



Countries: CANADA, UNITED STATES, MEXICO **Document ID:** IK1201414
Availability: ISIS, IsSIR **Revision:** 0
Major System: ENGINES **Created:** 4/4/2018
Current Language: English **Last Modified:** 11/6/2018
Other Languages: NONE **Author:** Jon Pierce
Viewed: 128

[Less Info](#)
☒ Hide Details

Coding Information

Copy Link 	Copy Relative Link 	Bookmark View My Bookmarks	Add to Favorites 	Print 	Provide Feedback 	Helpful 0	Not Helpful 0
---------------	------------------------	---	----------------------	-----------	----------------------	------------------	----------------------

Title: A26 Cold Start System Installation

Applies To: A26 engines not purchased with feature code 0012WEG

CHANGE LOG

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

11/06/2018 - Initial Article Release

DESCRIPTION

This document will guide the user through installing the optional cold start system.

A26 Cold Start System Description

The A26 cold start system includes a relay, solenoid, and integrated glow plug / fuel injector. The glow plug / fuel injector is located in the EGR mixer, just upstream of the air intake in the cylinder head. During very cold conditions and before the engine starter is engaged, the glow plug activates when in the key on position. Fuel is then sprayed onto the hot glow plug. The fuel ignites and heats the fresh air entering the cylinder head and combustion chamber.

System Benefits

- The cold start system helps the engine to be able to start in cold conditions.
- Once the engine starts, the system stays active for a short time to help the engine warm up faster and operate smoothly.

When to order the system

This system begins to provide start ability benefits at 0°F ambient. This system is required for engine start ability below -30°F ambient. The chart below from the operator's manual must be used when determining which cold start aids should be ordered and installed.

Ambient Temperature [°F]	-40	-30	-20	-10	0	10	20	30
Oil Heater								
Coolant Heater								
Cold Start Heater								

Required	
Beneficial	

SYMPTOM(s)

White smoke from the exhaust, long cranking, no start, rough idle at startup.

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

N/A

Customer Observations or Concerns:

Prolonged cranking on extremely cold mornings.

SPECIAL TOOL(s) / SOFTWARE

Tool Description	Tool Number	Comments	Instructions
NED	N/A	Always make sure your software is at the most current version	NED change log

SERVICE PARTS INFORMATION

Description	Part Number	Quantity Required	Notes
Bolt, M6X20	1817817C1	2	Bolts for cold start fuel solenoid
Seal BS-10.7-16	06566310104	2	Copper washer for fuel supply to solenoid.
Seal Ring BS 12.7X18-ST/FPM1-80	06566310105	2	Copper washer for fuel supply line at fuel filter housing.
Washer Flat Copper 8.2 ID X 11.9	3005383C1	2	Copper washer for fuel solenoid to igniter
Hollow Screw 6-M3360-RK5-K	06783490007	1	Banjo-bolt for fuel supply to solenoid
Hollow Screw 8 - M3360-K	0673490008	1	Banjo-bolt for fuel supply at fuel filter housing
Clip, hose	62974010575	1	Clip between fuel supply line and fuel line under pump
Bolt Banjo M8 X 1	3005382C1	1	Banjo-bolt for fuel line from solenoid to igniter
Tube assembly, cold start fuel supply, filter housing to solenoid	7096733C2	1	Fuel line from housing to solenoid
Relay, igniter	3008240C1	1	Main power relay for cold start
Solenoid, cold start fuel	3008754C1	1	Fuel solenoid(Cold Start Enable Device, CSED)
Plug, glow	3008752C1	1	cold start fuel igniter (CSFI)

Clip, Wiring DIA 6-6.5X15DIA 6-6.65	7097306C1	1	Clip for fuel line between solenoid and igniter
Clamp P D1-6X15-W1-2-EPDM	6673000626	3	P- Clamp for fuel supply line
Bolt, flange M6 X 25MM	1821643C1	2	Bolts for securing cold start relay
Clip, Wiring single	62974010562	1	Clip for fuel supply line
Hose supply fuel cold start	3005370C2	1	Fuel line from solenoid to igniter
Nut, Hex flg lock, M10-1.5,SS	3754538C2	1	Nut for PDM
Bolt, M8 X 15 Stud	7095894C1	1	Stud for fuel line at engine block
Harness, Cold start	2519463C91	1	Electrical harness
Bolt, M6 X 30	1818279C1	2	Bolts for securing fuel line to ECM bracket
Fuse, 80 AMP Bolt in MIDI	3752320C1	1	Fuse for PDM
Nut, Hexagon M5 X.8ZNI	4093371C1	2	Nuts for securing fuse to PDDM

