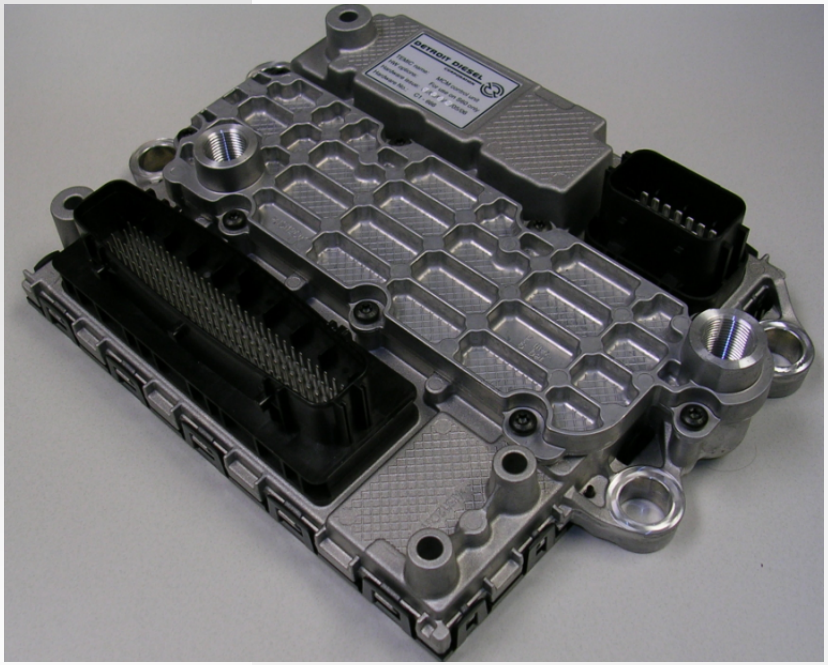
DETROIT DIESEL
Technical Support

2007 Electronic Tools for DDEC VI

Using
DDDL
7.0



I. The 2007 Electronic Tools Family of Products

3 Different Electronic Tools will be created from 1 main software package

Current Product	2007 Product Equivalent
DDDL	Detroit Diesel Diagnostic Link 7.0 (Customer Level – simple registration program)
DRS	Detroit Diesel Reprogramming System (Service Level – requires hardware key and DRS ID for programming functions)
DDC Cal Tools	Drumroll (Engineering / Plant Level only– advanced access key registration)

Operations for 2007 Electronic Tools

1- Perform Standard Fault Code Operations

2- Links to Traditional and Advanced Troubleshooting Information

3- Read Actual Values

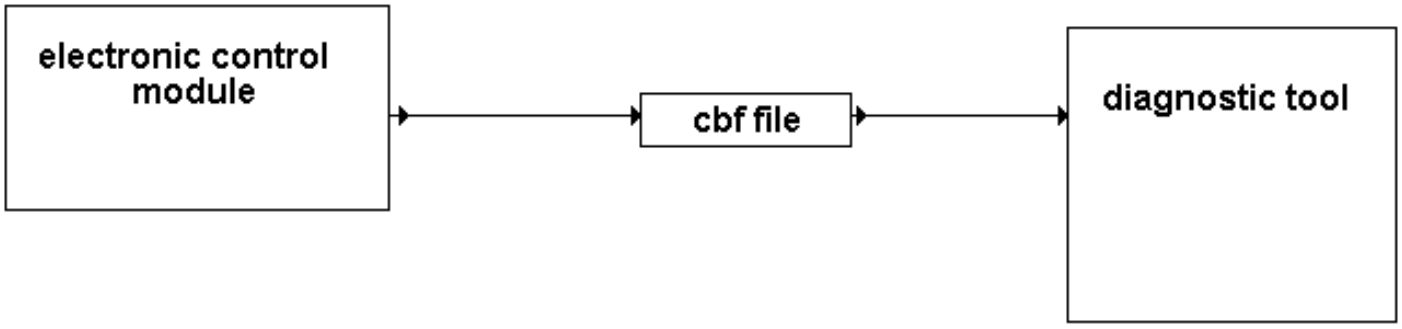
4- Configure and Manage Parameters

5- Perform Service Routines

6- Playback Logs of All Connected Activity

7- Programming Capability for the CPC / MCM (DDRS only with reprogramming station, hardware key and ID)

The DDC 2007 electronic tools are written to the new DCX standard. The new standard calls for the diagnostic tools to be “data driven” by the ECU.



With this approach the primary diagnostic functions are contained in the ECU software with the tool serving as the gateway to these functions. The CBF file serves as the tool’s gateway to the functionality of the ECU. Updates to the new electronic tools may often be done through web downloads of a new CBF file rather than the release of new CDs.

There will be two types of updates for the 2007 electronics tools:

Web based updates:

1- Download new CBF files that will allow the user to work with new levels of ECU software and add functionality to the tool

2- New cases for Advanced Diagnostics as they are developed from field experience

3- Other data based update

CD updates:

1- Will be required when major changes to the program occur, such as changes to the graphical user interface

II. Understanding 2007 Hardware and Communications

2007 Electronic Tools for DDEC VI

1- All DDEC electronics systems prior to DDEC VI used the J-1587 (messaging) / J-1708 (hardware) standards for all diagnostic and data communications.

2- All diagnostic software and translator hardware devices conform to the RP1210A communications standard of The Maintenance Council (TMC).

3- The DDEC VI system will now use the J-1939 (messaging) / CAN (hardware) standards for diagnostic communications.

4- DDEC VI Data Communications will continue to use the J-1587 (messaging) / J-1708 (hardware) standards.

5- DDEC VI software and translator hardware devices will continue to conform to the RP1210A standard.

Translator Box Hardware for DDEC VI Diagnostics

1- Translator box hardware for 2007 diagnostics must support CAN communications.

2- The Nexiq USB Link, the Nexiq Magic Key, and the DDC Multi-link translator boxes may all be used with 2007 diagnostic software.

3- The Multi-link will need a firmware update to function properly

4- The Nexiq Lite-link and DDC White translator do not support CAN communications and may not be used.

Additional Information on 2007 Electronics Communications

1- For data extractions (DDEC Reports) all the translator devices on the last page may be used as well as J-1708 devices like the Nexiq Lite-link.

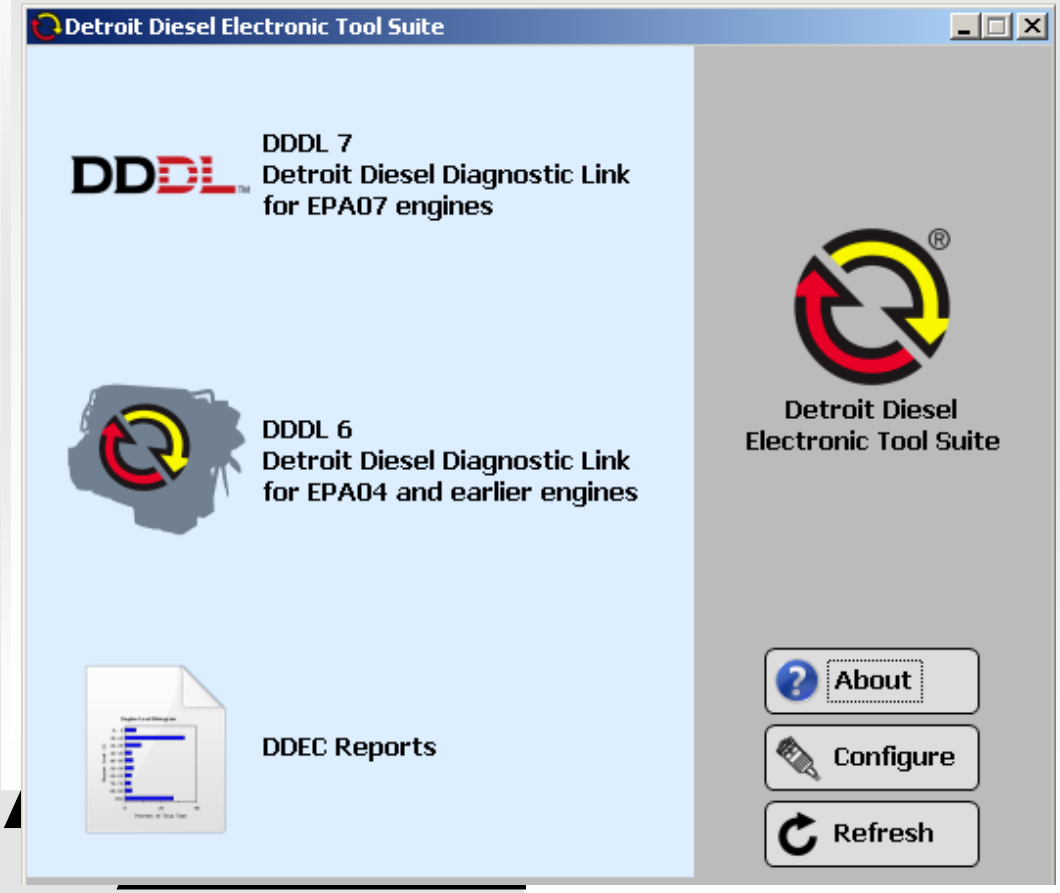
2- The Nexiq USB Link will be the translator device for programming DDEC VI modules (MCM and CPC). The USB Link will also be fully backward compatible with programming earlier DDEC modules in 1st Quarter 2007.

3- DDC electronic tools software may only be used with the Windows 2000 or Windows XP operating systems.

III. 2007 Electronic Tools Basics

Understanding the 2007 Launcher Utility
The Detroit Diesel Electronic Tools Suite

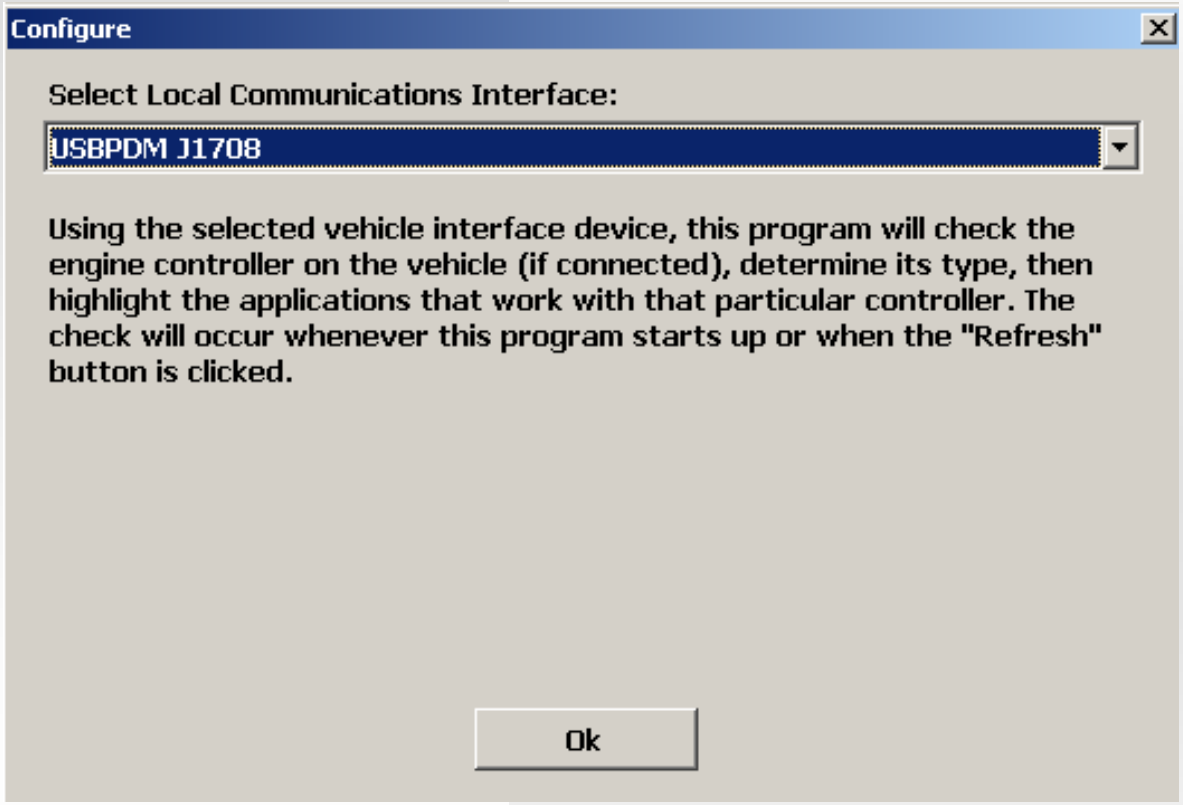
2007 Electronic Tools for DDEC VI



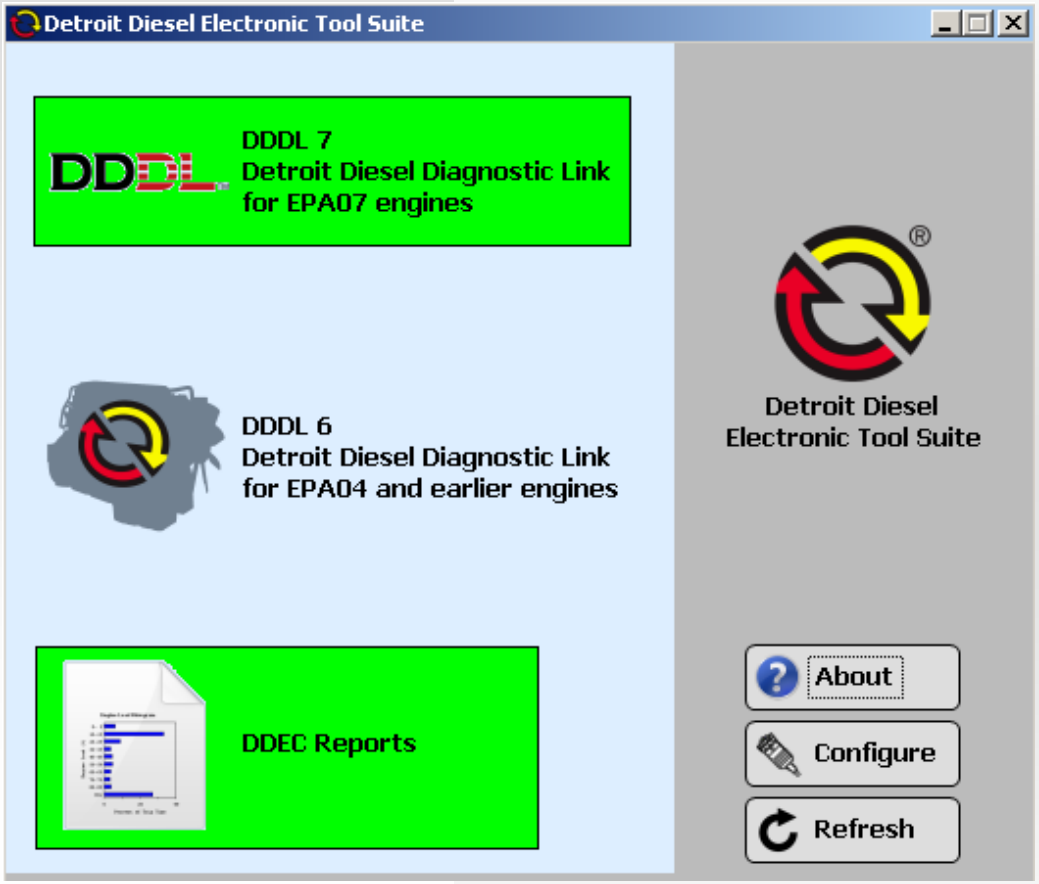
The Detroit Diesel Electronic Tools Suite is a utility designed to assist the user in determining the version of DDDL to use with a particular engine.

It monitors the J-1708 diagnostic bus for specific engine information and indicates the programs that may be used.

When running this program for the first time please click on the "About" box from main screen and review important information about how the program operates.



The next step is to configure the type of translator box you'll be using with the program. Choose the "Configure" box from the main screen of the utility and you'll be able to select from the same list of translators available for DDEC Reports. Make a selection from the list and choose "OK". You are now ready to use the program.



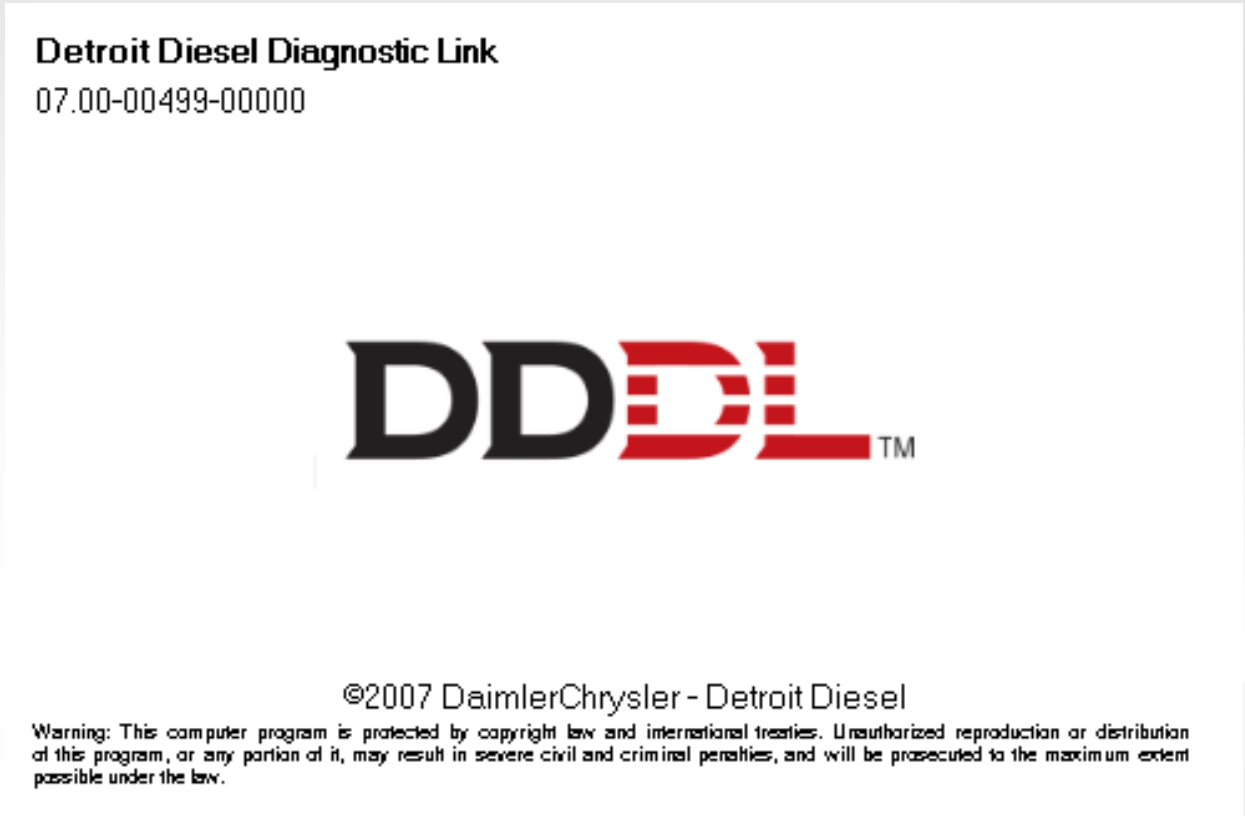
When connected through the vehicle diagnostic connector and the ignition is switched on the utility will automatically detect the type of module you are connected to and highlight the programs that may be used with this system by drawing a green border around them. You may launch the program by clicking inside the green area.

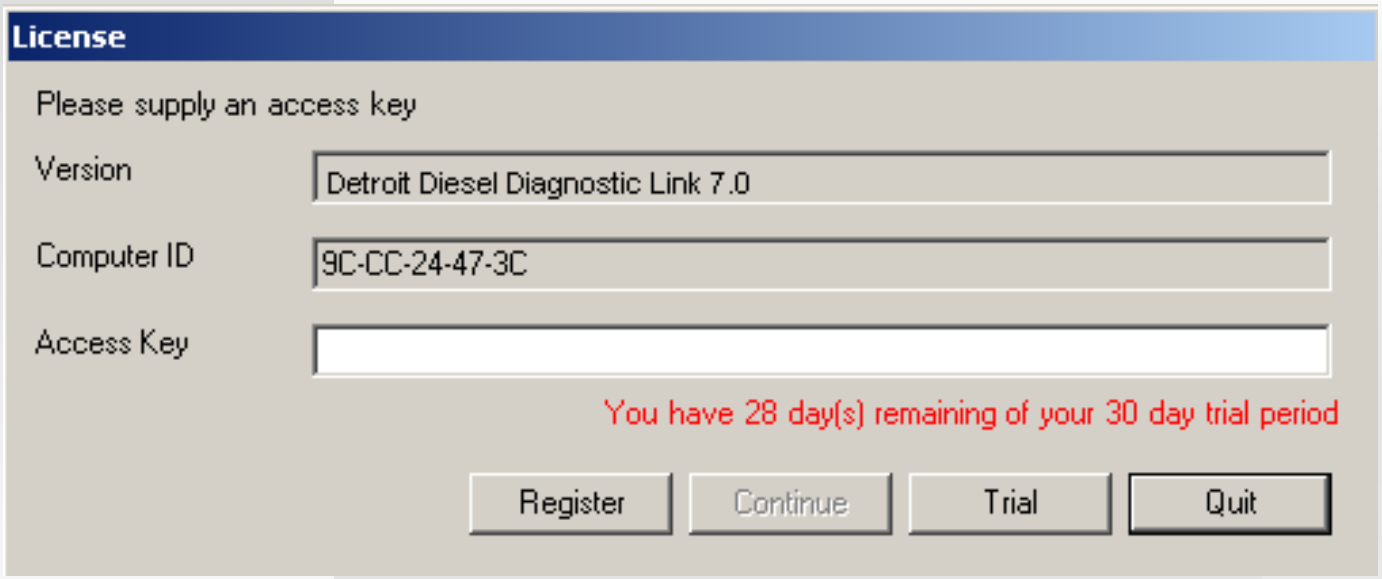
Note: The program will present additional program choices when loaded with the Detroit Diesel Programming Software, however the underlying details of the program are identical.

Opening DDDL 7.0

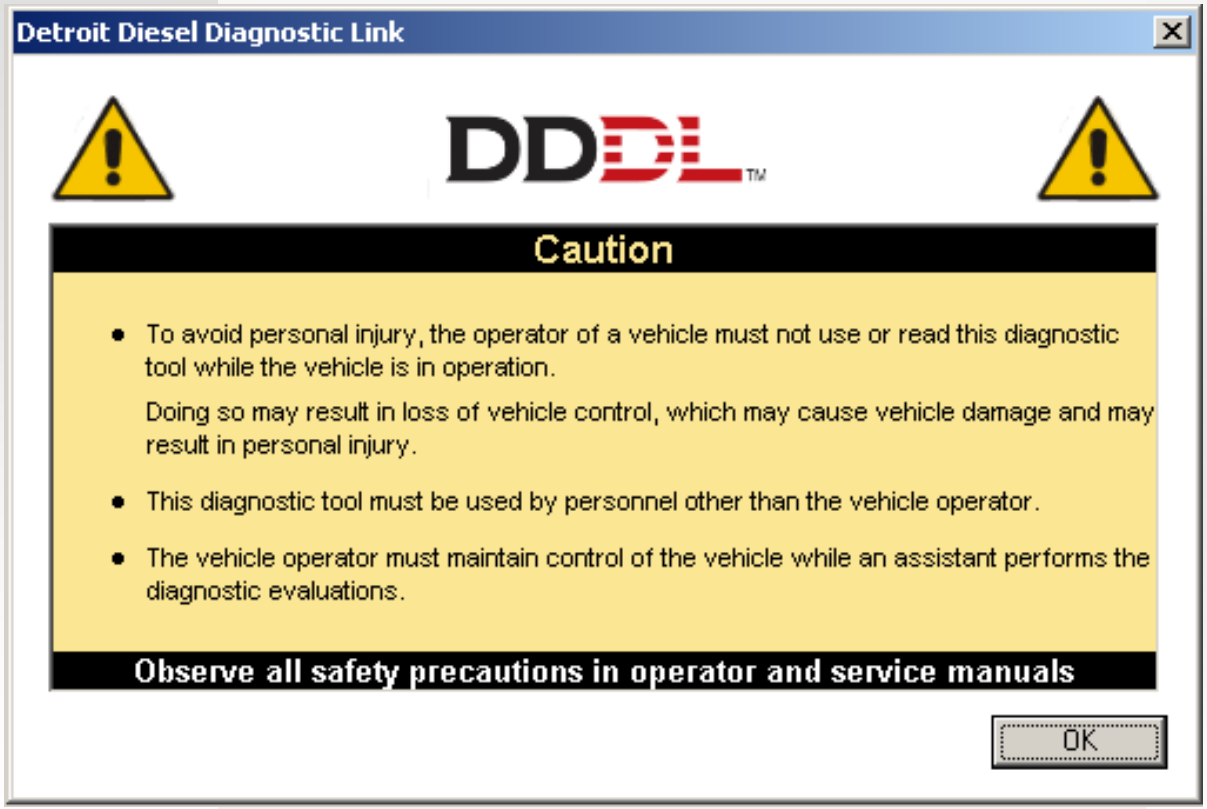
After the application has been successfully installed and the translator configured, you may access it from the Launcher utility or the icon that gets installed on your Windows desktop.

The DDDL application screen will appear as the software loads





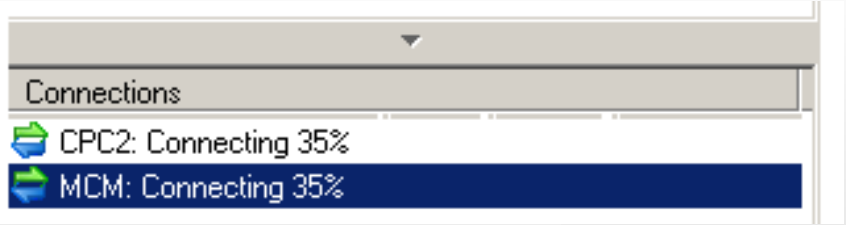
The registration screen will appear before the program loads completely. Please check the registration process document on the CD for details on registering your software.



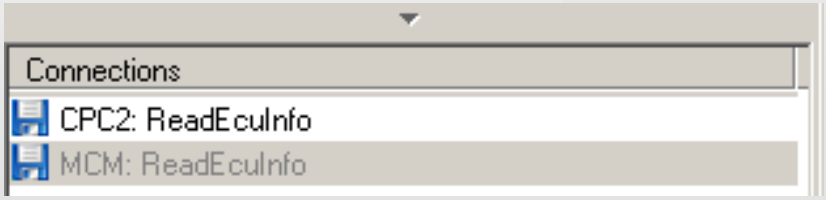
You'll need to acknowledge the safety message to finish loading the application. We're now ready to start using the program.

Connecting Automatically With DDDL 7.0

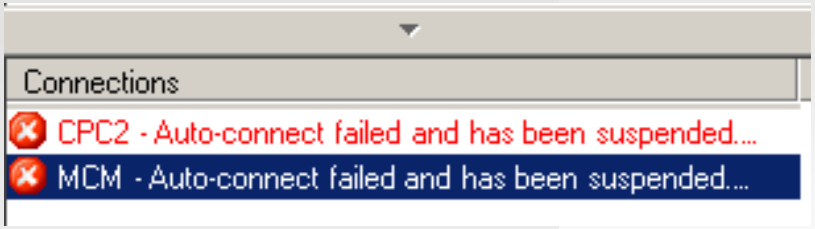
By default the electronic tools attempt to connect automatically to the CPC and MCM.



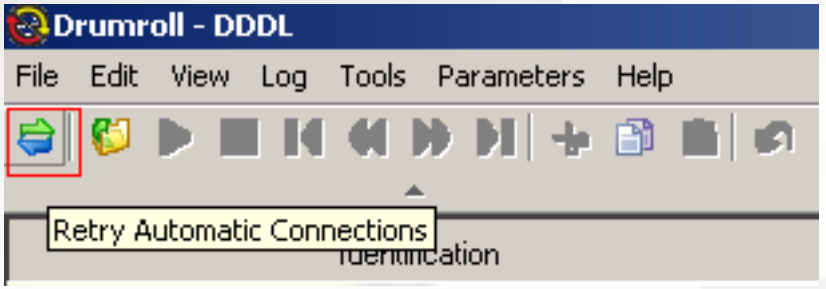
If the tool is connected to a live vehicle then the results of a successful connection are displayed in the status window in the lower left of your screen



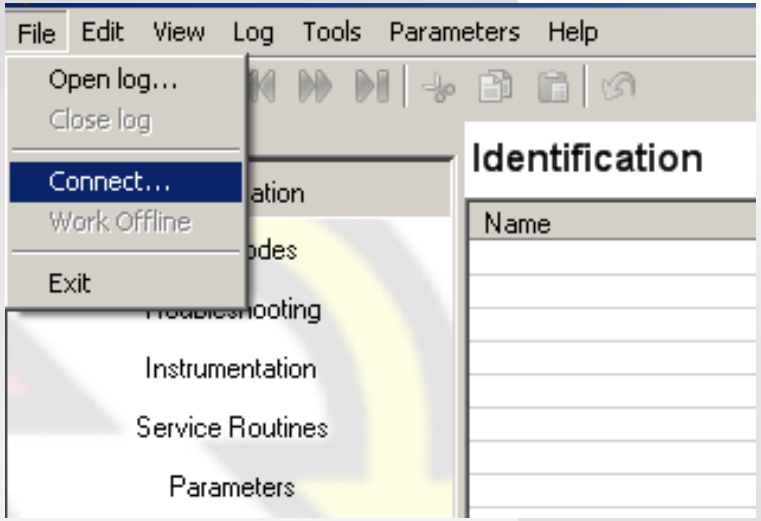
If the initial detection period elapses without connecting to a module attempts to continue making a connection are suspended



You may retry the connection process anytime after the initial auto-connect phase by clicking on the connect button in the icon bar.

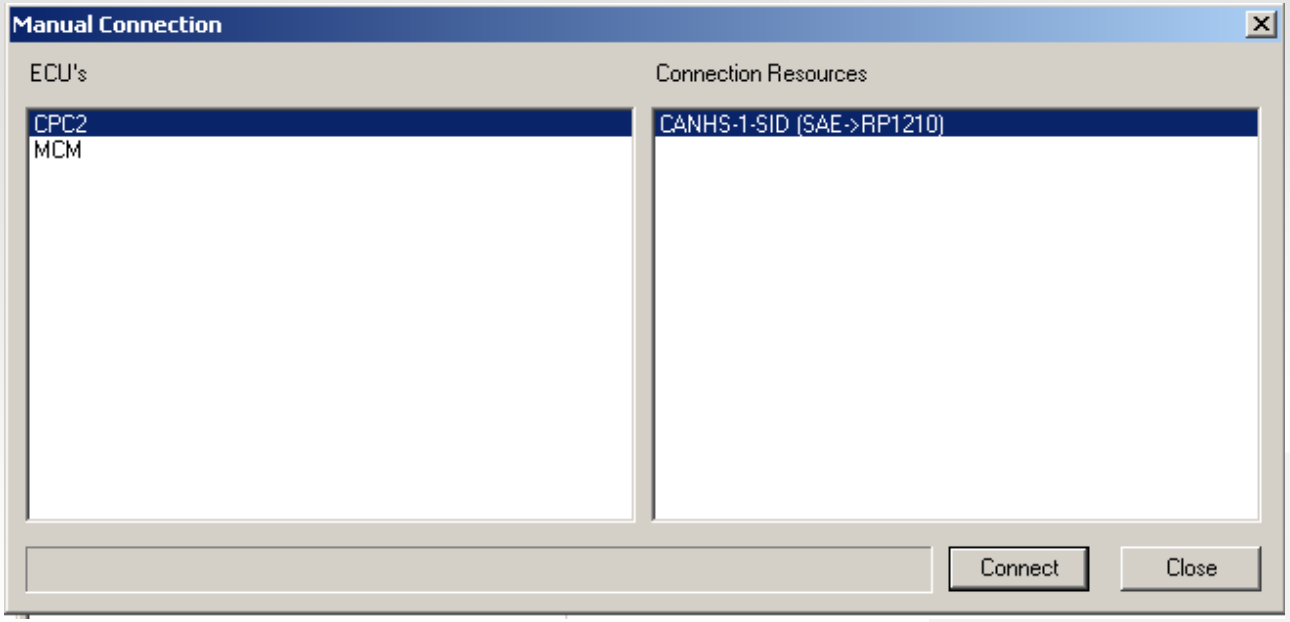


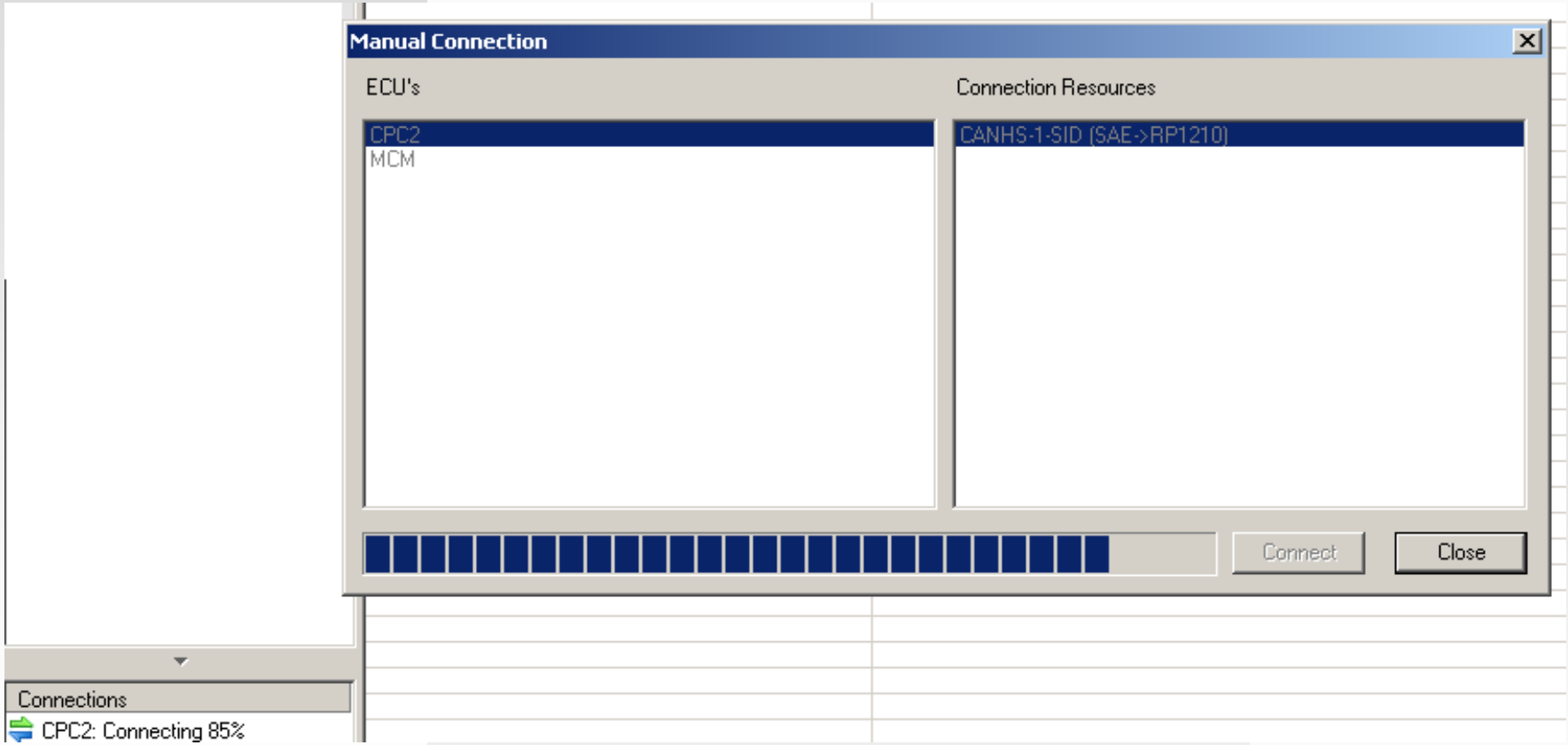
Making a Manual Connection with DDDL and Viewing the Main Screen Components



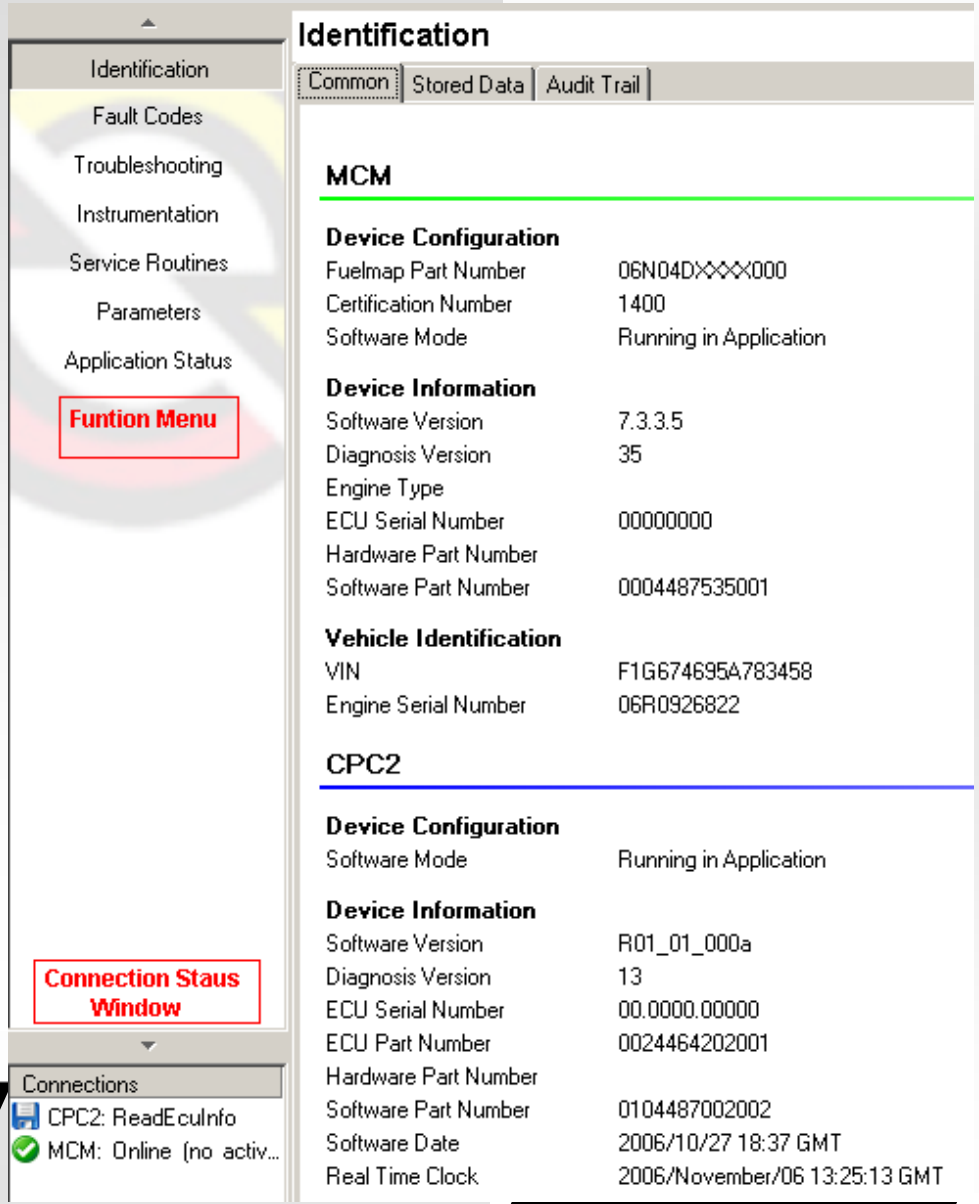
DDDL allows the user to make a manual connection to each controller by using the following procedure: From the "File" drop-down menu select the "Connect" option. A new box will appear showing a list of ECUs you may connect to. Highlight one of the choices and select "connect"

Special notes on making a connection: The user may connect to one or all of the modules listed in this window. There is no minimum number or combination of modules required. The user may re-enter the window and connect to other modules at any time.





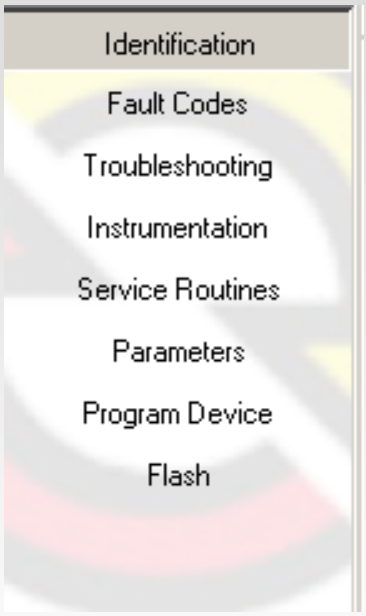
A progress bar will move quickly across the during the connection process. Once the process is complete the user may decide to establish another connection or work with connected



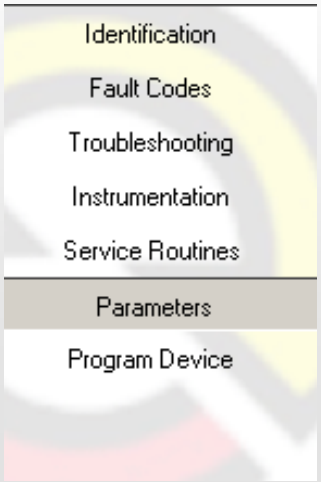
Main Workspace Area

Once the connection process is complete the main window components are ready for use.

