iKNOW Knowledge Base

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Current Language:	English	**Last Modified**:	6/27/2017
Other Languages:	NONE	**Author**:	Marcelo Sahagun
Viewed:	412		

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Coding Information

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Title: CPA Injector Misfire Detection

Applies To: EPA 2004-2006 DT 466/570-- EPA 2007-2009 MF DT/9/10-- EPA 2010-2013 MF DT/9/10-- EPA 2014-2017 N9/ N10

CHANGE LOG

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

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06/23/2017- Included 04 and 07 emission diag steps
05/16/2017 - Initial Article Release
```

DESCRIPTION:

This document describes the process for utilizing the CPA Injector Misfire Detection

CPA Injector Misfire Detection Apply To:

Emission Year	Emission Model	Description
2004-2006	DT 466/ 570	
2007-2009	MF DT/ 9/ 10	
2010-2013	MF DT/ 9/ 10	**2013 HD OBD engines must have calibration level EER5 or later in order to perform Full Load to Highway Speed Test. Ignore 637-10 code if found in engine after CPA used**
2014-2017	N9/ N10	

Note: ALL previous MaxxForce 7 injector diagnostic tests should follow the Base Engine Analysis Module (BEAM) IDLE Test

Software Release:

Version	Change Description	Release Date
2.0.0.148	**Warranty Authorization Code (WAC) for 2 injectors in Injector Misfire Detection**	09/25/2013
1.0.0.329	**MED Duty Injector Misfire Detection Launch**	03/20/2012

Software must always be current. Refer to the **CPA Resource Article**

SYMPTOMS/ FAULT CODE(s)

Follow the FCAP/ Fault Code Diagnostics/ Symptom Based Diagnostics from the appropriate Engine Diagnostic Manual.

DTC/Light	Description
SPN and FMI dependent on Engine Model	Description dependent on Engine Model
Symptom	**Description**
Engine Misfire	
Rough Idle	
Low Power	

Engine Model	Diagnostic Fault Codes (Status Active or Inactive)	Diagnostics to Perform
EPA 2007 Maxxforce 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	1. Perform Injector Misfire Detection
EPA 2007 Maxxforce 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	1. Perform *EPA 2007 System Diagnostics* (below)
EPA 2004 DT466/ 570	• 421-428-High Side to Low Side Open • 431-436-Hgh 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	1. Perform Injector Misfire Detection
EPA 2004 DT466/ 570	Misfire/ Rough Running	1. Perform *EPA 2004 System Diagnostics* (below)

EPA 2004 System Diagnostics:

- Outline of diagnostics in **EGED290-1**
    1. **Perform KOEO Standard Test**
    2. **Perform KOEO Injector Test**
    3. **Verify Engine Oil Quality and Level**
    4. **Verify Fuel Quality and Level**
    5. **Verify Fuel Pressure and Aeration**
    6. **Relative Compression Test**
    7. **IPR Circuit Check: Wiggle IPR pigtail at engine idle and ensure NO engine stumble**
    8. **Perform CPA Injector Misfire Detection Test**

EPA 2007 System Diagnostics:

- Outline of diagnostics in **EGED380**
    1. **Visual Inspection**
    2. **Verify Fuel Quality and Level**
    3. **Verify Fuel Pressure and Aeration**
    4. **Sensor Compare Check**
    5. **Verify Engine Oil Quality and Level**
    6. **IPR Circuit Check: Wiggle IPR pigtail at engine idle and ensure NO engine stumble**
    7. **Perform CPA Injector Misfire Detection Test**

SPECIAL TOOL(s):

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

Tool Description		Tool Number	Comments
EZ-Tech or Computer			ServiceMaxx/ NED and CPA software must be installed