DIAGNOSTIC STEP(s)

NOTE:

Assumption for this document is that customer did not order feature code 0012WEG



WARNING:

Failure to observe the following warning may cause property damage, personal injury, or death. Park the vehicle on a flat, level surface. Make sure the engine ignition is in the off position and the transmission is in neutral, or in the park position if the vehicle is equipped with an automatic transmission. Set the parking brake, chock the wheels, and disconnect the batteries at the negative terminal before doing any service procedures on the engine or vehicle.

Please refer to Figure #1 below, for general component location

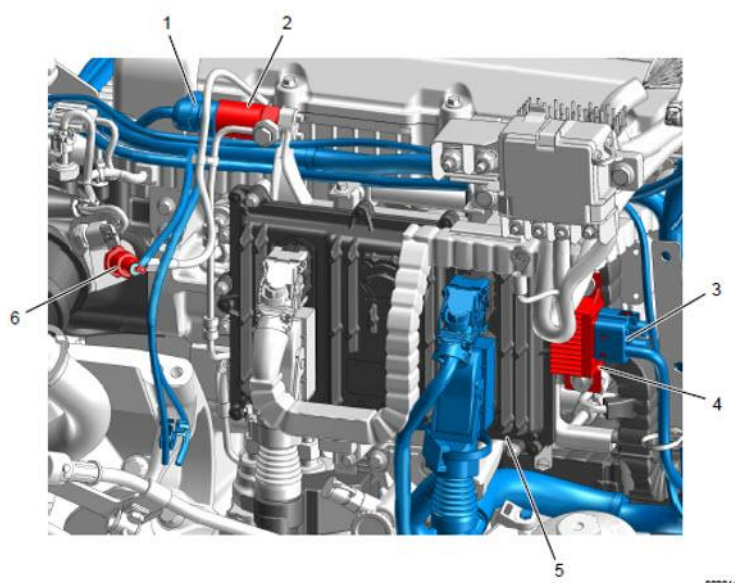


Figure #: 1 CSED Component Locator

- Item 1: CSED power (chassis) harness
- Item 2: CSED Start Enable Device (CSED) solenoid
- Item 3: CSFI power (Chassis) harness
- Item 4: Cold Start Fuel Relay (CSFR)
- Item 5: Engine Control Module (ECM)
- Item 6: Cold Start Fuel Igniter (CSFI)

REPAIR STEP(s)

1. Disconnect batteries
2. Remove Alternator
3. Install the Cold Start Enable Device (CSED) Solenoid (3008754C1) to the stand on the upper left side of the ECM bracket, verifying that the arrow on the solenoid is pointed towards the valve cover (fuel flow direction)
 - a. Torque (2) M6 X 20 bolts (1817817C1) to 45 lb-in (5.1 Nm)

