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Title: CPA BEAM RCT and Idle Test for A26 engine

Applies To: A26 engine

CHANGE LOG

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

04/29/2021 - Updates to support misfire diagnostics
 03/11/2019 - Improved breakout harness ID
 01/03/2019 - Initial Article Release

DESCRIPTION:

This document describes the process for utilizing the Cylinder Performance Analyzer Base Engine Analysis Module (CPA BEAM) tests for the A26 engine

CPA BEAM Tests Apply To:

Engine Platform	Emission Year	Engine Model
Big Bore	2017-2021	A26

Note: Software must always be current. Refer to the [CPA Resource Article](#)

SYMPTOMS:

For proper diagnostics follow the appropriate engine diagnostic manual for step by step instructions

Symptom
High Blow-By
Low Compression
Hard Start
Engine noise or knock
Suspected bent rod
Oil Carry-Over at Road Draft
Low Power
Oil Consumption
Misfire & misfire faults
Engine runs rough

SPECIAL TOOL(s) / SOFTWARE:

- Tools required for component removal: Refer to the appropriate engine service manual
- To perform CPA BEAM Tests properly, the following tools are required:

Tool Description	Quantity	Tool Number	Comments

EZ-Tech	1		Navistar Engine Diagnostics and CPA software must be installed
RP1210 Communication Device	1		Nexiq
CPA Module	1	OE-11178 / 12-999-01-01	
CPA extension harnesses	3	12-999-01-05	
CPA to Banana jack leads	3	12-999-01-06	
180 Pin breakout box	1	00-00956-08	
E1 ECM breakout harness	1	12-801-05-03	and overlay -04

[Tools Resource Center](#)

CPA BEAM DESCRIPTION:

CPA BEAM is a family of tests that accurately measures base engine performance

BEAM Test	Description	Engine Platform Application	Notes
Idle Test (misfire)	Measures each cylinder contributions at steady RPM. Idle speed to 1200 RPM.	A26	Do not use cruise switches to hold engine RPM, use the throttle pedal. Hold at RPM that the engine runs the worst . Repeat test several times & compare results
Relative Compression Test (RCT) Note- It is not practical to perform RCT+ on an A26 UNLESS it has a 2 cylinder compressor (RCT+ uses the Pressure+ Module)	Measures compression per cylinder	A26	Perform with engine warm (if possible)

