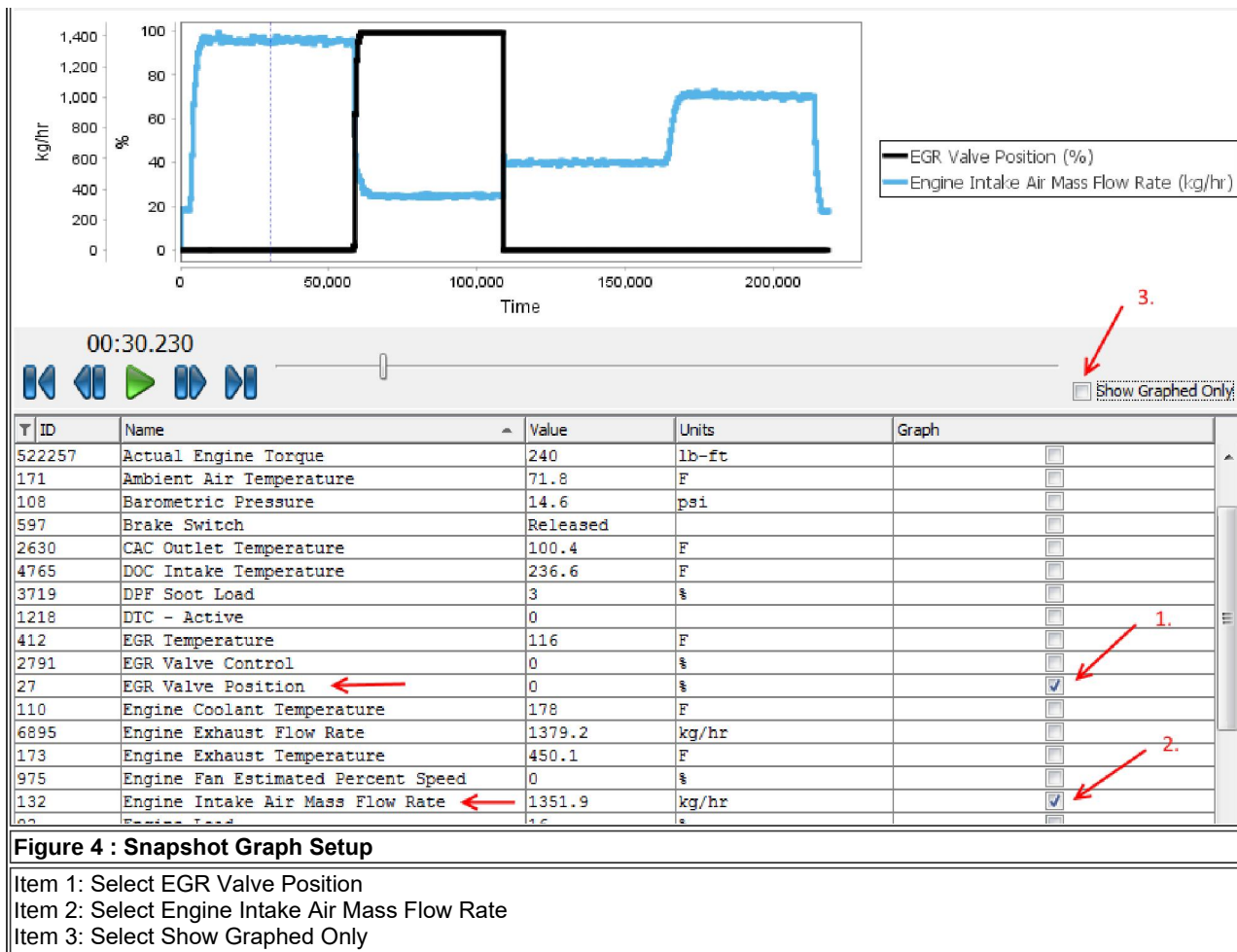
- Item 1: Select AMT Snapshot Location Folder
Item 2: Select AMT Snapshot File
Item 3: Click Open

