



Countries: CANADA, UNITED STATES Document ID: IK1200812
 Availability: ISIS, FleetSIS Revision: 11
 Major System: ENGINES Created: 9/4/2012
 Current Language: English Last Modified: 10/21/2013
 Other Languages: NONE Author: Mark Ehlers
 Viewed: 8464

[Less Info](#)

Hide Details

Coding Information

Copy Link 	Copy Relative Link 	Bookmark View My Bookmarks	Add to Favorites 	Print 	Provide Feedback 	Helpful 51	Not Helpful 6
---------------	------------------------	---	----------------------	-----------	----------------------	-------------------	----------------------

Title: Diagnosing Performance Related Symptoms Using the CPA Tool

Applies To: 2010 & OBD Emissions MaxxForce® DT, 9 & 10, 2007 Emissions MaxxForce® DT, 9 & 10, 2004 Emissions DT466, DT570 & HT570

Description:

This article describes the recent software upgrades (effective 9/30/13) to the CPA Tool, CPA Tool description, and the procedure for diagnosing performance related symptoms using the CPA Tool.

The CPA Tool is a specialized tool that is capable of detecting cylinder performance concerns during hot idle, cold idle, and a road test. The CPA tool helps troubleshoot cylinder performance concerns, including intermittent issues.

The tool can also be used to analyze and interpret other engine sensor signal and actuator data with the assistance of Navistar Technical Services.

WARNING- When testing a 2013 OBD MaxxForce DT, 9, & 10 the CPA Tool must only be connected when the vehicle is parked and the parking brake is set. NEVER DRIVE the vehicle with the CPA Tool (or its cables) connected to the engine on the 2013 OBD engine. The engine can stall without warning.

2013 OBD MaxxForce DT, 9, & 10 engines can be identified with ServiceMaxx engine diagnostic software or if engine serial number is 3500000 to 3999999

Please update your CPA software ASAP and review each linked articles as ALL were updated in Sept. 2013.

CPA Related Links

- CPA Tool Instructions ([here](#))
- CPA Tool replaces ServiceMaxx cylinder cutout test [IK1200750](#)
- CPA Software installation (upgrade) [IK2700062](#) Note: It can take over an hour on some EZ-Techs to complete the update
- Warranty information relating to CPA
- [WPL13-008G](#) - Warranty iApproval Requirements
- [WIL2800061](#) CPA WAC explanation
- **Note:** CPA SRT's were revised on 10/7/13. Road test is now an add-on as it is not needed if misfire is noticeable at idle or at no load.

Vehicle Symptoms:

- Engine Misfire
- Rough Running

Check for Diagnostic Trouble Codes (DTC):

- Are there any active or inactive DTCs related to the Code Groups identified below?

1. Code Group 1

- If there are active or inactive codes from Code Group 1 then perform CPA Test

2. Code Group 2

- If there are active or inactive codes from Code Group 2 then perform Condensed Performance Diagnostics

3. Misfire or rough running but no DTCs- perform Condensed Performance Diagnostics

- Any active DTCs not listed in Code Group 1 or 2 should be diagnosed per applicable Engine Diagnostic Manual:

CODE GROUP 1

(EPA 2010) MaxxForce DT, 9, 10:

- 651-3, 652-3, 653-3, 654-3,,655-3, 656-3-Injector Short to Power
- 651-4, 652-4, 653-4, 654-4, 655-4, 656-4-Injector Short Circuit
- 651-5, 652-5, 653-5, 654-5, 655-5, 656-5-Injector Open Circuit
- 2797-3-Injector Control Group 1-Open Coil Short
- 2797-4- Injector Control Group 1-Close Coil Short
- 2798-3-Injector Control Group 2-Open Coil Short

- 2798-4-Injector Control Group 2-Closed Coil Short
- 3659-4, 3660-4, 3661-4, 3662-4, 3663-4, 3664-4-Injector Close Coil-Short Circuit
- 3659-5, 3660-5, 3661-5, 3662-5, 3663-5, 3664-5-Injector Close Coil-Open Circuit

(EPA 2007) MaxxFace DT, 9, 10:

- 8001-6, 8002-6, 8003-6, 8004-6, 8005-6, 8003-6-Injector Closed Coil-Open Circuit
- 8001-5, 8002-5, 8003-5, 8004-5, 8005-5, 8003-5-Injector Open Coil-Open Circuit
- 8001-4, 8002-4, 8003-4, 8004-4, 8005-4, 8003-4-Injector Open Coil-Short Circuit
- 8001-3, 8002-3, 8003-3, 8004-3, 8005-3, 8003-3-Injector Close Coil-Short Circuit
- 8151-5-Bank A Injector Open Coil Short
- 8151-6-Bank A Injector Close Coil Short
- 8152-5-Bank B injector Open Coil Short
- 8152-6-Bank B-Injector Close Coil Short