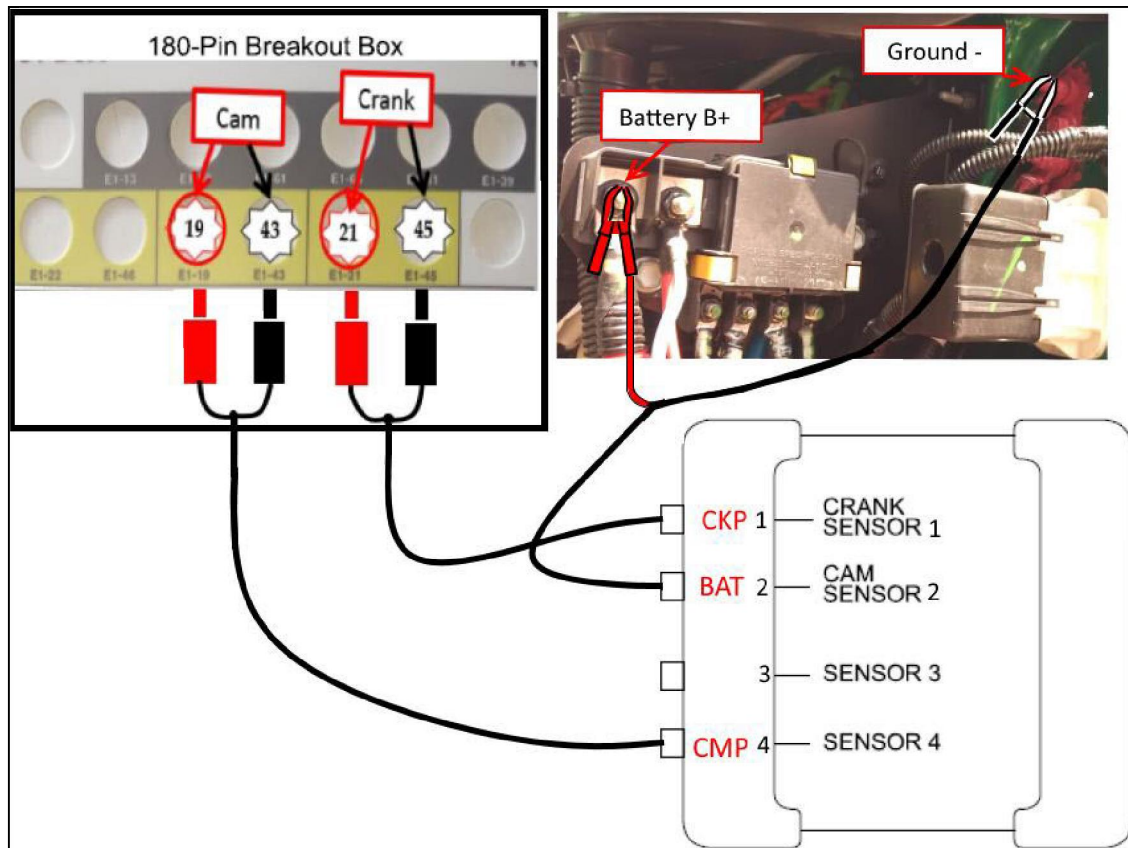
Equipment Condition

1. Verify engine coolant temperature is > 150°F (65°C). If engine does not start the RCT test may still be performed.
2. Verify battery voltage is > 12.5 volts.

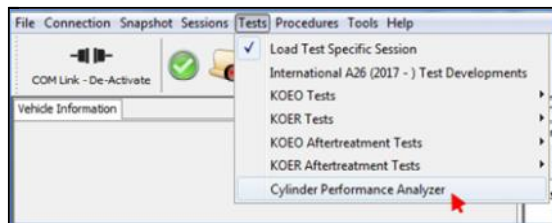
NOTE : Disconnect battery charger before beginning tests.