5. Select from the list 2 signals for graphing : Figure 4

- EGR Valve Position
- Engine Intake Air Mass Flow Rate

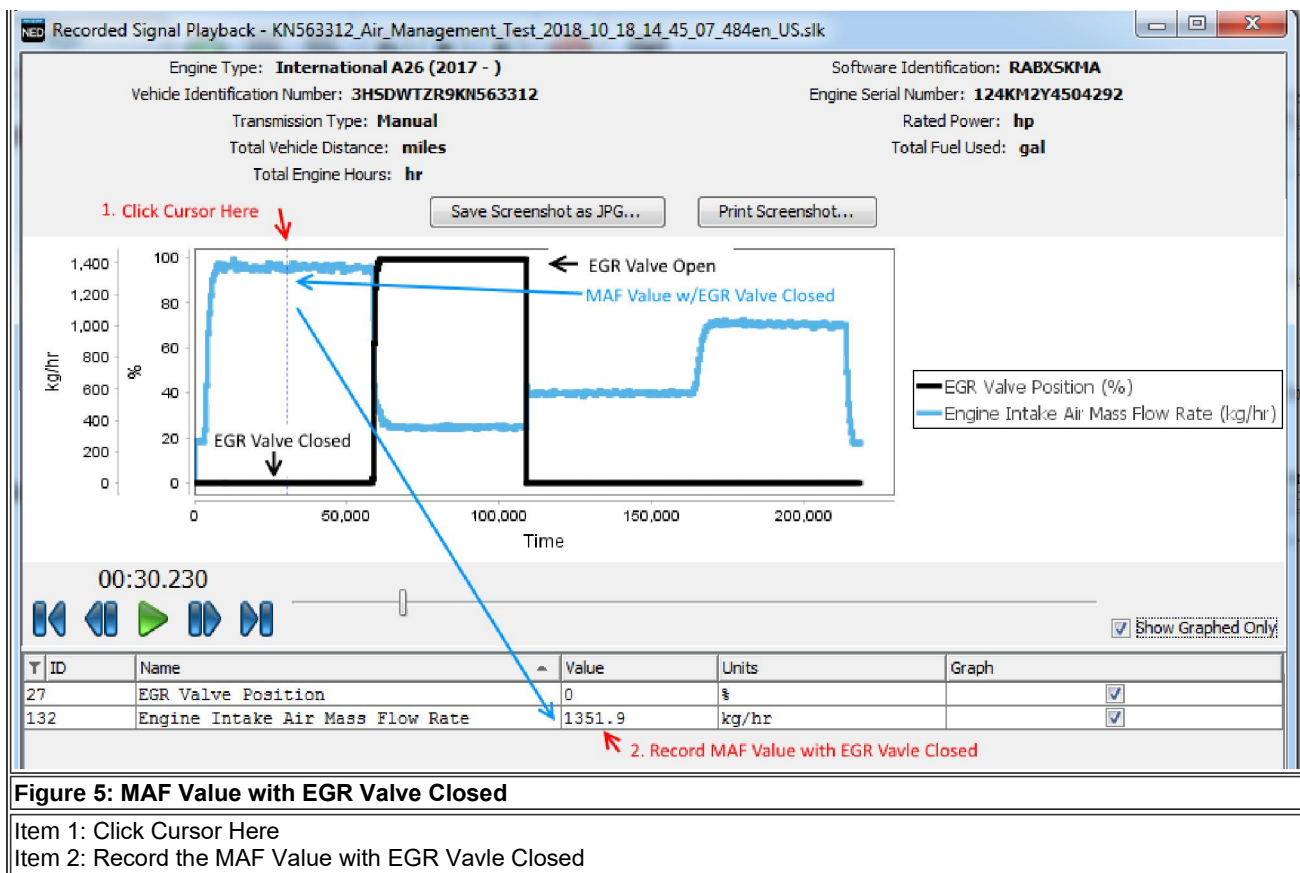
6. Select: Show Graphed Only box





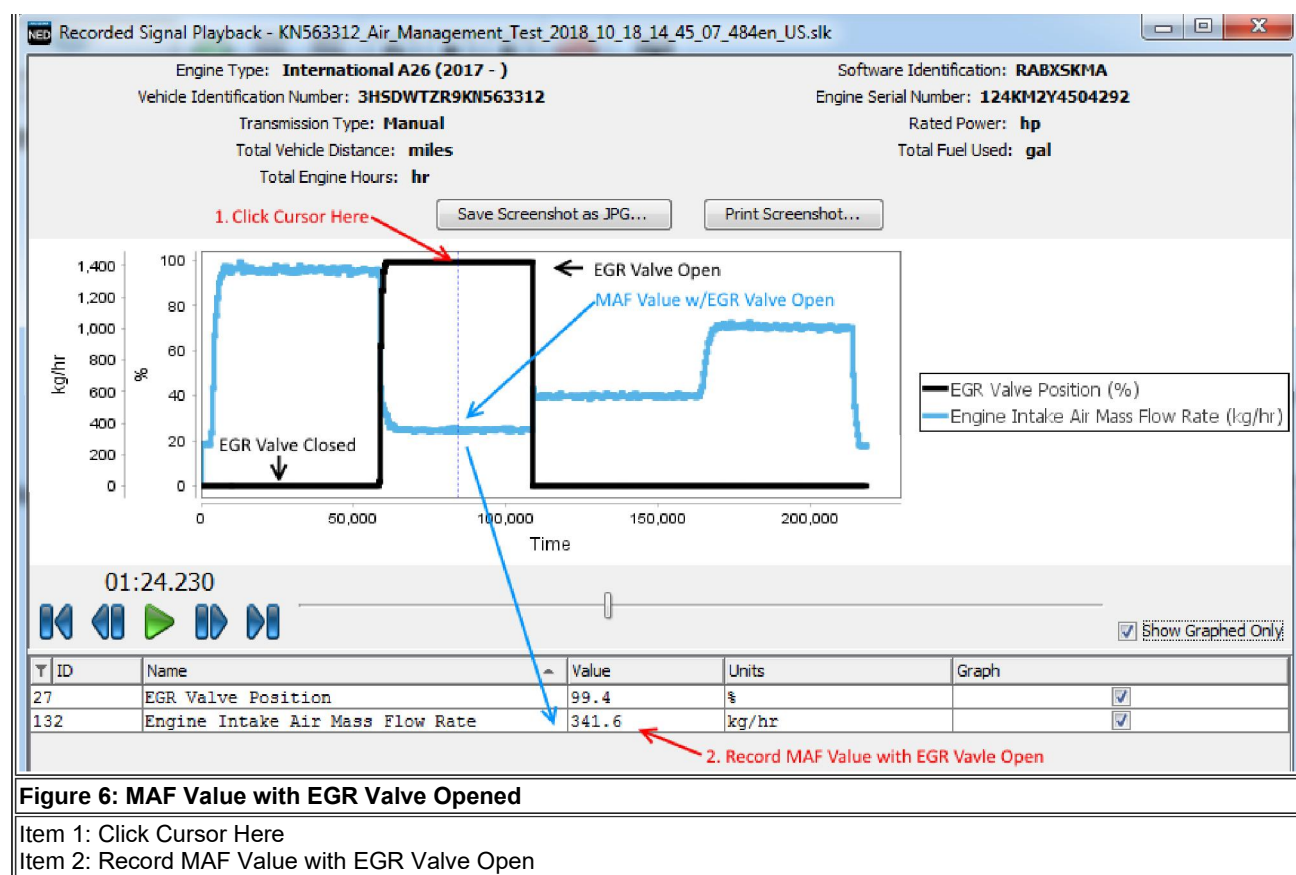
7. Click your cursor in the middle of the MAF line while the EGR Valve was Closed as shown in Figure 5

8. Record the MAF value (Intake Air Mass Flow Rate) . This is the total Mass Air Flow (MAF) value with the EGR Valve closed



9 . Click your cursor in the middle of the MAF line while the EGR Valve was Open as shown in Figure 6

10. Record the MAF value (Intake Air Mass Flow Rate) . This is the total Mass Air Flow (MAF) value with the EGR Valve Open



Calculating MAF Value difference with EGR Valve Closed and EGR Valve Opened:

11. Using your 2 recorded MAF values, 1. MAF with EGR Valve Closed and 2. MAF with EGR Valve Open

12. Use this formula to calculate the difference in percentage or use the calculator below :

Using recorded values from example :

MAF value with EGR Closed = 1351

MAF value with EGR Valve Open = 341

$(\text{MAF with EGR Valve Closed} - \text{MAF with EGR Valve Open}) / \text{MAF with EGR Valve Closed} \times 100 = \text{MAF difference in percentage}$

Shown with values from example: $(1351 - 341) / 1351 \times 100 = 75\%$ (rounded)

MAF Difference Calculator :

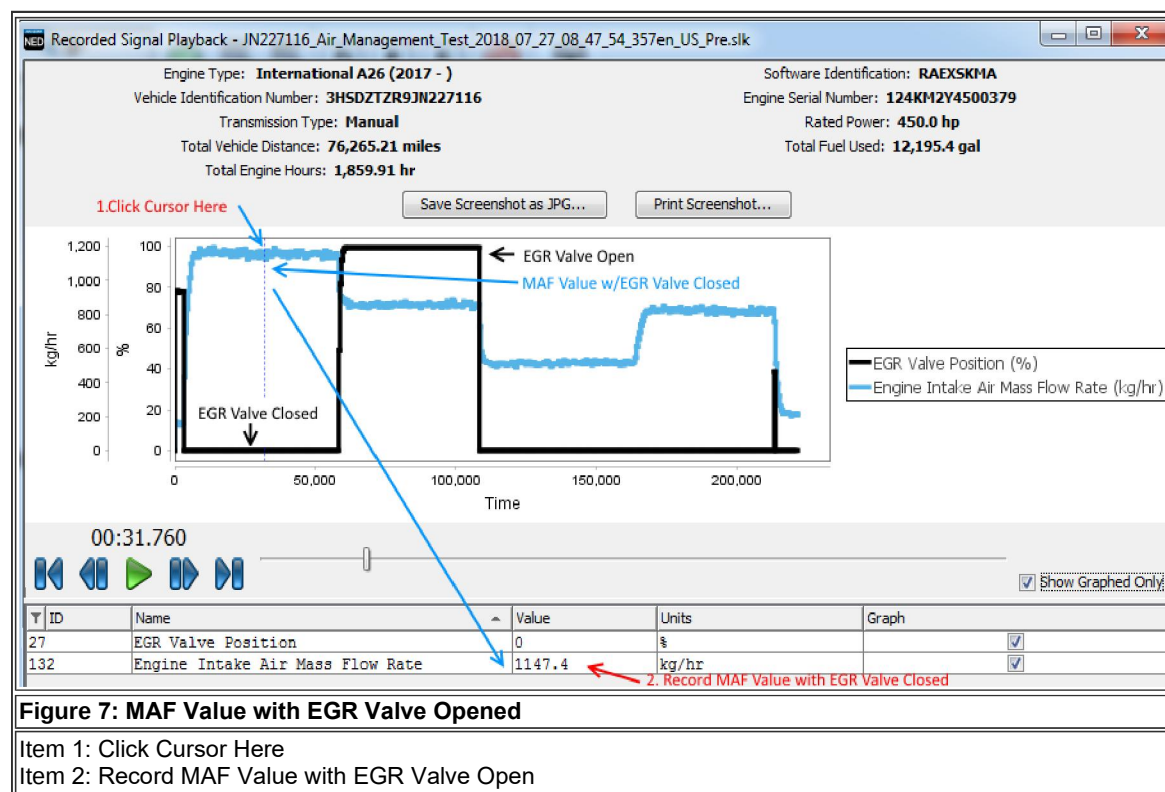
Enter MAF Value EGR Valve Closed	
Enter MAF Value with EGR Open	
MAF Decrease with EGR Open %	
Calculate	