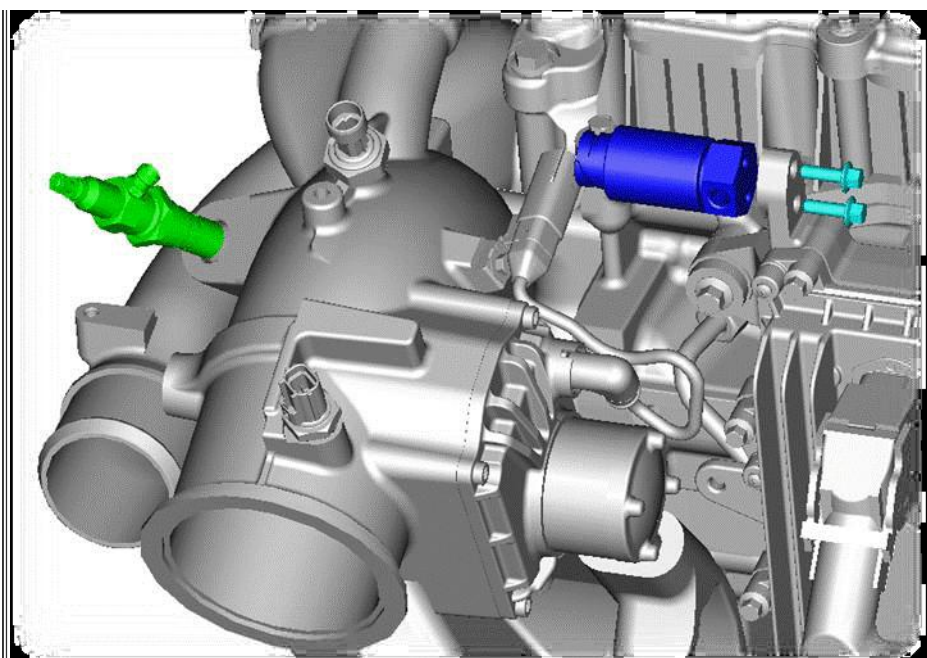


Figure #2: Cold Start Solenoid with Injector

4. Install the Cold Start Fuel Injector (CSFI) – PN 3008752C1

- a. Remove and discard the plug in the EGR mixer duct, using a 3/8" Allen wrench
- b. Rotate lock nut on CSFI until top of nut is aligned at top of threads
- c. Insert CSFI into EGR mixing duct and thread until lock nut contacts port surface of EGR mixing duct
- d. Back out CSFI for proper orientation of the fuel fitting (straight fitting), orienting it as shown in the figure below
- e. Torque lock nut to 17 lb-ft

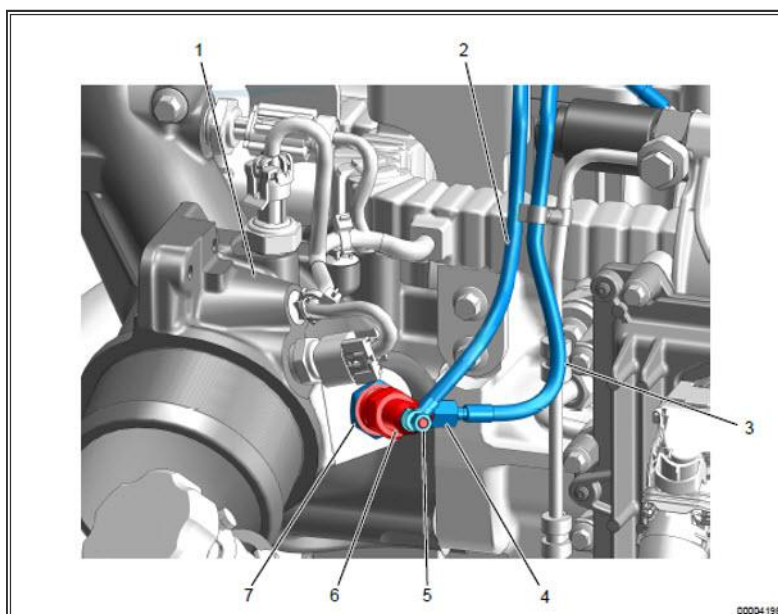


Figure #3: CSFI Connections

- Item 1: EGR mixing duct
 Item 2: CSFI power (chassis) harness
 Item 3: CSFI fuel supply line
 Item 4: Tube nut
 Item 5: M6 hex nut
 Item 6: Cold Start Fuel Igniter (CSFI)
 Item 7: Lock nut

5. Install the Cold Start Relay

- a. Install CSFI relay (3008240C1) onto ECM mounting bracket, securing with two M6 x 25 bolts (1821643C1). Tighten bolts to 10 lb-ft (13 N•m).