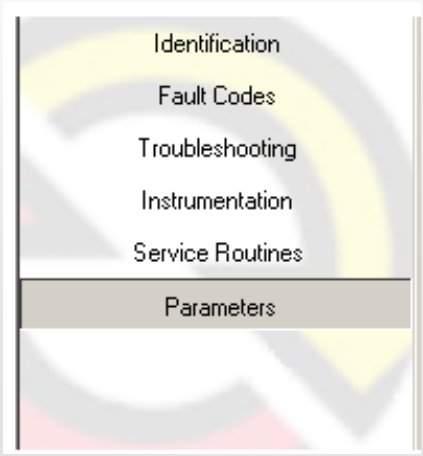
2007 Electronic Tools for DDEC VI



Drumroll



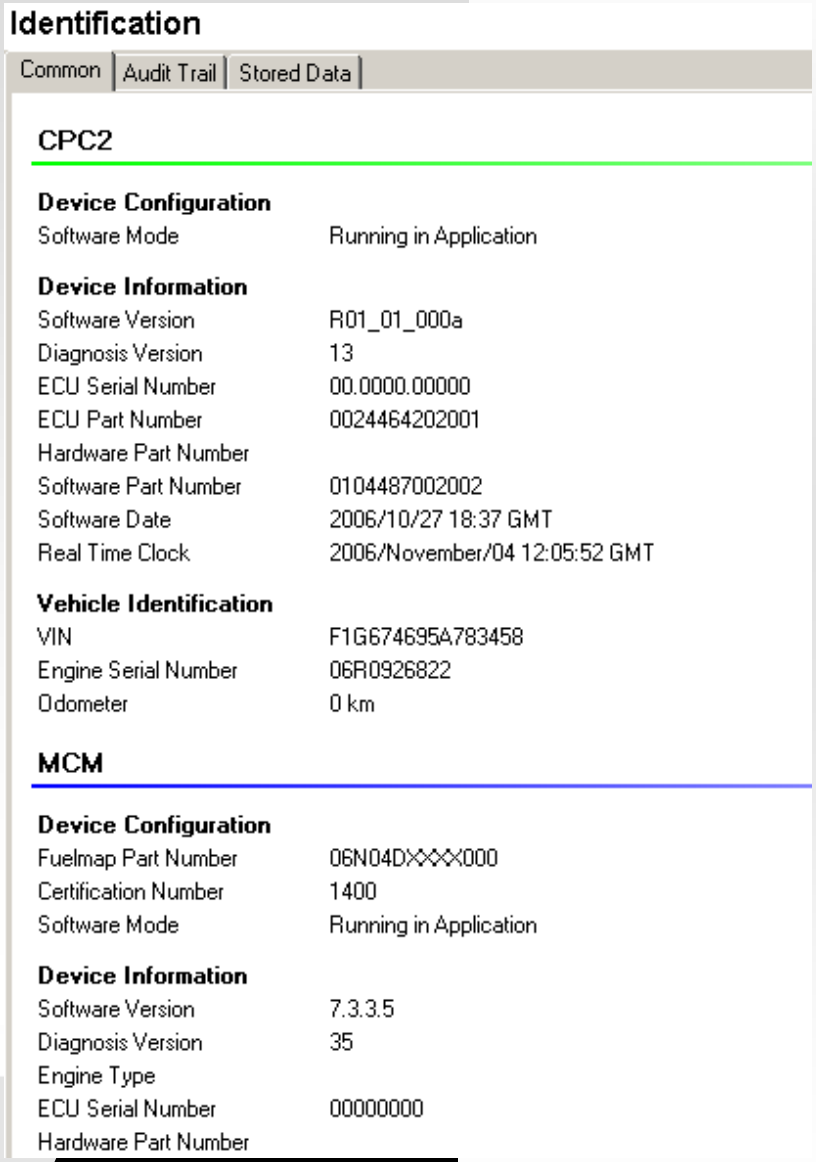
DDRS



DDDL 7.0

In the function menu the numbers of items will vary depending upon the access level of the tool.

IV. Identification

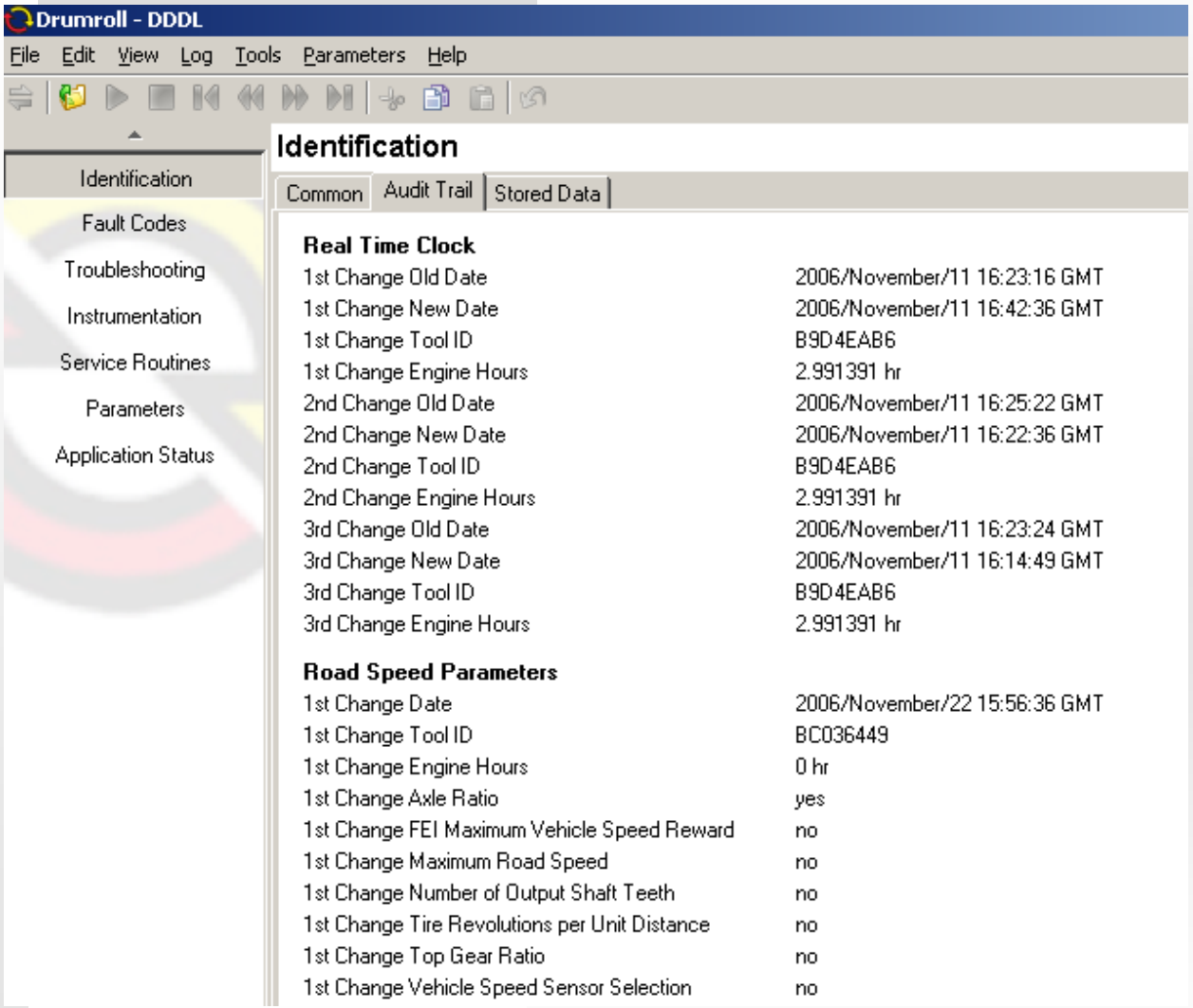


Complete information on all connected modules appears in this section.

CPC and MCM information appear in clearly marked, separate sections throughout the application.

The other components of the the Identification window are the “Stored Data” tab and the Audit Trail” tab.

2007 Electronic Tools for DDEC VI



In Audit Trail tab allows the user to track information on the 3 most recent changes made in the following areas:

- General "Customer Parameter" changes

- Changes made to the "Password Groups"

- Changes made to the "Engine Rating"

- Changes made to the "Real Time Clock"

- Specific changes made that effect the "Vehicle Road Speed"

The tracking of changes made to the passwords is new to DDDL. All the other groups were tracked in earlier versions of DDDL.

Identification

Common | Audit Trail | Stored Data

MCM

Stored Data

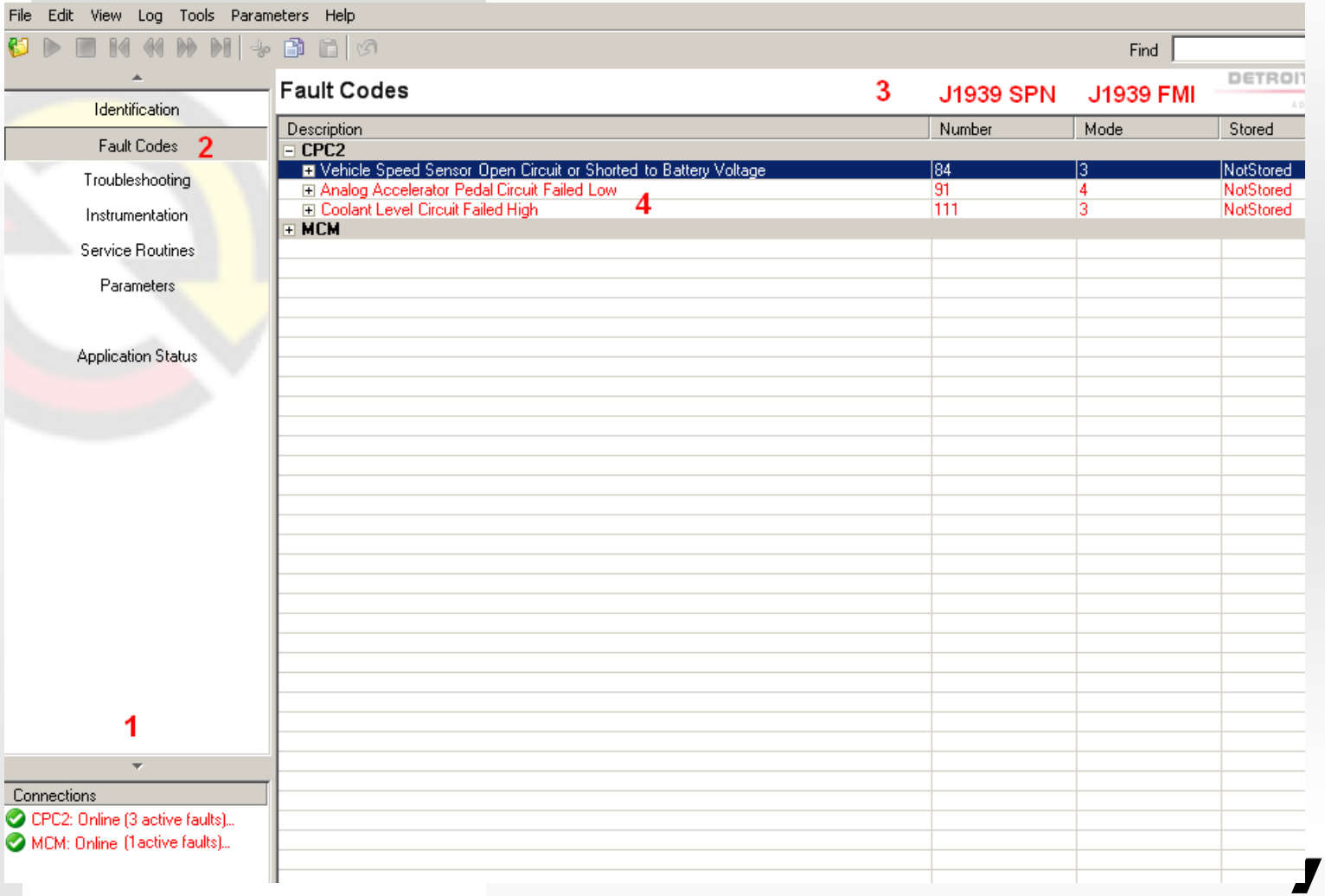
Active Diagnostic Information: Gateway	false
Active Diagnostic Information: Session Type	Extended
Active Diagnostic Information: Variant	1
DDC Fuelmap Part Number: DDC Fuel Map Part Number	06N04D7534002
Fuelmap Description: MCM Fuel Map Description	MY2007 EGR ONHWY TRUCK 490 1550
Governed engine speed: Governed engine speed	8400
Governed power for rat 0: Governed power for rat 0	236
Governed power for rat 1: Governed power for rat 1	220
Hardware Supplier production date: cal_week	57
Hardware Supplier production date: cal_year	6
Hardware Supplier: Information	Conti Temic
Hardware Version: Hardware Type	0
Hardware Version: Patch Level	3
Hardware Version: Sample Number	2
Maximum Engine Torque: Maximum Engine Torque	1450
Maximum Torque Speed: Maximum Torque Speed	365
Mercedes Truck Software: Part Number Flash Boot Loader	0004487635001
Mercedes Truck Software: Part Number Original Firmware	0000000000000
OBD/EMD CAL ID: cal_id	06N04D7534002
Rated brake power for rat 0: Rated brake power for rat 0	365
Rated brake power for rat 1: Rated brake power for rat 1	339
Rated engine speed for rat 0: Rated engine speed for rat 0	7200
Rated engine speed for rat 1: Rated engine speed for rat 1	7200
Rating Code: Rating Code	1543

The “Stored Data” tab contains detailed information on the module hardware and software versions.for both the MCM and CPC.

The fuel map part number is on this screen as well as rating information on the engine.

V. Using the Fault Code Window

2007 Electronic Tools for DDEC VI



Fault codes appear for each module appear in the main window when the you select the "Fault Code" function (2)

The "Number" refers to the J1939 SPN and the "Mode" refers to the J1939 FMI (3)

The "+" signs to the left of the fault codes indicate additional information on this code is available (4)

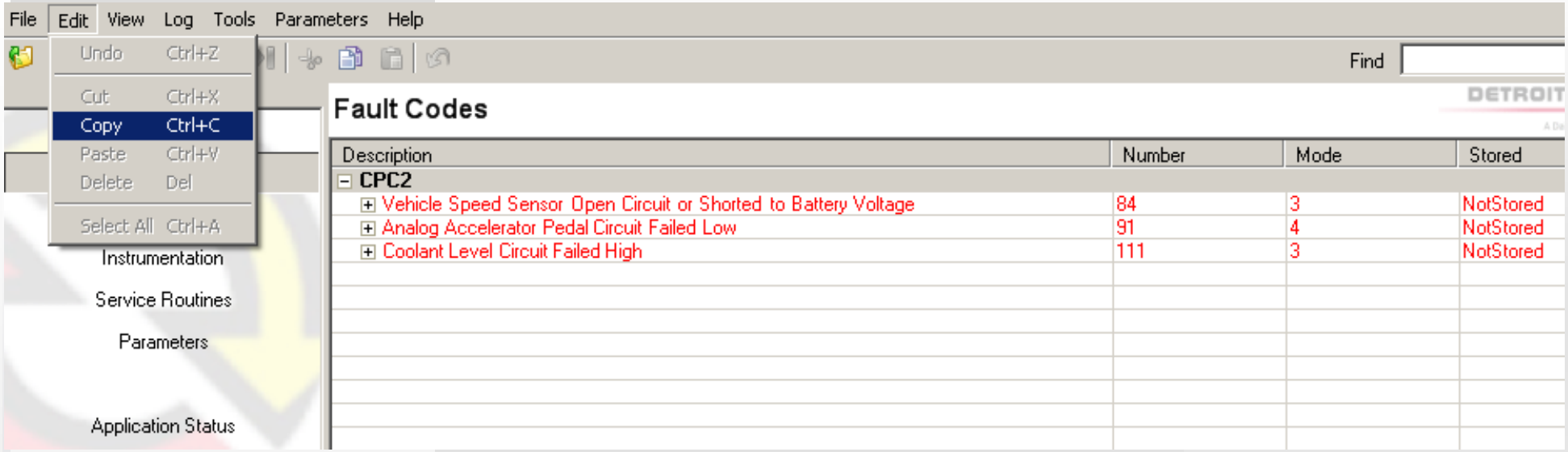
The connection status window displays the a summary of active faults (1). The status message is displayed in red if faults are active, black in all other cases.

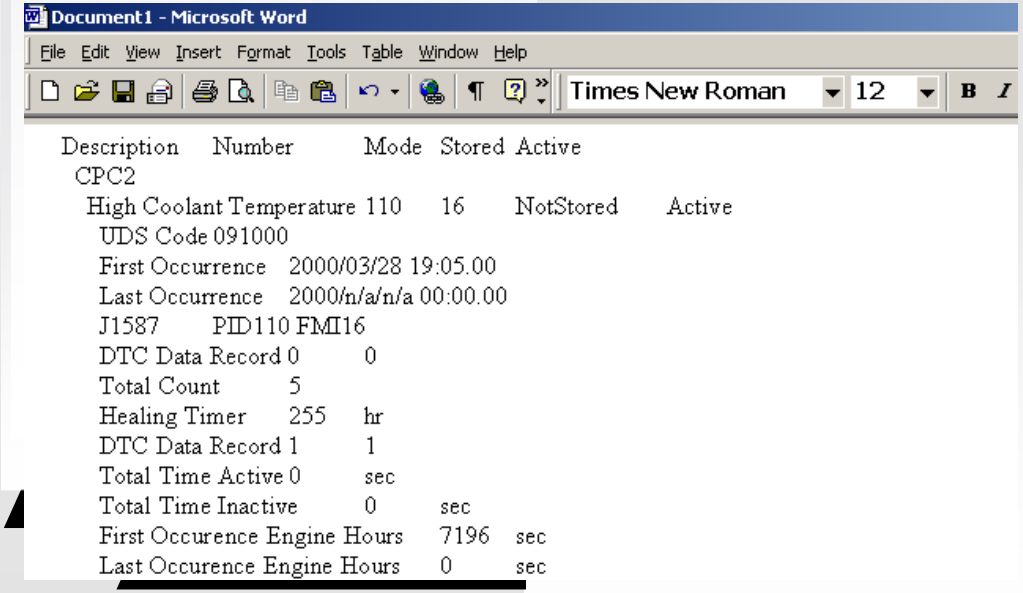
Fault Codes

Description	Number	Mode
MCM		
No Data Received from Engine CAN Link	625	9
Engine Coolant Outlet Temperature Circuit Failed High	110	3
Intake Air Throttle Circuit Failed Low	51	4
DPF Oulet Temperature Circuit Failed High	3246	3
DOC Outlet Temperature Circuit Failed High	3250	3
DOC Inlet Temperature High	3242	3
UDS Code	870F00	
First Occurrence	2006/11/03 15:33.53 GMT	
Last Occurrence	2006/11/03 15:33.53 GMT	
J1587	PID 318 FMI 3	
Extended Data Record #1 "Counter"	0	
Extended Data Record #2 "Time Stamp"	1	
Extended Data Record #3 "Physical Data"	2	
Engine Speed	0	rpm
Engine Torque	0	ft-lb
Engine Coolant Temperature	100	°F
Boost Pressure	4000	mbar
Calculated Load Value	0	%
Vehicle Speed	0	mph
Reserved for Number of Engine Overrides	255	
Reserved for Extreme Parameter	65535	
Extended Data Record #4 "Fault Code Data"	3	
Extended Data Record Number 5th Data Record "Enhanced Environmental Data"	4	
Extended Data Record Number [0x06], "DPF Data"	12	

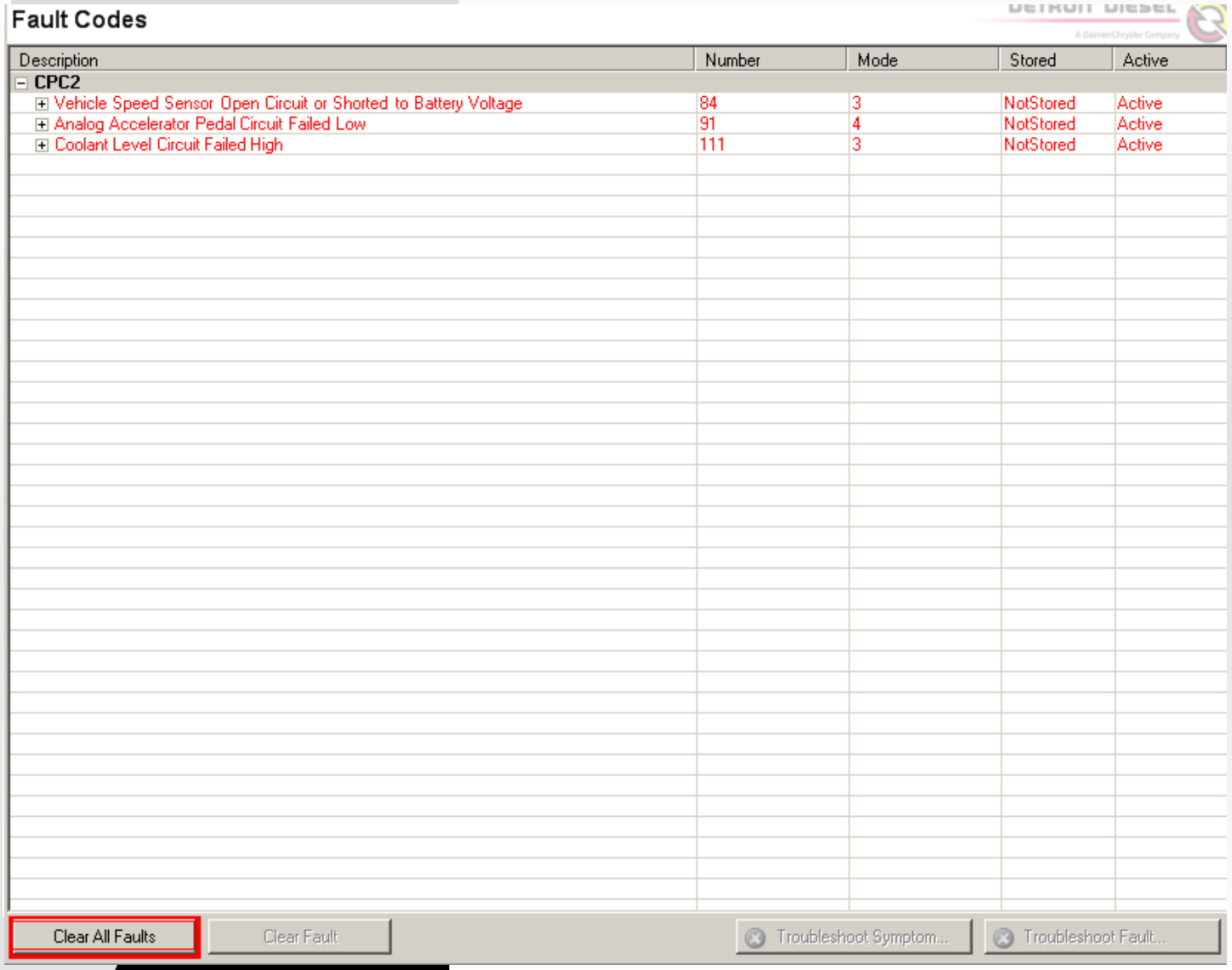
A sample of the extended fault code information available for 2007 fault codes. The 2007 codes contain much more information on each code than previous versions of DDEC.

To view the extended data click on the "+" plus sign in front of the fault in the main fault code menu. To view the contents of the data in each of the records click on the "+" sign in form of each section. Extended records 1 through 3 contain information that will be of use to all technicians. Data in Extended Records 4 and 5 will be of interest to technical support and engineering.





You may copy the entire contents of the fault window and paste it to a different application, by going to “Edit” and choosing “Copy”. This function is available in other windows as well.



To clear all fault codes go to the lower left of the window and choose to “Clear All Faults”. To clear a single code highlight the code you wish to clear and choose the “Clear Fault” box.

VI. Interactive Troubleshooting Material

2007 Electronic Tools for DDEC VI

In the 2007 electronic tools users will be able to access 2 types of troubleshooting material.

1- The first is the traditional troubleshooting material that has been an important part of DDDL since its initial release.

2- The Advanced Diagnostics material is being introduced for the first time for DDEC VI. Advanced Diagnostics will guide the user through troubleshooting complex systems (ATS, EGR, etc.) by evaluating sensor data from the engine running under specific conditions and running diagnostic routines. Cases for Advanced Diagnostics will be created based on the latest engineering and information from the field.

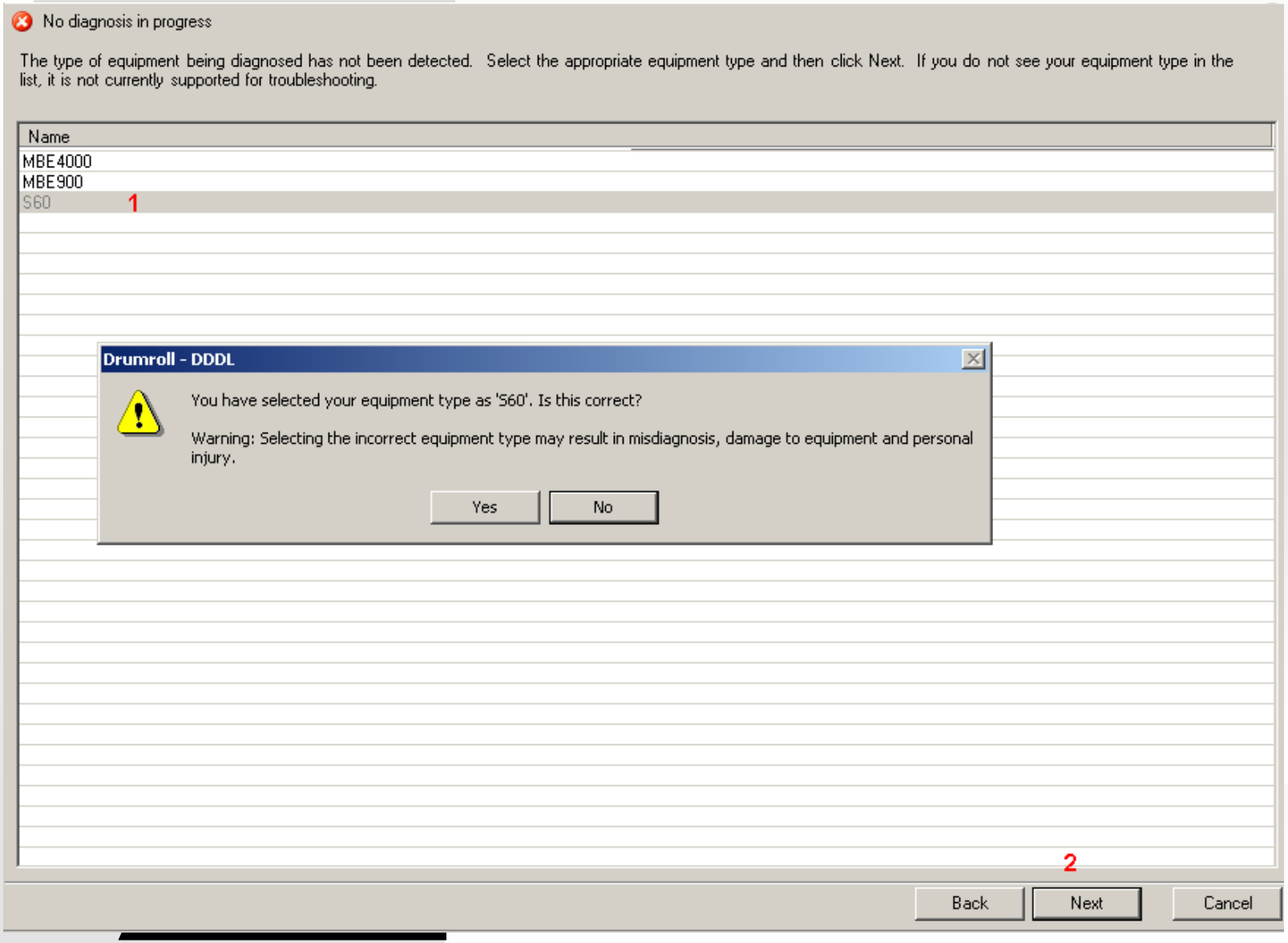
3- Both types of troubleshooting information will be updated via Internet downloads.

Using Traditional Troubleshooting Information in Diagnostic Link

Description	Number	Mode	Stored
CPC2			
Vehicle Speed Sensor Open Circuit or Shorted to Battery Voltage	84	3	NotStored
Analog Accelerator Pedal Circuit Failed Low	91	4	NotStored
Coolant Level Circuit Failed High	111	3	NotStored
MCM			

To access the standard troubleshooting material highlight the fault code you wish to work on.

Move to the lower right of the fault code window and select the "Troubleshooting Fault" box.



A screen will appear asking the user to select the engine type being worked on. It is critical to select the correct engine type. Once the choice is made go to the "Next" box in the lower right of the window.

SPN 84/FMI 3

This diagnostic condition is typically VSS open circuit.

Open Circuit Check

Check as follows:

1. Disconnect the Vehicle Speed Sensor (VSS).
2. Measure the resistance between pin 13 of the CPC connector #3 (21–pin) and pin 1 of the VSS.
   i. If the resistance is greater than 3 Ω, repair the open between pin 13 of the CPC connector #3 (21–pin) and pin 1 of the VSS. Refer to "Verify Repairs" .
   ii. If the resistance is less than 3 Ω, go to step 3 .
3. Measure the resistance between pin 14 of the CPC connector #3 (21–pin) and pin 2 of the VSS sensor.
   i. If the resistance is greater than 3 Ω, repair the open wire between pin 14 of the CPC #3 connector (21–pin) and pin 2 of the VSS. Refer to "Verify Repairs" .
   ii. If the resistance is less than 3 Ω, go to step 4 .
4. Measure the resistance between pin 13 of the CPC connector #3 (21–pin) and pin 1 of the VSS sensor.
   i. If the resistance greater than 3 Ω, replace the VSS. Refer to "Verify Repairs" .
   ii. If the resistance is less than 3 Ω, repair the short in the harness between pins 13 and 14 of the CPC connector #3 (21–pin). Refer to "Verify Repairs" .

The troubleshooting material for the selected fault will appear on the screen. Follow the steps in the guide using the hyperlinks until the repair is completed.

The troubleshooting guide may also be accessed when not connected to the vehicle by choosing the "Troubleshooting" item from the main function menu.

Using Advanced Diagnostics Troubleshooting Information in Diagnostic Link

The Advanced Diagnostics material is being introduced for the first time for DDEC VI. Advanced Diagnostics will guide the user through troubleshooting complex systems (ATS, EGR, etc.) by evaluating sensor data from the engine running under specific conditions and running diagnostic routines. Cases for Advanced Diagnostics will be created based on the latest engineering and information from the field.

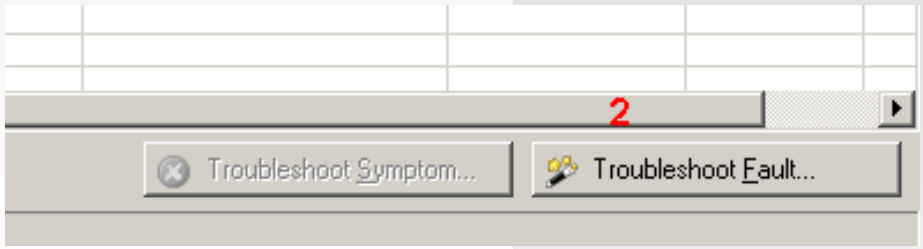
Indicates traditional troubleshooting information is available for the fault

Indicates advanced diagnostics troubleshooting information is available for the fault

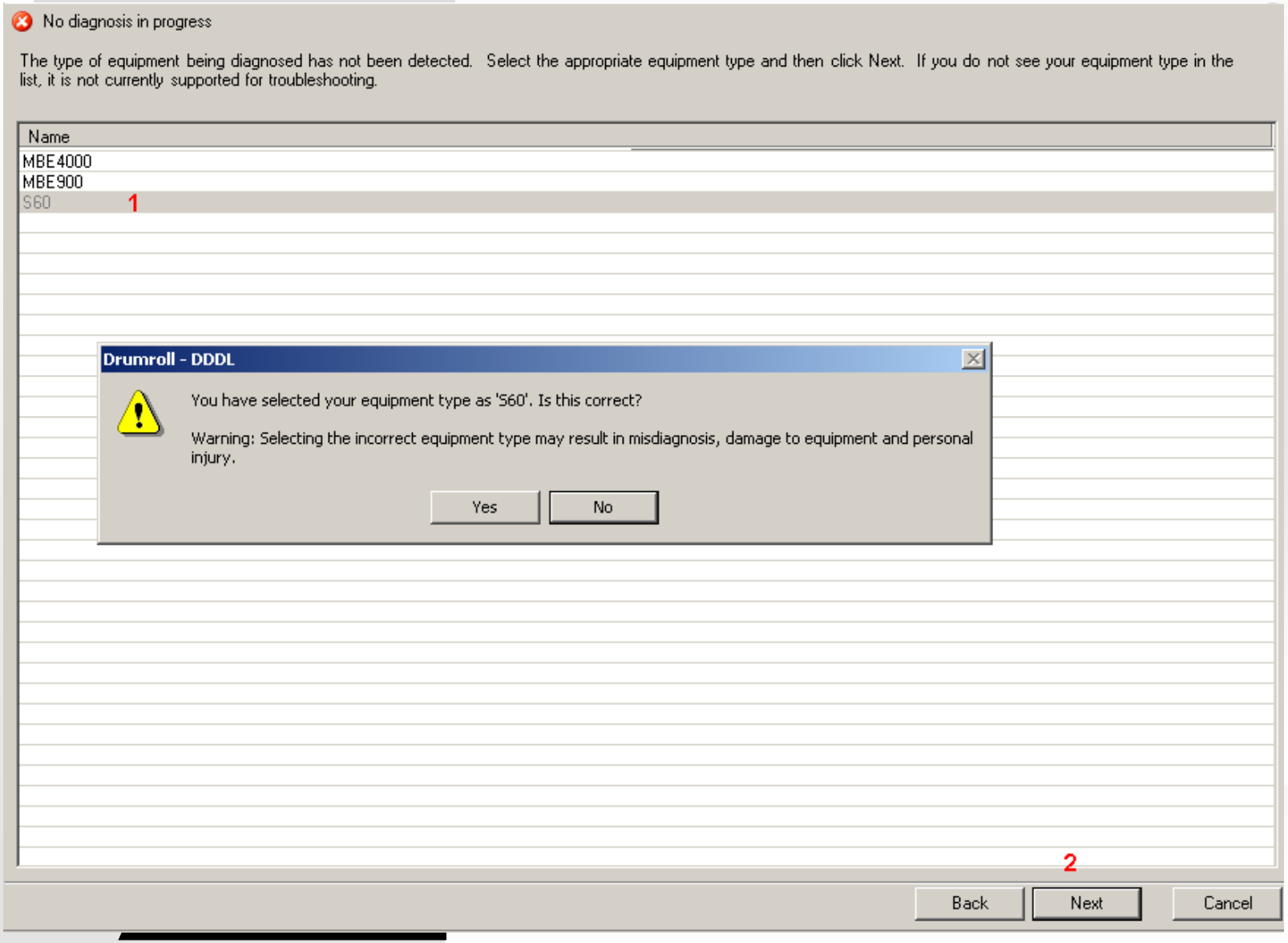
The user will begin the advanced diagnostics troubleshooting process in the same manner as the traditional troubleshooting guide material. Select a fault code from the list in the fault code window and then go to the "Troubleshoot Fault" box in the lower right of the window.

Fault Codes

Description	Number	Mode
MCM		
Actuator Manager Position EGR Deviation	2791	7
CPC2		

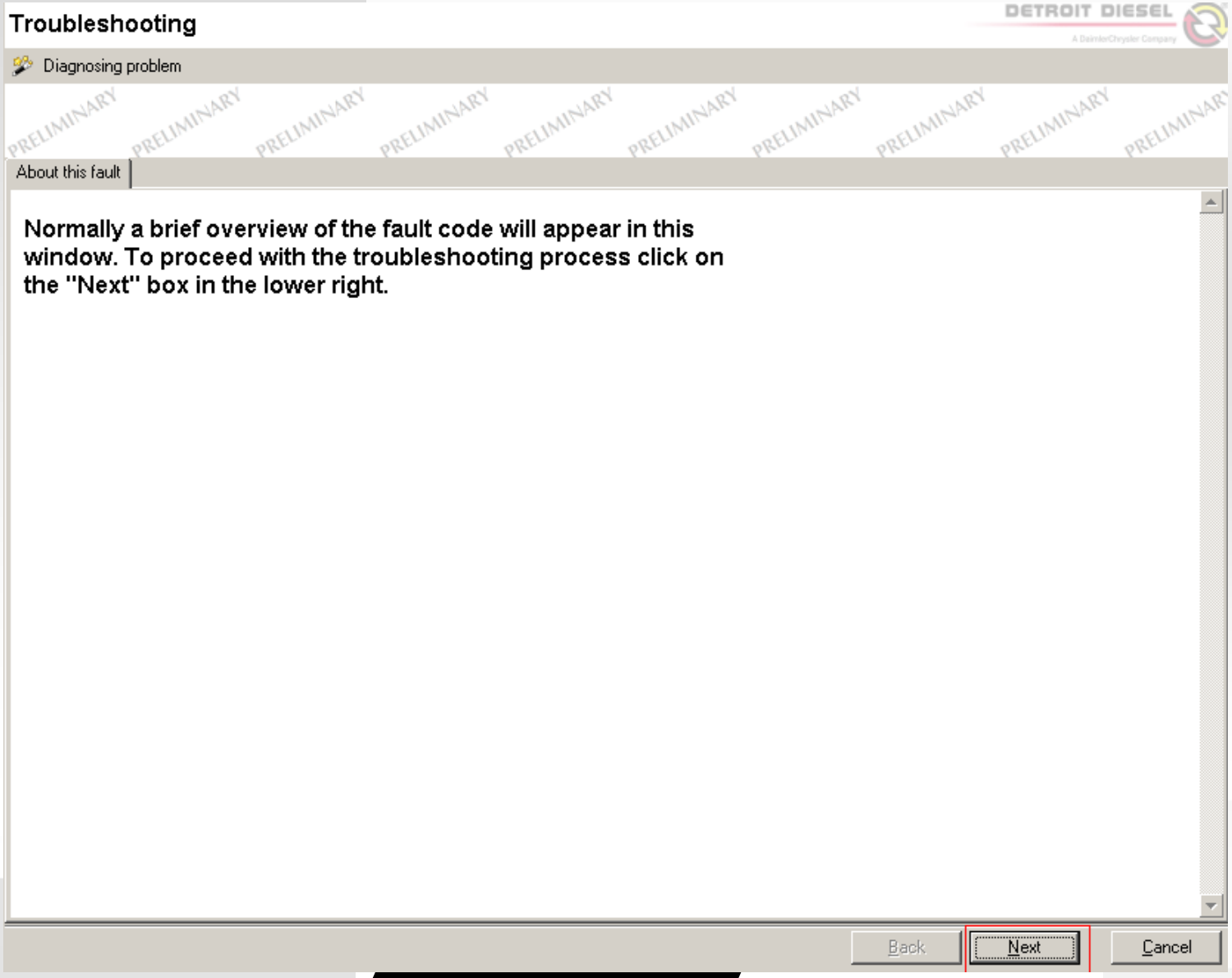


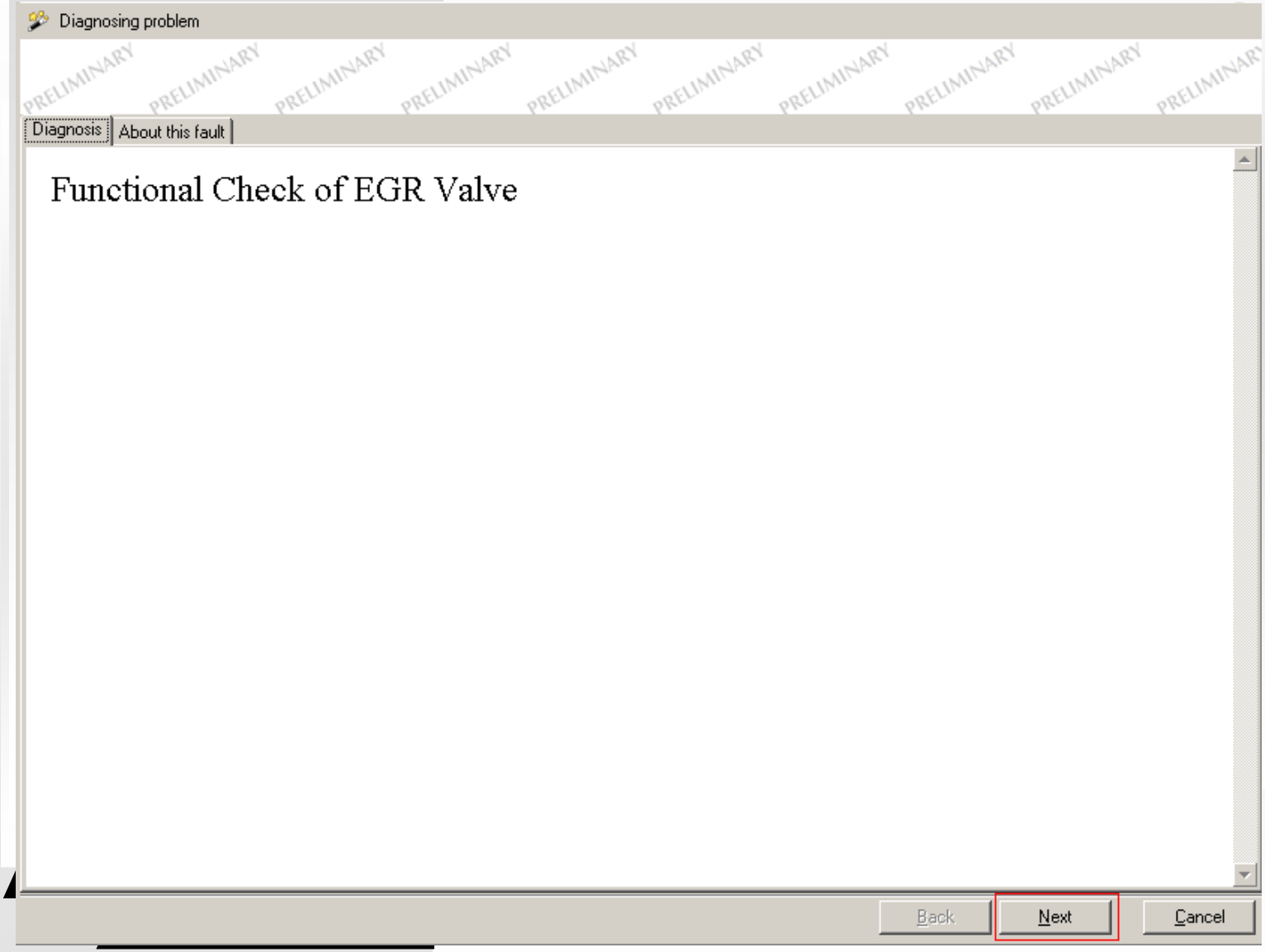
The fault code SPN 2791 FMI 7 is displayed in the MCM fault code list. When the code is highlighted (1) you'll note that this fault has an Advanced Diagnostics troubleshooting procedure. To proceed with the advanced procedure click on the "Troubleshoot Fault" box..