RP1210			NavCom or Nexiq
CPA Module		OE-1178/ 12-999-01-01	

CPA CAM harness (Yellow)		OE11178-2/ 12-999-01-02	
CPA CRANK harness (Black)		12-999-01-03	
CPA Extension Harness			2 required for Cam and Crank harnesses

Tools Resource Center

CPA Injector Misfire Detection Descriptions:

Learning Management System (LMS):

Instruction Course is available on Navistar Service Portal
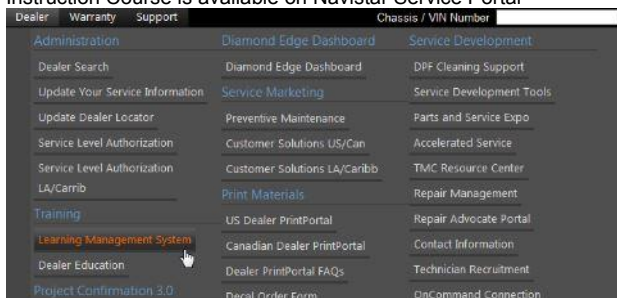
Training Videos:

Training Video Coming Soon to this article but available to download through the CPA software:
Click: CPA Video Download

Test Descriptions:

CPA Injector Misfire Detection Test	Detailed Analysis
Signal Check	• **Ensures engine can safely reach 2200rpm** • **WAC is not issued**

|	
Cold Idle	• **60 second test** • **Measures engine rpm oscillations**
Hot Idle	• **60 second test** • **Perform test at engine operating temperature** • **Measures engine rpm oscillations**
Full Load to Highway Speed	• **Signal Check test must be performed prior** • **Measures engine rpm oscillations at various gear shifts** • **Note: 2013 disclaimer**
User Defined	• **Open 5min test** • **No conclusions given**

Signal Descriptions:

Result	Description
High Vibration	• **High engine oscillation not associated to an injector misfire** • **BLUE X indicator** • **Possible ICP adaptation/ ECM calibration error** • **Possible under valve cover (UVC) leak**
Defect Found	• **Engine oscillation associated to an injector misfire** • **RED indicator**
No Defect	• **No abnormal enigne oscillation detected**
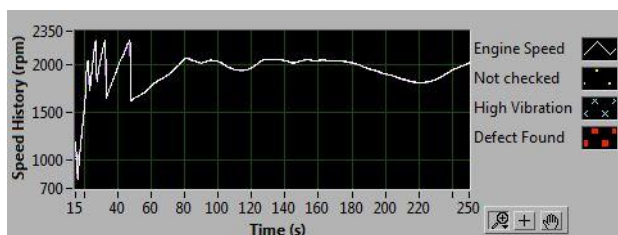
Speed History Graph: For most accurate results, ensure CPA captures engine speed throughout all gear shifts
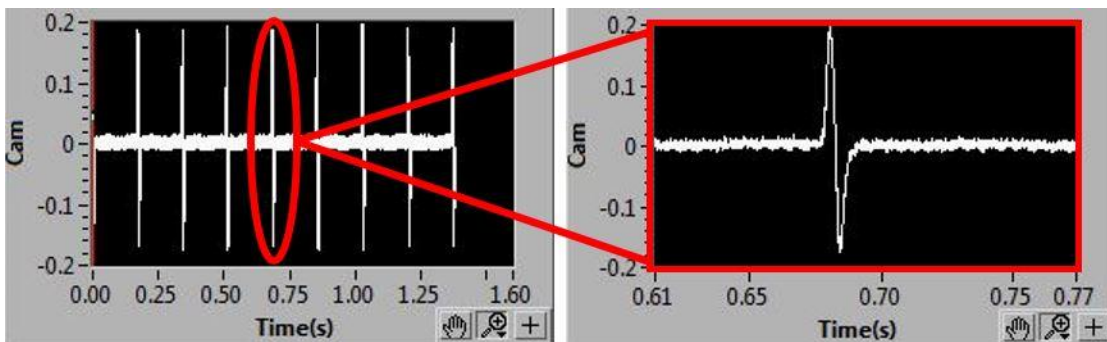
CAM Signal: Sample of good CAM signal
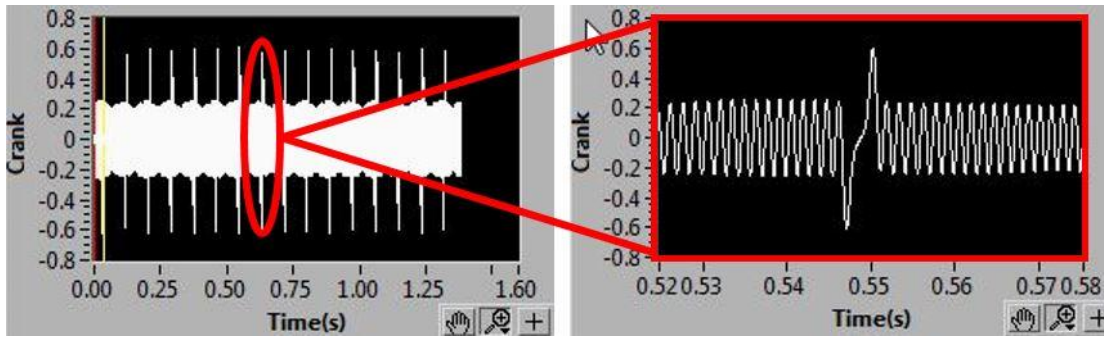
CRANK Signal: Sample of good CRANK signal

CAM Signal Diagnostics:

Step	Action: Turn Key On Engine Off	Decision
1	Ensure connection between CPA Extension cable and CPA Module is secured Note: Inspect CAM sensor port	If connection is tight then proceed to step 2
2	1. Disconnect CPA Extension cable from CPA Module CAM Sensor Port 2. With a DMM measure resistance at the CPA Extension center terminal and outer grounding shell Does the DMM read between 300 - 400 Ohms?	Yes: Inspect the CPA Module for possible defect or loose connection No: Proceed to step 3
3	1. Disconnect CPA Extension cable from CAM Sensor Breakout Harness 2. With a DMM measure resistance at the 2-pin connection Does the DMM read between 300- 400 Ohms?	Yes: Possible defect in CPA Extension cable. Replace and Retest as needed No: Proceed to CAM circuit and synchronization diagnostics in the appropriate engine diagnostic manual

Additional Diagnostics:

Air Gap Specifications

WARRANTY INFORMATION:

CPA Module	WAC can be issued for components listed	Navistar Engine Model	Example WAC	Related Articles
Injector Misfire Detection	1 or 2 Fuel Injectors	• EPA 2004-2006 DT 466/570 • EPA 2007-2009 MF DT/ 9/10 • EPA 2010-2013 MF DT/ 9/10 • EPA 2014-2017 N9/ N10	XXXX	

- All Component Replacement Requirements are covered under policy letter: WPL2800126
- Reference the Warranty Resource Center for the most recent iApproval/ Warranty Authorization Code (WAC) requirements letter
- Refer to the Warranty Coding Manual for Group and Noun Codes.

Standard Repair Time(s):

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

OTHER RESOURCES

Master Service Information Site

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