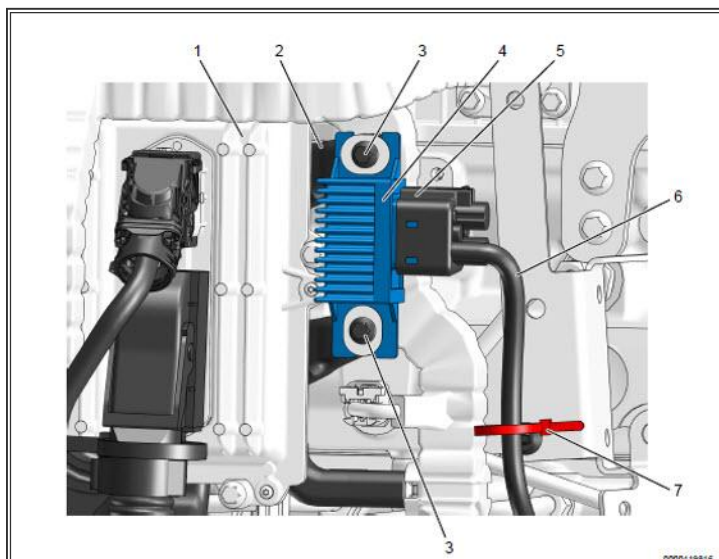
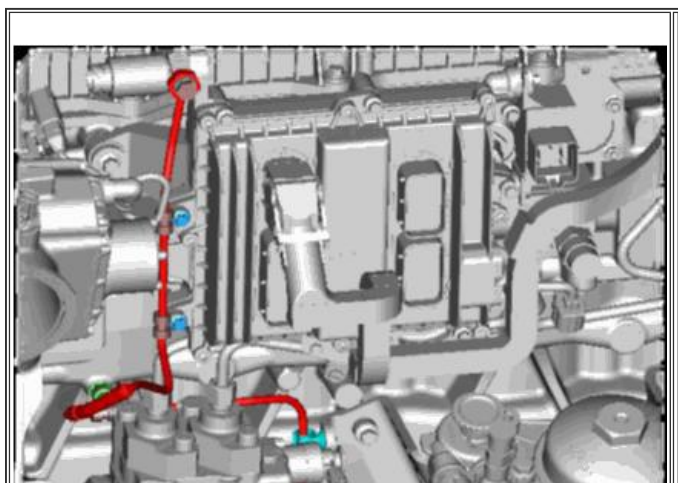


Figure #4: Cold Start Fuel Igniter Relay

- Item 1: Engine Control Module
 Item 2: ECM mounting bracket
 Item 3: M6 X 25 bolt (2)
 Item 4: Cold Start Fuel Igniter relay (CSFI)
 Item 5: CSFI relay harness connector
 Item 6: CSFI relay power (chassis) harness
 Item 7: Tie strap (secures to cab harness bracket)

6. Install cold start fuel supply tube assembly

- Route the cold start fuel supply tube (7096733C1) behind the fuel pump as shown in the figure below.
- Remove the plug on the bottom of the fuel filter housing using a 6mm Allen wrench, then assemble the lower end of the tube to the filter housing using a banjo bolt (6783490008) and two copper washers (6566310105). Do not tighten yet.
- Assemble the upper end of the tube to the CSED using a banjo bolt (6783490007) and two copper washers (6566310104). Do not tighten yet.
- Secure the fuel supply tube using two P-clamps (6673000626) and two M6 x 30 bolts (1818279C1) to the left side of the ECM bracket. Torque to 13Nm.
- Install M8x15 stud in to port on the side of the engine block, behind the front of the fuel pump. Torque to 23 lb-ft (31 Nm). Install p-clamp to the fuel line and secure it to the stud using M6 x 1.0 nut. Torque to 10 LB-ft (13 Nm).
- Insert Clip (62974010562) in to bracket at the rear of the fuel pump, then push fuel line in to clip.
- Torque the banjo bolt at the CSED to 11 lb-ft (15 Nm)
- Torque the banjo bolt at the filter housing to 11 lb-ft (15 Nm)
- Install clip (06673000626) between the cold start fuel supply line and the fuel supply line to the fuel pump (orient to prevent contact or chaffing between the fuel lines).