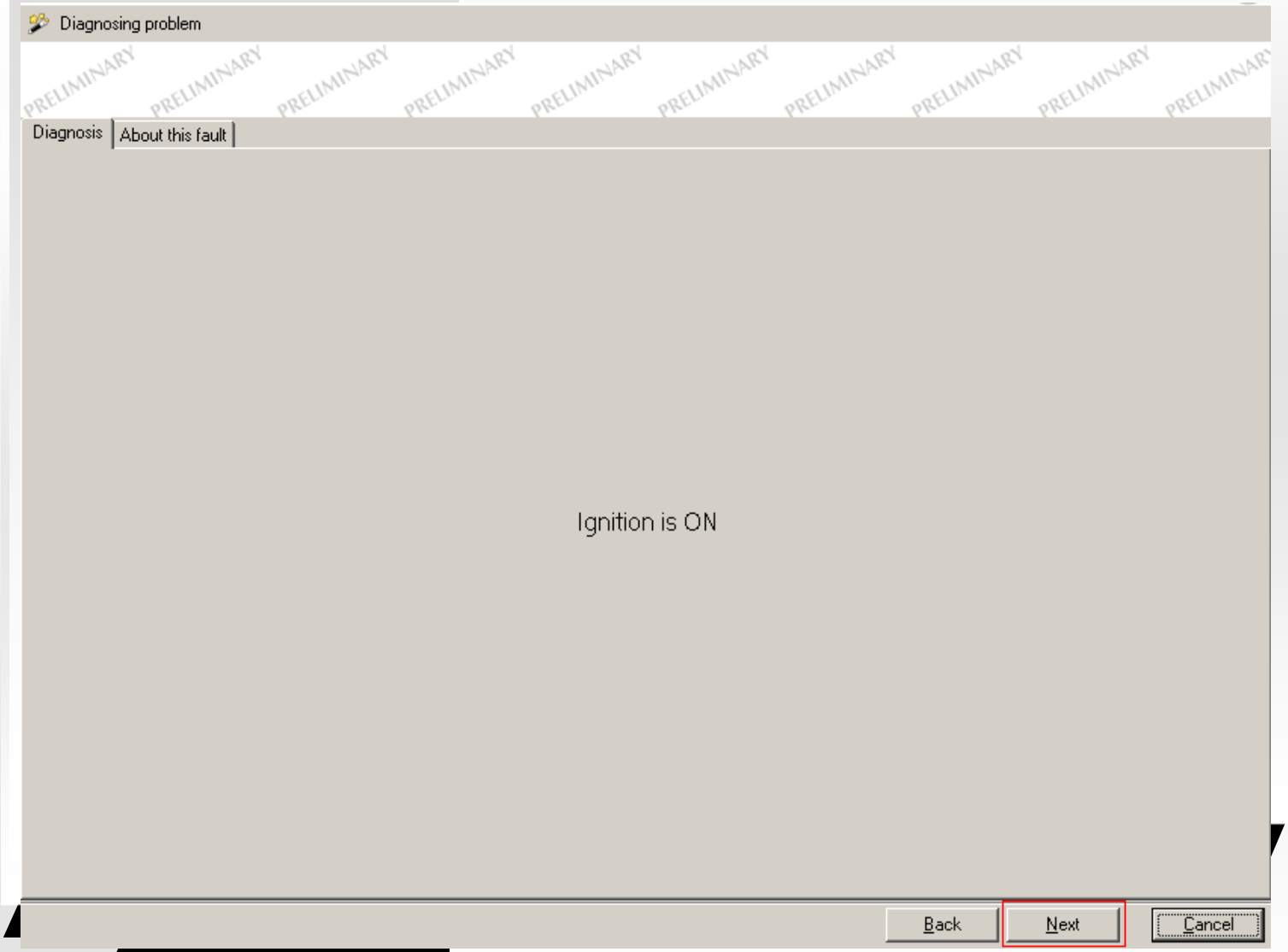
A screen will appear asking the user to select the engine type being worked on. It is critical to select the correct engine type. Once the choice is made go to the "Next" box in the lower right of the window.

NOTE: With later versions of MCM software this window will no longer appear because the program will auto-detect the engine type.

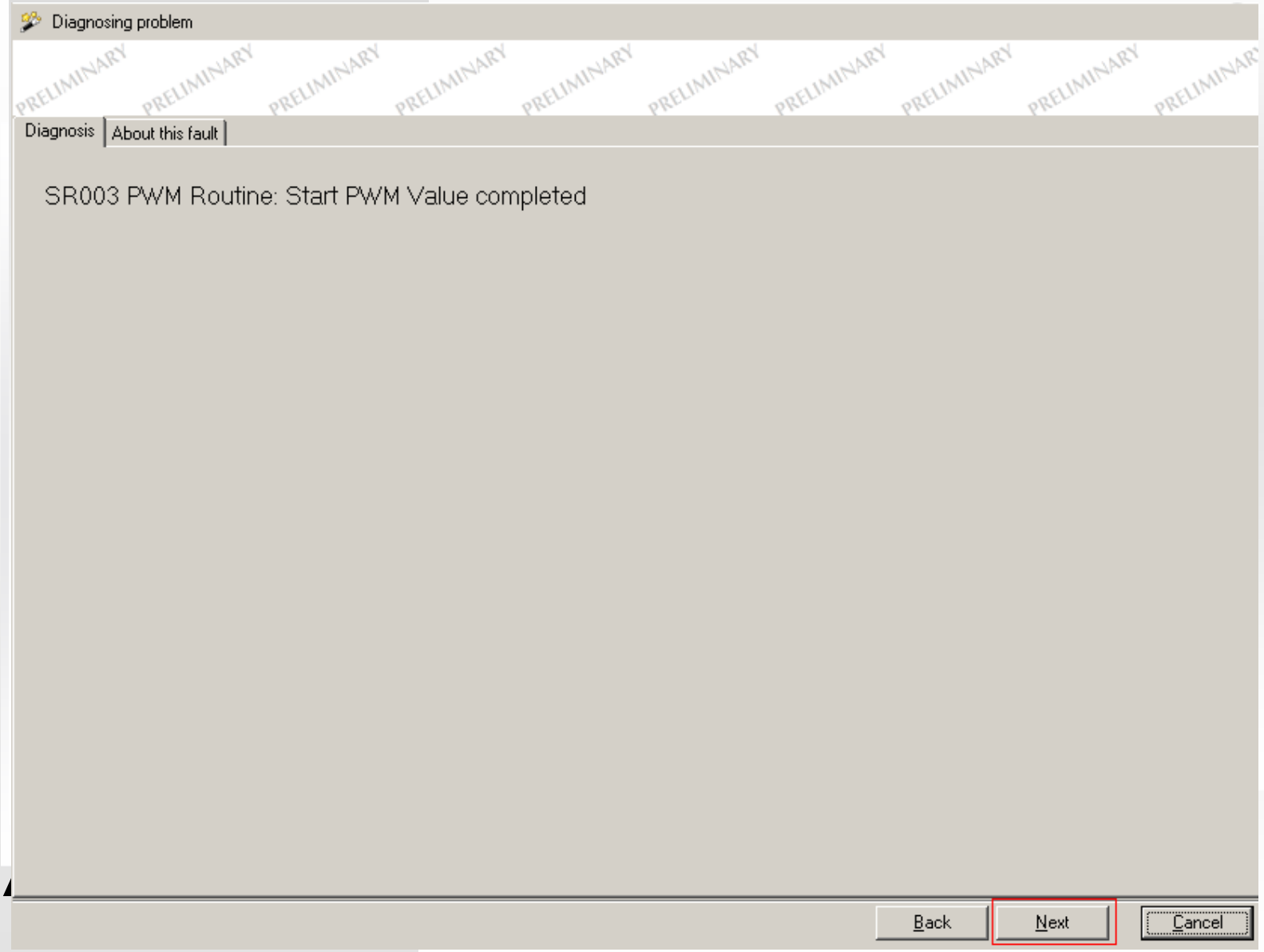




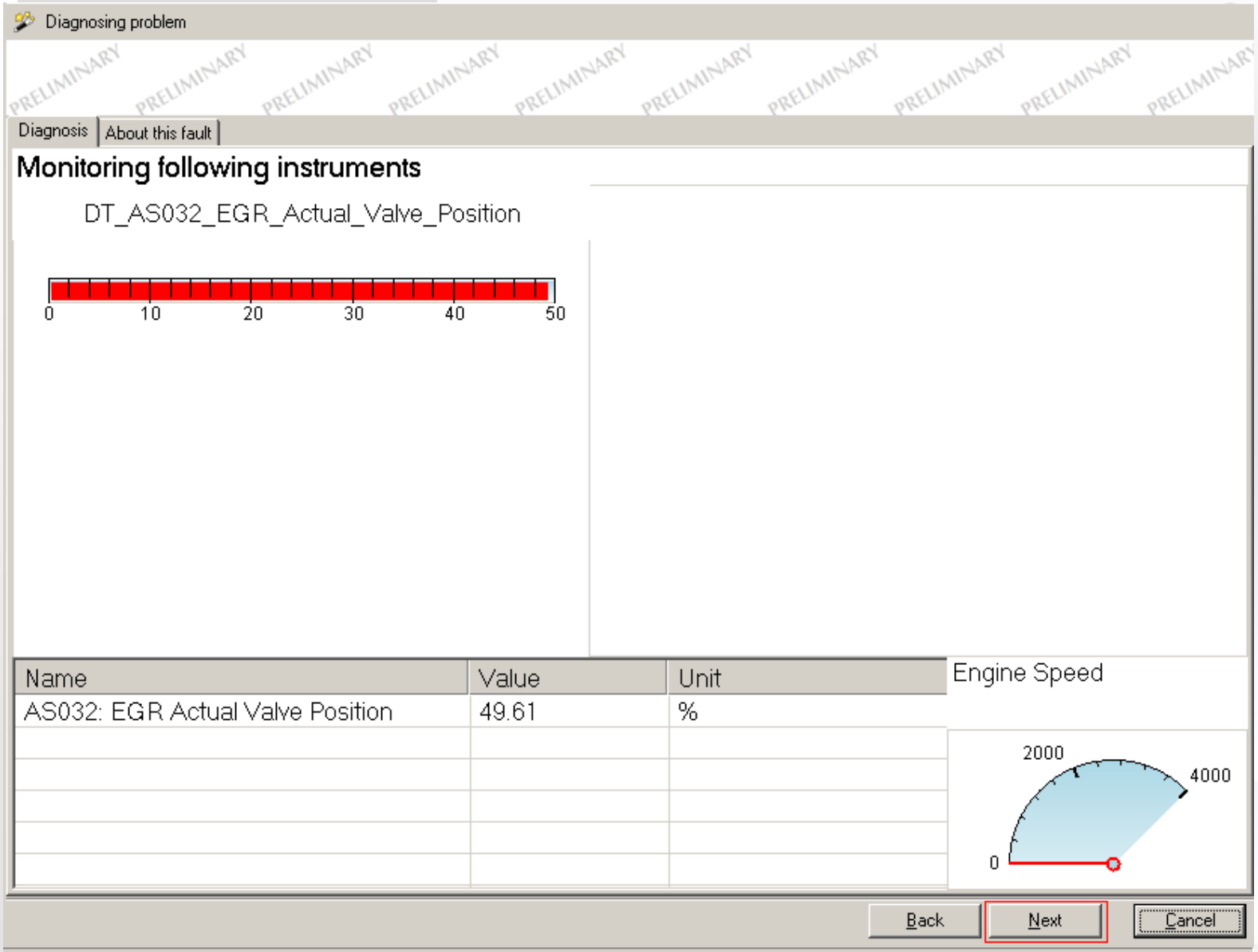
The next screen informs the user of how the diagnostic process will proceed. In this case the tool will perform a functional check of the EGR valve. To proceed click on the “Next” box in the lower right.



The next screen informs the user that the ignition is "ON". To proceed click on the "Next box in the lower right.

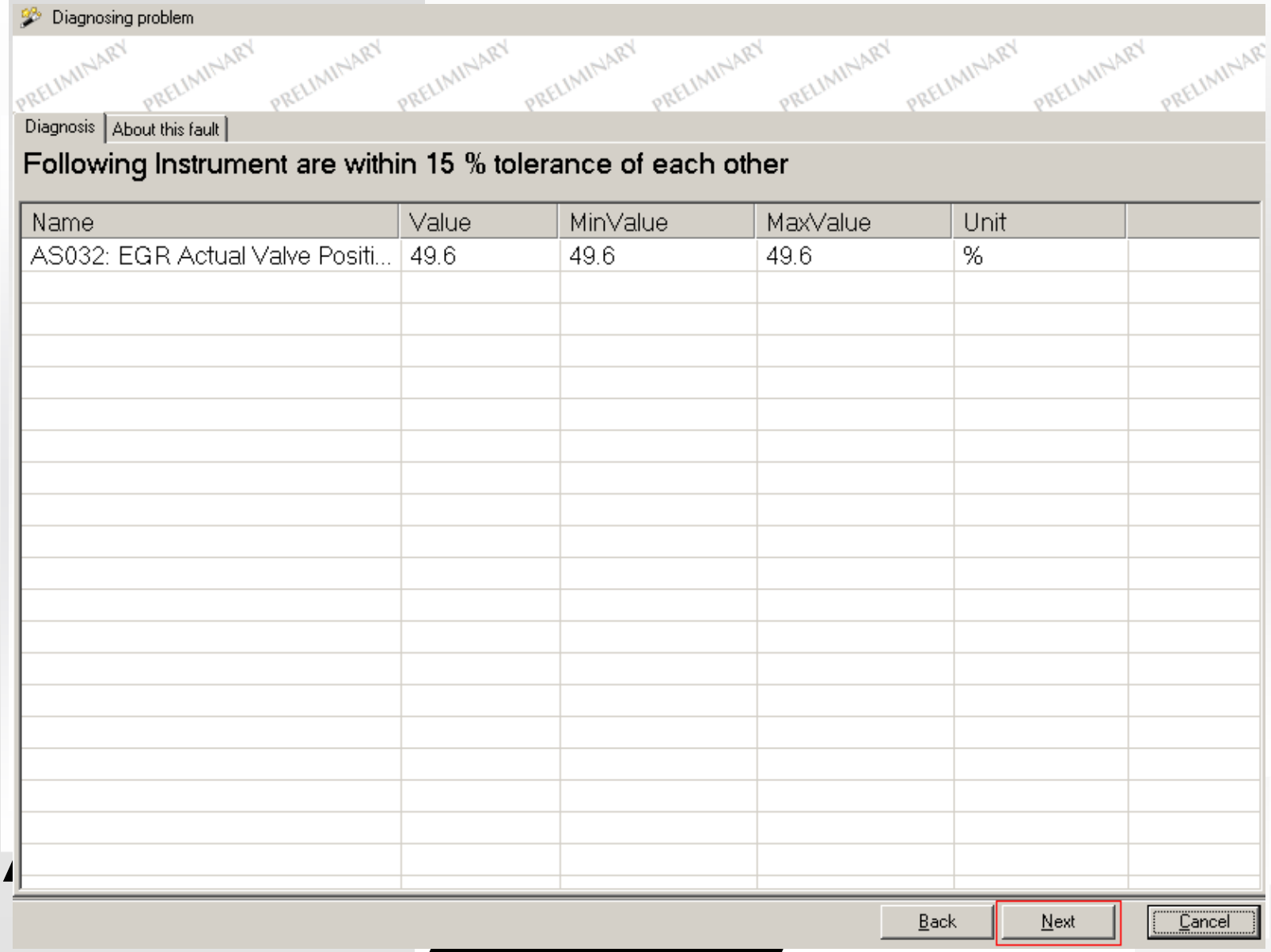


On the next screen the user sees that the application has run the MCM service routine to activate PWM outputs. The values are pre-set for the routine and the results will analyzed on the next screens. To proceed click on the “Next” box in the lower right.



On the next 2 screens we receive more information on what was just done. The routine requested that the valve be opened to a value of 50%.

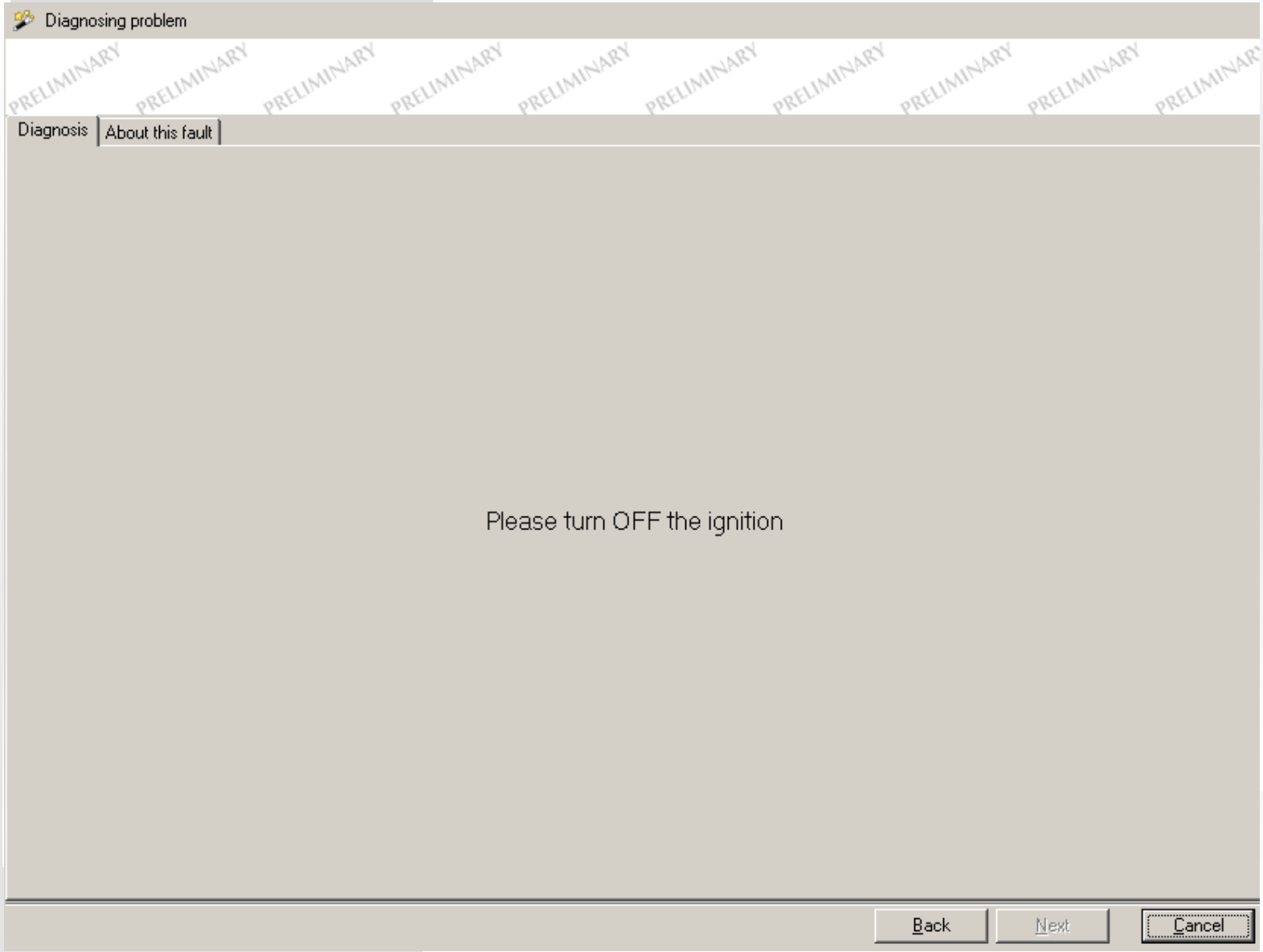
For further analysis the user should move to the next screen by clicking on the “Next” box.



The next screen tells us that the valve opened to a position within the tolerance of the value requested. .

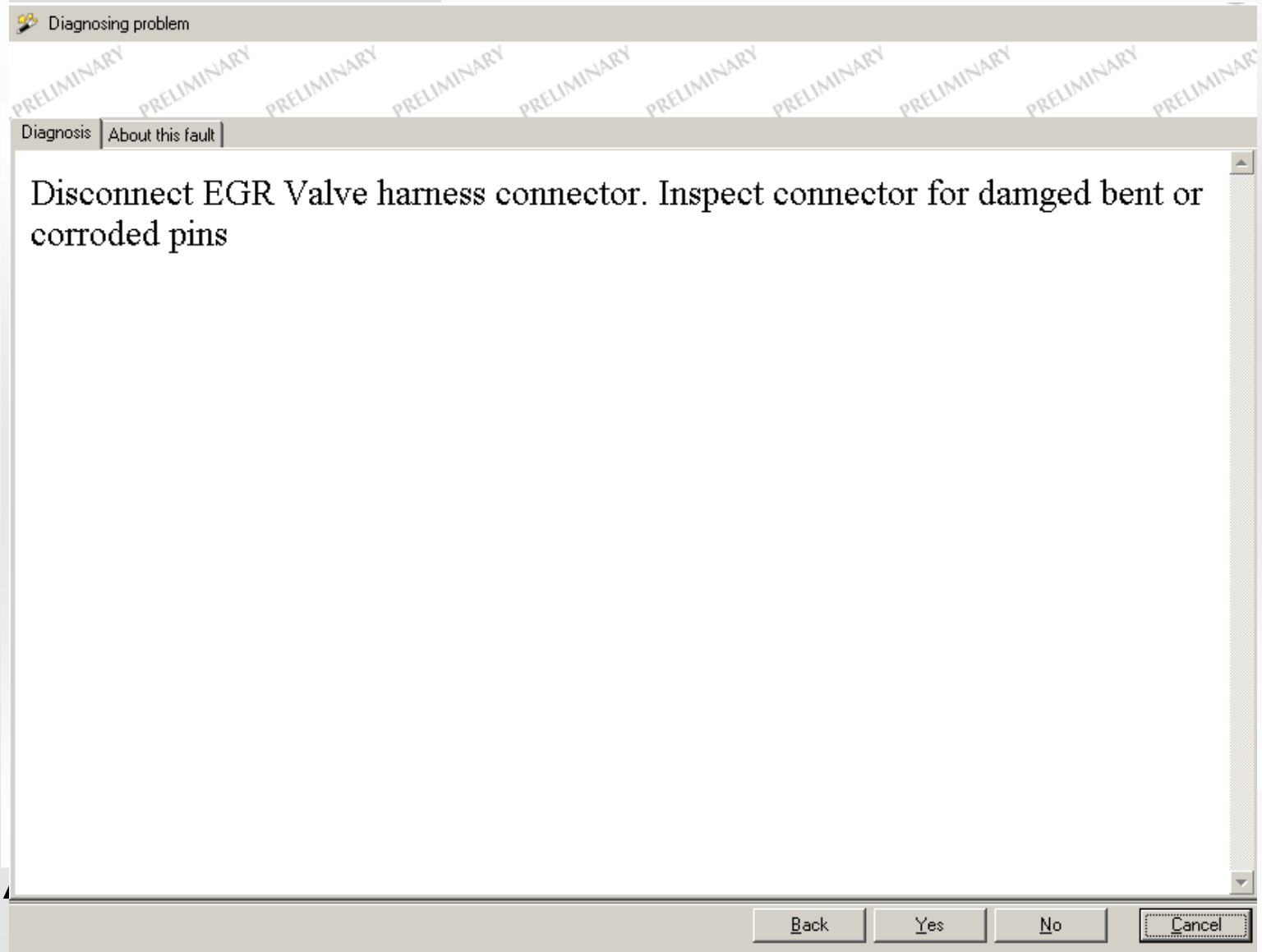
Based on this feedback from the tool we are prepared to proceed with the process by selecting the "Next" box.

If the value fell outside the accepted tolerance of the test the diagnostic process would proceed in a different direction.

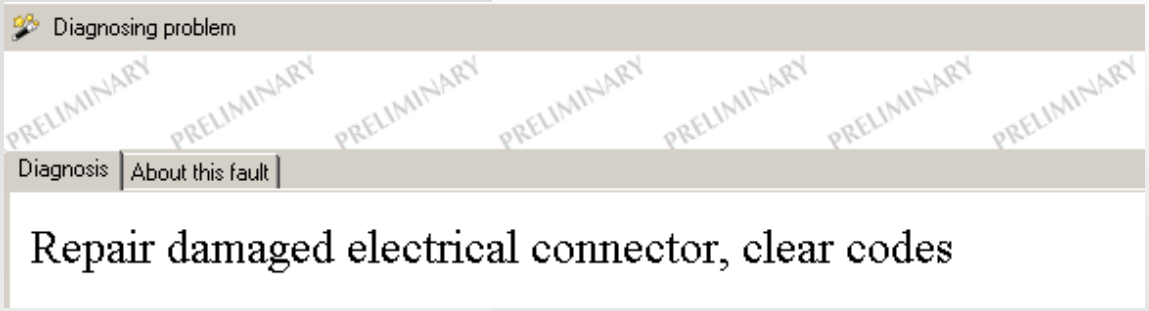


In the next screen the user is requested to turn off the ignition.

The tool will automatically detect when the ignition is shut off and will automatically switch to the next screen in the process.



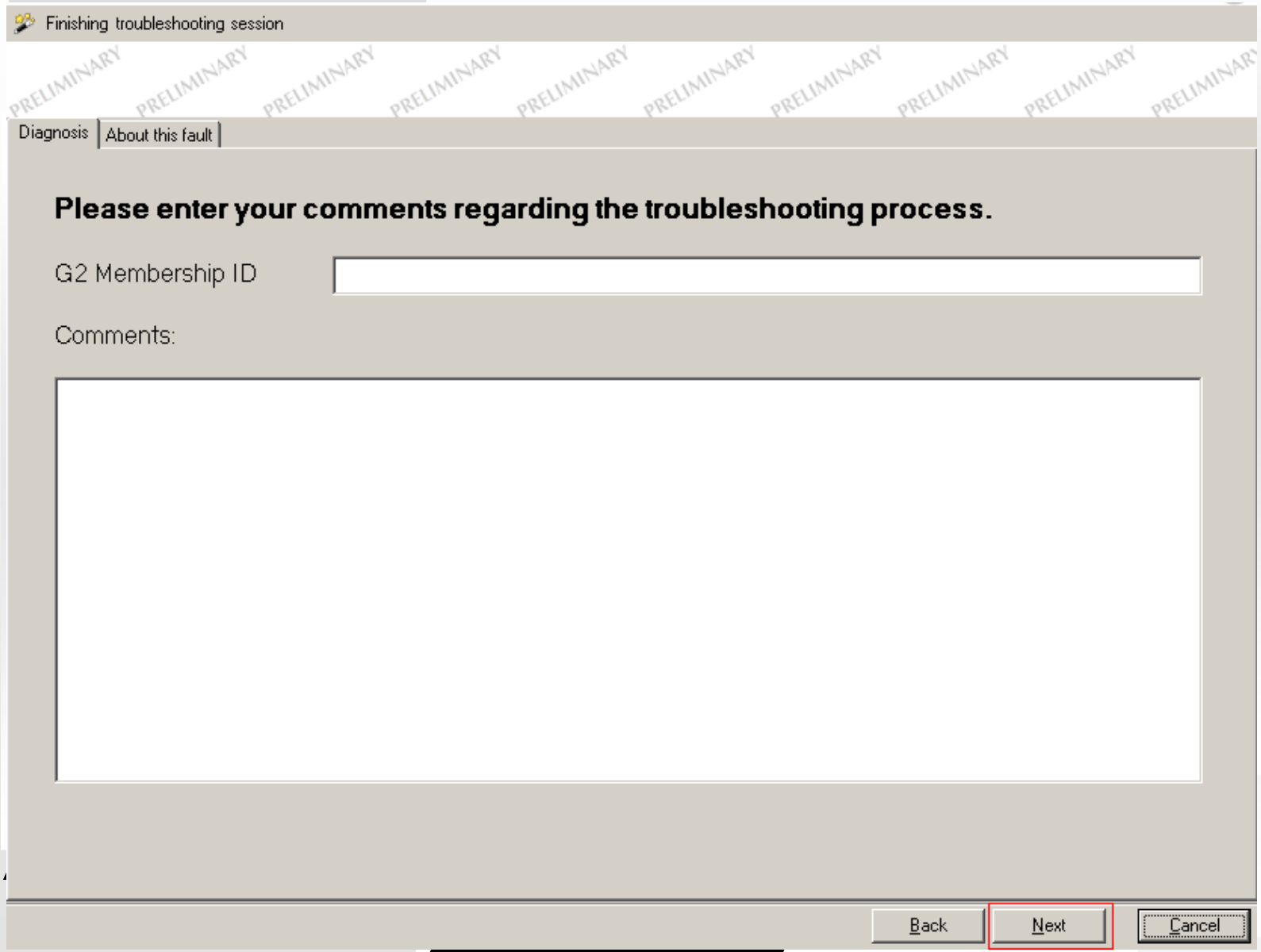
Once the ignition has been shut off the user is directed to perform specific physical checks on the EGR valve. When the checks have been completed one of the answers at the bottom of the screen should be selected to proceed.



If the user answers "Yes" he'll be instructed to repair the damage he's observed and clear the fault.

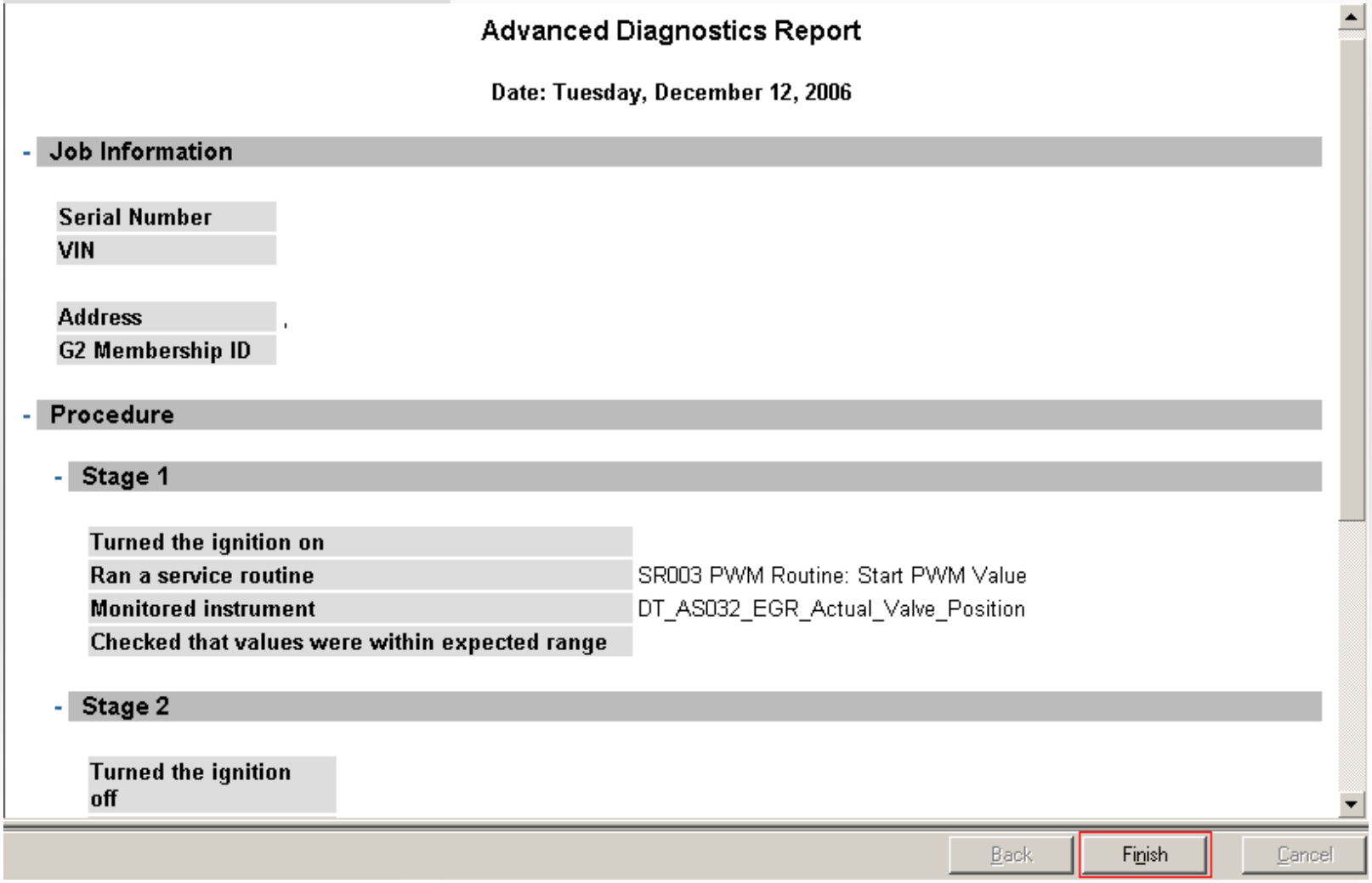
If the answer is "No" then the user should contact technical support for further information.

In either case, to proceed the user should click on the "Next" box in the lower right of the screen.



In closing out the Advanced Diagnostics procedure, the user is asked to fill in comments on the troubleshooting process.

After this is section is completed the user should click on the “Next” box to see a complete report on the steps taken.

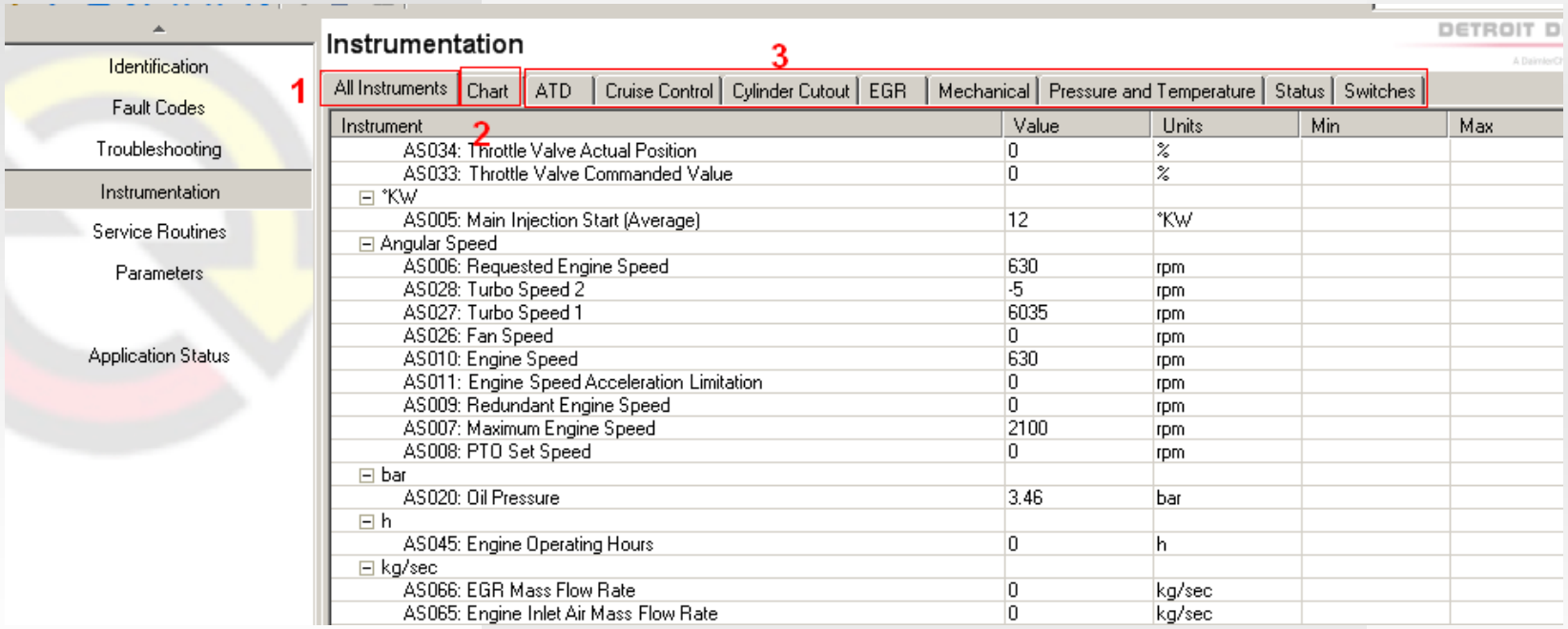


A final summary will appear with details of the case. Click on the "Finish" to close out the procedure.

VII. Understanding the Instrumentation Windows

The Instrumentation Window

1- There are 3 main functions to this section

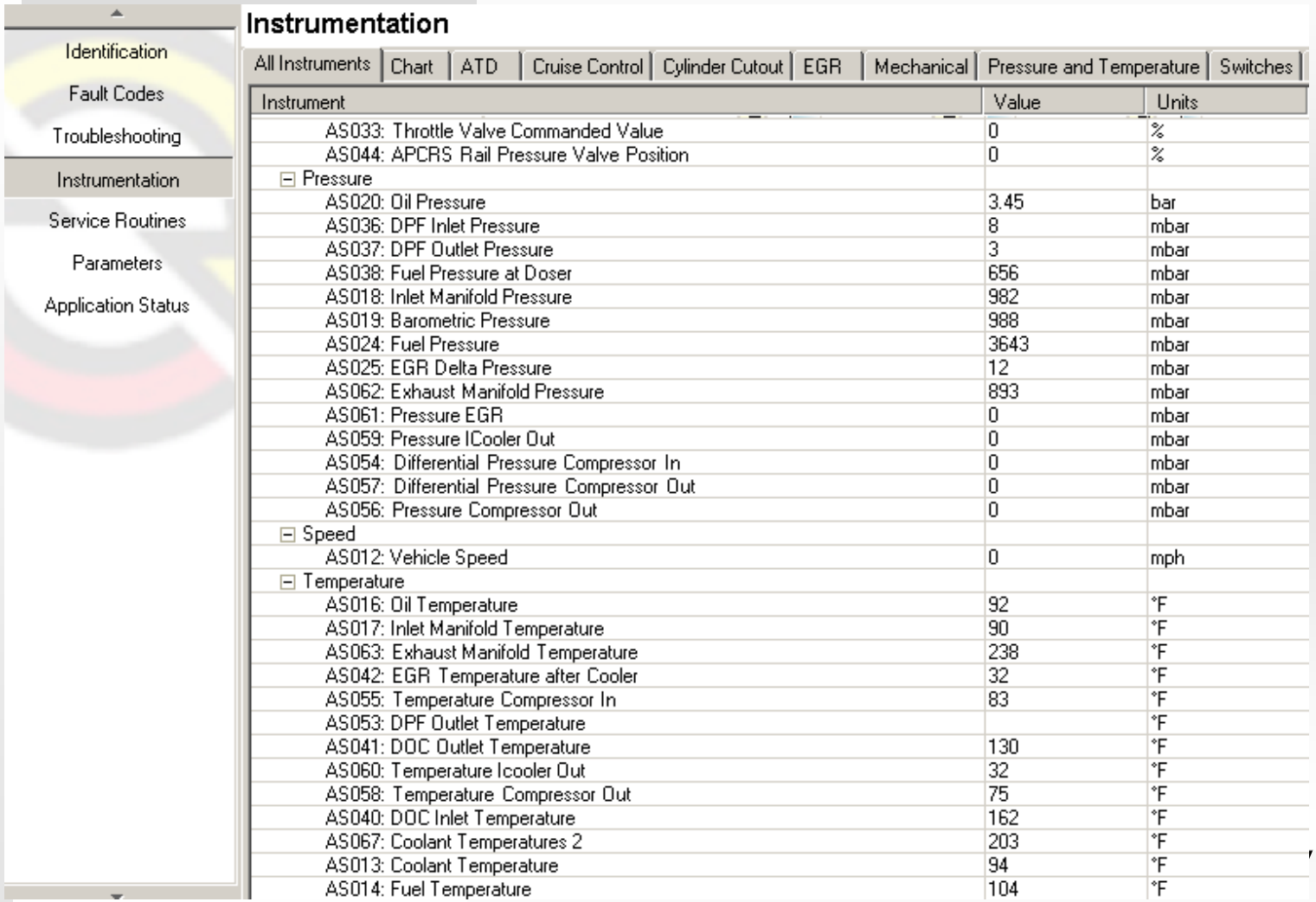


2- All Instruments (1) / The Chart (2) / Individual Panels (3)

3- The CPC and MCM values are listed by module in the “All Instruments” list

The values may be from either module in the “Individual Panels”

Units may be viewed in English or Metric

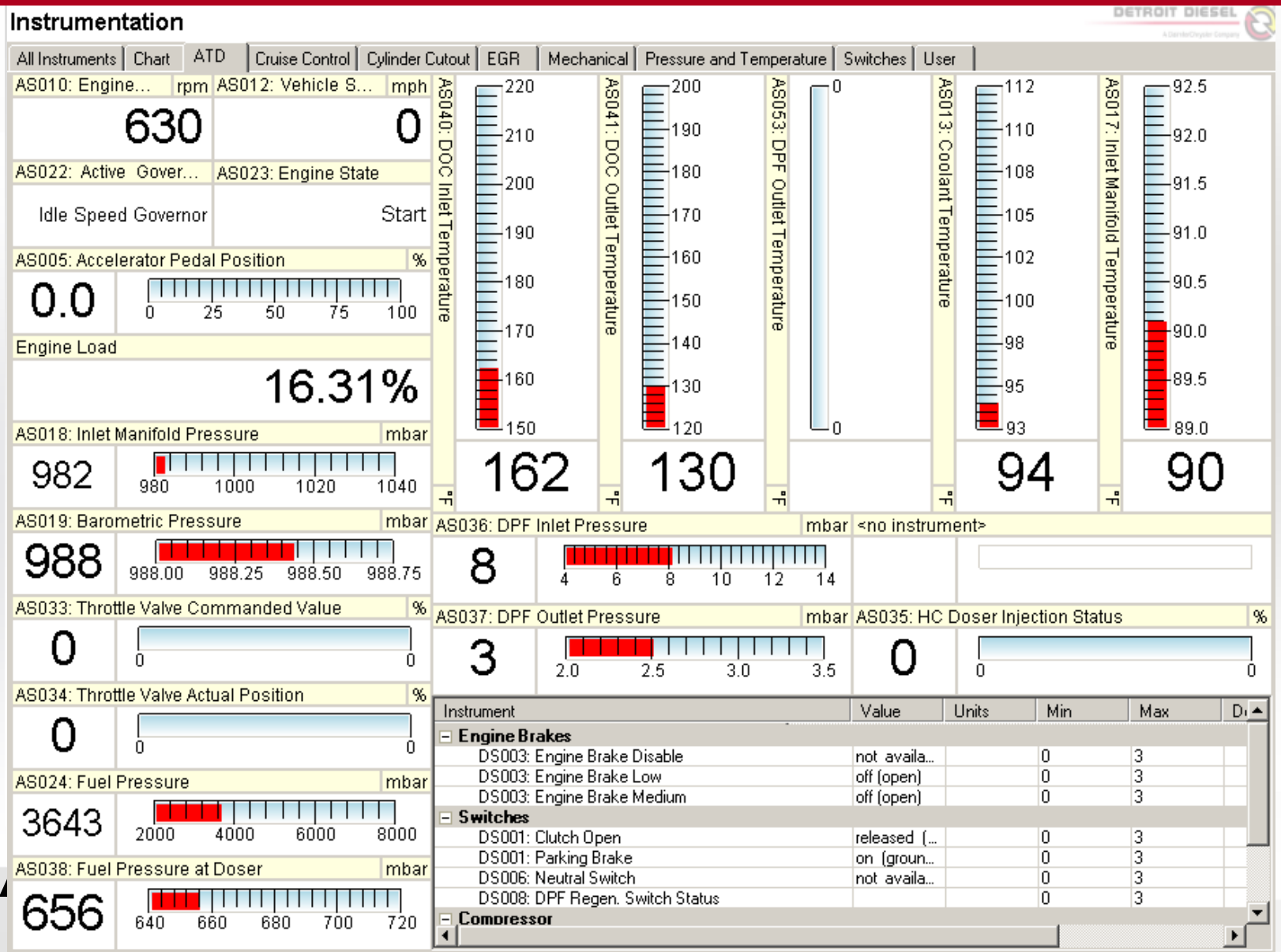


Instrumentation

All Instruments | Chart | ATD | Cruise Control | Cylinder Cutout | EGR | Mechanical | Pressure and Temperature | Switches

Instrument	Value	Units
AS033: Throttle Valve Commanded Value	0	%
AS044: APCRS Rail Pressure Valve Position	0	%
⊟ Pressure		
AS020: Oil Pressure	3.45	bar
AS036: DPF Inlet Pressure	8	mbar
AS037: DPF Outlet Pressure	3	mbar
AS038: Fuel Pressure at Doser	656	mbar
AS018: Inlet Manifold Pressure	982	mbar
AS019: Barometric Pressure	988	mbar
AS024: Fuel Pressure	3643	mbar
AS025: EGR Delta Pressure	12	mbar
AS062: Exhaust Manifold Pressure	893	mbar
AS061: Pressure EGR	0	mbar
AS059: Pressure ICooler Out	0	mbar
AS054: Differential Pressure Compressor In	0	mbar
AS057: Differential Pressure Compressor Out	0	mbar
AS056: Pressure Compressor Out	0	mbar
⊟ Speed		
AS012: Vehicle Speed	0	mph
⊟ Temperature		
AS016: Oil Temperature	92	°F
AS017: Inlet Manifold Temperature	90	°F
AS063: Exhaust Manifold Temperature	238	°F
AS042: EGR Temperature after Cooler	32	°F
AS055: Temperature Compressor In	83	°F
AS053: DPF Outlet Temperature		°F
AS041: DOC Outlet Temperature	130	°F
AS060: Temperature Icooler Out	32	°F
AS058: Temperature Compressor Out	75	°F
AS040: DOC Inlet Temperature	162	°F
AS067: Coolant Temperatures 2	203	°F
AS013: Coolant Temperature	94	°F
AS014: Fuel Temperature	104	°F

A sample shot of MCM values from the "All Instruments" tab. Data values in the all instruments tab are arranged by the type of value being displayed (temperatures, pressures, etc.)