CPA Module Connections

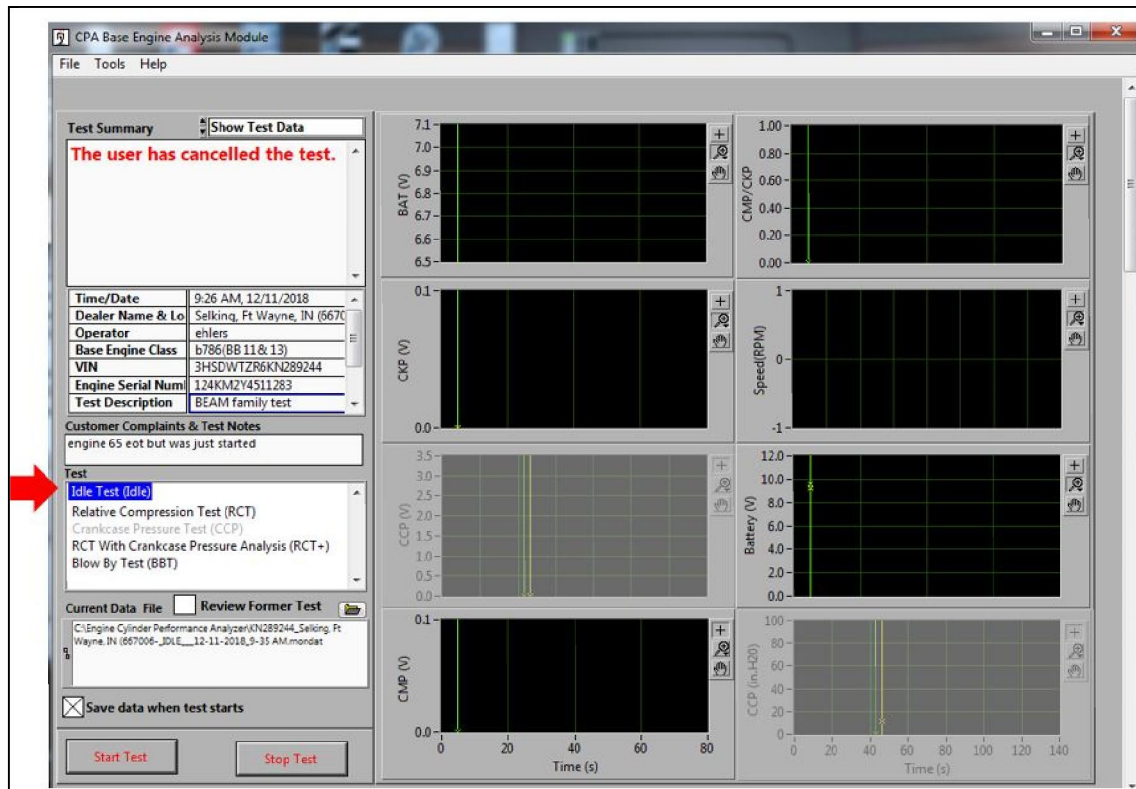
1. Connect CPA module 12-999-01-01 to Electronic Service Tool (EST).
2. Connect E1 Breakout harness 12-801-05-03 between ECM and engine harness. Use Overlay 12-801-05-04
3. Connect CPA extension harness 12-999-01-05 and CPA to Banana Jack leads (12-999-01-06 or 12-999-01-08) to Channel 1 of CPA tool. Connect the RED lead to pin E1-21 and the black lead to pin E1-45 on the Breakout box.
4. Connect CPA extension harness 12-999-01-05 and CPA to Banana Jack leads (12-999-01-06 or 12-999-01-08) to Channel 4 of CPA tool. Connect the RED lead to pin E1-19 and the black lead to pin E1-43 on the Breakout Box



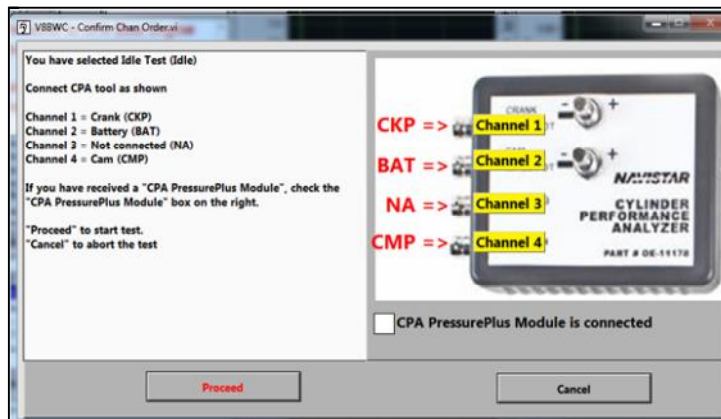
- It is recommended to perform the BEAM **Idle Test** first and then the **RCT** test.
- Launch CPA from **NEDs** as shown below:



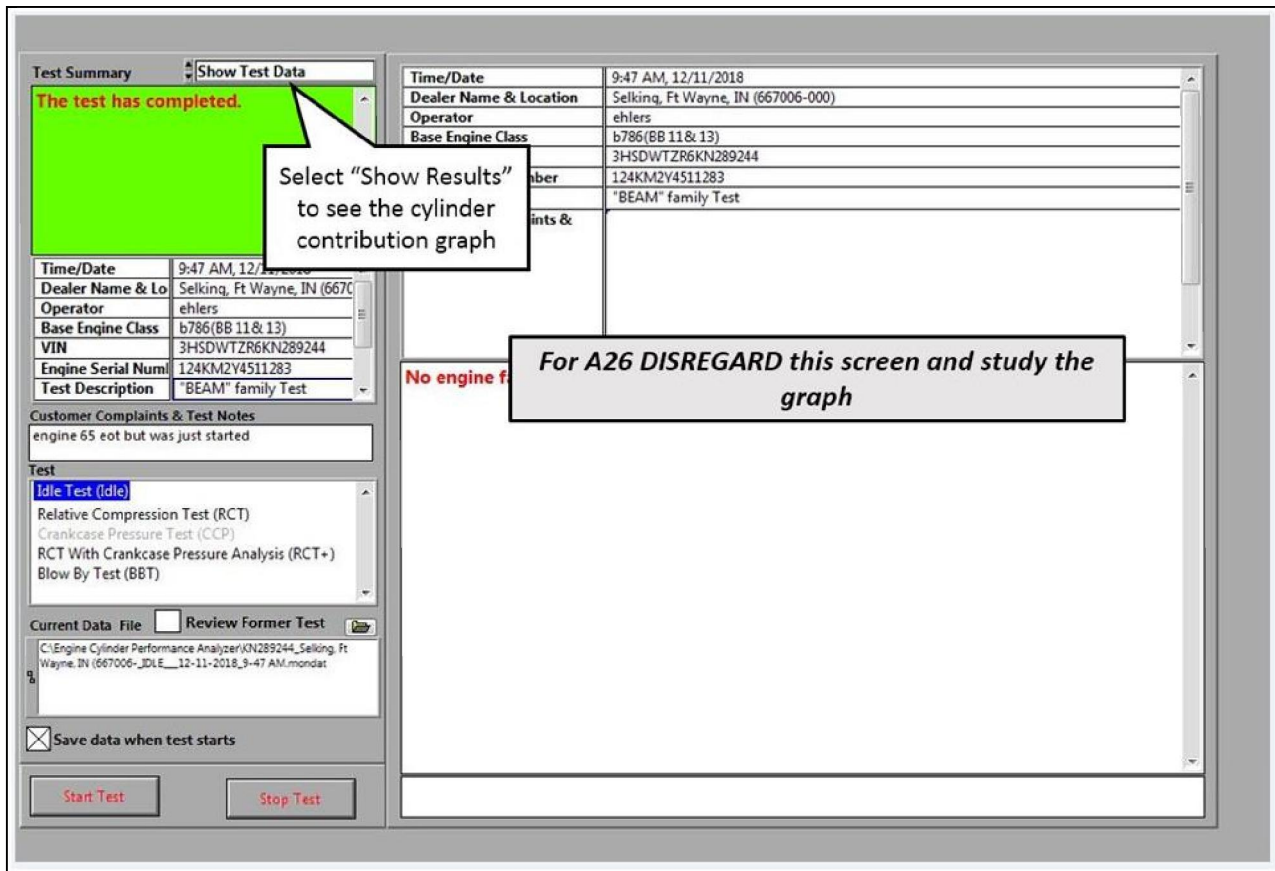
- Select **Idle Test** as shown below & **Start Test**



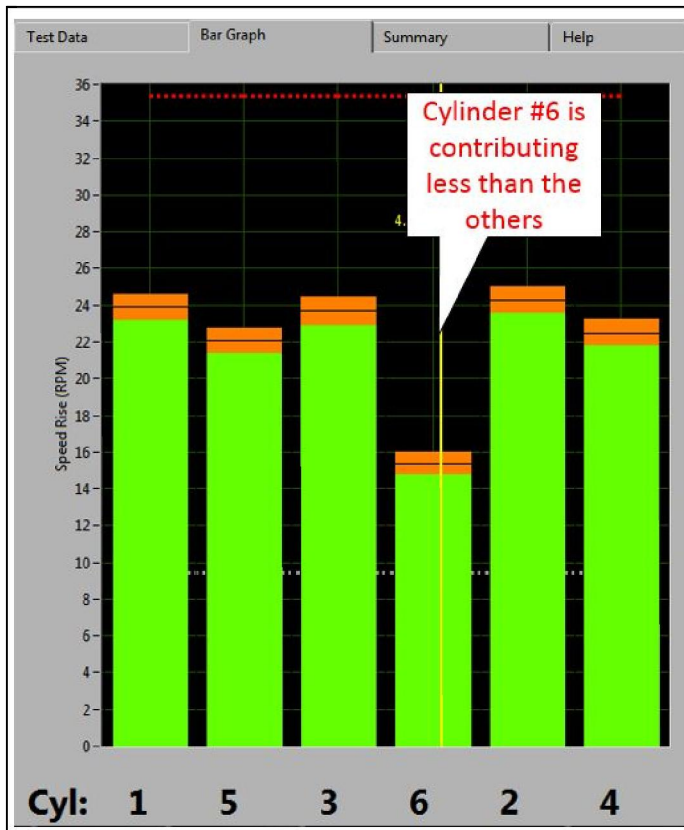
- The screen below will pop-up to confirm that you have the cables connected properly to the CPA box
 - For A26 **Idle Test** and **RCT** we **DO NOT** use the PressurePlus Module