- Item 4: CSED solenoid
- Item 5: ECM
- Item 6: CSED fuel supply tube
- Item 7: Cold Star Fuel Igniter (CSFI)
- Item 8: EGR mixing duct

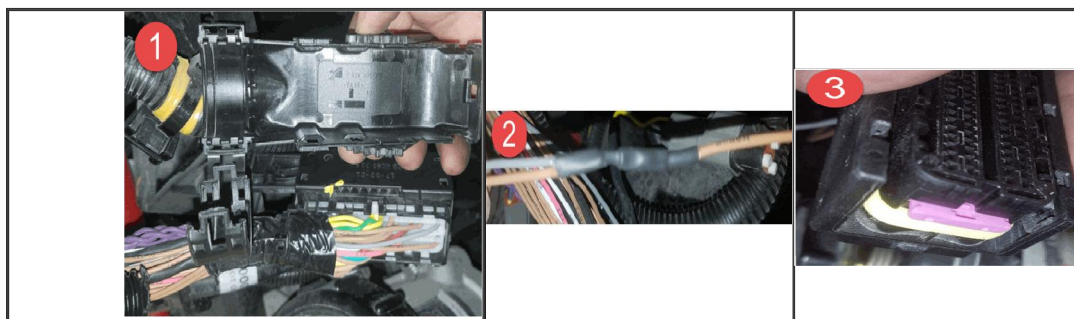
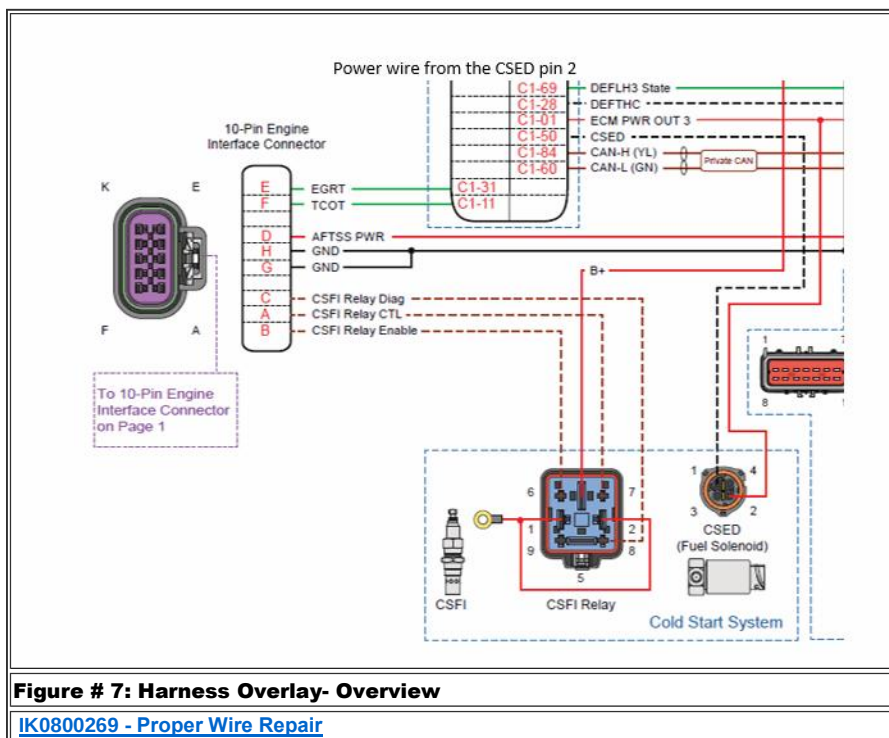


Figure #8 ECM Connector Installation Overview

- Item 1: ECM backshell
- Item 2: Proper Wire Repair
- Item 3: Connector Lock
- Item 4: Connector with Terminals

8. Install the CSED / fuel solenoid wiring harness (2519463C91) - (Figures 7 & 8)
 - a. Connect the round 4-pin connector to the CSED .
 - b. Disconnect the ECM 16 pin C2 chassis connector and the 96 pin C1 connector and lay them out of the way to allow routing of the CSED harness.
 - c. Route the CSED wiring harness along the top of the ECM following the existing loomed harness and then down the right side of the ECM. Install zip-ties to secure the harness approximately every 3 – 4 inches to the existing harness.
 - d. Route the CSED harness to come out under the ECM bracket, and even with the ECM 96 pin chassis side connector.
 - e. Carefully remove the back-shell from the ECM 96 pin harness (Figure#8 item 1).
 - f. Gently remove split loom and cut the electrical tape from the harness so that approximately 4 inches of the harness is exposed.
 - g. Locate the C1-01 cavity and trace the wire back 3 inches. Cut the wire 'ECM PWR OUT 3', and using a butt splice, solder, and heat shrink, splice in the power wire from the CSED pin 2, making a 'Y' (Figure #8 item 2).
 - h. Locate pin C1-50 on the ECM C1 connector, then Insert the pin from the CSED pin 1 to pin C1-50.
 - i. Note – In order to insert the pin in to the cavity, gently pull the purple lock assembly out of the end of the connector body. (Figure #8 item 3).
 - ii. Insert the terminal in to the cavity making sure to orient the terminal so that it aligns with the slots in the connector body.