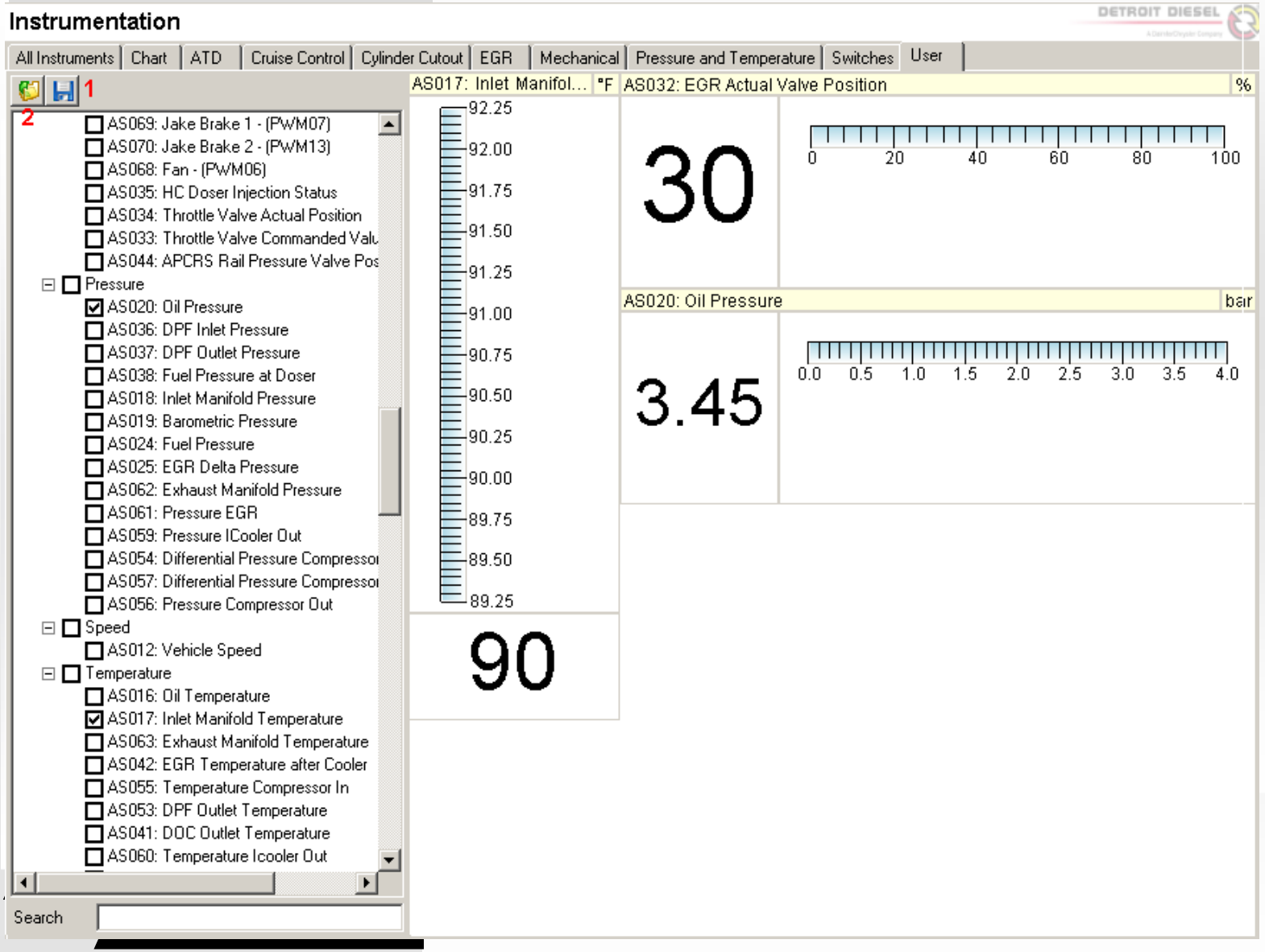
A sample shot of the After Treatment Device (ATD) tab

Instrumentation

All Instruments | Chart | ATD | Cruise Control | Cylinder Cutout | EGR | Mechanical | Pressure and Temperature | Switches | User

Instrument	Value	Units	Min
Switches			
DS001: Clutch Open	released (ground...		0
DS001: Ignition Switch	on (grounded)		0
DS001: Parking Brake	on (grounded)		0
DS001: Service Brake	released (ground...		0
DS002: Cruise Control Enable	off (open)		0
DS002: Cruise Control Pause	not available		0
DS002: Cruise Control Resume/Accel	off (open)		0
DS002: Cruise Control Set/Coast	off (open)		0
DS003: Engine Brake Disable	not available		0
DS003: Engine Brake Low	off (open)		0
DS003: Engine Brake Medium	off (open)		0
DS004: Limiter 0 Set Switch	off (open)		0
DS004: Limiter 1 Set Switch	off (open)		0
DS005: Hood Tilt Switch	not available		0
DS005: Fan Control Override	off (open)		0
DS005: Shutdown Override	off (open)		0
DS006: Idle Validation Switch 1	on (grounded)		0
DS006: Idle Validation Switch 2	off (open)		0
DS006: Neutral Switch	not available		0
DS006: Two Speed Axle Switch	not available		0
DS007: ABS System Active	not available		0
DS007: External Engine Shutdown Switch	not available		0
DS007: External Engine Shutdown via J1939	not available		0
DS008: DPF Regen. Switch Status			0
DS008: Starter Signal	off (open)		0

A sample shot of the “Switches” tab



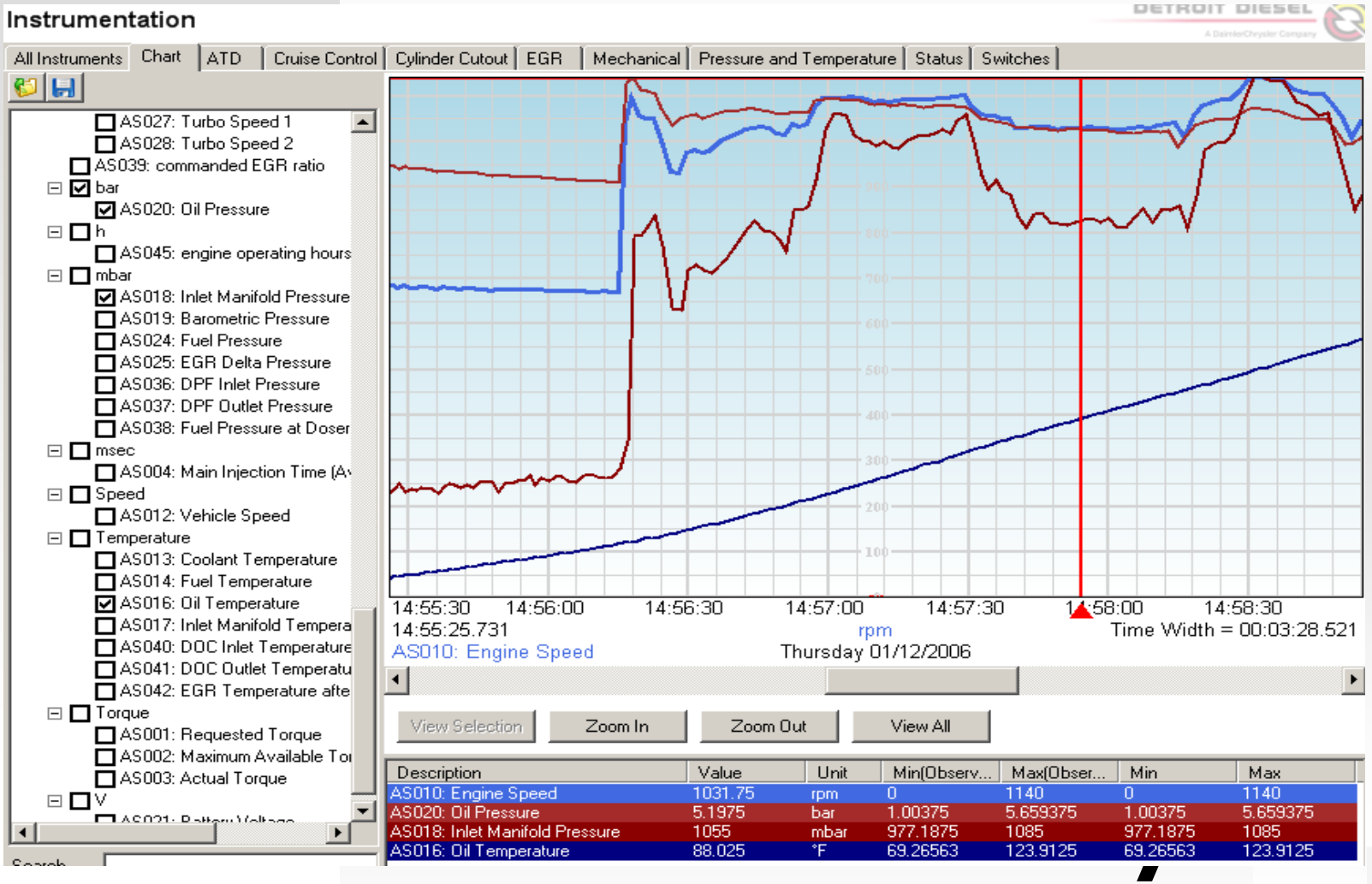
The "User" tab allows the user to configure his own selection of instruments form any module he is connected to.

The selection may also be saved for future use by clicking the disk icon (1) and providing a file name.

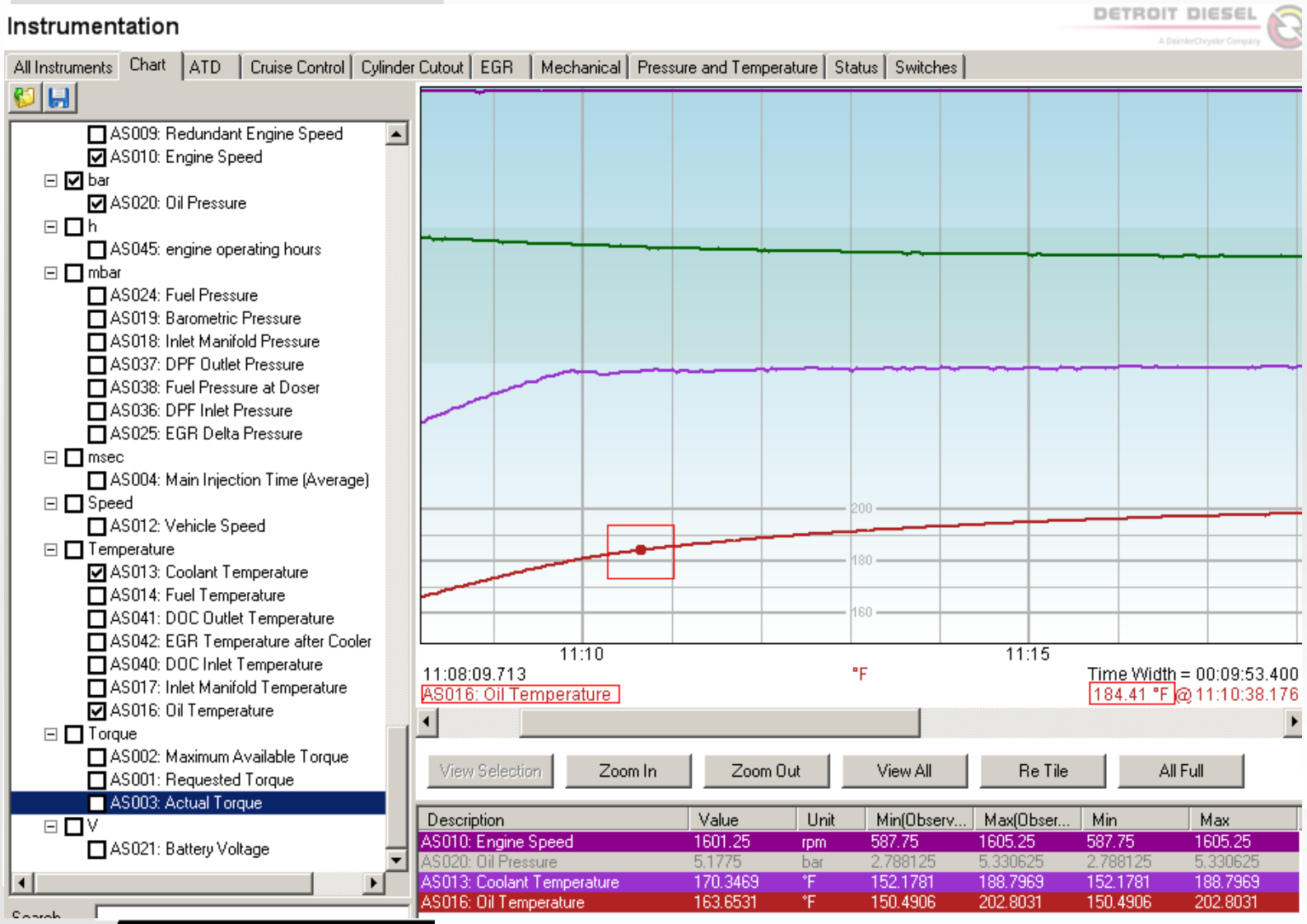
Stored selections may be opened by clicking on the folder icon (2).

Chart Features

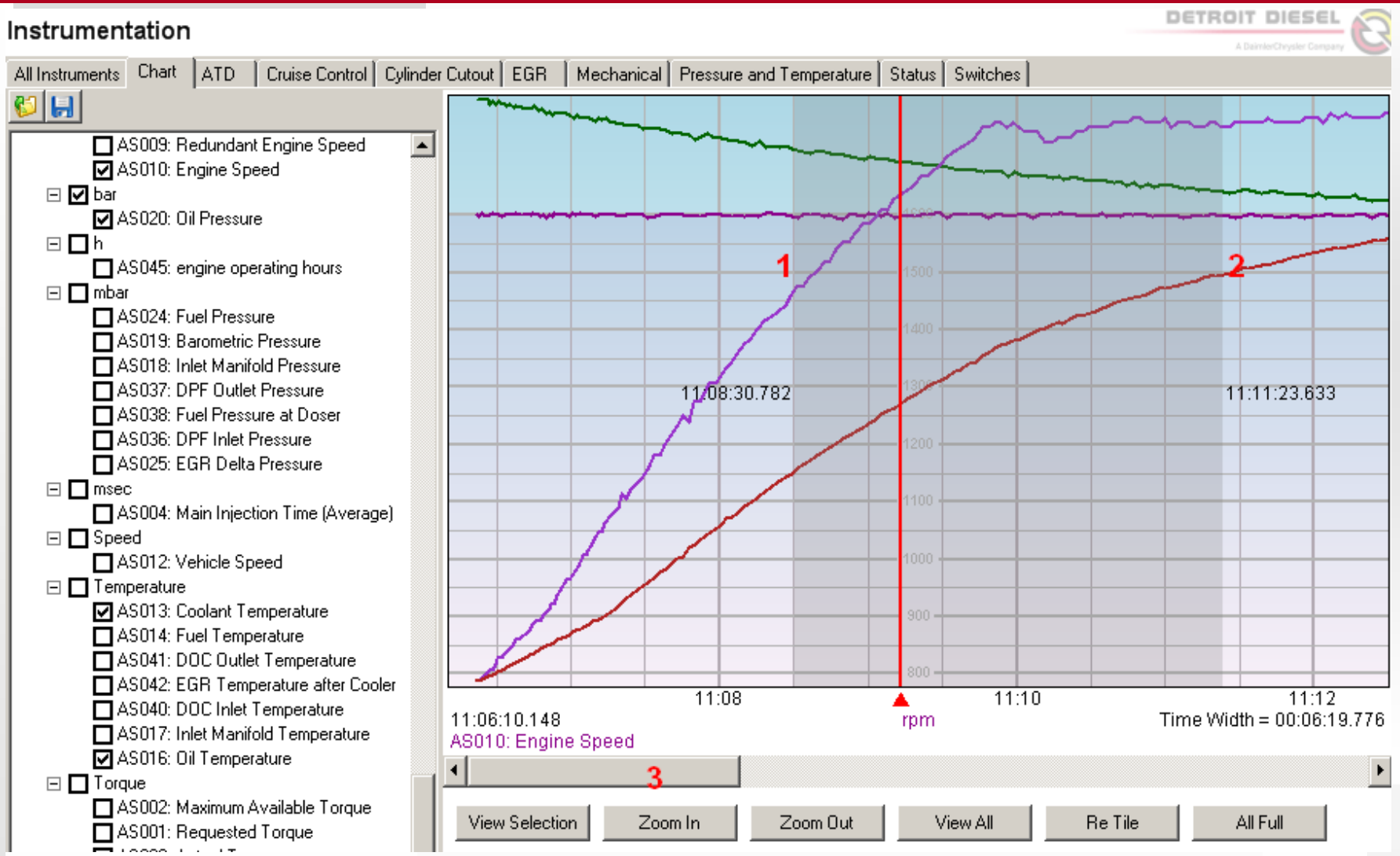
- Parameter list always “on-top” to select new items.
- All chart related windows are completely re-sizeable.
- Gives the user the ability to check on the scale being used for each parameter.
- Gives the user the ability to pinpoint a value at any point on the chart.
- Gives the user the ability to zoom in on a certain section of data



A sample shot of the “Chart” function



A sample shot of reading a specific value in the "Chart" function

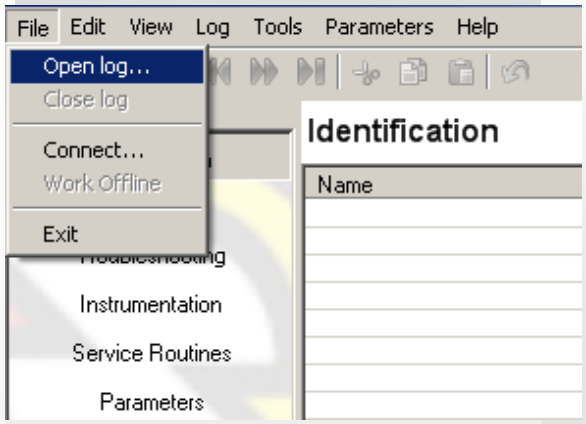


To [redacted] function, mark each boundary of the zoomed area by dragging your mouse (1 & 2) across the area desired and then select the "Zoom In" box (3).

VIII. Understanding the Logging Function

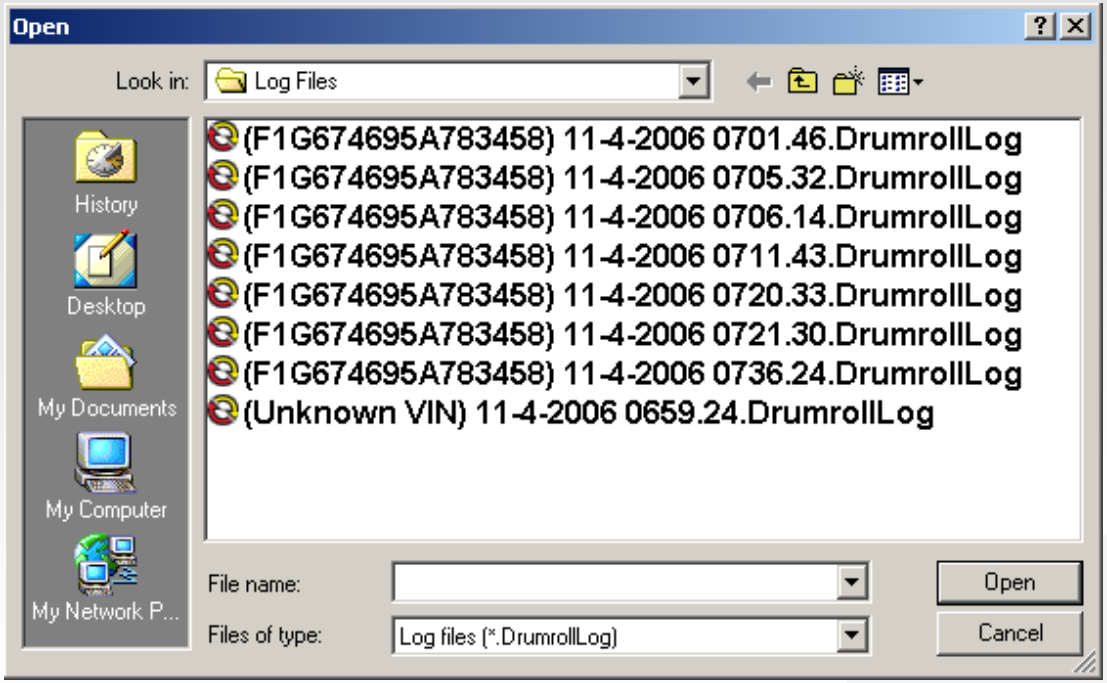
The Logging Function

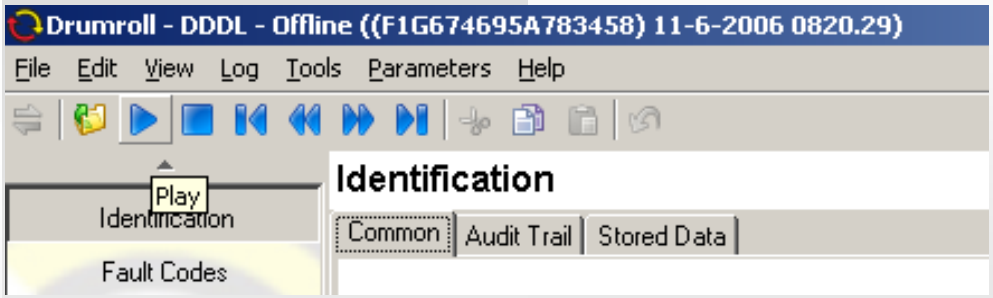
- DDDL keeps a running log of all the activity that occurs during a connection with an ECU.
- The logs are stored as files on the hard drive and are available for playback.
- Once a log file is opened the playback buttons in the toolbar become activated.
- Many DDDL functions can be used when playing back the log file without needing to be connected to an ECU.
- Log files may not be played if the user is connected to an ECU
- Please note that only data from connected modules will be stored in the log files. For example, if you have only connected to the CPC your log will not contain MCM data even though the engine is running.



To play a log file choose the "File" drop-down menu and choose the "Open log" option.

A dialog box will appear with all the log files. It will open to a default folder but you may move to any folder containing logs. They are identified by a specific date / time stamp and VIN (when available). Highlight the file you wish to open and click on the "Open" box.





Once a log file has been loaded the playback controls in the application toolbar will become active and ready to use. The user may identify the function of each control by running their mouse across the top of the control.

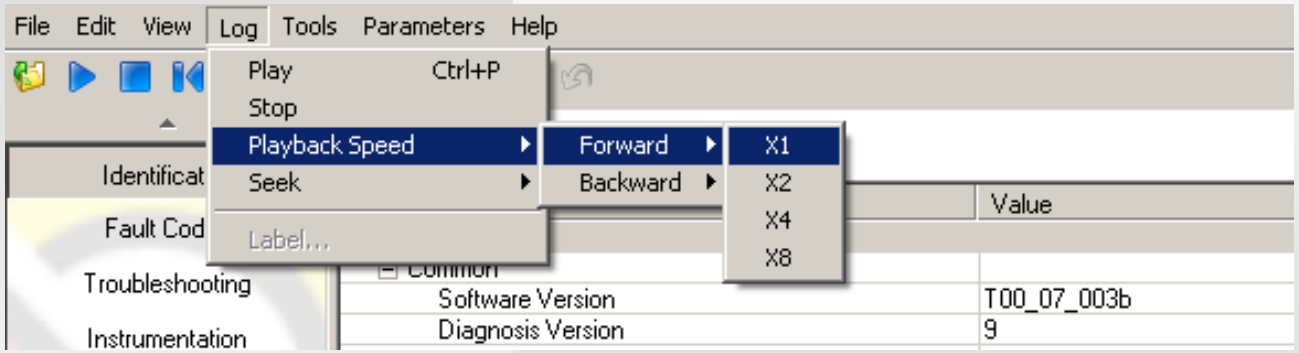
Instrumentation

All Instruments | Chart | ATD | Cruise Control | Cylinder Cutout | EGR | Mechanical | Pressure and Temperature | Status | Switches

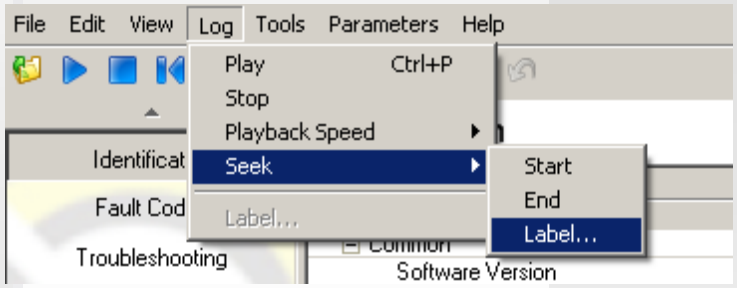
Instrument	Value	Units	Min
AS034: Throttle Valve Actual Position	0	%	
AS033: Throttle Valve Commanded Value	0	%	
⊟ °KW			
AS005: Main Injection Start (Average)	12	°KW	
⊟ Angular Speed			
AS006: Requested Engine Speed	630	rpm	
AS028: Turbo Speed 2	-5	rpm	
AS027: Turbo Speed 1	6035	rpm	
AS026: Fan Speed	0	rpm	
AS010: Engine Speed	630	rpm	
AS011: Engine Speed Acceleration Limitation	0	rpm	
AS009: Redundant Engine Speed	0	rpm	
AS007: Maximum Engine Speed	2100	rpm	
AS008: PTO Set Speed	0	rpm	

Once the "Play" button becomes active the panels will fill up with data that was collected during the log session.

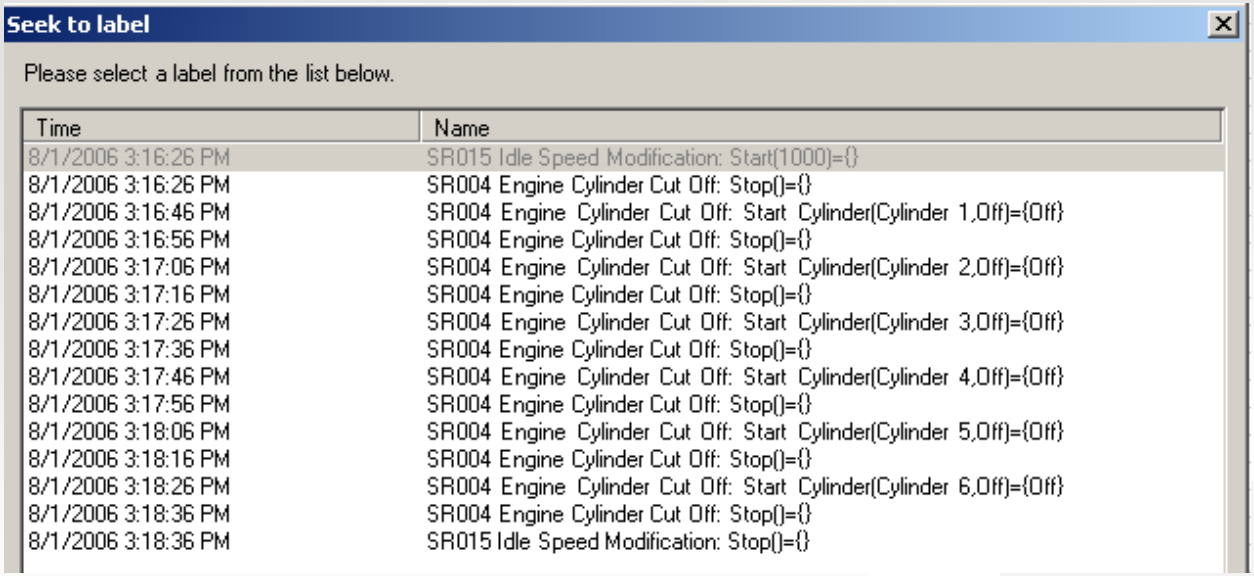
Additional playback control features



You may alter the playback speed of the log file



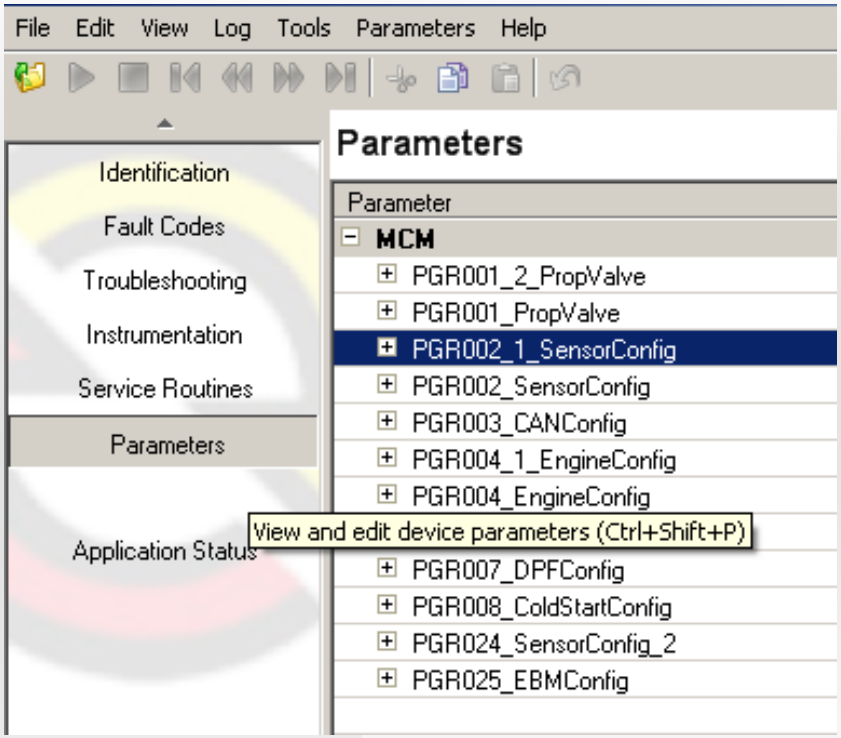
Service routines are marked for easy identification in playback mode

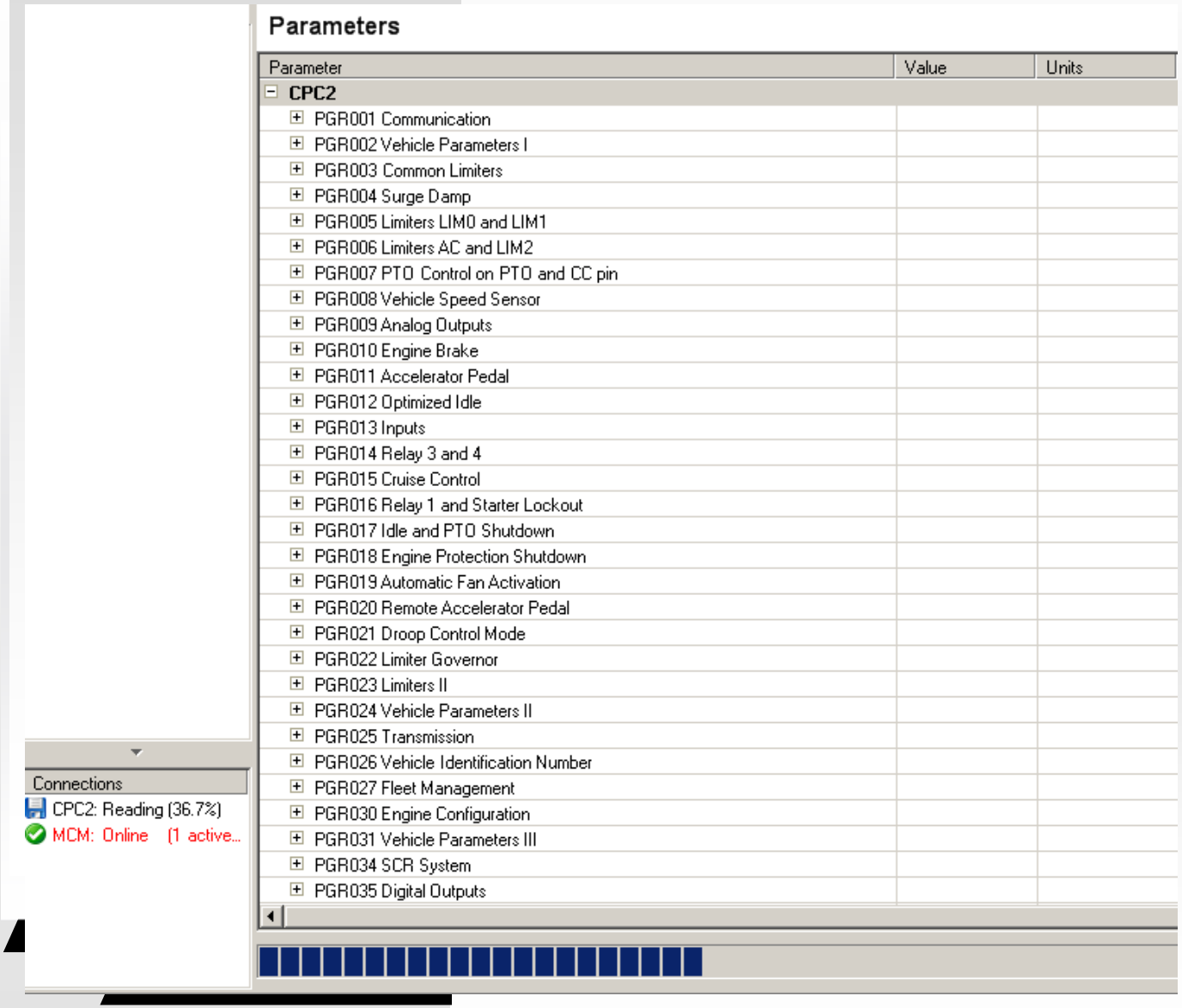


IX. Configuring Parameters for 2007 Engines

Important Notes on the Parameters Function

- The layout of the parameters is similar to the current MBE system
- Values may be displayed in Metric or English units (units of distance, temperature, and volume change; pressure readings remain in bar units)
- Parameter sets may be stored as files for printing or sending in e-mails using the “Export” function.
- Immediate recycling of the ignition to save settings should be done to save ECU changes.





When entering the "Parameters" section all the values of the parameters from all connected modules will be read. Progress will be tracked on screen.

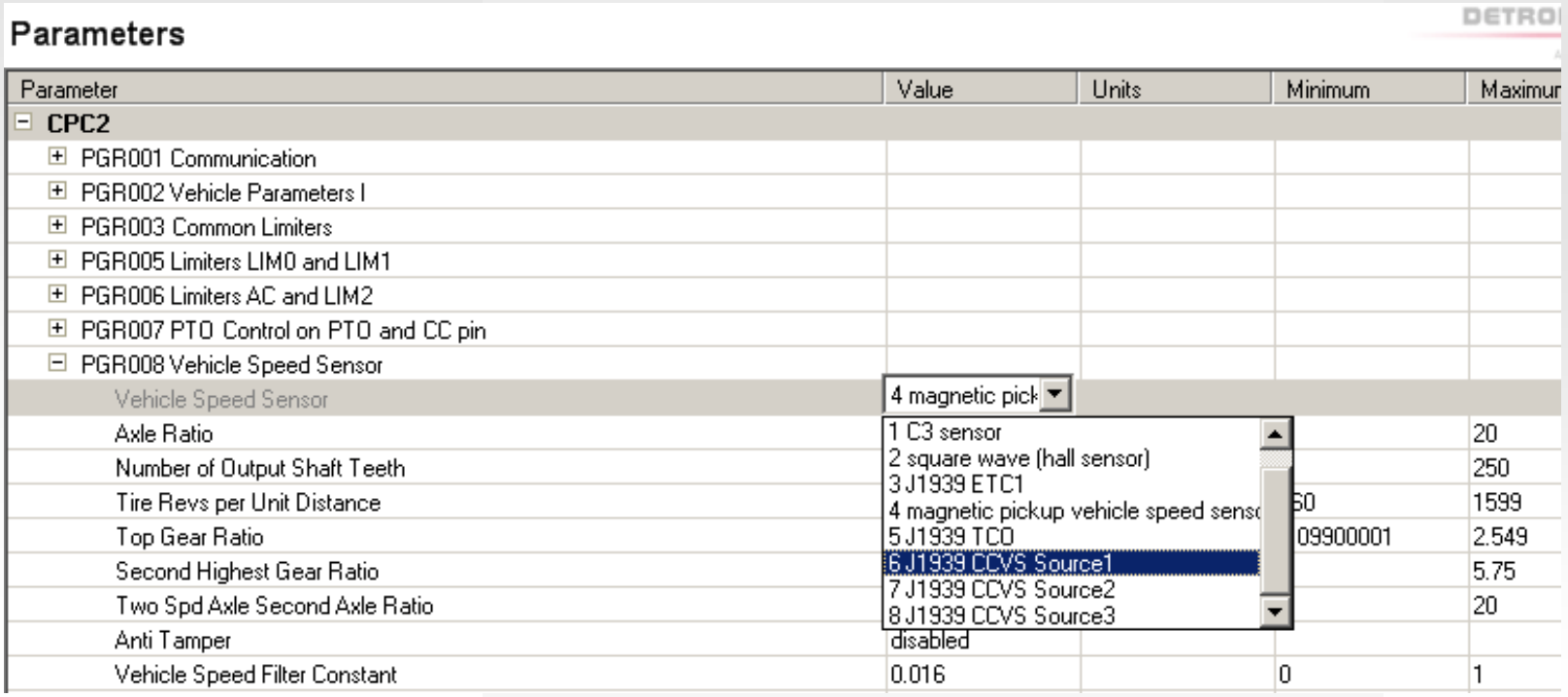
Viewing the individual values of parameters

- Parameters are placed in groups. To view the values of any parameter within the group the user opens and closes the folder by clicking on the “+” or “-” in front of the group name similar to the operation in Windows Explorer.

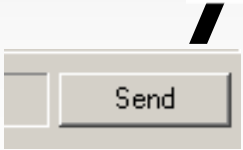
Parameters

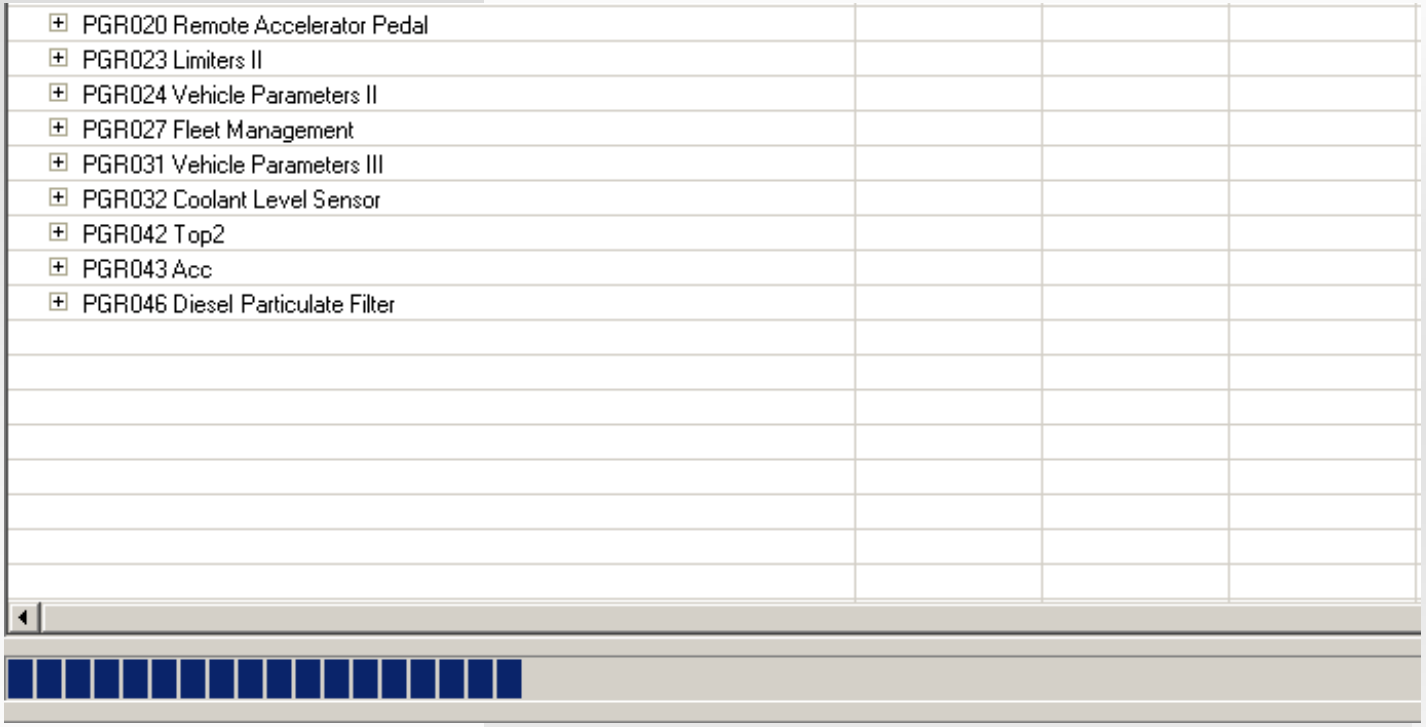
Parameter	Value	Units	Minimum	Maximum
⊟ CPC2				
⊞ PGR001 Communication				
⊞ PGR002 Vehicle Parameters I				
⊞ PGR003 Common Limiters				
⊞ PGR005 Limiters LIM0 and LIM1				
⊞ PGR006 Limiters AC and LIM2				
⊞ PGR007 PTO Control on PTO and CC pin				
⊟ PGR008 Vehicle Speed Sensor				
Vehicle Speed Sensor	magnetic pickup...			
Axle Ratio	5.29		1	20
Number of Output Shaft Teeth	16		0	250
Tire Revs per Unit Distance	319	1/km	160	1599
Top Gear Ratio	1		0.09900001	2.549
Second Highest Gear Ratio	2.55		0	5.75
Two Spd Axle Second Axle Ratio	5.29		1	20
Anti Tamper	disabled			
Vehicle Speed Filter Constant	0.016		0	1
⊞ PGR010 Engine Brake				
⊞ PGR012 Optimized Idle				
⊞ PGR013 Inputs				
⊞ PGR015 Cruise Control				

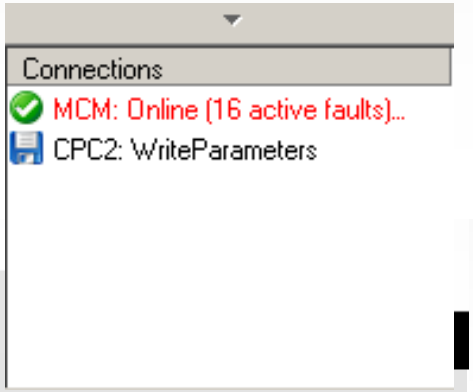
To change a parameter simply click into the values column. For numerical values simply type in the desired value. For CPC parameters with more than one configurable selection (as seen below), a drop-down menu will appear.