- Follow the on-screen instructions for the **Idle Test**.
- Use the throttle pedal (not the cruise switches) to hold the engine RPM stable at the RPM which the engine runs **the worst**.
 - BEAM **Idle Test** can analyze any stable RPM between idle and 1200 RPM
 - The engine can be loaded during the **Idle Test** with fan or power steering or driving (in a parking lot)
 - Repeat the **Idle Test** several times to increase accuracy of weak cylinder identification. Change the RPM of the test if needed to help ID a weak cylinder.
- When the test ends disregard the **Summary** screen (A26 Summary statements are still being calibrated). Select "Show Results" and study the graphs.
 - See below:



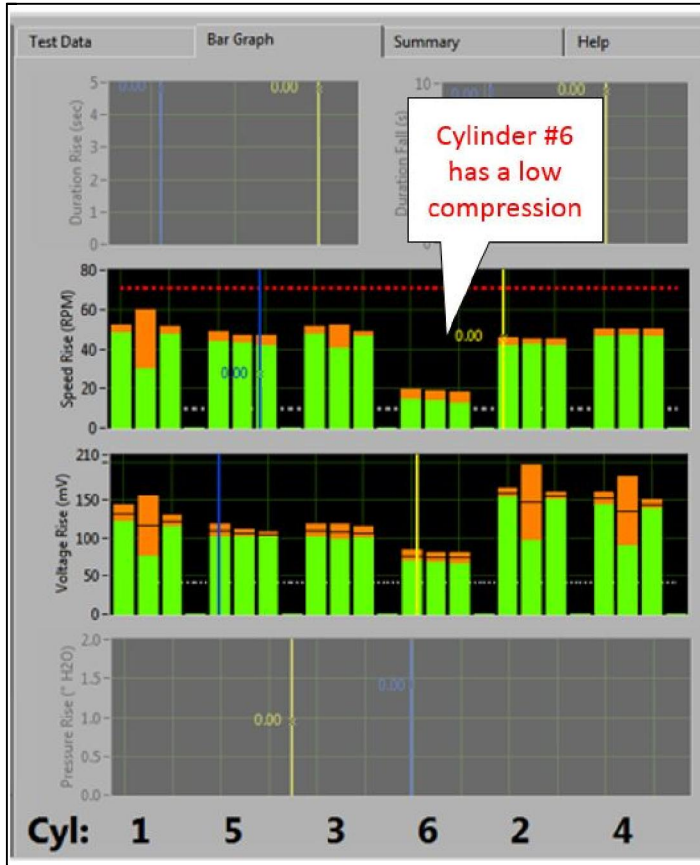
- Example of Idle Test Results below:



- The BEAM RCT test uses the exact same connections as the IDLE Test.

- Unplug the ECM injector connection (prevents engine start) and follow the on-screen instructions.
- Do not have a battery charger connected to the truck
- Perform with engine warm if possible
- Clear faults after removing the breakout box from the ECM

• Example of RCT test Results below:



WARRANTY INFORMATION

Description	SRT Link
12 - CYLINDER PERFORMANCE ANALYZER (CPA) TOOL, DIAGNOSIS	CPA Diagnostics

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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