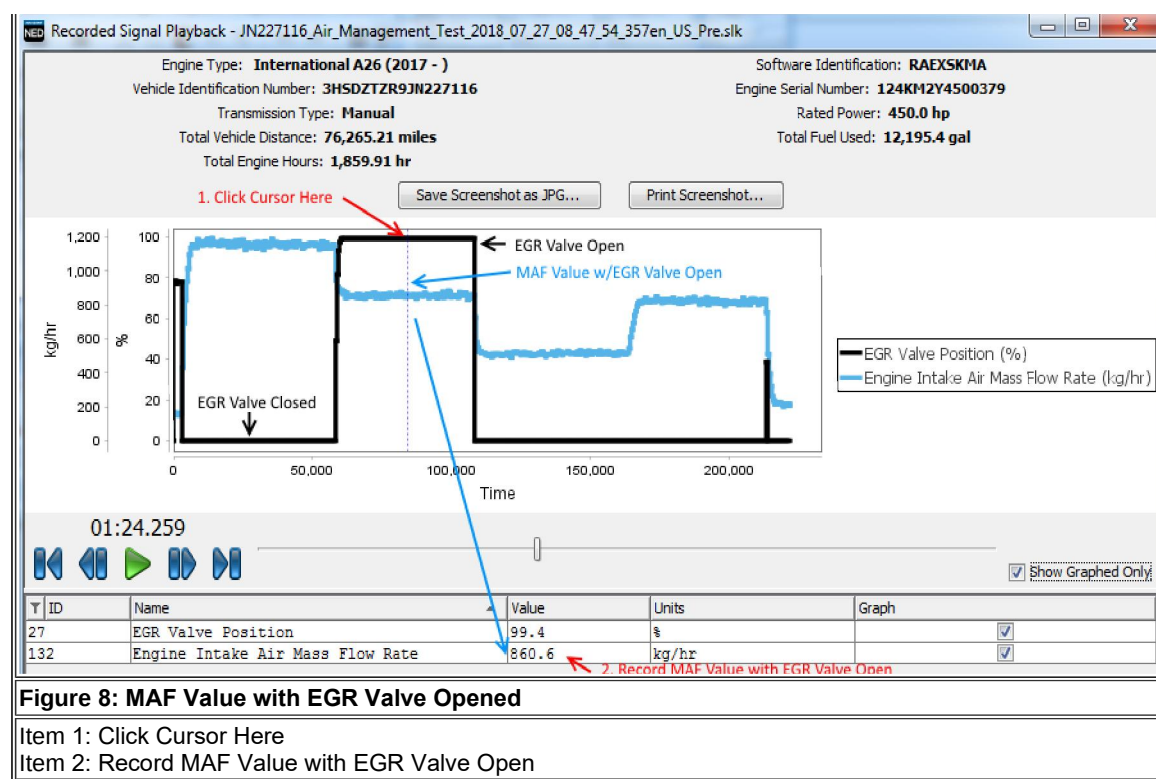
13. Use the scale below to determine if the decrease in MAF when the EGR valve is open is within specifications.

MAF Decrease with EGR Valve Open	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%
	Check EGR Valve and EGR Cooler						MAF within specifications			
Answer to Step 3:	No: Go to Step 4						Yes : End Diagnostics, Retest for SPN 2659			

14. Calculated MAF difference (decrease) when the EGR valve is opened is expected to be greater than 60% .
15. Calculated values below 60% could be an indication of an EGR valve mechanical issue and /or soot deposits either in the EGR valve or in the inlet of the EGR cooler causing restricted EGR flow .
- 16 . Please follow FCAP steps after making the determination if the MAF difference (decrease) is within specifications.

Below is an example where the calculated MAF difference is below specifications and would require further inspection of the EGR Valve and EGR Cooler: :





MAF value with EGR Valve Closed = 1147

MAF value with EGR Valve Open = 860

Shown with Values from example: $(1147 - 860) / 1147 \times 100 = 25\%$ (rounded)

REPAIR STEP(s)

N/A

WARRANTY INFORMATION

Warranty Claim Coding:

Refer to the [Warranty Coding Manual](#) for Group and Noun Codes.

Standard Repair Time(s):

Refer to the [SRT Manual](#) for Repair Times

OTHER RESOURCES

[Master Service Information Site](#)

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