(EPA 2004) DT466, 570:

- 421-428-High Side to Low Side Open
- 431-436-High Side Shorted to Low Side
- 451-456-High Side Shorted to Ground or Vbat
- 513-Low Side to Bank 1 Open
- 514-Low Side to Bank 2 Open
- 515-Bank 1 Low Side Short to Ground
- 521-Bank 2 Low side Short to Ground

CODE GROUP 2**(EPA 2010) MaxxFace DT, 9, 10:**

- 3387, 3388, 3389, 3390, 3391, 3392-20-Cylinder Balance Maximum Limit Exceeded
- 3387, 3388, 3389, 3390, 3391, 3392-21-Cylinder Balance Below Minimum Limit

(EPA 2007) MaxxFace DT, 9, 10:

- 8001, 8002, 8003, 8004, 8005, 8006-1-Cylinder Balance Below Minimum Limit
- 8001, 8002, 8003, 8004, 8005, 8006-0-Cylinder Balance Maximum Limit Exceeded

CPA Tool Steps:**NOTE:**

'Signal Check' does not diagnose cylinders; it is part of the set up process and checks for a strong CMP and CKP signal. The 'Signal Check' will NOT issue a WAC

WARNING:

When testing a 2013 OBD MaxxFace DT, 9, & 10 the CPA Tool must only be connected when the vehicle is **parked and the parking brake is set**. NEVER DRIVE the vehicle with the CPA Tool (or its cables) connected to the engine on the 2013 OBD engine. The engine can stall without warning.

The only engine that can have CPA Tool road test without the assistance of Navistar Technical Services is the EPA 2004 DT, 2007 & 2010 MaxxFace DT, 9 & 10.

1. Perform one of the following tests:
 - a. 'Cold Idle' (perform Signal Check after running the Cold Idle test)
 - b. 'Hot Idle' (Signal Check highly recommended first)
 - c. 'Perform Signal Check' (required in order to perform any road test)
 - d. 'Full Load to Highway Speed' (road test)- **DO NOT USE ON 2013 MaxxFace 9, 10 & DT OBD ENGINES**
 - e. 'User Defined' (Tech Services will instruct technicians as needed)
 - f. 'Recorder' (newly offered, no WAC provided. Enables "Sensor 3 & 4" of the CPA Tool- Tech Service will instruct as needed)
2. If there is an issue with one or two cylinders, a WAC will be generated.

NOTE:

A WAC does not confirm a failed injector, but does confirm that the cylinder has a problem. Condensed Performance Diagnostics may point out other conditions such as a valve train or compression concerns.

Disregard the WAC if repairing the injector harness or connector corrects the performance complaint.

NOTE:

Use of the CPA Tool is required for diagnosis of one or more injectors and an iApproval number is required when more than two

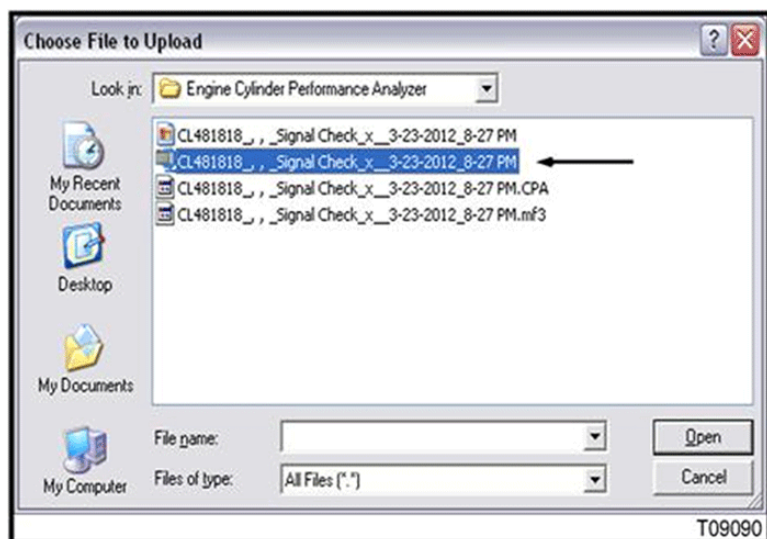


Figure 5

NOTE:

When a CPA test is conducted, the program automatically saves four files into the Engine Cylinder Performance Analyzer desktop folder. The four files are a: CPA File, MF3 File, JPEG File, and a WinZip File. The ONLY file that needs to be uploaded onto the case file is the WinZip File.