When all the changes are made click on the "Send" box in the lower left of the window.

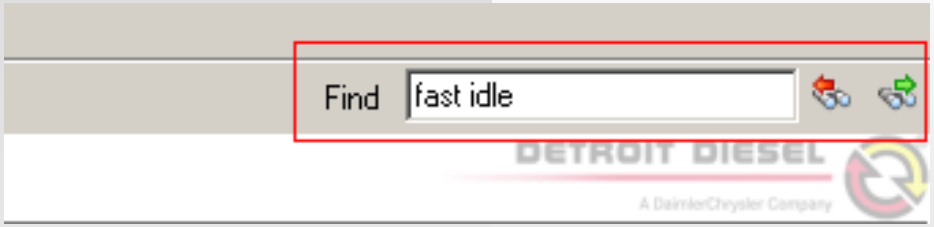






As the parameters are written back to the module a progress bar will appear until the process is complete.

<u>At this point you should re-cycle the ignition to store the changes.</u>



The "Find" function allows the user to search the entire parameter list for a key word(s). Type in the name of a parameter you wish to locate.

You'll be taken to the first location of that name in the parameter list

Find: fast idle

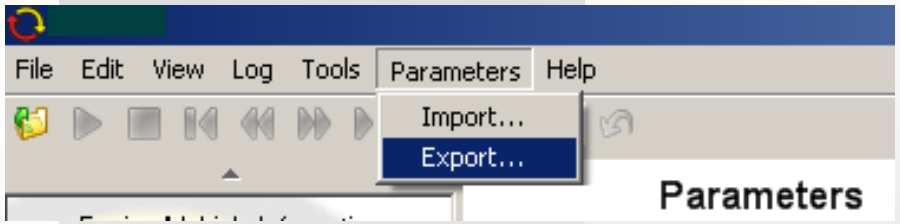
Parameters

Parameter	Value	Units	Minimum	Maximum
CPC2				
PGR001 Communication				
PGR002 Vehicle Parameters I				
PGR003 Common Limiters				
PGR004 Surge Damp				
PGR005 Limiters LIM0 and LIM1				
PGR006 Limiters AC and LIM2				
Enable Fast Idle on AC Input	FTL AC neutral			
Fast Idle Spd Air Cond Input	600	rpm	500	3000
Limiter2 Min Eng Speed Enabled	500	rpm	0	4000
Limiter2 Max Eng Speed Enabled	4000	rpm	0	4000
Limiter2 Max Road Speed Enabled	94.44842	mph	0	94.44842
Limiter2 Max Eng Torque Enabled	3687.805	ft-lb	0	3687.805
Limiter2 Limit Governor Air Condition	Gov. in MR, w...			
limit / LIM 2 maximum acceleration	10	m/ss	-15.625	15.625

Import / Export Function

The Import / Export Function

- This function allows the user to work with parameter sets from both the CPC & MCM.
- Using the “Export” selection, parameter sets may be saved to the user’s hard drive, recalled, and printed out.
- The “Import” function allows the user to load a complete or partial parameter set to a module. The user must use a file with a .par extension for import purposes.
- Users may use the “Import” function to view and edit par files when not connected to a live CPC or MCM.

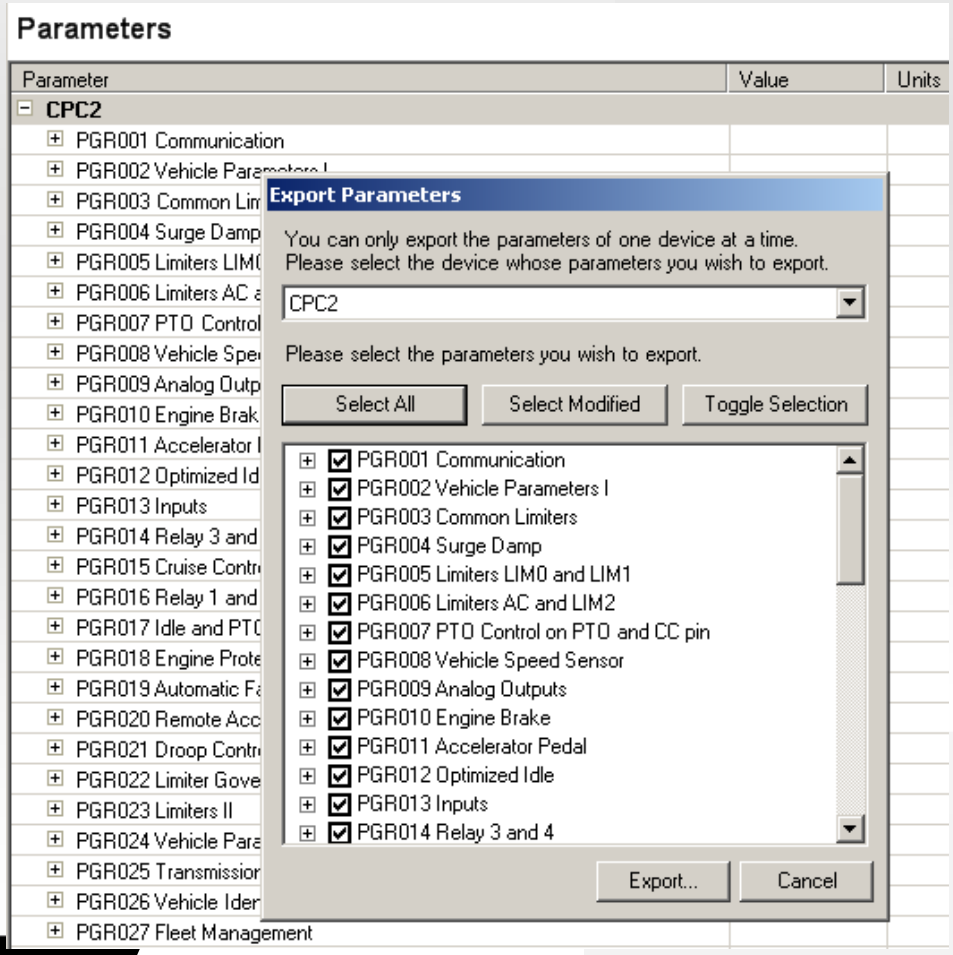


To begin the export process enter the "Configure Parameters" section. After retrieving the settings, choose the "Export" selection from the "Parameters" drop-down menu.

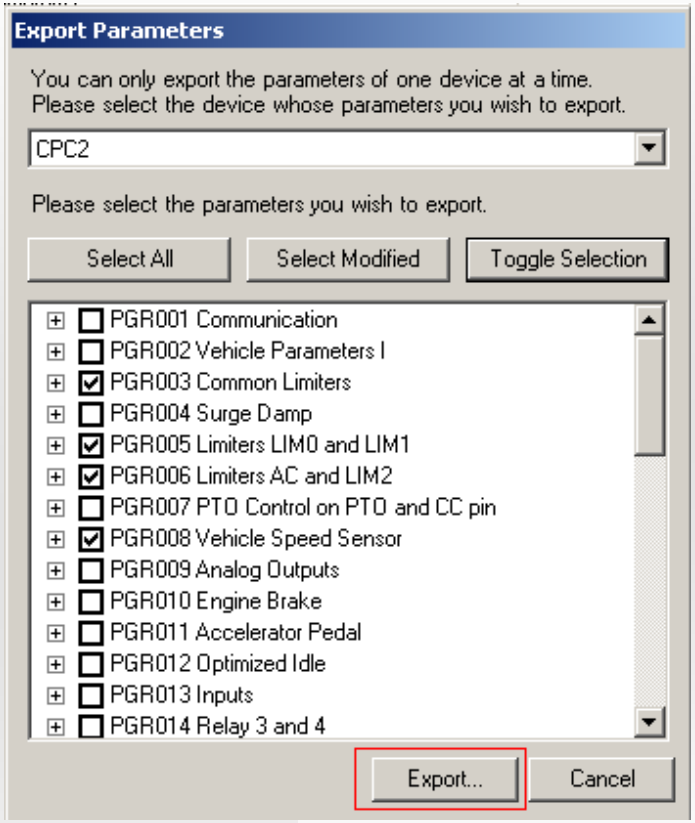
A dialog box will appear that allows the user to decide what groups of parameters should be exported. By default the parameters checked are those that have settings that are different from those loaded at the time the CPC was built.

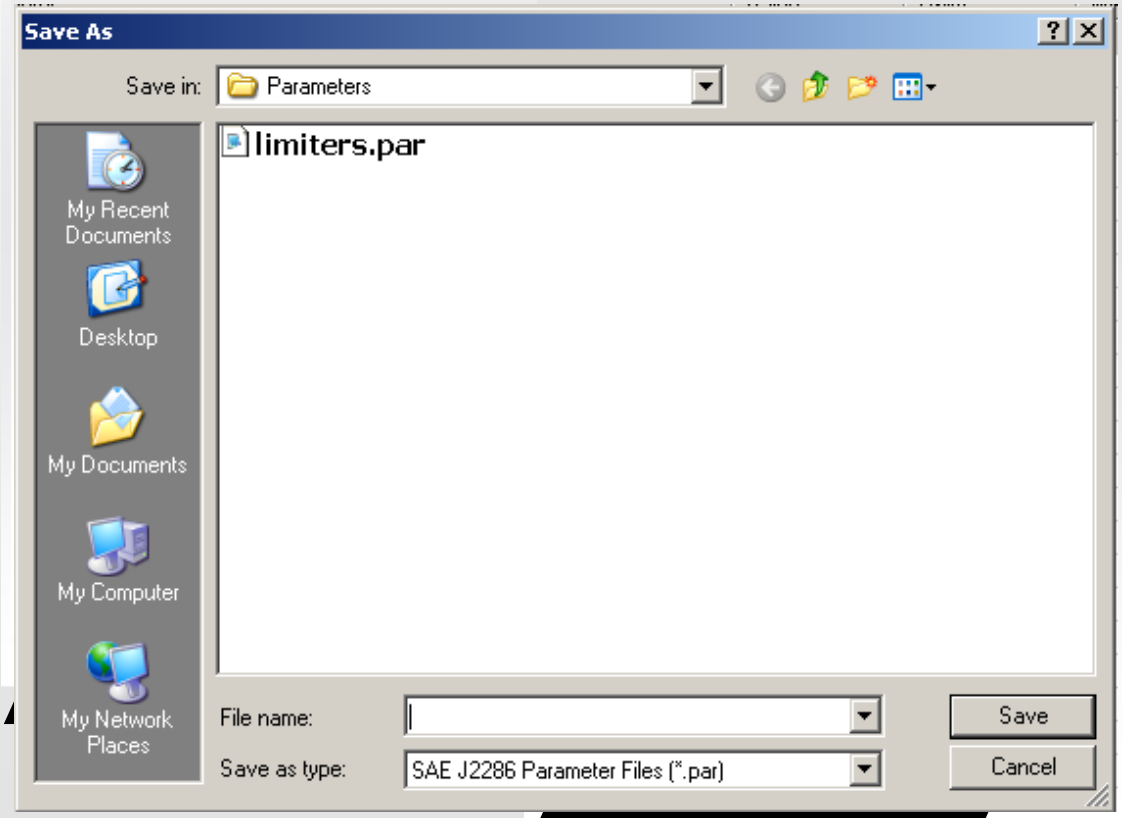
You may use the "Select Modified" box to clear the settings and only mark certain groups for export.

To undo changes that you've made you may use the "Toggle" box.



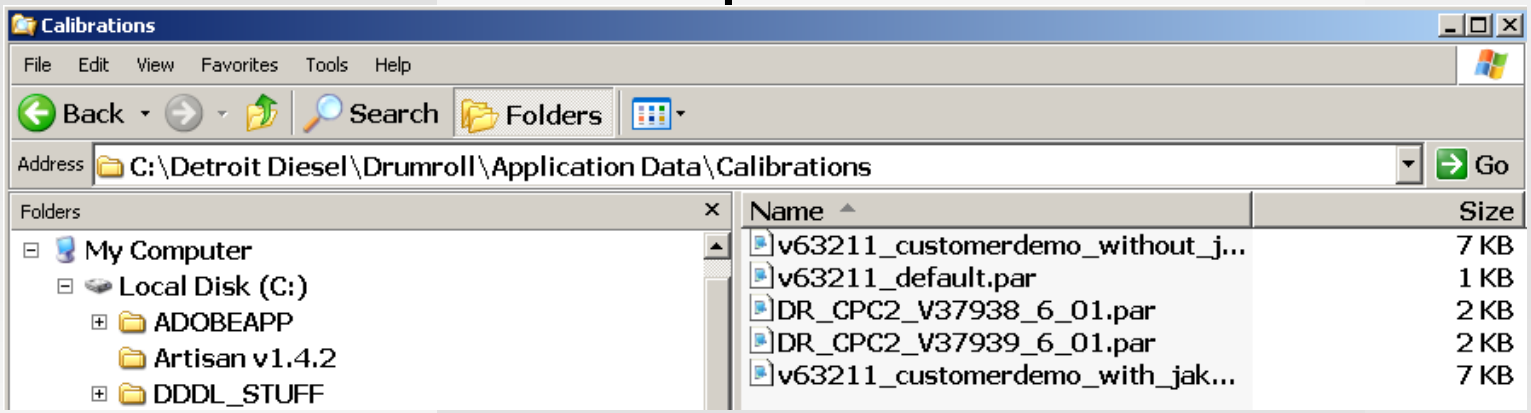
Once you've completed making your selections click on the "Export" box to continue



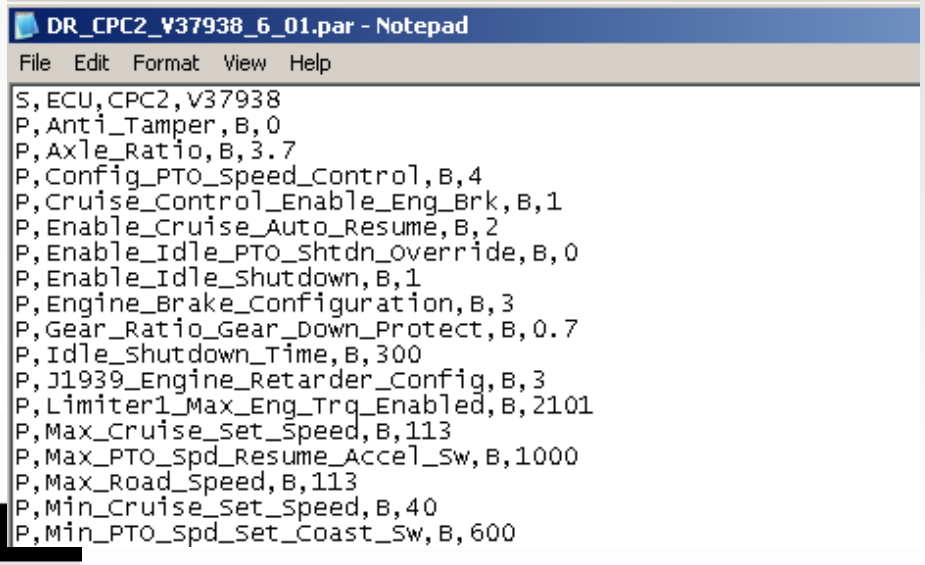


A new dialog box will appear asking for a file name. Give the file a name and then click on the "Save" box to complete the process

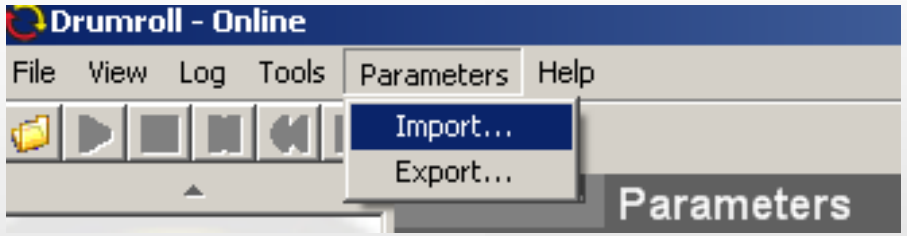
To open a previously saved exported file for review or printing, locate the file in Windows Explorer.

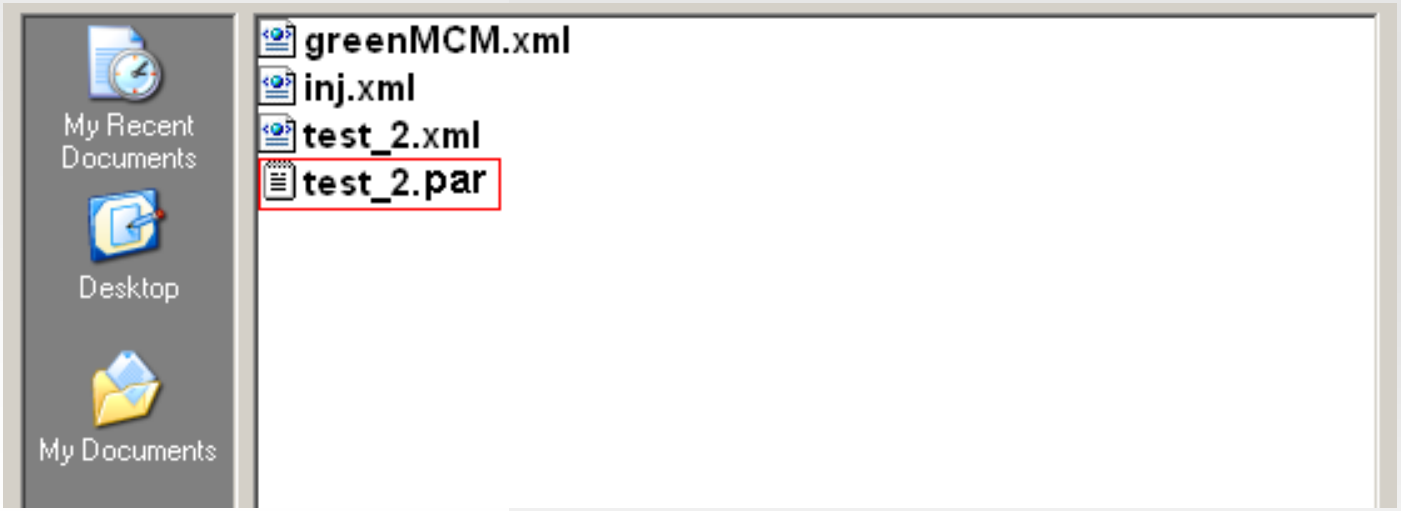


Click twice on the file and it will open in Notepad.



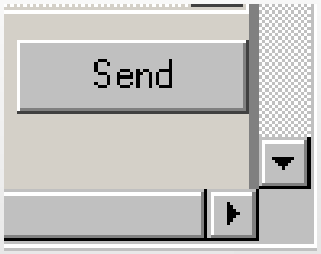
To load a previously created file you must first enter into the “Parameters” window. After the parameters are read out, choose the “Import “ function form the “Parameters” drop-down menu.

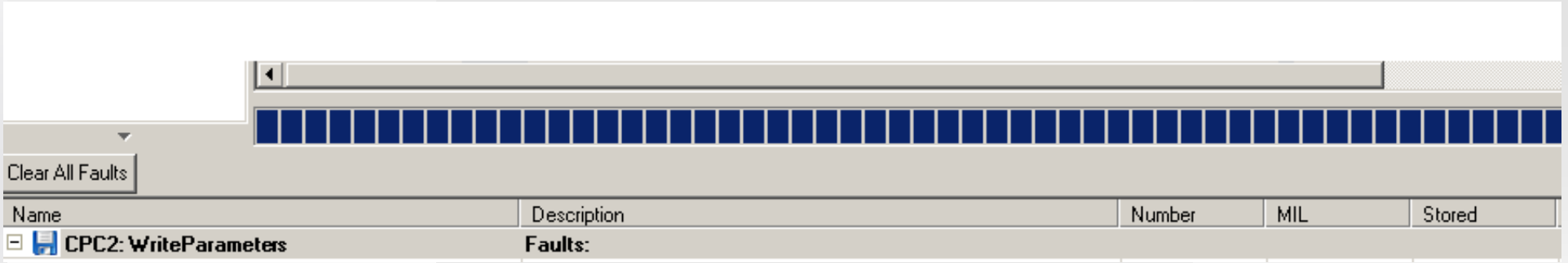




When the dialog box of previously stored files appears, choose the one you wish to import into the module and select “Open”.

After choosing the file it will need to be sent to the module. Choose the send button just as if you've made a parameter change.





You will see the progress bar moving across the screen as the parameters are written back to the module.

When the process is complete you will need to re-cycle the ignition to store the changes.

Understanding Security Levels for the Import / Export Functions

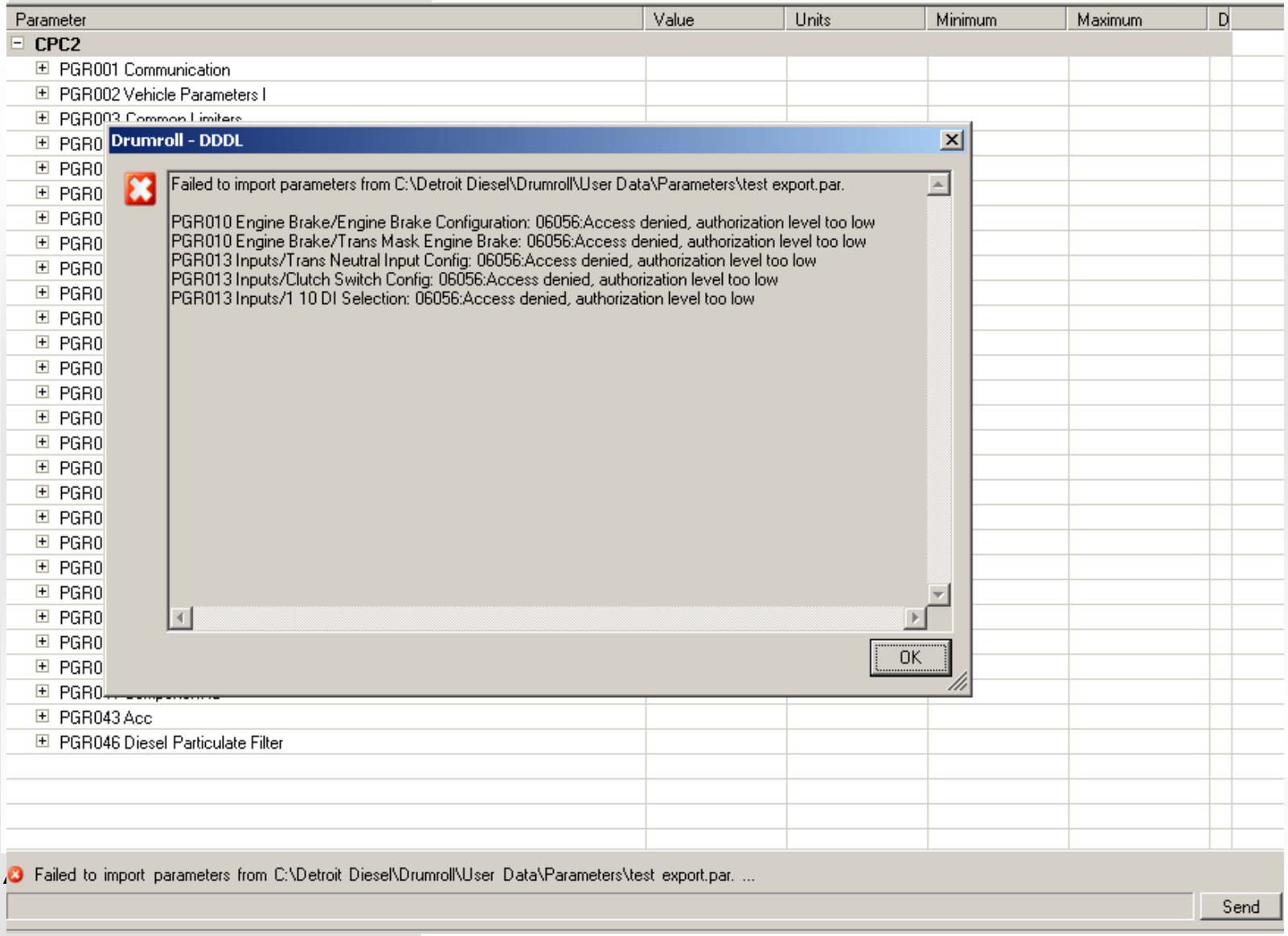
The feature “Access Levels Considered with Import/Export of Parameter Data” allows for more security on PAR files. It is not possible for DDC Engineers to provide a PAR file containing Level 3 parameters to a user with Level 1 or Level 2 tools, and expect all parameters to be sent to a device. An error message will be provided to the lower level users when this is attempted. The error will list which parameters were not sent because of insufficient access .

Parameters will be sent to the device in this manner:

- Level 1 Tool (DDDL): only Level 1 parameters are sent to the device without generating an error message.

- Level 2 Tool (DDRS): Level 1 and Level 2 parameters are sent to the device. without generating an error message.

- Level 3 Tool (Drumroll): All parameters (Level 1, Level 2 and Level 3) are sent to the device without generating an error message.



This screen shot illustrates an error message generated by the tool when a DDDL user (level 1) attempts to import a PAR file which was exported from a DDRS application.

Please note the import process successfully sent all the parameters which only needed level 1 access. Only the items listed in the box were not sent. The message at the bottom of the screen will be modified.

Understanding Password Protection

CPC Password Protection

- CPC modules containing R1 software have the ability to password protect their settings.

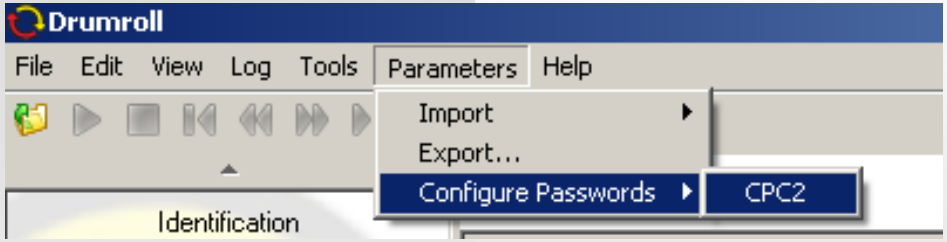
- Users may protect all their CPC settings with one general password.

- A secondary level of protection for certain parameter groups is also available.

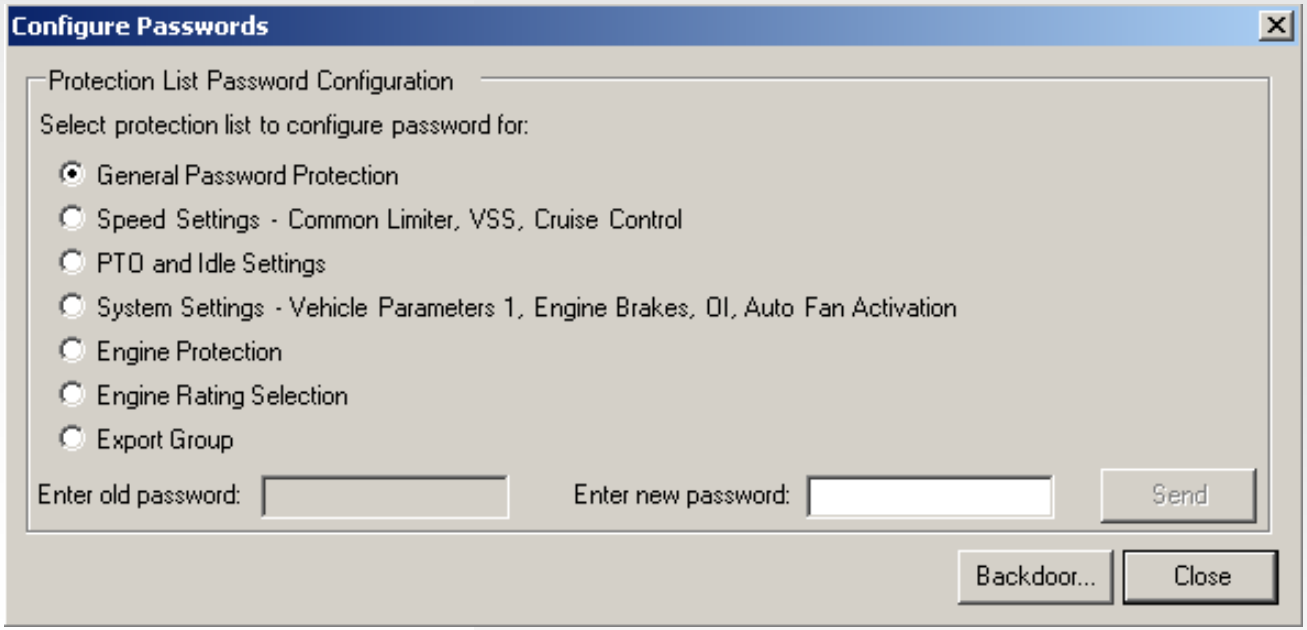
- Password are 4 characters long and may consist of numbers or letters.

- 2007 Detroit Diesel electronic tools contain complete support for CPC password functions.

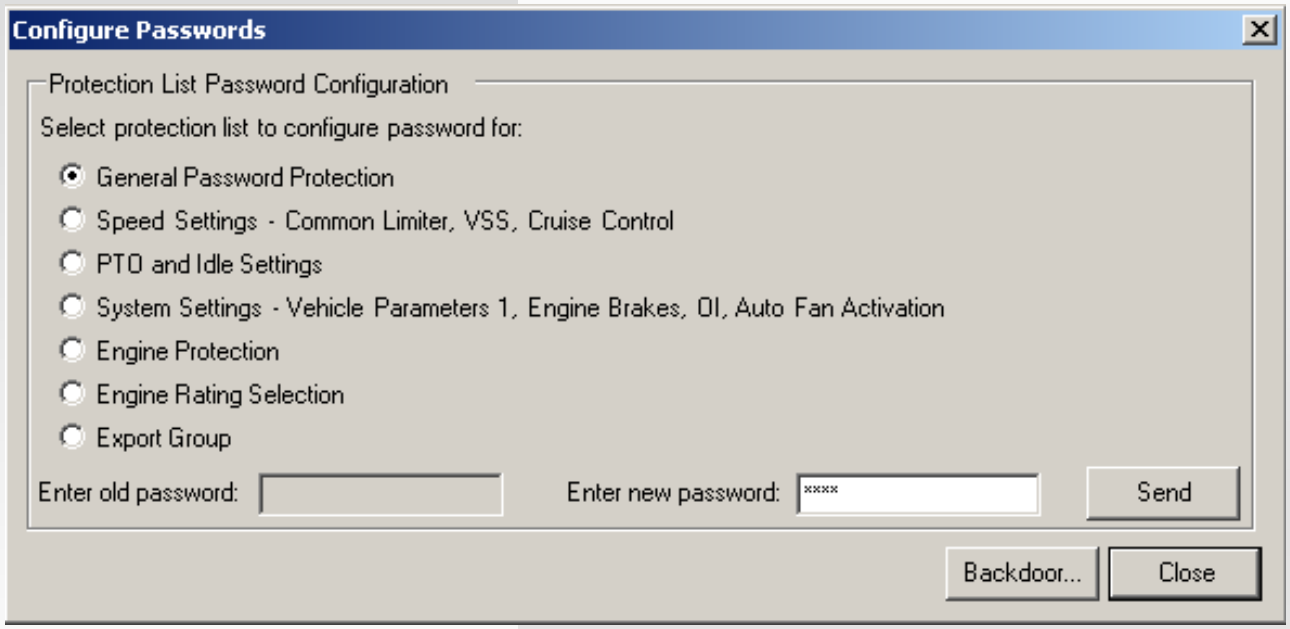
- The 2007 CPC password protection system has many similarities to the current MBE system.

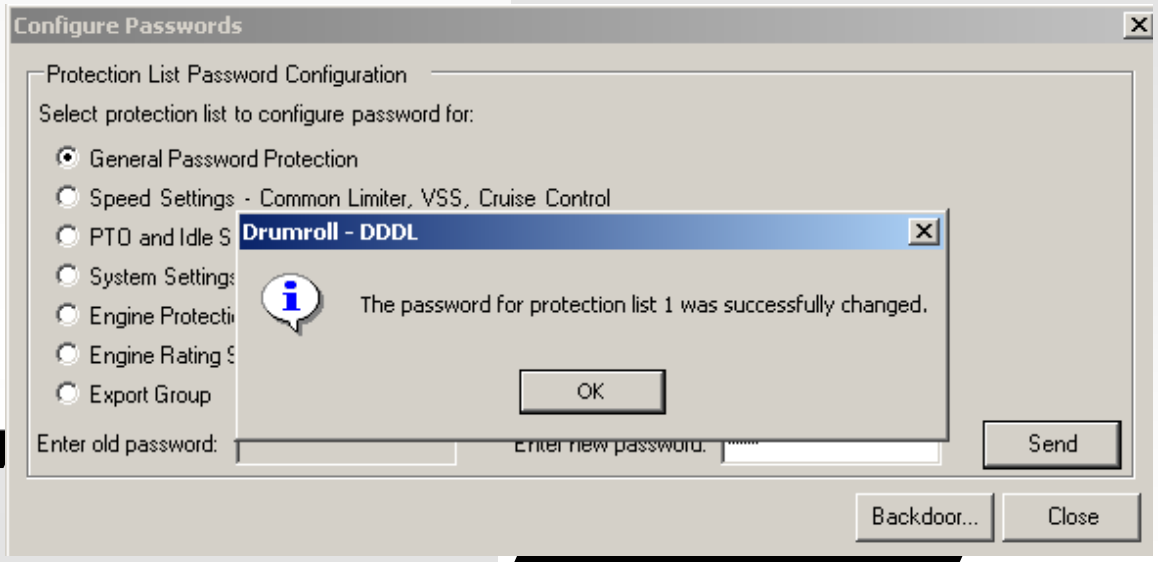


To access the password functions, go to the "Parameters" drop-down menu and choose "Configure Passwords".



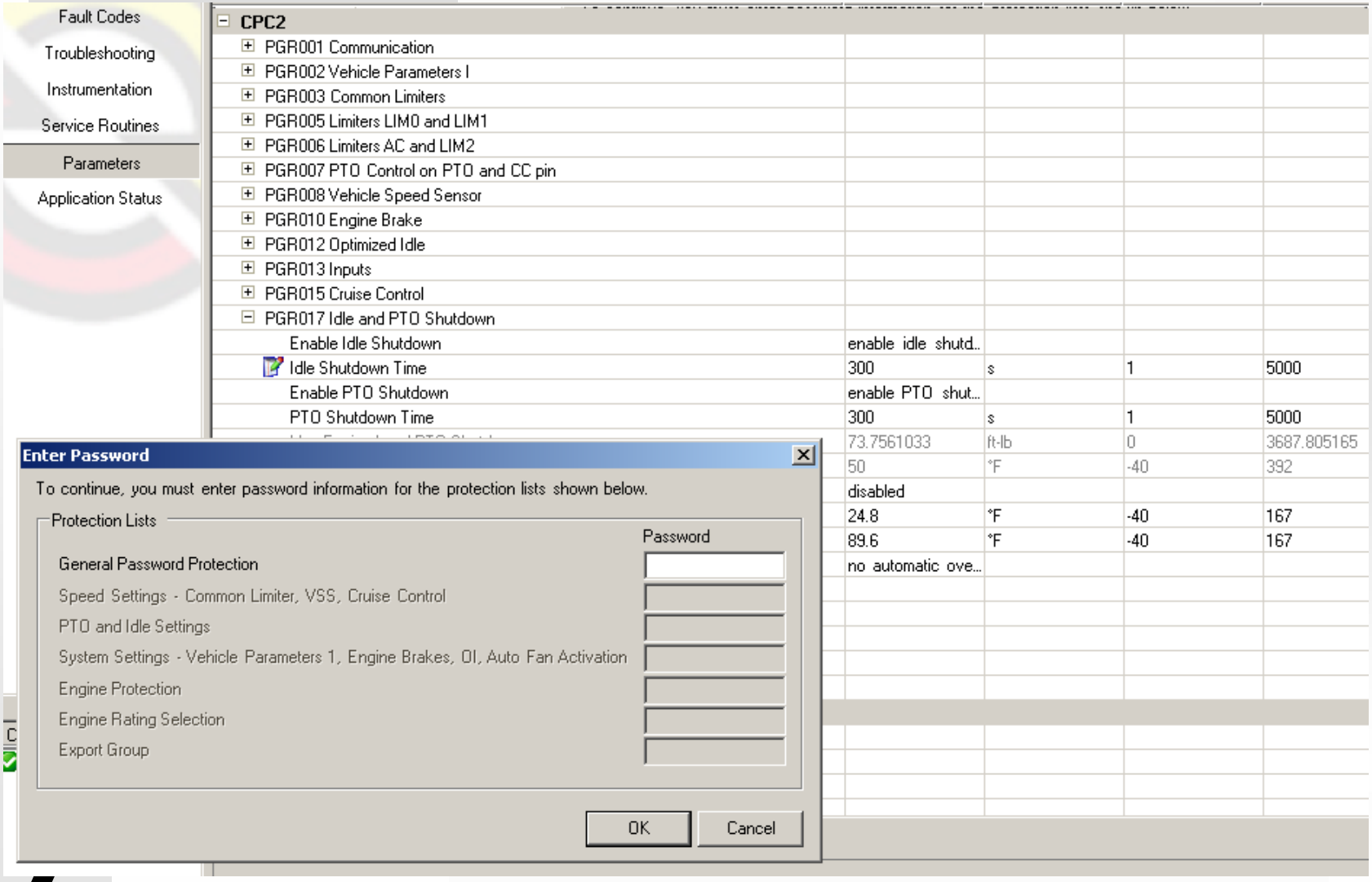
The main screen for setting and changing passwords will appear. You will also see the various groupings available for secondary password protection on this screen.





To enter a new password simply enter the desired password and choose the "Send" box. When the operation is successfully completed you'll get a message confirming the operation. .

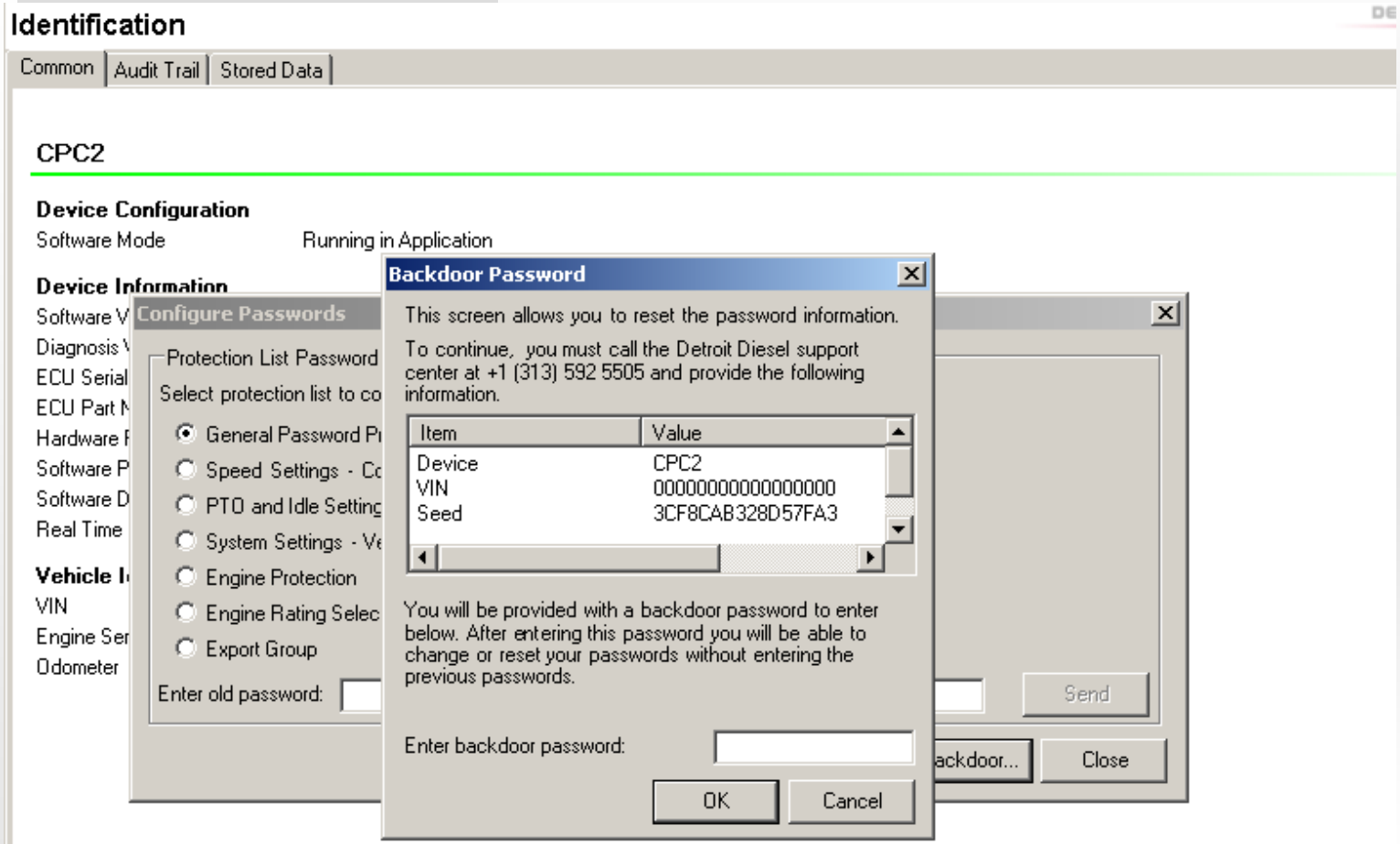
To change a password already in place you would go to the same screen but enter the old password first.



This screen illustrates what the user will observe when he attempts to change a parameter in a CPC that is currently password protected.

The user will make any changes as described previously but the protection screen will appear after the “Send” button is clicked.