- iii. Reinstall the purple lock and verify all terminals are fully engaged and locked in to the connector.
 - i. Reinstall electrical tape around the harness so that the wiring is secured but not pulled so taught that it puts tension on any one wire. Reinstall the back shell on the harness connector.
 - j. Reinstall the C1 and C2 connector on to the ECM.
- 9. Connect the relay connector to the relay
- 10. Route the wiring for the igniter and the ten pin connector down along the side of the ECM. Then up along the right side of the ECM and across the top of the ECM, keeping them in line with the existing harness bundle. Install a cable-tie every 3 inches to secure the wiring.
- 11. Route the power feed for the relay across the chassis harness that connects to the firewall so that the feed wire comes out directly below the PDM.
- 12. Connect the ring terminal to the igniter using the M6 hex nut on the igniter. Torque to 115 lb-in (13 Nm).
- 13. Disconnect the 10-pin engine interface connector (located in the harness directly above the ECM). (Figure #9 item 1).

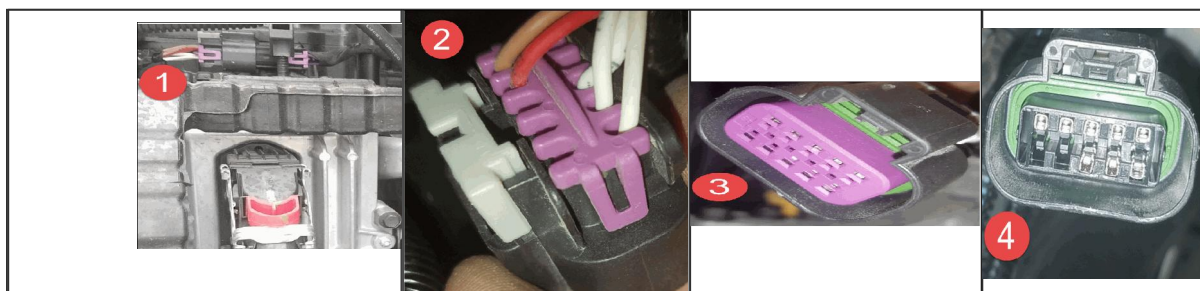


Figure #9 6033 VIC (10 pin Connector) Overview

- Item 1: 10 pin Location on Truck
- Item 2: Connector Lock
- Item 3: Terminal Lock
- Item 4: Connector view of Terminals

- 14. Remove the purple lock from the rear of the male connector (loose connector toward the front of the engine); (figure #9 item 2)
Remove the connector seals from cavities A, B, and C.
- 15. Remove the purple lock from the face of the connector body (Figure #9 Item 3) and gently insert the terminals in to the appropriate cavities making sure to orient them correctly.
 - a. Wire 21B2 to cavity A
 - b. Wire 21B1 to Cavity B
 - c. Wire 21B3 to Cavity C
- 16. Reinstall both purple wiring locks on to the connector (front and back) and reconnect the 10 pin engine interface connector .

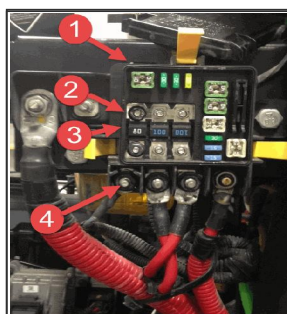


Figure # 10: PDM Overview

- Item 1: Underhood PDM
- Item 2: Nut - Qty. 2 (4093371C1)
- Item 3: 80 AMP fuse (3752320C1)
- Item 4: Power lead Connection location - Nut (3754538C2)

- 17. Connect to the truck through the 9-pin in cab diagnostic connector and open DLB.
- 18. Under the features tab, verify that feature code 0597052 "BSM Prog, Wait to start ind" is checked (enabled).
 - a. If the feature needs to be added refer to [DLB Quick Start User's Guide](#).
- 19. Disconnect DLB and reconnect with NED (Navistar Engine Diagnostics).
- 20. Using NED, navigate to the parameter section and select the "all Parameters" tab.
- 21. Program parameter ID 71003 "Glow Plug / Inlet Air Heater Control Mode" to 'Enable'.
- 22. Click "Program Engine"
- 23. Cycle the key to allow the parameter change to take effect.