4. Verify the WinZip File is under the Attachments section of the case file home screen.

Condensed Performance Diagnostics:

Condensed Performance Diagnostics steps are required prior to using CPA Tool if no injector DTC's are present

A. (EPA 2010 & OBD) Based on [EGED555](#) (steps):

1. Initial Key ON Check
2. Visual Inspection
3. Electronic Service Tool (EST) Connection and Data Recording
4. Check for Diagnostic Trouble Codes (DTCs)
 - Example of SRT for this is KL12-2135T [Steps 1-4](#) for 2010 MaxxForce DT in 4400 (.5 hours)
8. IPR Circuit Test
 - Example of SRT for this is KL12-2118T [Step 8](#) for 2010 MaxxForce DT in 4400 (.1 hours)
14. CPA Tool test
 - Example of SRT for this is KL12-2126T [Step 14](#) for 2010 MaxxForce DT in 4400 (.7 hours)

If problem is not found with CPA test then proceed with steps 5, 6, 7, 9, 10, 11, 13, 12

B. (EPA 2007) Based on [EGED380](#) (steps):

1. Visual Inspection
- 2.1 Fuel Quality
- 2.2 Fuel Pressure and Aeration
3. Sensor compare
4. Check for Diagnostic Trouble Codes (DTCs)
 - Example of SRT for this is K12-2240K [Steps 1-4](#) for 2007 MaxxForce DT in 4300 (.8 hours)

-IPR Circuit Test: wiggle IPR connector with engine idling & listen for stumble (not cited in EGED380)
-Run CPA Tool test

C. (EPA 2004 DT466, 570) Based on [EGED290-1](#) (steps):

1. Diagnostic Trouble Codes

2. KOEO Standard Test
 3. KOEO Injector Test
 4. Engine Oil
 5. Fuel
 6. Fuel Pressure and Aerated Fuel
 12. Relative Compression
- IPR Circuit Test:** wiggle IPR connector with engine idling & listen for stumble (not cited in EGED380)
- Run CPA Tool test**

Cylinder Performance Analyzer Test:

The CPA test analyzes the crankshaft and camshaft speed signals to determine cylinder performance. The data is processed by the CPA tool and indicates which cylinder(s) has a performance issue. The CPA tool assists the technician in the evaluation of performance concerns.

1. Launch the CPA tool from ServiceMaxx and follow the instructions for the CPA tool. The link to instructions is at the beginning of this article and they reside on the CPA software application- "Help" > "User's Manual"
2. Connect CMP and CKP breakout cables to the sensors and CPA tool. Rotate both knobs (POT) fully clockwise +(right).
3. Select appropriate test
 - Cold Idle test (perform Signal Check after running the Cold Idle test)
 - Hot Idle test (Signal Check highly recommended first)
 - Signal Check (Signal Check is required before a road test)
 - Full Load to Highway Speed test (road test). **DO NOT USE ON 2013 MaxxForce 9, 10 & DT OBD ENGINES**

Record the results

If the CPA Tool does not identify a suspect cylinder, proceed to the next step in the Performance Diagnostics form.

If the CPA Tool generates a WAC Code, inspect for mechanical damage and inspect the injector wiring and all related connectors. Otherwise, replace the failed injector.

Warranty Authorization Code (WAC)

This WAC is required on warranty claims for injector replacements (up to two). iApprove is required when more than two injectors needs replaced. This is described in Warranty Policy Letter WPL12-018G. Note: The initial version of CPA was limited to 1 injector WAC.

With CPA software version 2.0.0.148 a four digit **Warranty Authorization Code** (WAC) will be displayed in the test results screen when one or two cylinder performance issues are identified (See image below). The warranty claim must include the failed cylinder numbers.

Contact Information

If you would like to order additional Tools, have questions, concerns, feedback, or need replacement parts, please contacts the Navistar Service [Tool Support Center](#).

Phone: 1-800-365-0088 (Toll Free) or 630-985-4171 **OR** Submit a Service Tool IKNOW Case

Hide Details	Feedback Information
	Viewed: 8463 Helpful: 51 Not Helpful: 6
<input type="text" value="No Feedback Found"/>	

Copyright © 2013 Navistar, Inc.