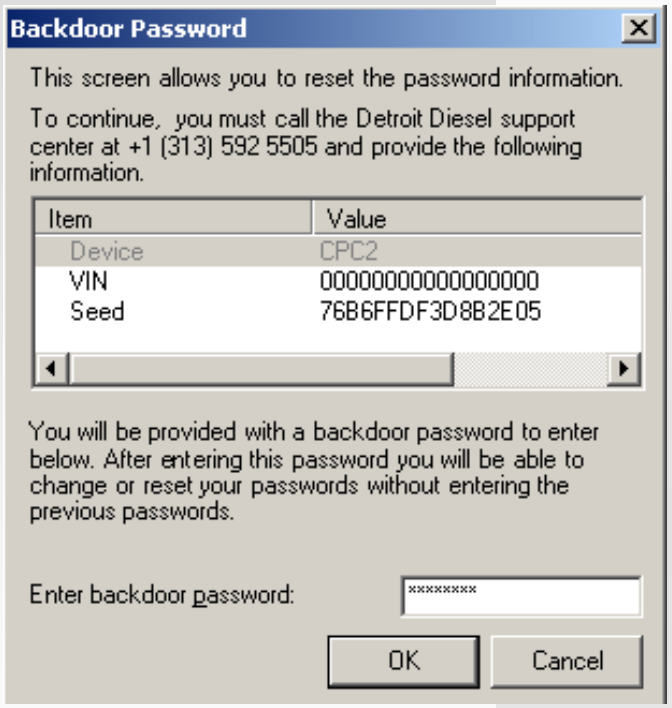
[redacted]d click on “OK” to finish sending the change.

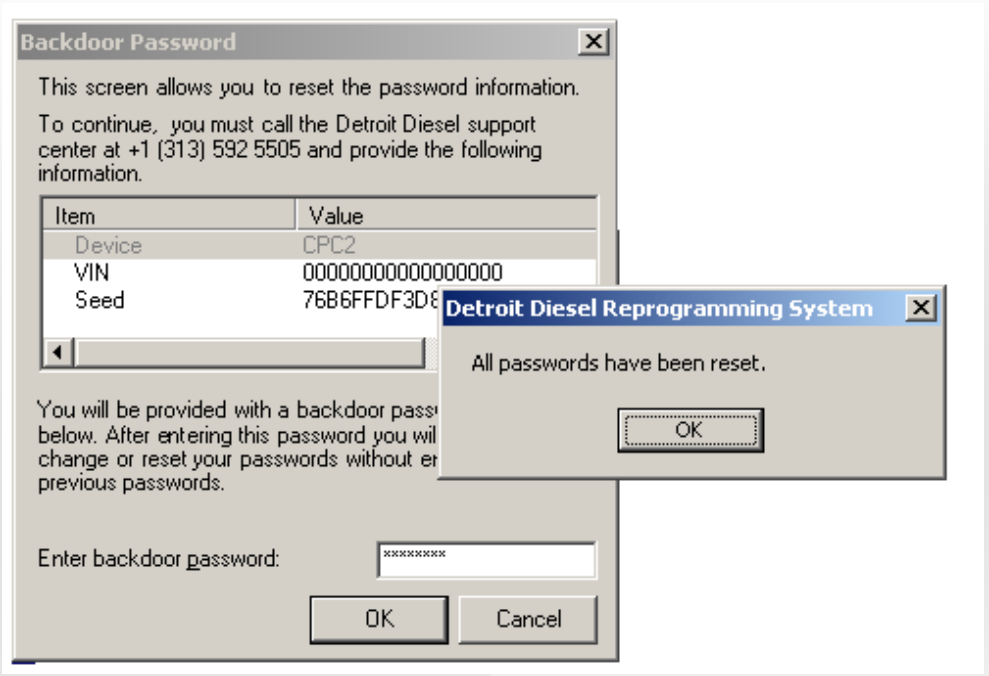


For instances of lost or forgotten passwords there is a backdoor function which may be accessed through from the main password configuration screen.

To begin the process of unlocking a CPC with with an unknown password copy the "Seed" value and call the Customer Support Center (CSC) at 313-592-5800.

Note: DO NOT close the original window where the seed value appears. If you close the window the seed will change.





The CSC will require that you provide specific information on the particular circumstances of the backdoor request prior to releasing a backdoor password. This is for security and tracking purposes.

When you have received the backdoor password enter it in the proper box and select the "OK" box.

When the correct password has been entered you will receive message telling you that all the passwords have been reset.

Note: The 2007 backdoor function permanently clears all set passwords in the CPC. You will need to reset your chosen password levels to resume CPC password protection.

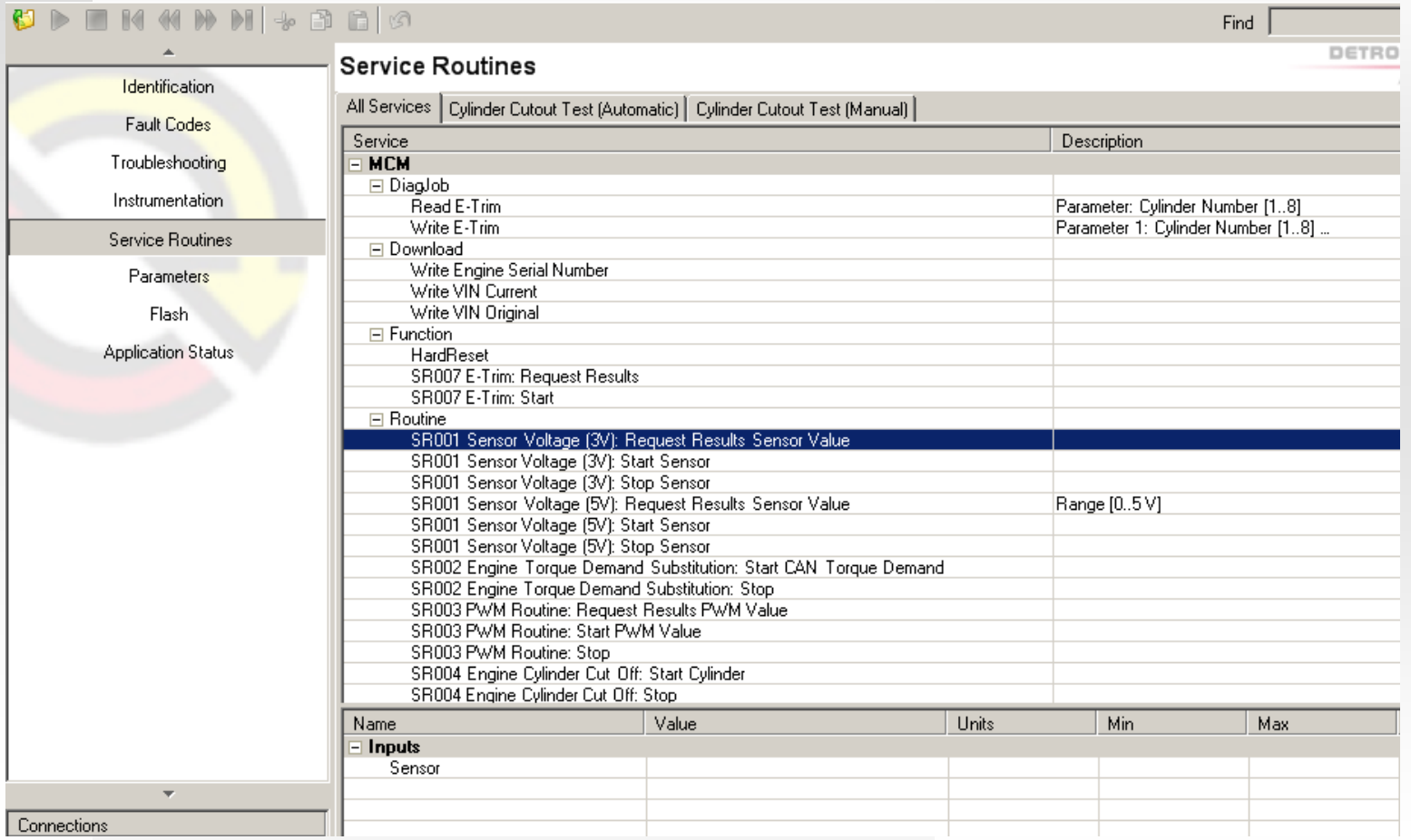
X. Using the Service Routine Window

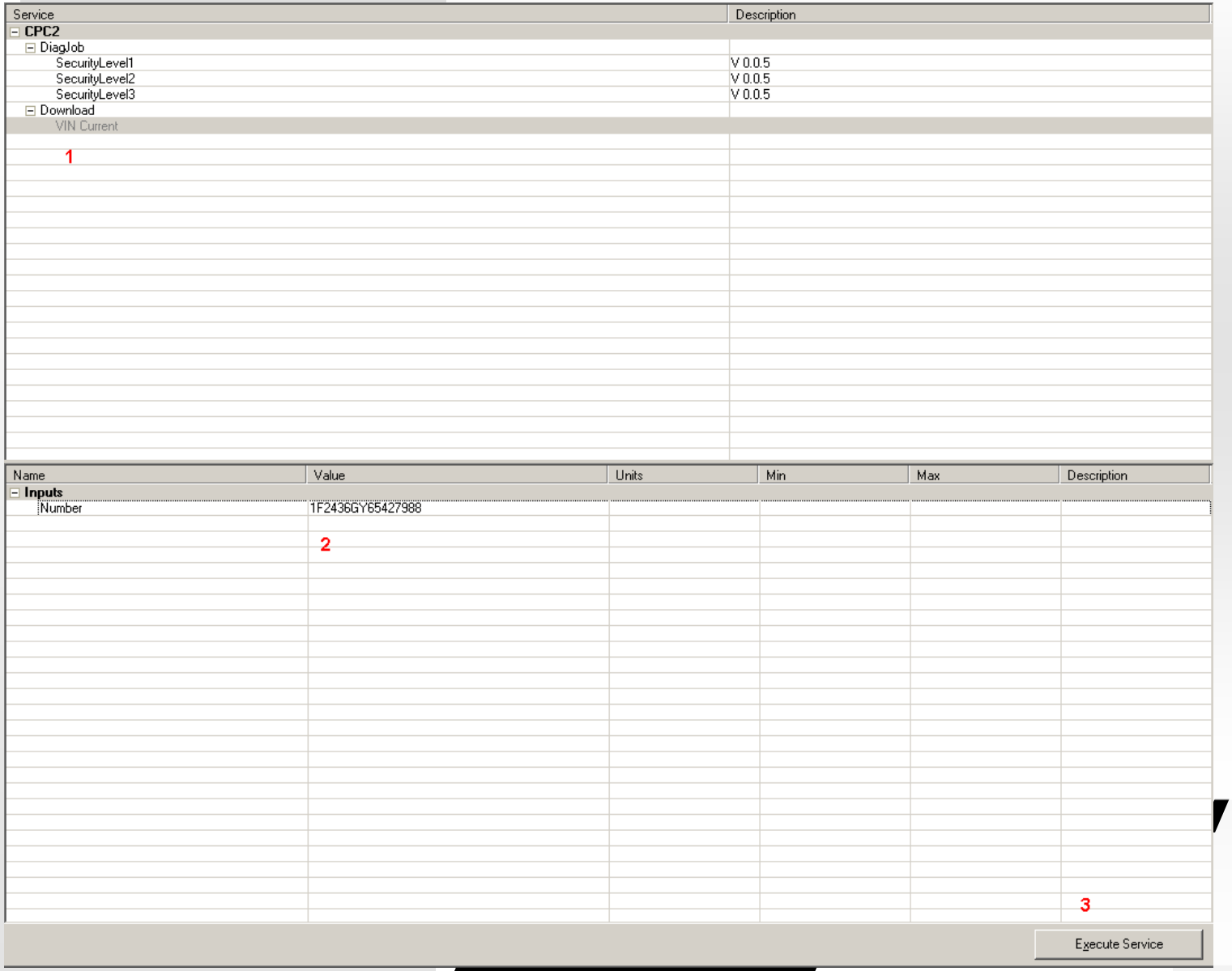
Service Routines

- Service routines are located in both the MCM and CPC modules and cover a wide variety of functionality

- <u>Routines may appear differently depending upon the level of software in the modules and the type of tool being used.</u>

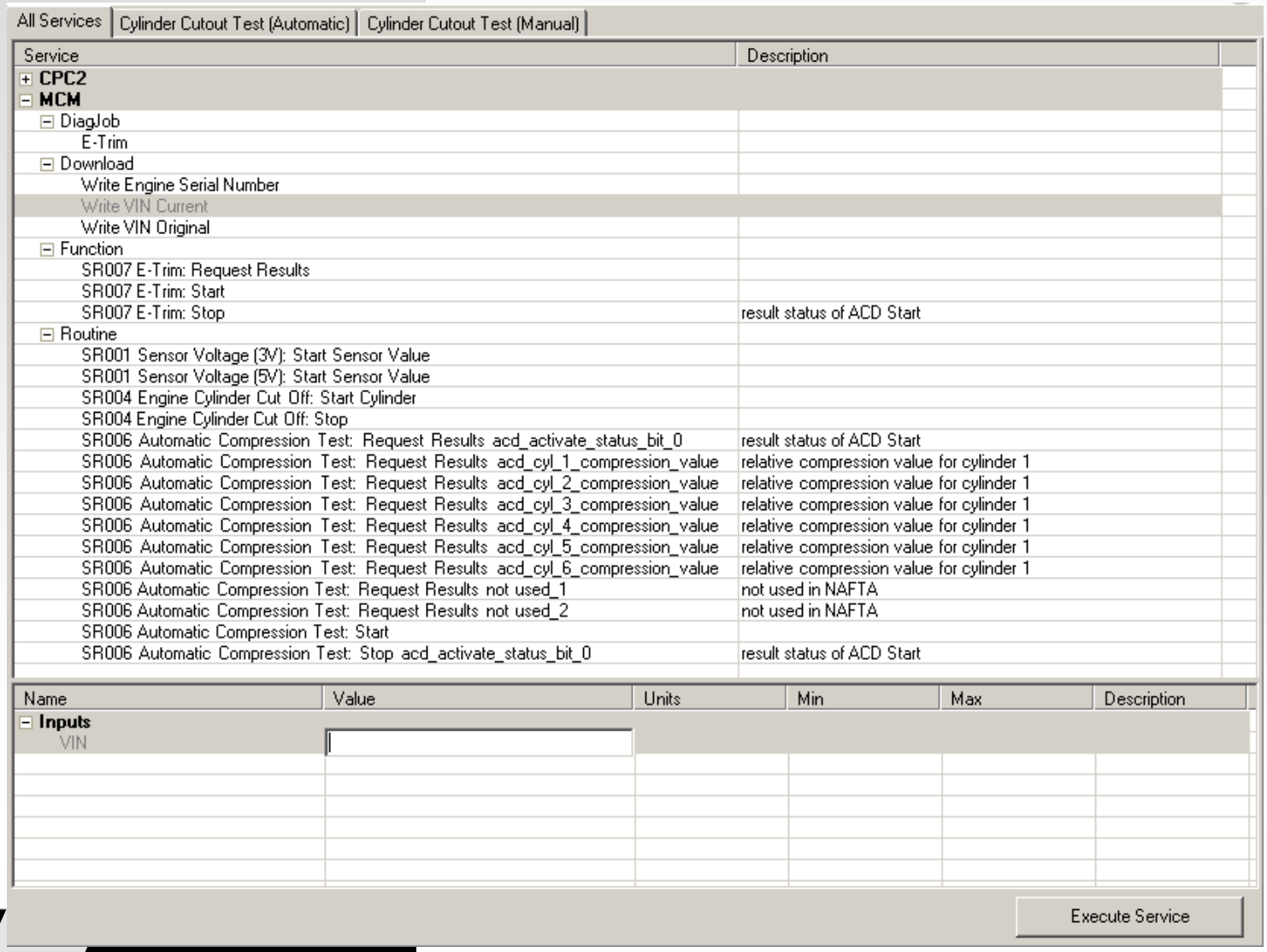
- Some routines have automatic implementation, others require manual implementation by the user.





The service routine window has 3 main portions. To implement any routine make a selection from the list (1), configure the routine in the workspace (2), and execute the routine (3).

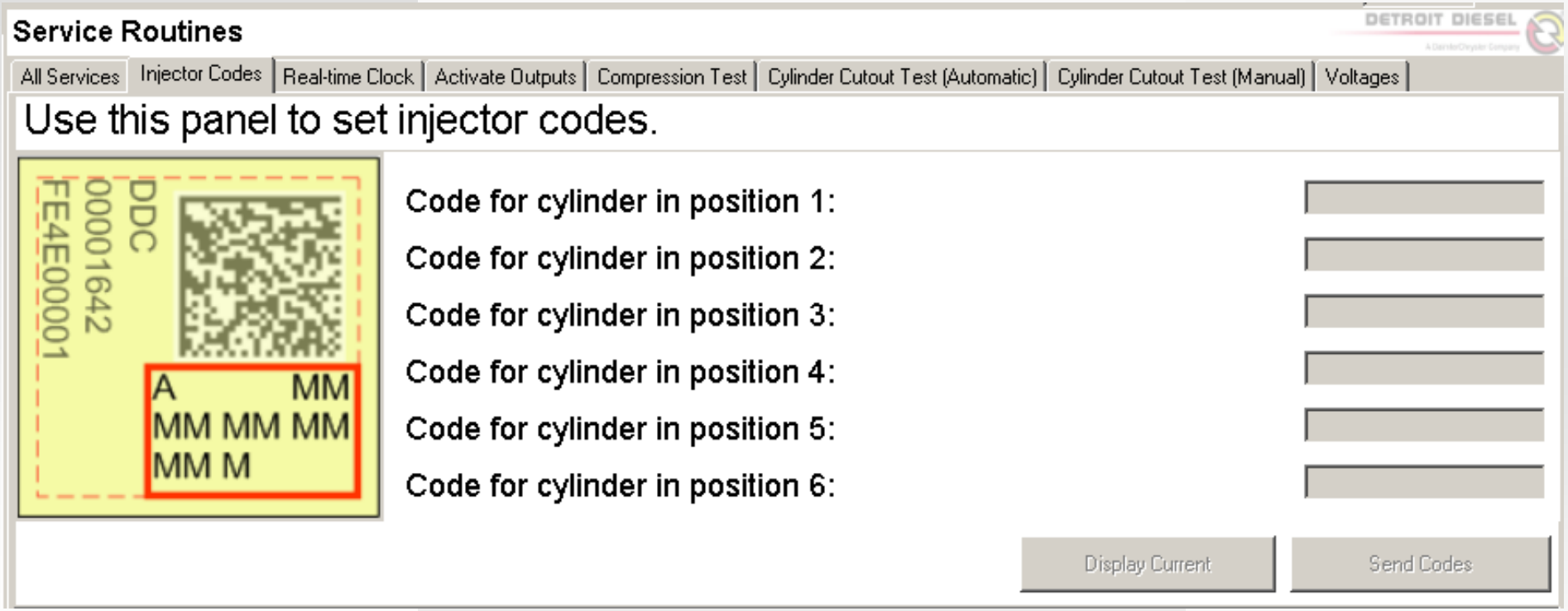
This example shows the how to write the VIN using the CPC service routine.



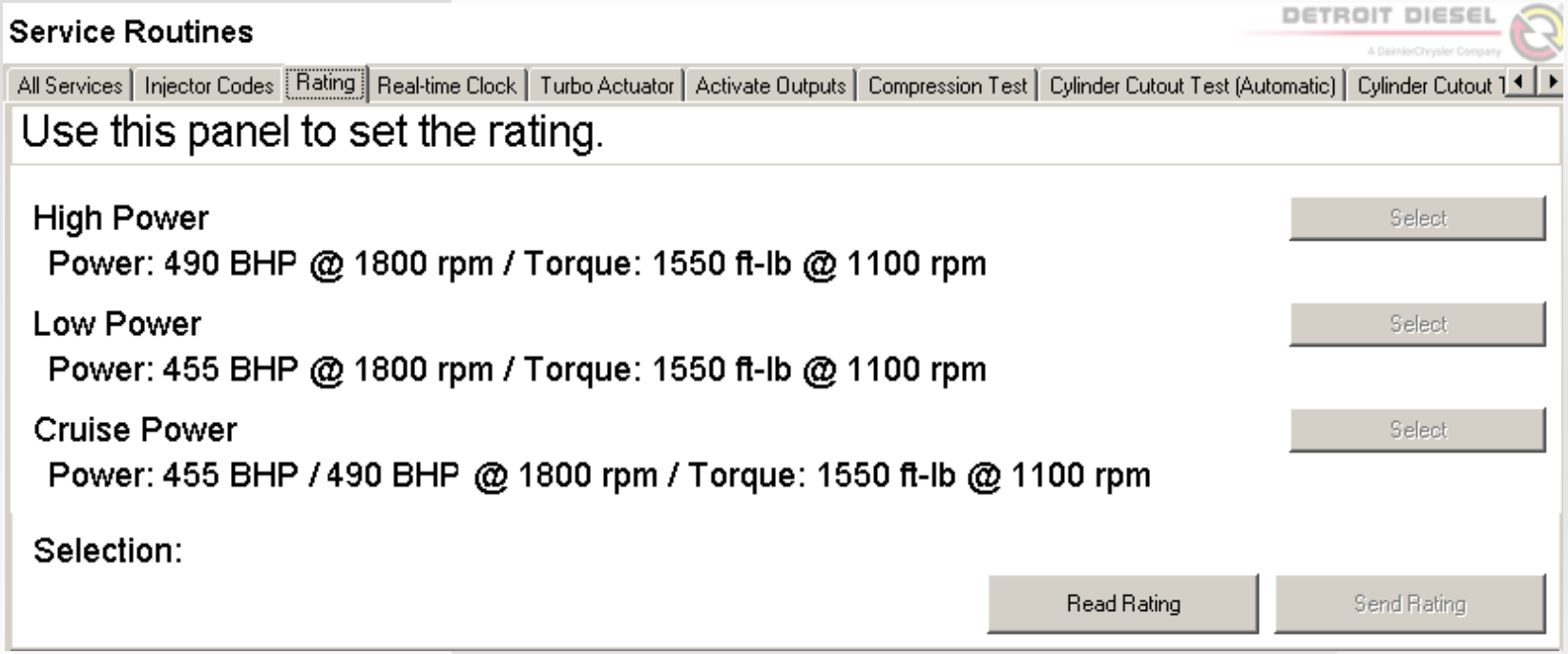
A cross section of service routines available in the MCM software.

In addition to the "All Services Tab", The most frequently used service routines appear on user-friendly tabs:.

- **The Injector Codes Tab**
- **The Rating Tab**
- **The Real-time Clock Tab**
- **The Turbo Actuator Tab**
- **The Activate Outputs (for both MCM & CPC) Tab**
- **The Compression Test Tab**
- **The Automatic & Manual Cylinder Cutout Test Tab**
- **The DPF Regeneration Tab**
- **The Voltage Tab (for all 3 & 5 volt sensors).**

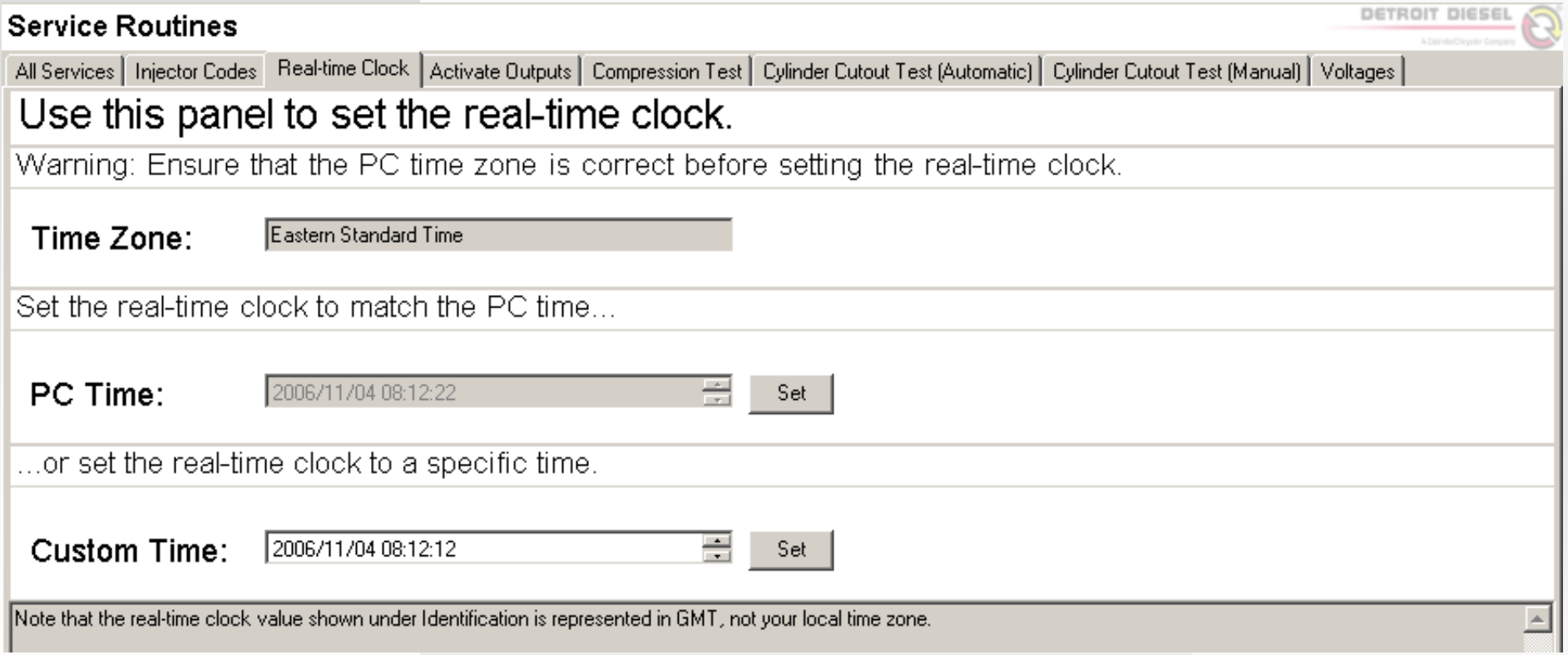


Injector Codes Panel / Production DDEC VI engine injectors will contain injector codes for optimal performance. This panel will allow the user to read the current values of the injectors and also allow the entry of new values when the injector is replaced in the shop. The user will enter the value on the of the new injector (highlighted in red in picture above) and then send the value to the MCM. There is built in error checking procedure to prevent entry errors.

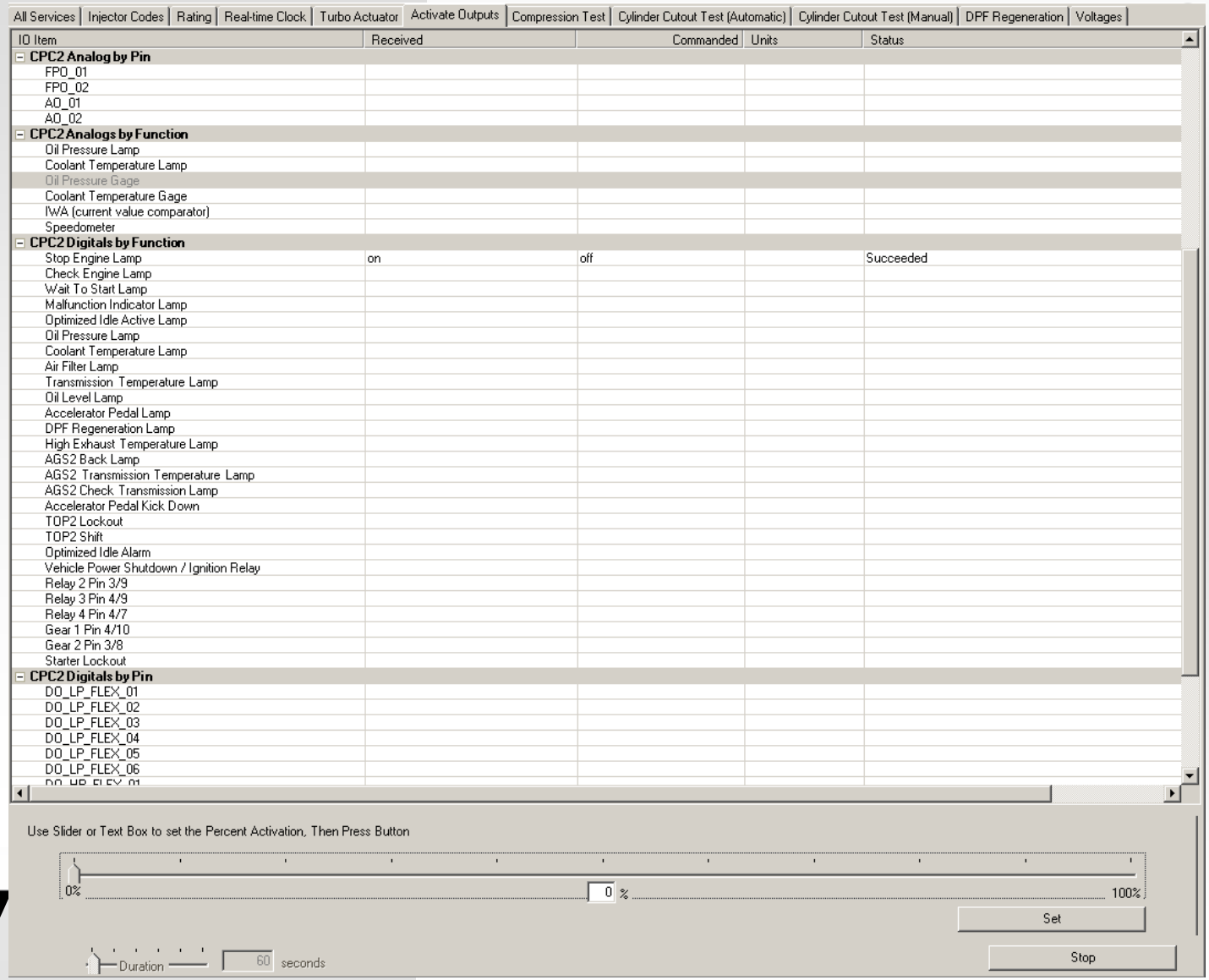


The Rating Panel allows the user to easily manage the horsepower choices available in a particular fuel map. To see which of the ratings is currently selected click on the "Read Rating" box. The rating currently selected will remain grayed out while the other two choices will be darkened in indicating they are available for making change. To make a change the user selects the new rating he wants and then clicks on the "Send Rating" box.

Note: If the CPC password protection feature is being used, the user will be asked to enter the proper password (or passwords) before this change will be sent to the module.



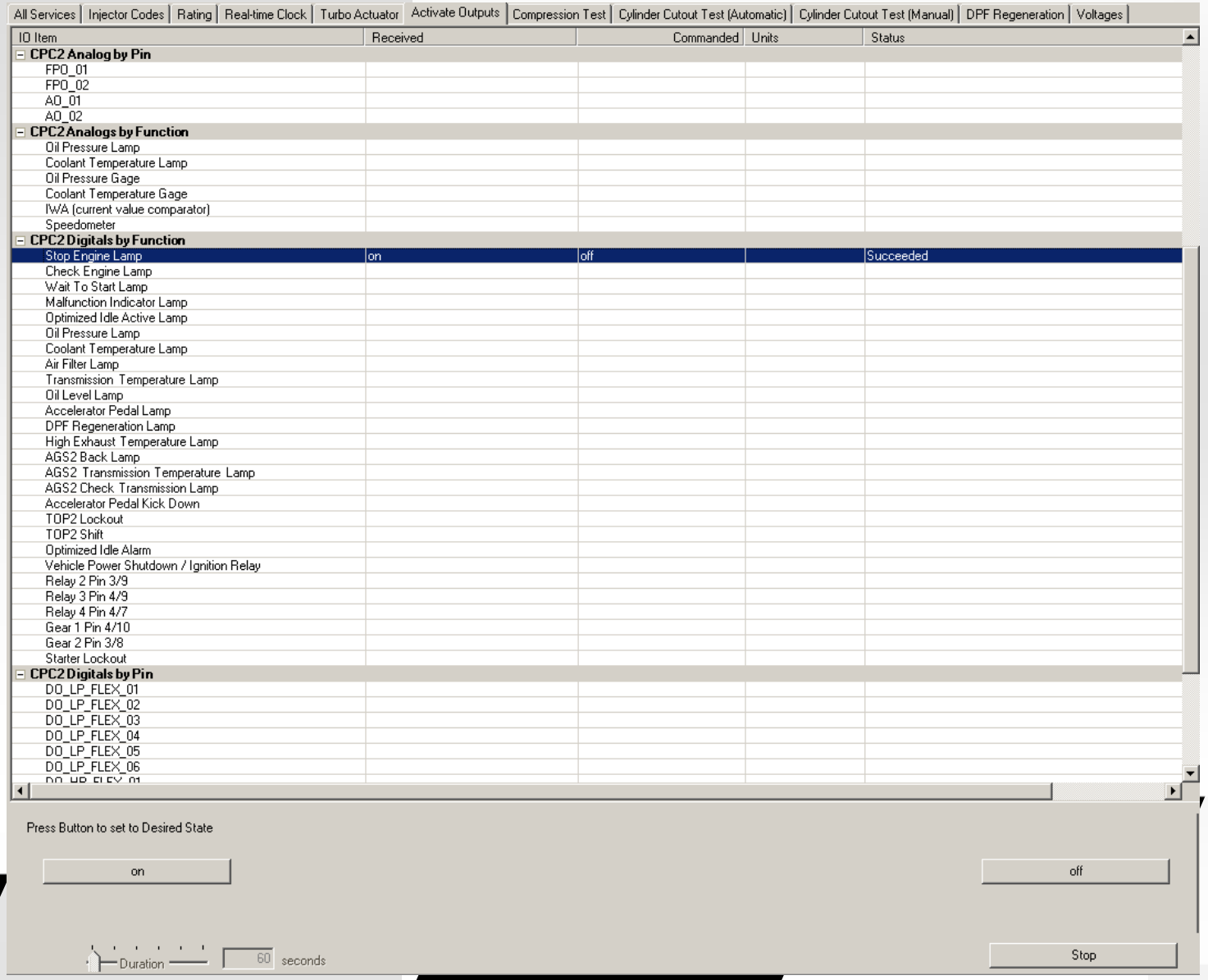
Real-time Clock Panel – In early CPC hardware the real time clock was not set at the factory but could be changed manually. CPC production intent hardware has the time set to GMT as part of production process. Production electronic tools will display the time and date stamp data based on the local PC time zone.



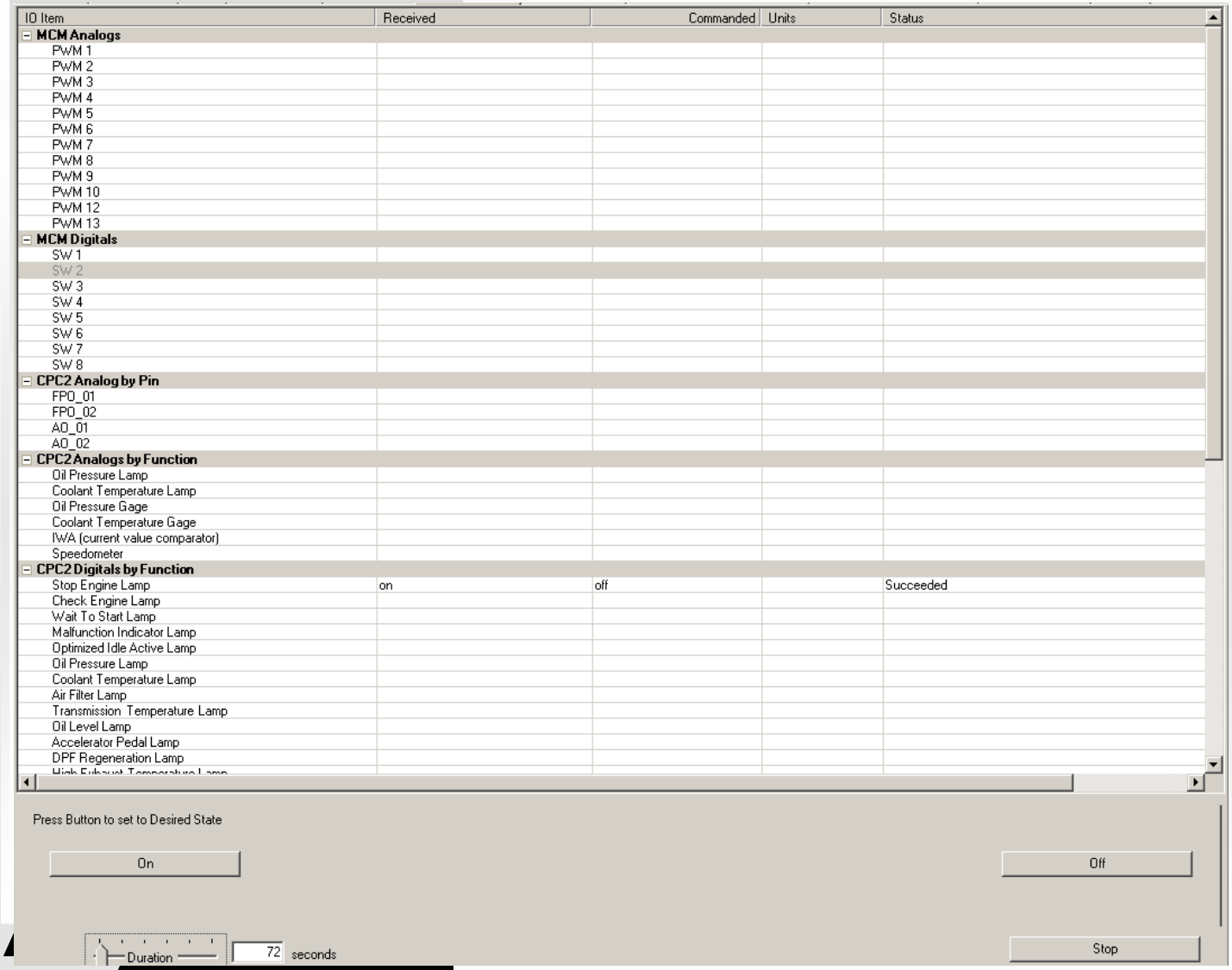
The "Activate Outputs" Service Tab works with outputs from both the MCM and CPC.

The appearance in the main workspace will change depending upon which group of outputs you are working in.

In the example of the CPC analog gauge outputs the user may set a desired output percentage, and initiate start / stop commands, but not set a duration for the commands.



In the example of the CPC digital outputs by function, the inputs may only be turned on or off. The are no percentages or duration settings available.



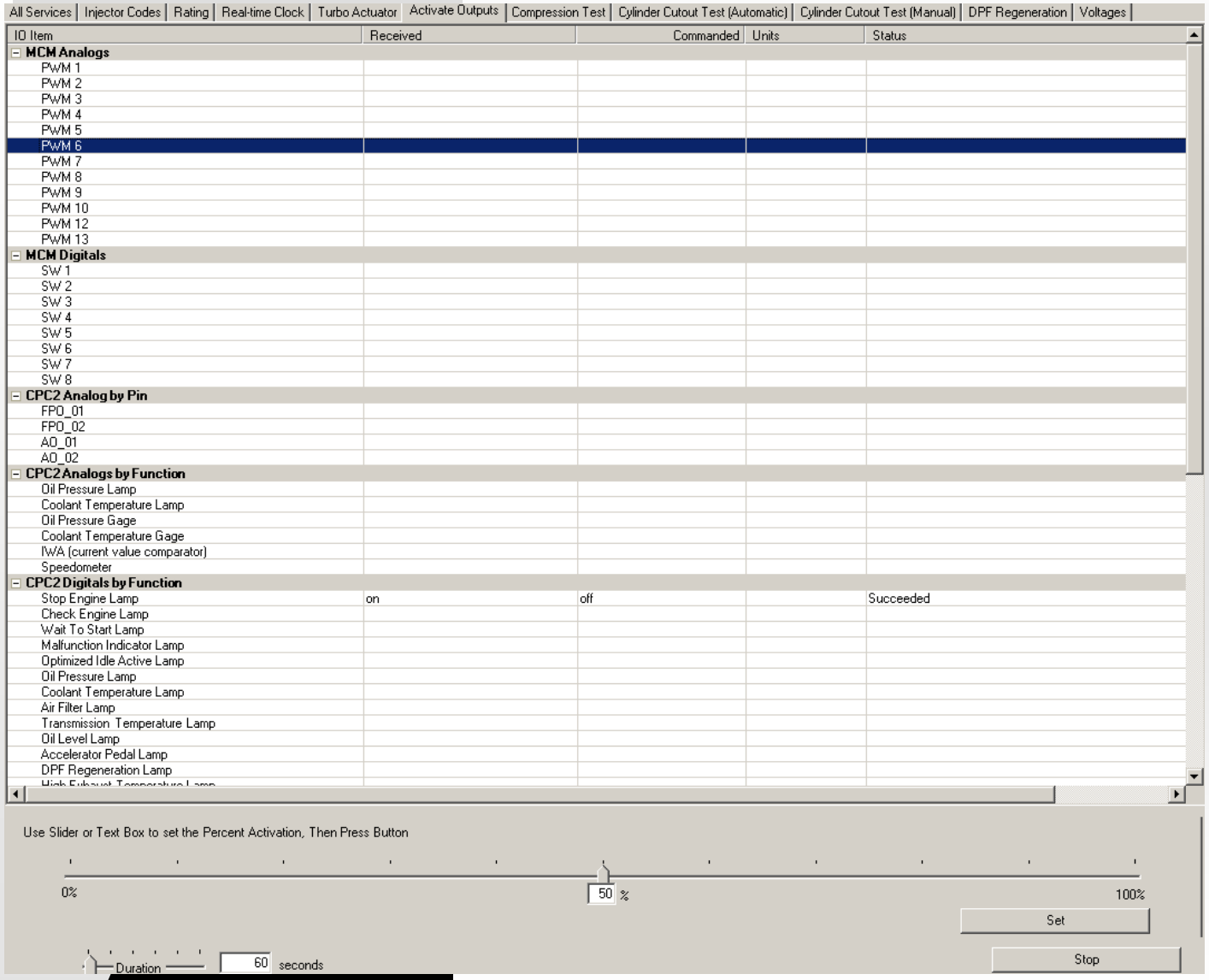
The MCM digital outputs section (to control engine SW functions) allows the user to:

- Turn the switch function on or off

- Set the duration of time the desired.switch is on

Note: At this time the user needs to go view the MCM par file to properly identify the PWM and Switch settings for the specific engine being worked with.