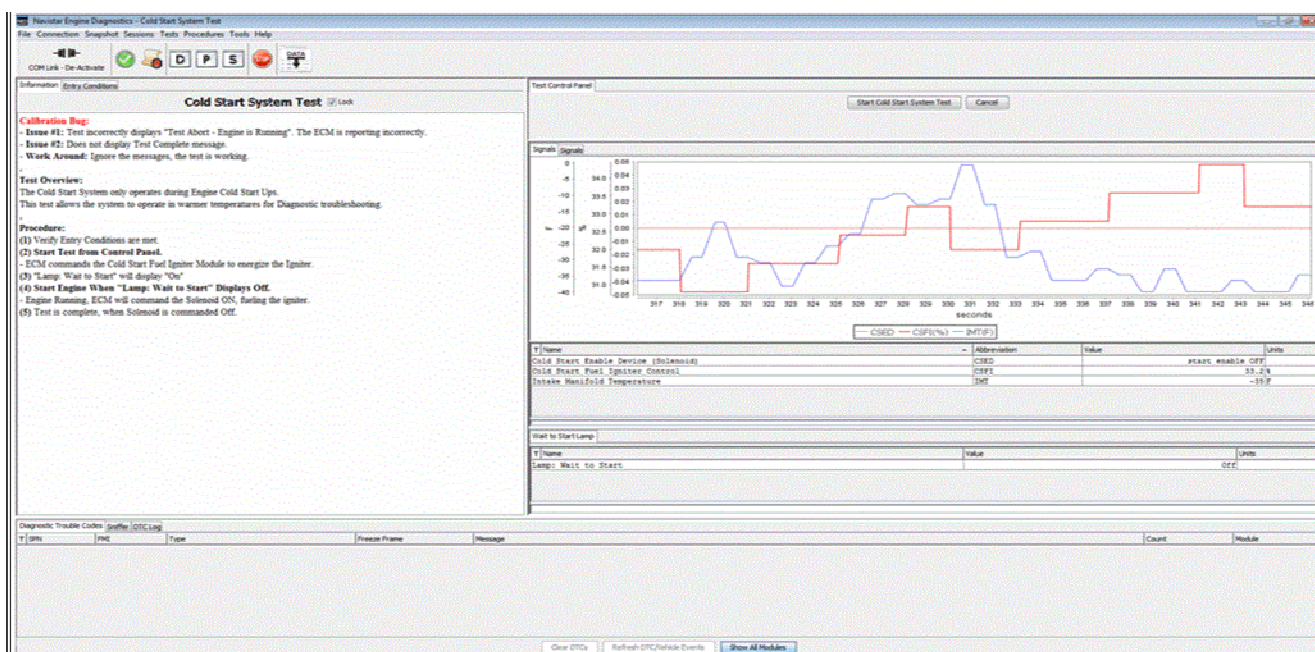


Figure #11: Cold Start System Test

24. Test the cold start assist system :

- Using NED, navigate to the "tests" tab and then select "Cold Start System Test" from the KOEO tests drop down menu.
- Follow the instructions in the information panel to complete the test.
- Test Overview:
 - The Cold Start System only operates during Engine Cold Start Ups.
 - This test allows the system to operate in warmer temperatures for Diagnostic troubleshooting.
- Procedure:
 - Verify Entry Conditions are met.
 - Start Test from Control Panel.
 - ECM commands the Cold Start Fuel Igniter Module to energize the Igniter.
 - Lamp: Wait to Start" will display "On"
 - Start Engine When "Lamp: Wait to Start" Displays Off.
 - Engine Running, ECM will command the Solenoid ON, fueling the igniter.
 - Test is complete, when Solenoid is commanded Off.
- Verify proper operation with no visible fuel leaks.

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](#)

Hide Details

Feedback Information

Viewed: 127

Helpful: 0

Not Helpful: 0

No Feedback Found

Copyright © 2018 Navistar, Inc.