2007 Electronic Tools for DDEC VI



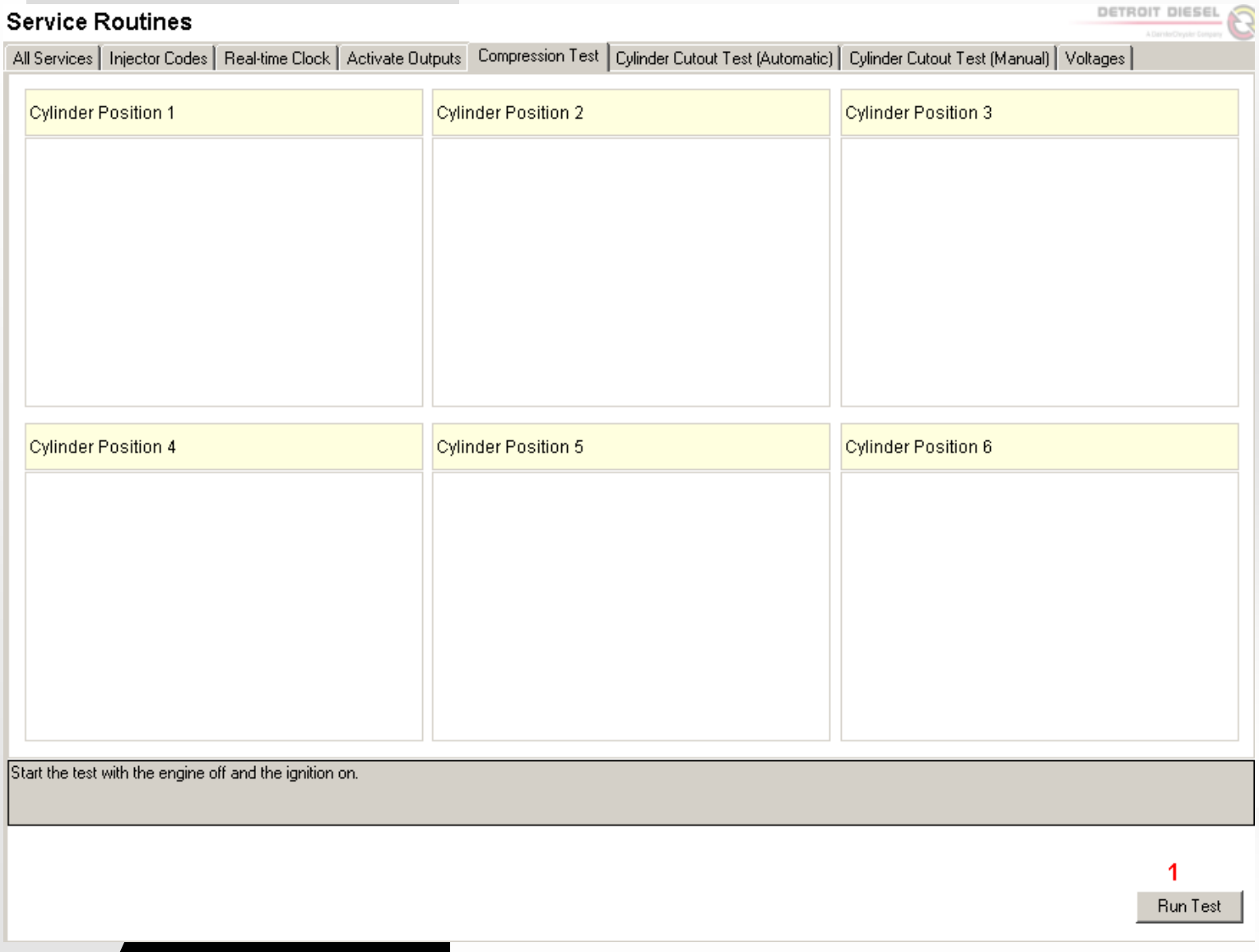
The MCM analog outputs section (to control engine PWM functions) allows the user to:

- Set a percentage of the PWM output.

- Set the duration of time the percentage is desired.

- Start and Stop the function

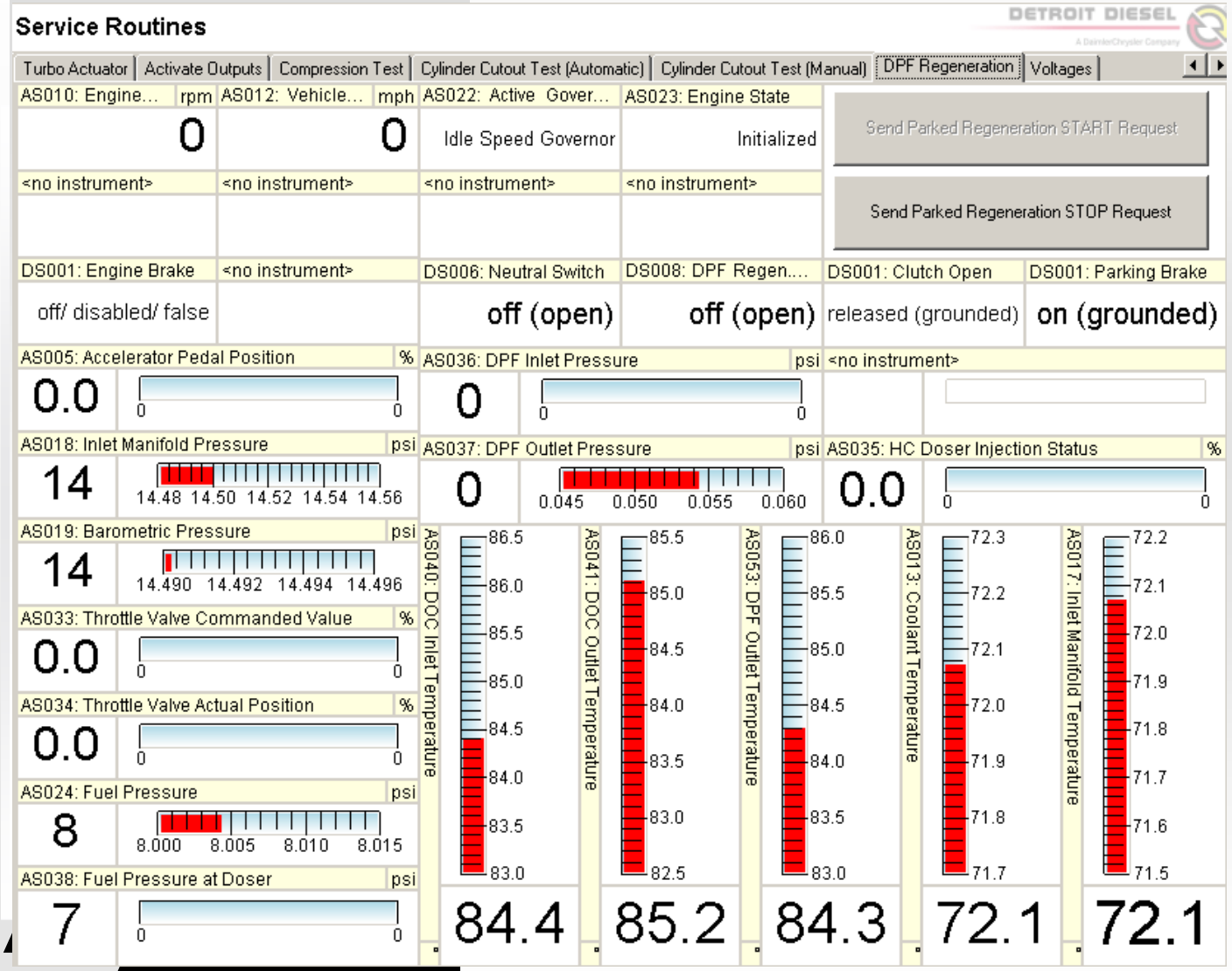
Note: At this time the user needs to go view the MCM par file to properly identify the PWM and Switch settings for the specific engine being worked with.



C1 – Compression Test - For all engine types from 7.3.3.5 and higher levels of software with the proper fuel map configuration. This will vary with wide variety of test software currently in the field but will be available for production vehicles.

The test measures relative compression of all cylinders based on cylinder with the "best" compression.

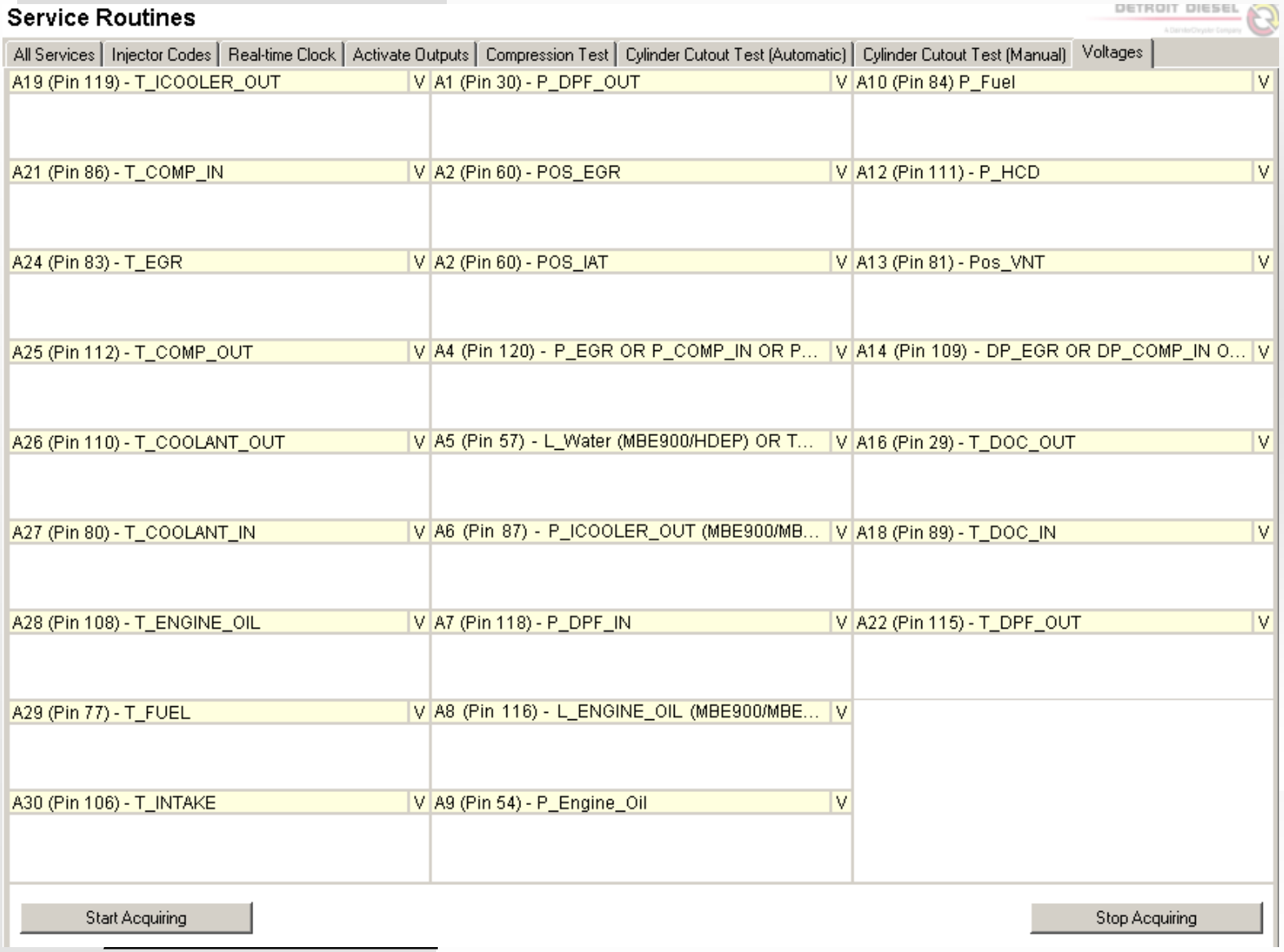
To begin the test click on the "Run Test" box (1) in the lower right and follow the instructions that follow.



The DPF Regeneration tab allows the user to start a manual regeneration of the after treatment device, monitor the values of key after treatment system components while the test is in progress without leaving the service routine screen, and stop the process for any reason once it has begun by selecting the "Stop Request" box.

To initiate the command to start the Regen process the user must complete all the necessary safety checks (see the After Treatment Technician's Guide for details). The "Start Request" box will become active and the process may be started..

Note: A regen process begun by the DDDL 7.0 tool will be terminated if the tool is removed from the vehicle diagnostic connector.



3 and 5 Sensor Voltage Routines

To begin monitoring the sensor voltage values, click on the "Start Acquiring" box.

At this time you must use the pin chart to clearly identify the values.displayed.

Please note not all values on the tab will be configured on every vehicle.

The Turbo Actuator Service Tab

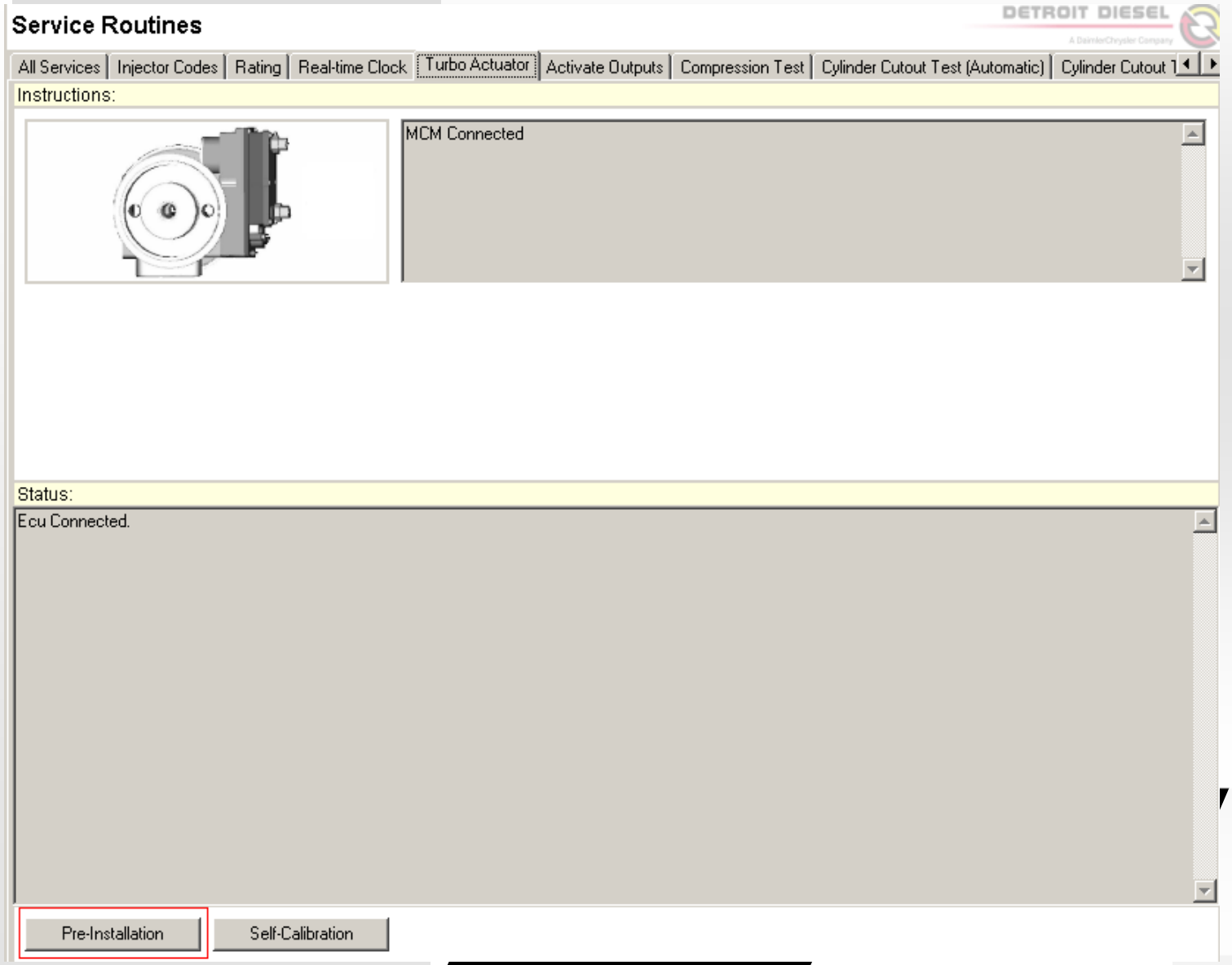
The S-60 production turbocharger has an electronic actuator controlled by the MCM via CAN communications. There are 3 service routines that are used for installing and diagnosing the electronic actuator.

1) The Pre-Alignment test – rotates the output gear to coincide with the nozzle position Note:This test must never be run with the actuator mounted on the turbo.

2) The Self Calibration test – enables the actuator to memorize the turbo end stops

3) The Scan test –checks for free nozzle movement

Running the Pre-Installation Routine

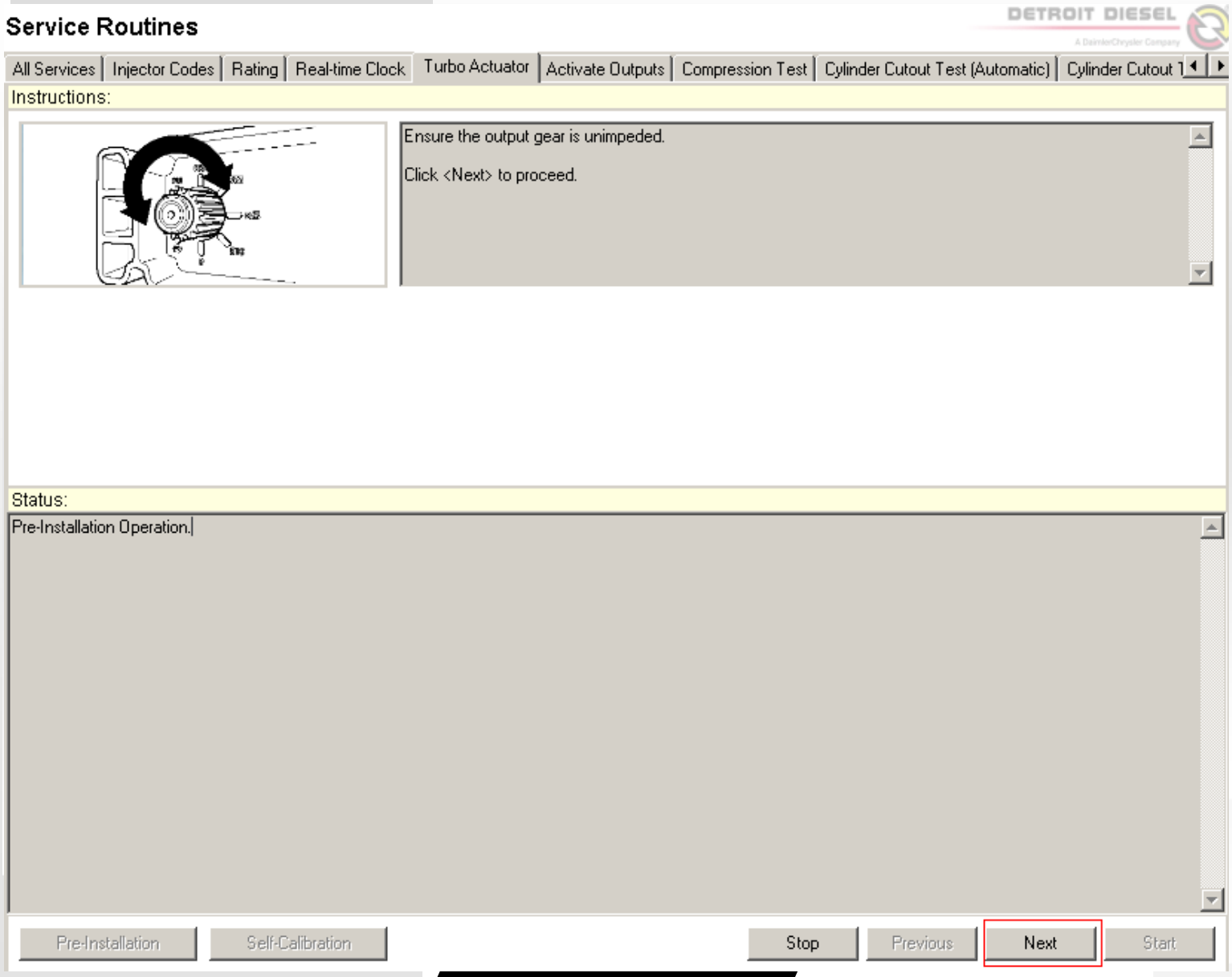


The pre-installation routine is run on the actuator prior to installation on the turbo.

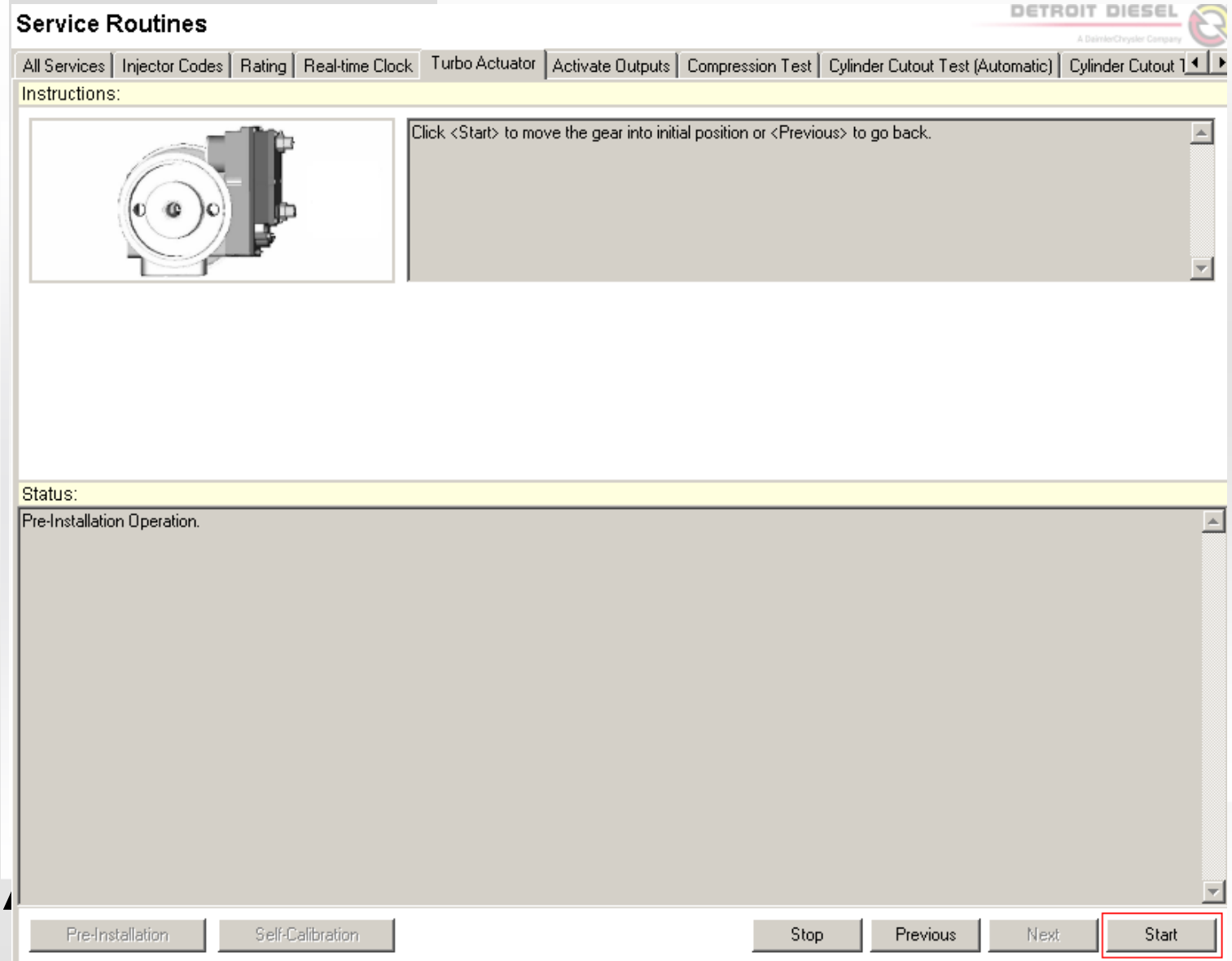
Connect the actuator to vehicle harness.

With DDDL connected through the vehicle's diagnostic connector,go to the "Turbo Actuator" tab of the "Service Routines" section.

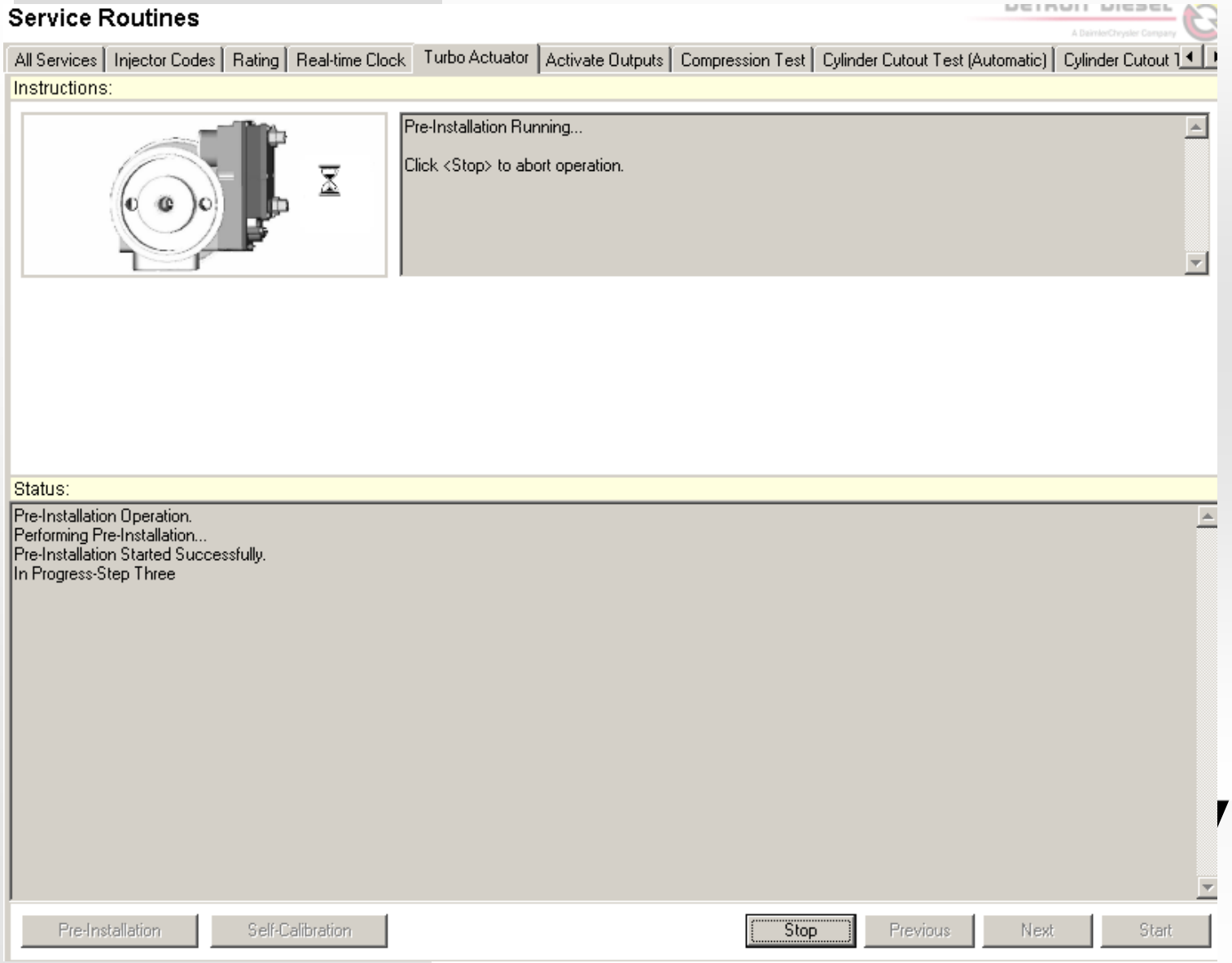
Select the "Pre-Installation" box in the lower left of the screen.



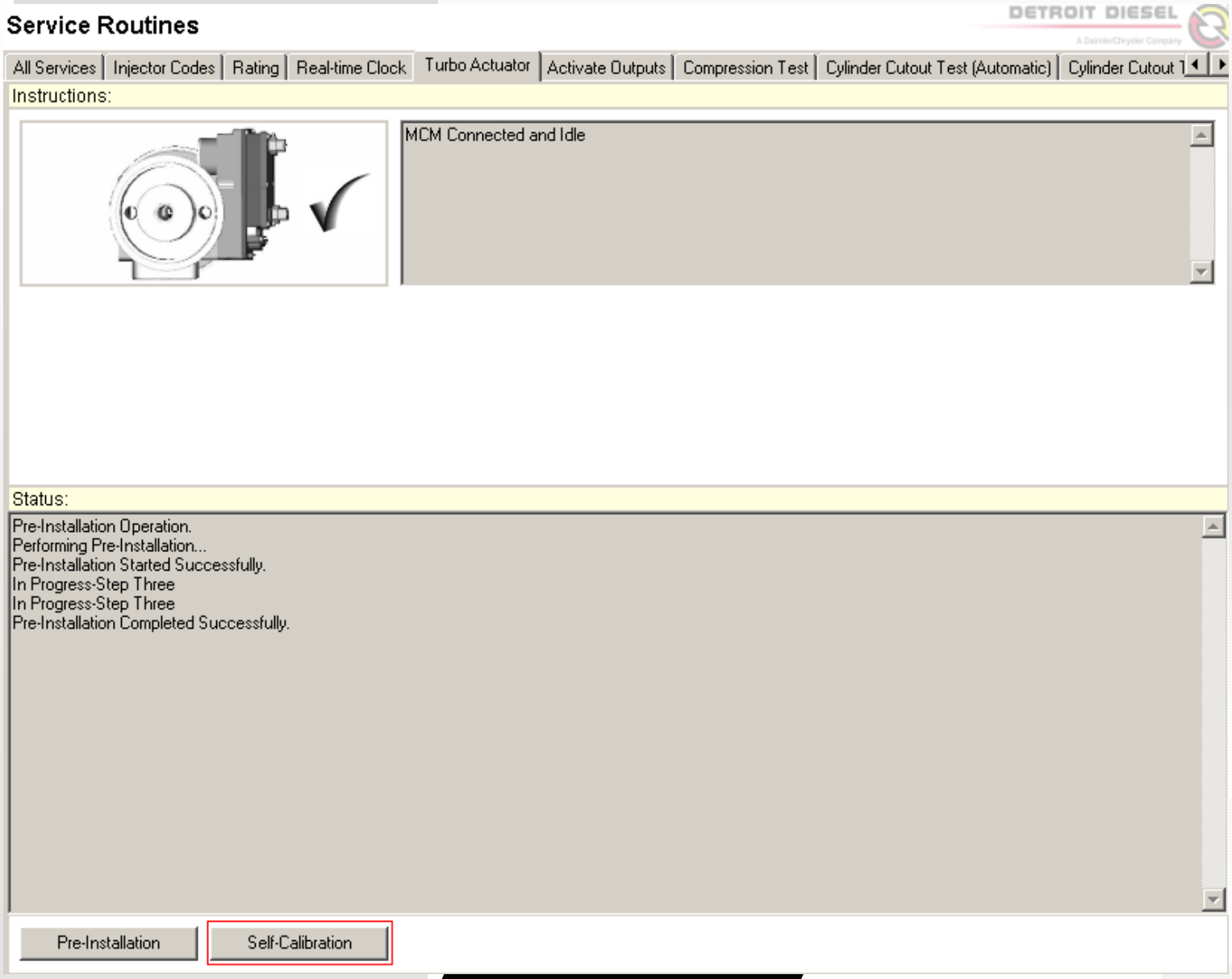
Follow the instructions in the upper half of the screen. Click on the "Next" box in the lower right to proceed.



To begin the routine click on the "Start" box in the lower right of the screen.

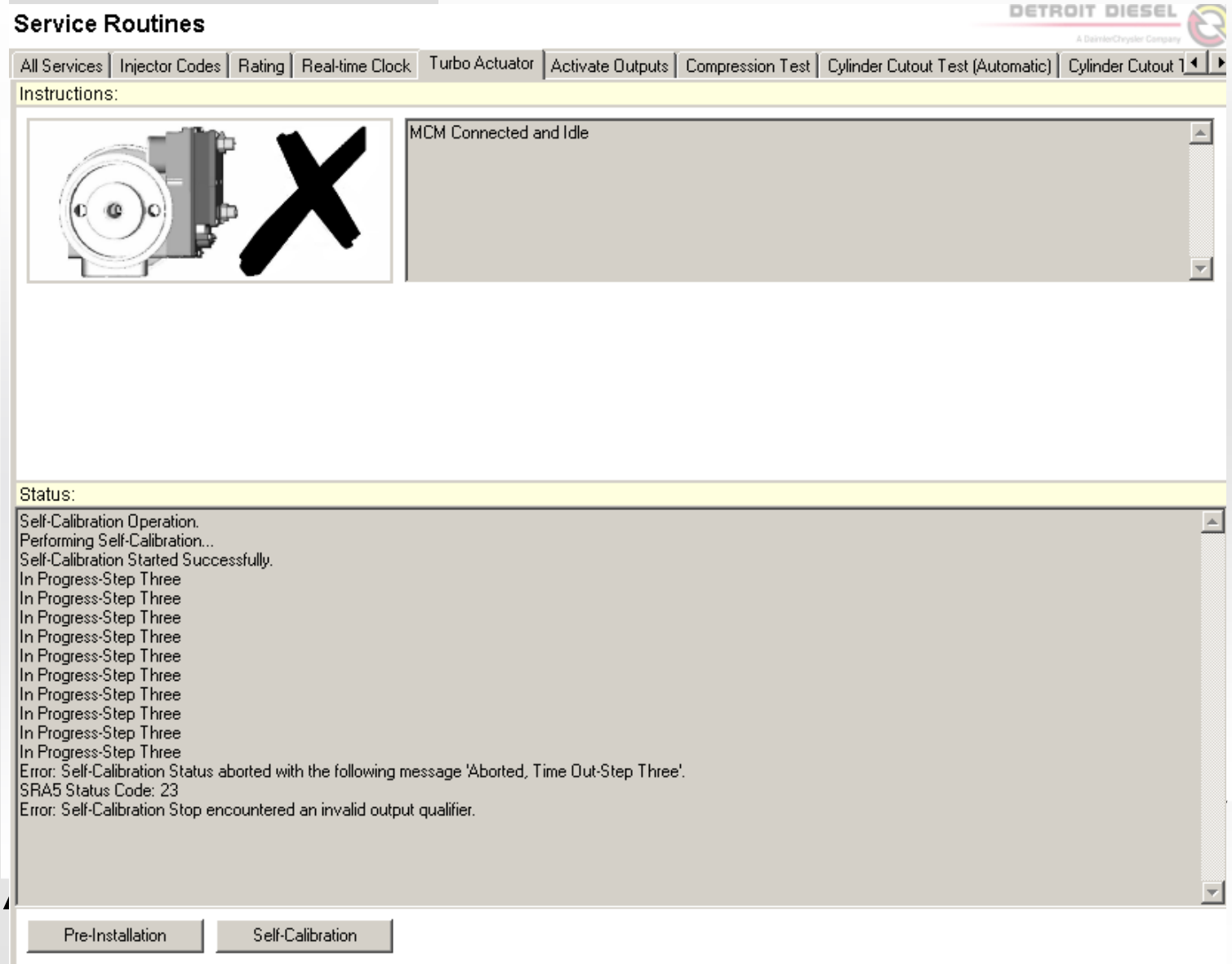


Once the routine is started the progress is tracked in the lower half of the screen. The movement of the gear will be audible as the function is completed. The function takes only a few seconds to run.



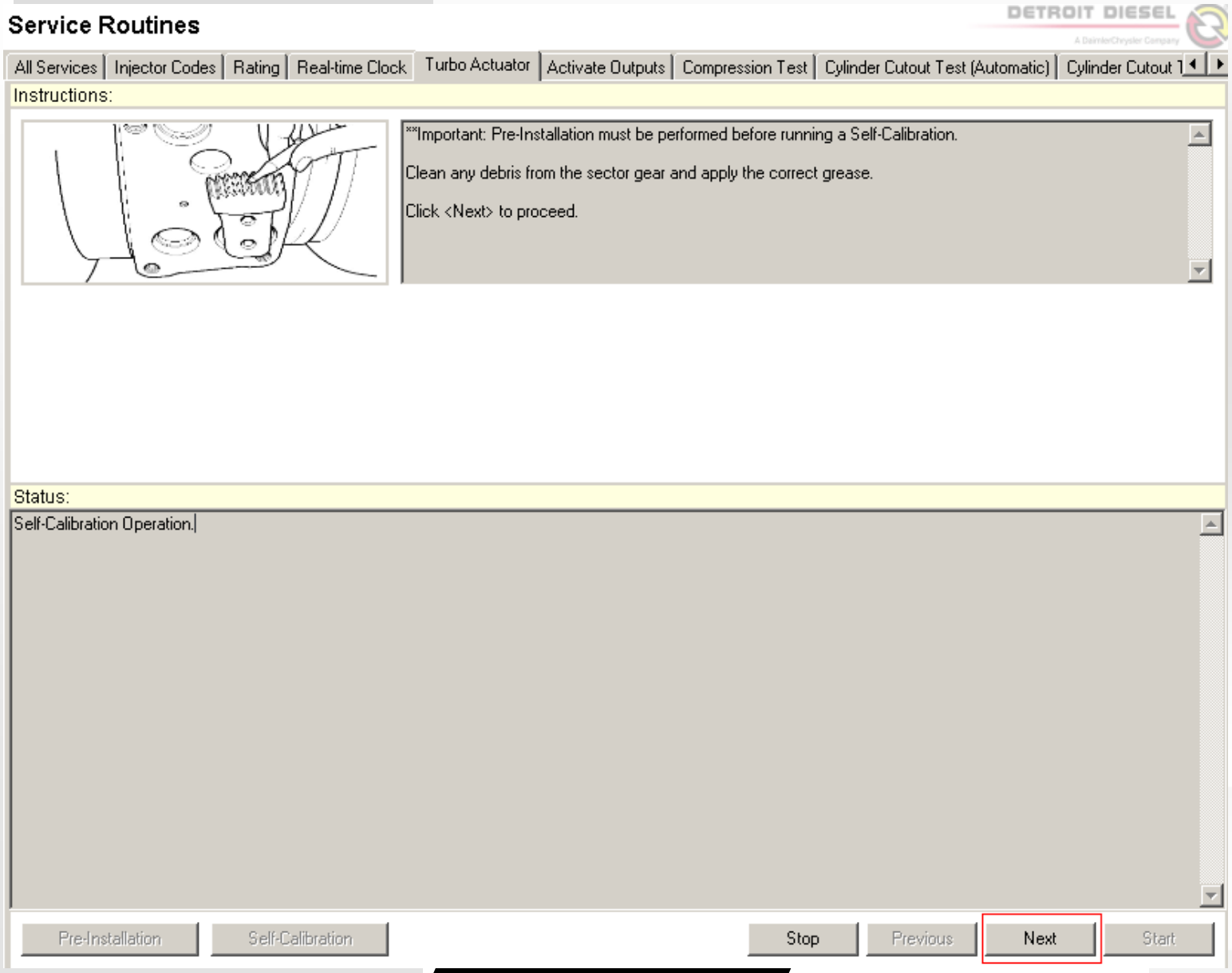
When the routine has finished the results will appear automatically. The user will see a check mark in the upper half of the screen and a message saying the test was successfully completed in the lower half of the screen.

To move on the next step select the “self Calibration” box in the lower left.



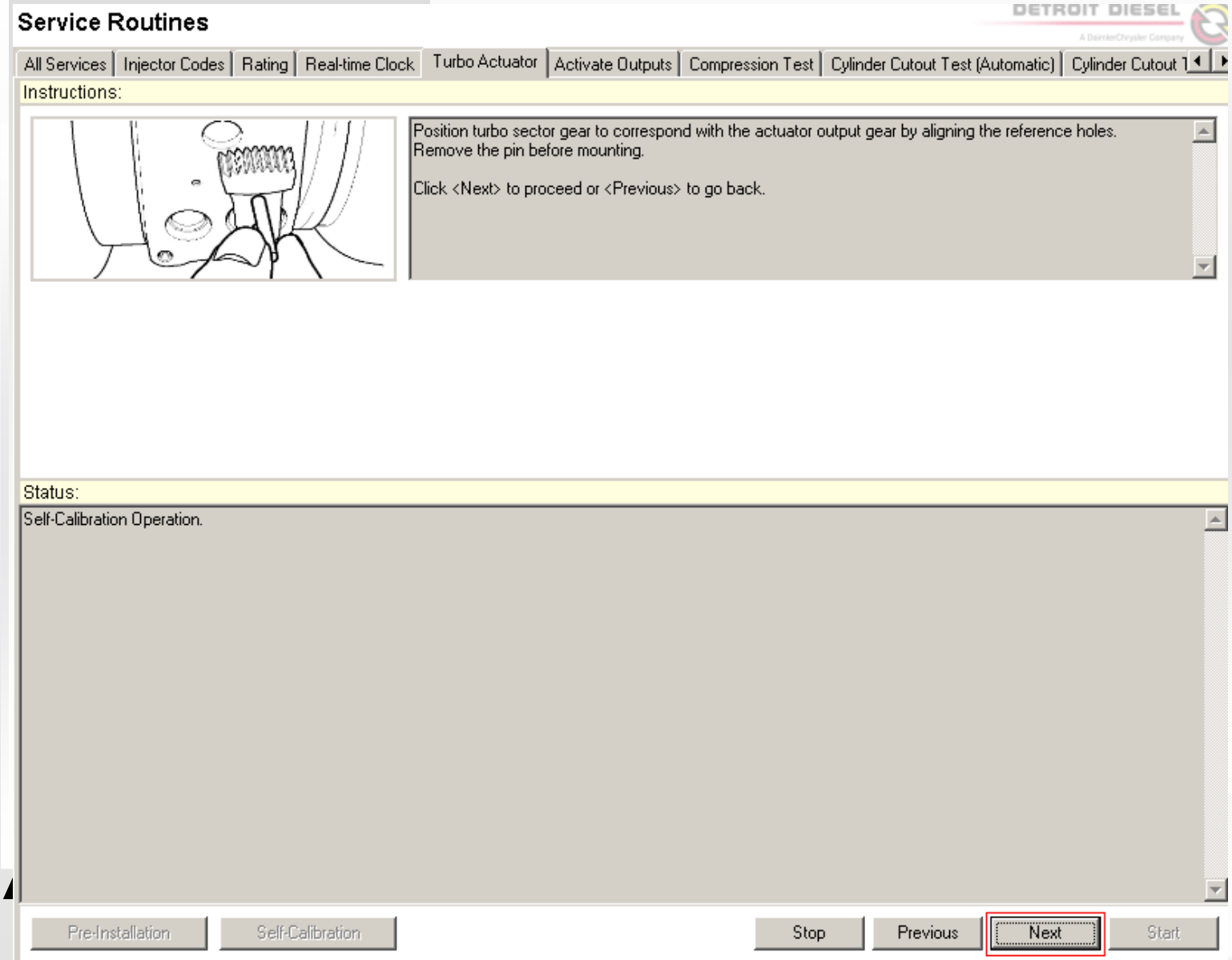
If the test fails the top half of the screen will alert the user with an "X" in the graphic and the text at the bottom of the screen will give more details on the nature of the failure.

Running the Calibration Routine

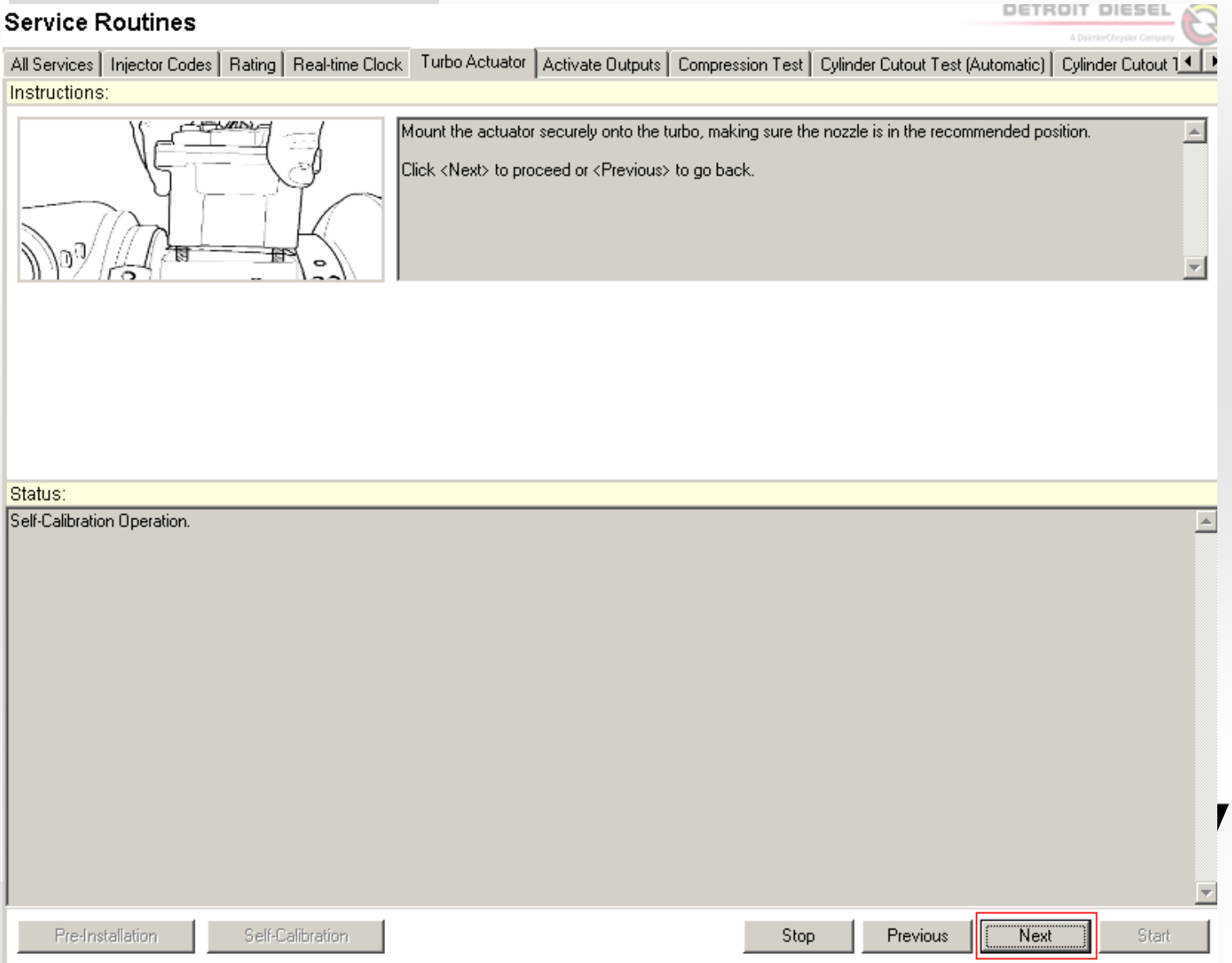


Follow the on-screen instructions for installing the actuator properly on the turbo. Make sure you have all the correct pieces from the installation kit. The kit should contain mounting bolts, alignment pin, and grease.

Select "Next" when you are ready.

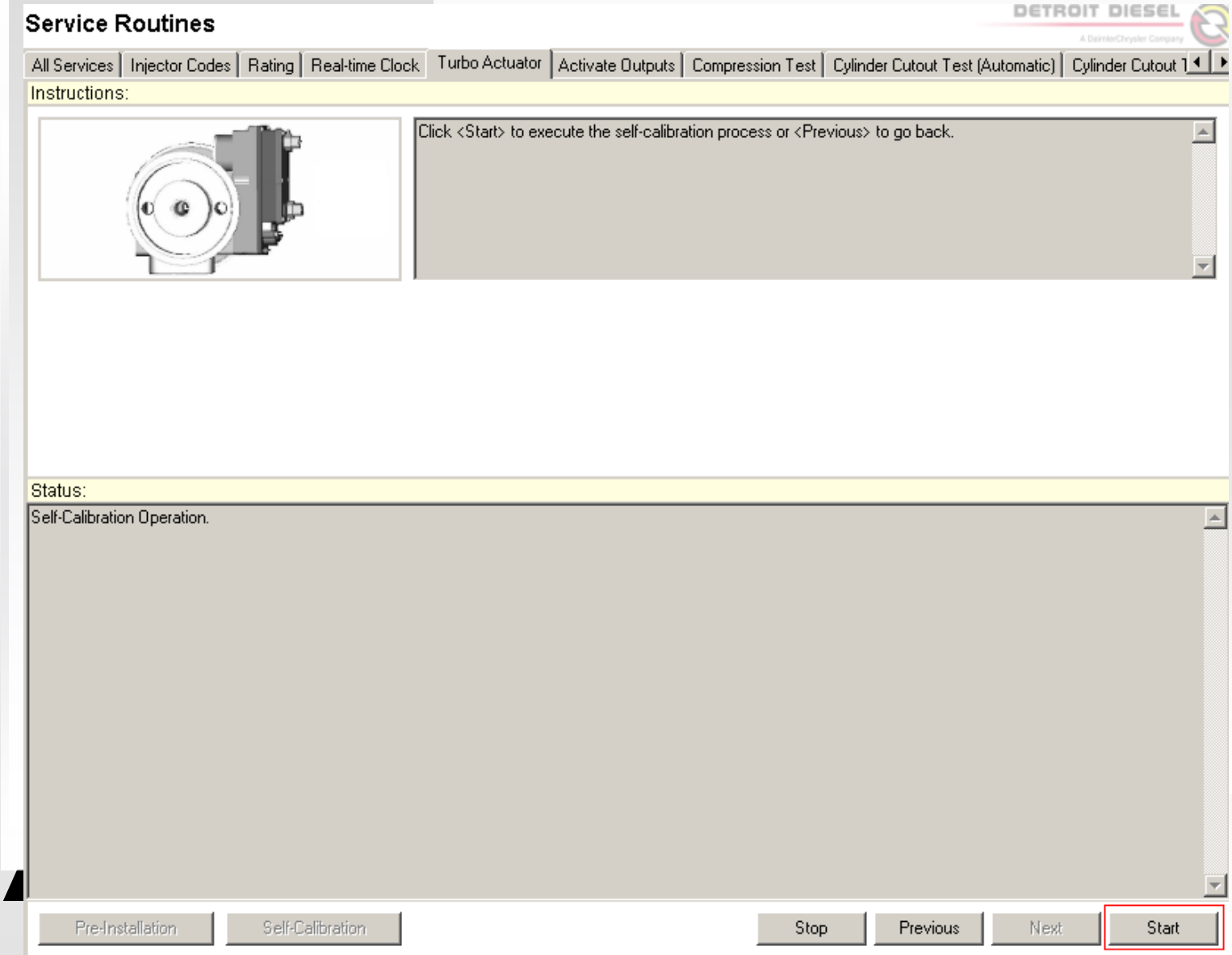


Follow the on-screen instructions to align the reference holes and select "Next" when finished

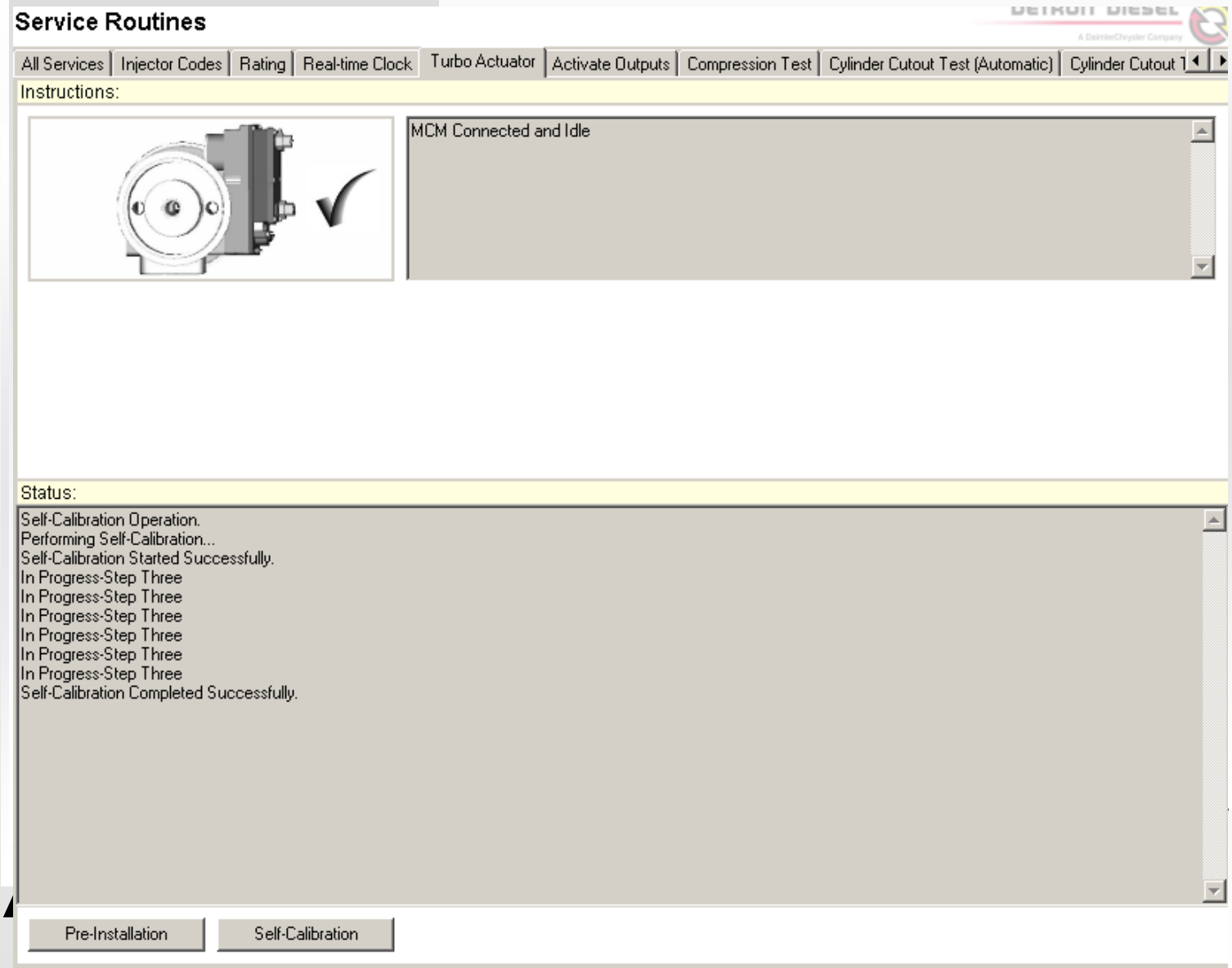


You may now mount the actuator. Make sure the new gasket is properly aligned during the installation and the mounting bolts torqued to proper specifications.

Once the actuator is securely installed select the "Next" box.



To begin the routine click on the "Start" box in the lower right of the screen.



When the routine is finished the results will appear automatically. The user will see a check mark in the upper half of the screen and a message saying the test was successfully completed in the lower half of the screen.

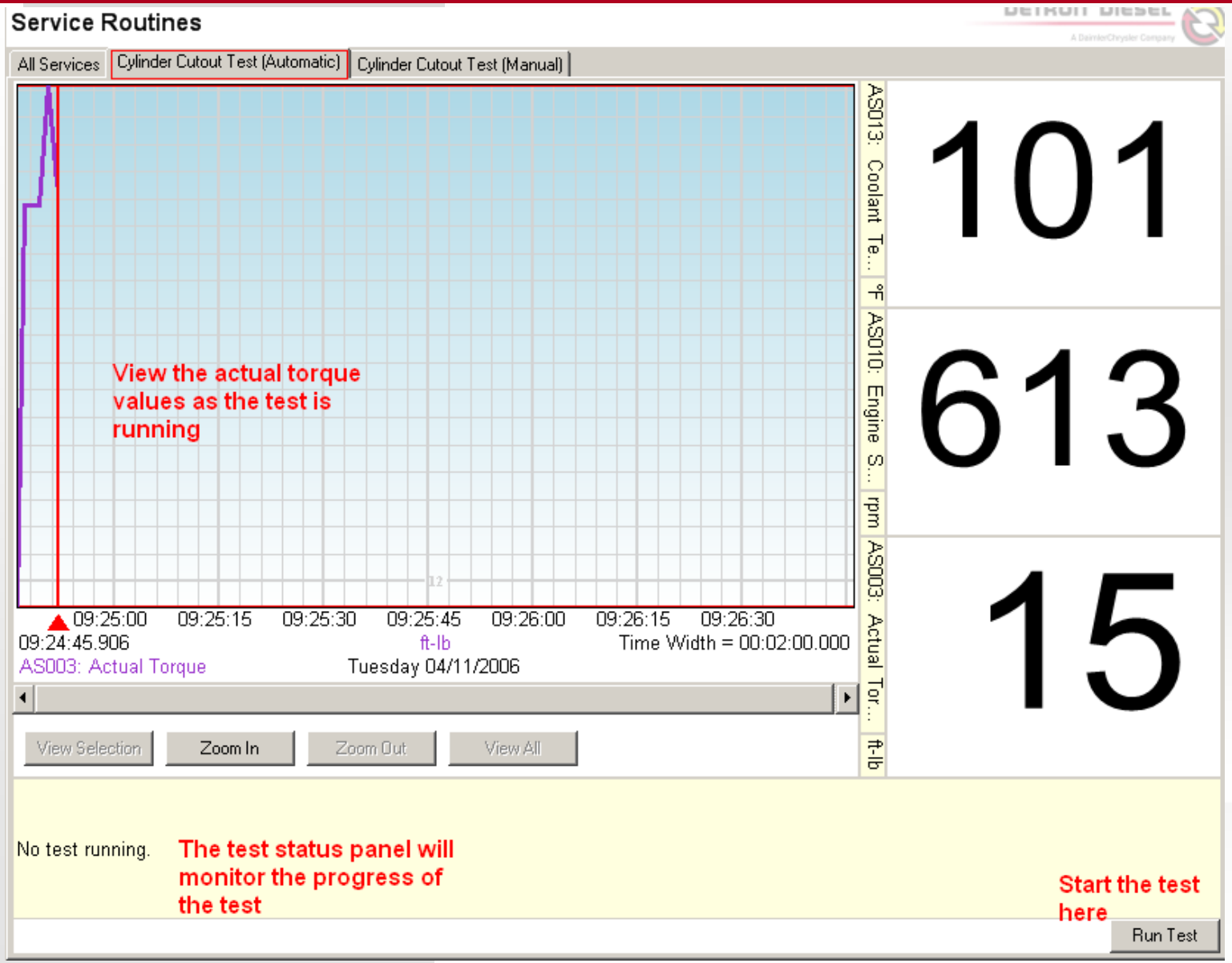
If the test fails there will be a black “X” displayed in the graphic in the upper portion of the screen and descriptive test in the lower half of the screen.

Note: The Scan test is still being implemented and will be documented at a later time

A Step by Step Look at the Cylinder Cutout Routine

The Cylinder Cut Out Routine

- This section will document the procedure using the cylinder cutout test to help diagnose a faulty cylinder with DDDL.
- DDDL offers users the choice of running the automated cylinder cutout test (running at 1000 RPM) or allows the user to manually run the test.
- The cylinder cutout test has special tabs in the “Service Routines” section.
- It is recommended that a new diagnostic session be initiated to begin a new log file.
- <u>It should be noted that cylinders are identified by position within the 2007 electronic tools and not by firing order.</u>

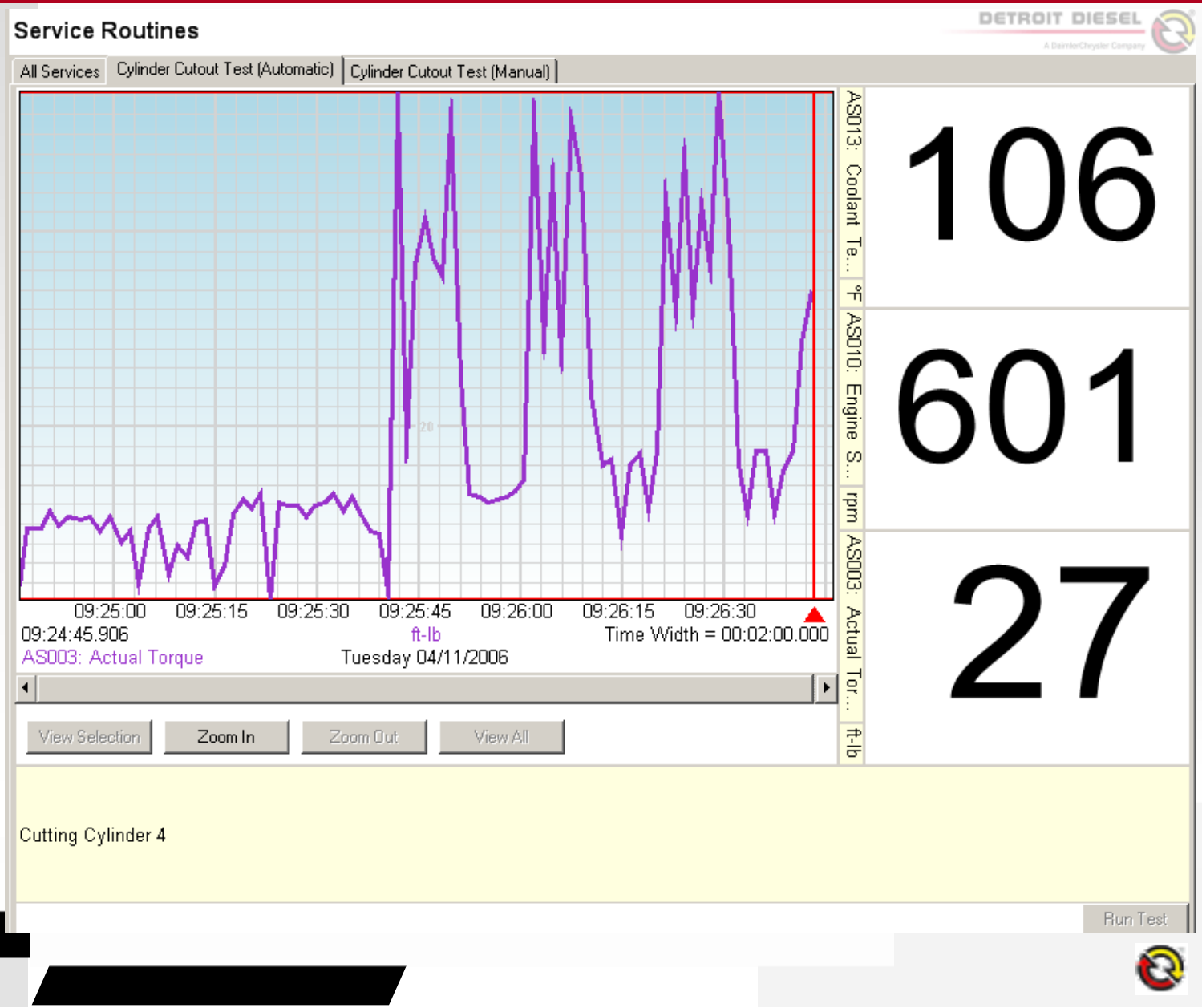


We'll begin by reviewing the procedure for the automatic cylinder cutout test.

The automatic test currently cuts out one cylinder at a time in physical sequential order.

To begin the test click on the "Run Test" box.

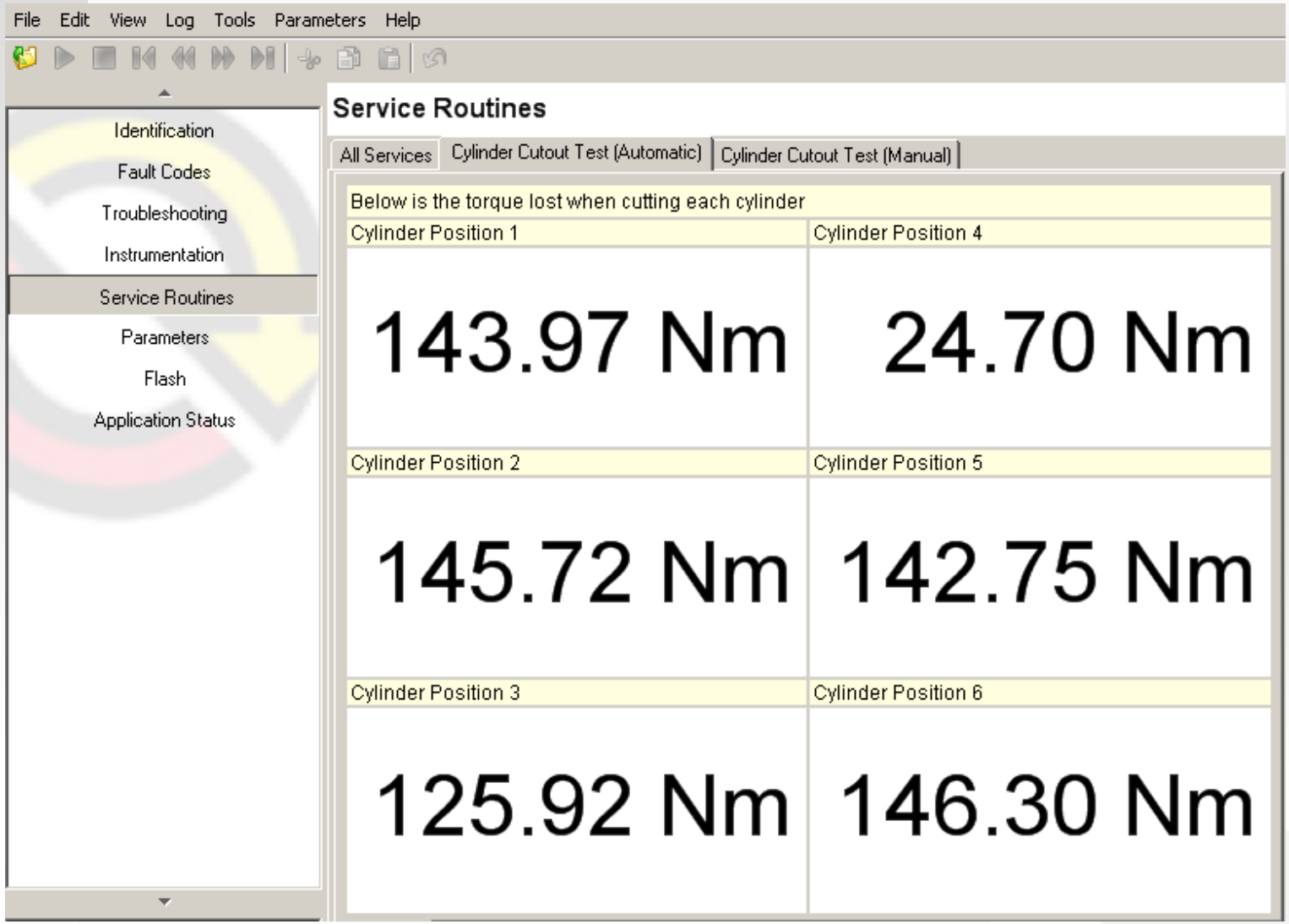
- We are now viewing the screen as it will appear during an automatic cutout test.
- The actual torque value rises each time a good cylinder is cut out to compensate for the torque loss.
- Cutting a bad cylinder will not change the actual value.
- The window below the chart gives the status of the test as it moves forward.



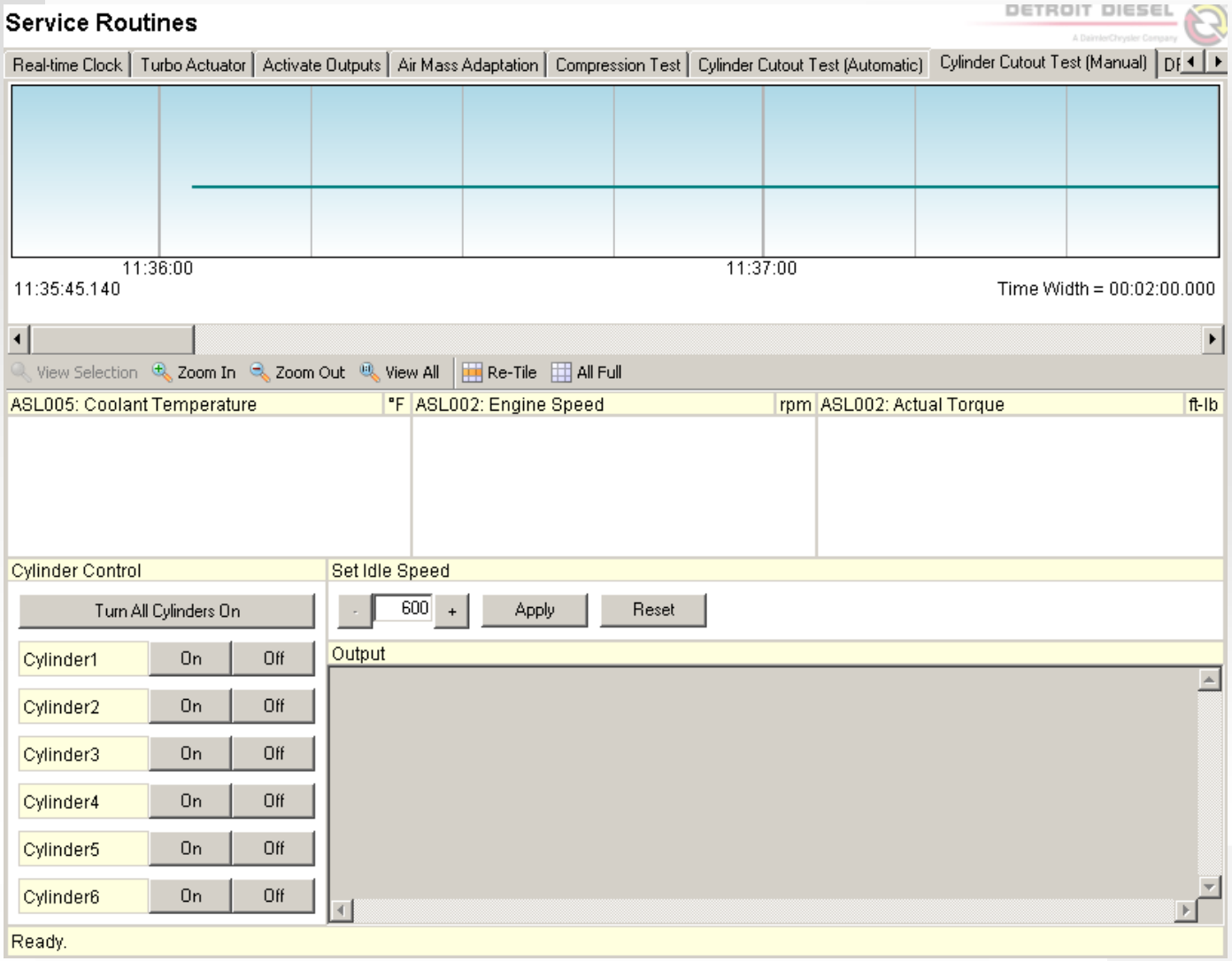
When the test is complete you'll informed in the status window below.

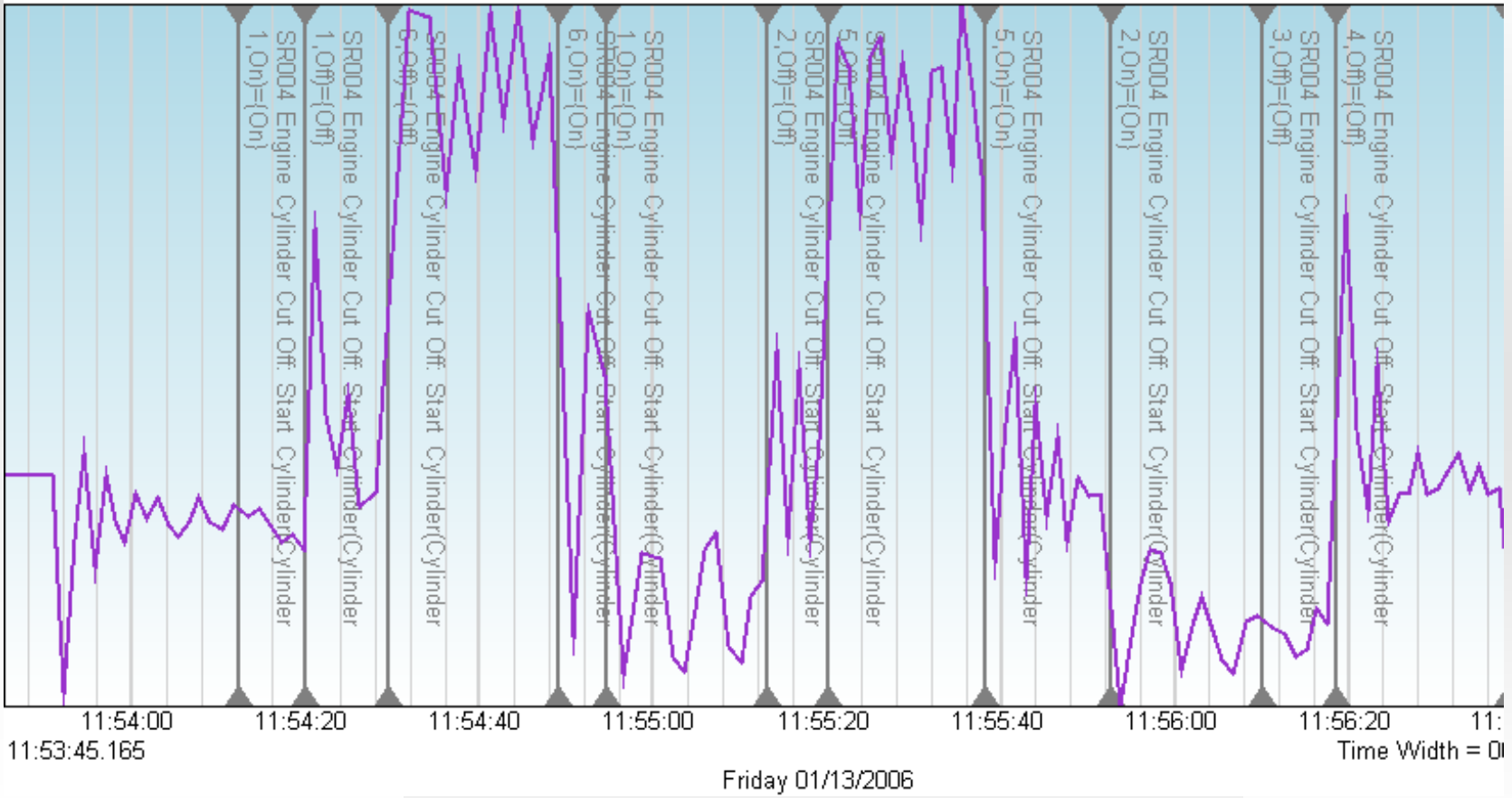
Cylinder Cutout test complete.

The numerical results of the test are displayed completely at that time. The complete results may also be viewed graphically.



You may also go the tab for performing a manual cylinder cutout and manually run the test. You need to go to the workspace in the lower level of the screen. You will be able to select the cylinder and issue the instructions in manual mode.





You must use the manual mode to cut out more than one cylinder at a time in Drumroll. You may cut out up to 3 cylinders at a time. It is recommended that mated pairs be cut out (1,6 / 2/5, 3/4) as a first step in the multiple cylinder testing. The shot above is from a test where pairs were cut out.

XI. Understanding Electronic Tools Configuration Settings

This section covers how to customize important settings in the 2007 electronic tools:

1- How to change from one translator box to another

2- Users may now select between metric and English units of measure

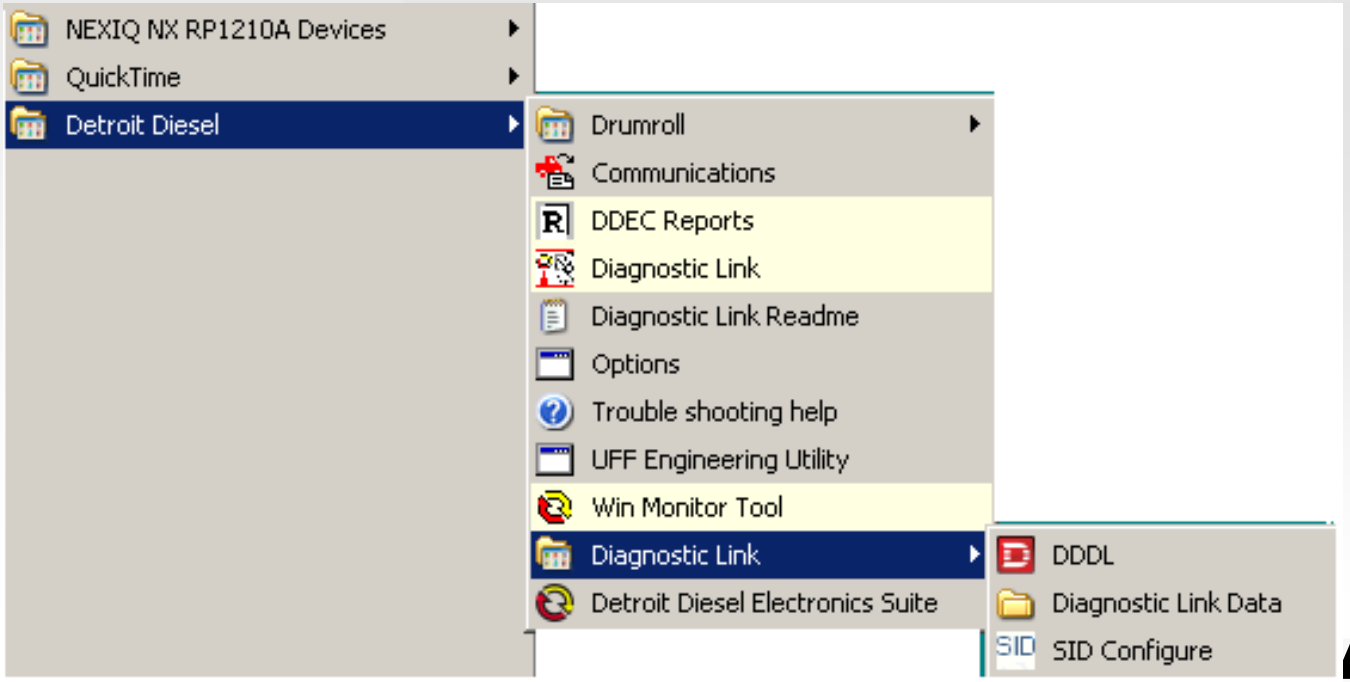
3- Customizing the display settings for the “Chart” feature

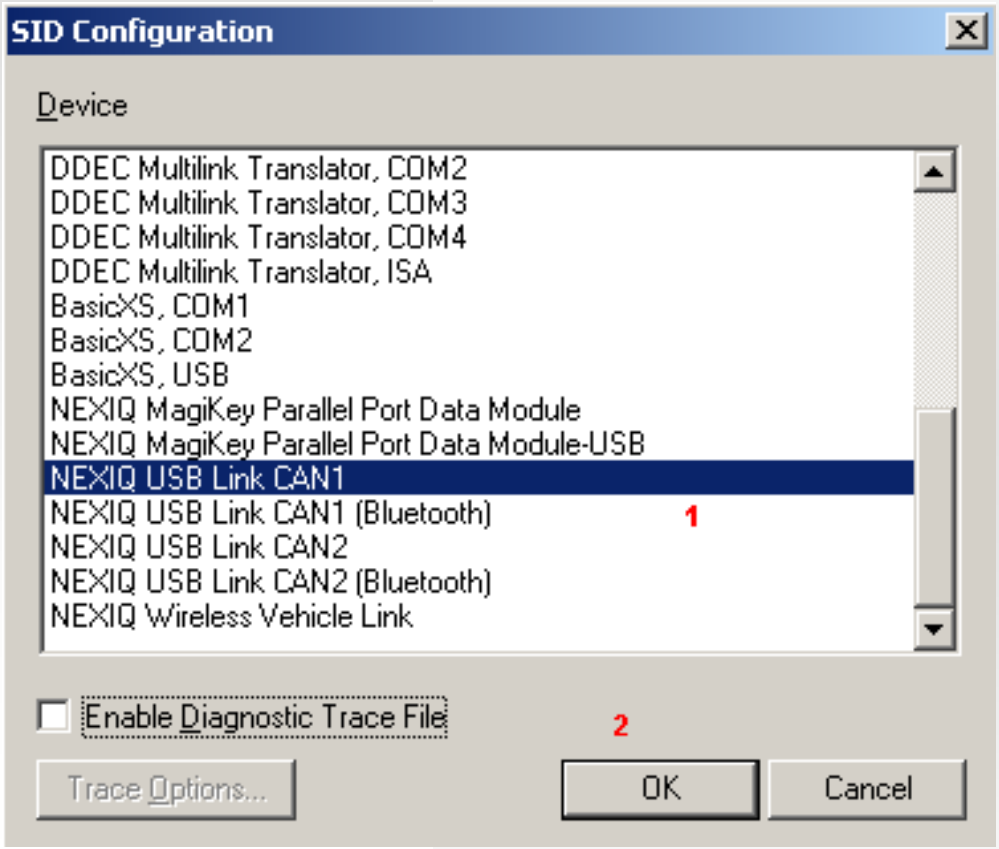
4 – How to change the settings for the automatic or manual connection settings

5 - How to set up a connection to the DDC reprogramming server for DDRS users

When changing from using one translator box to another you must change the translator type in DDDL.

From the main screen of Windows, go to “Start”, “Programs”, “Detroit Diesel”. Choose the “SID Configure” option.

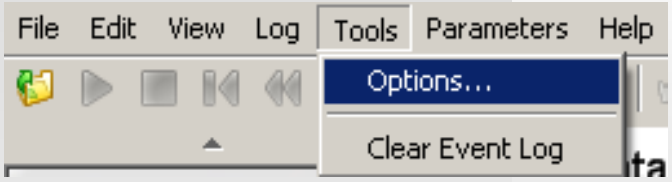




A new window will appear giving you a list of all the choices that you may pick from. Choose the translator box that you want (1) and then choose "OK" (2). Your new selection will work the next time you open the application.

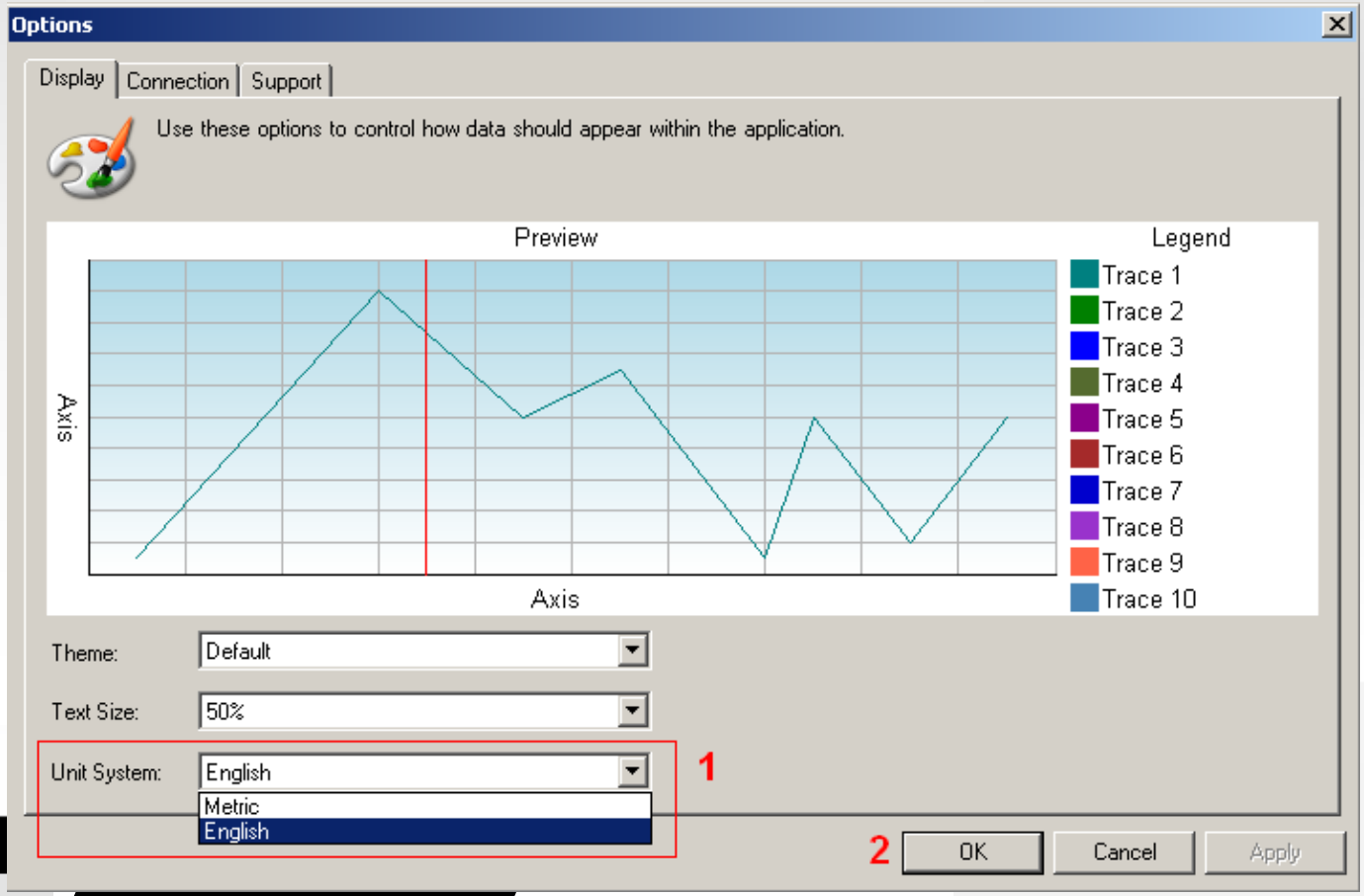
Special Note: The number of devices that appear in this window will vary with the number of translator box software drivers you have loaded on your computer.

Selecting Units of Measure



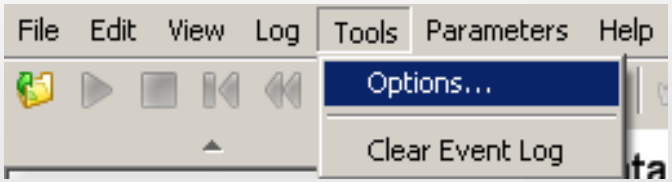
From the "Tools" drop-down menu select "Options"

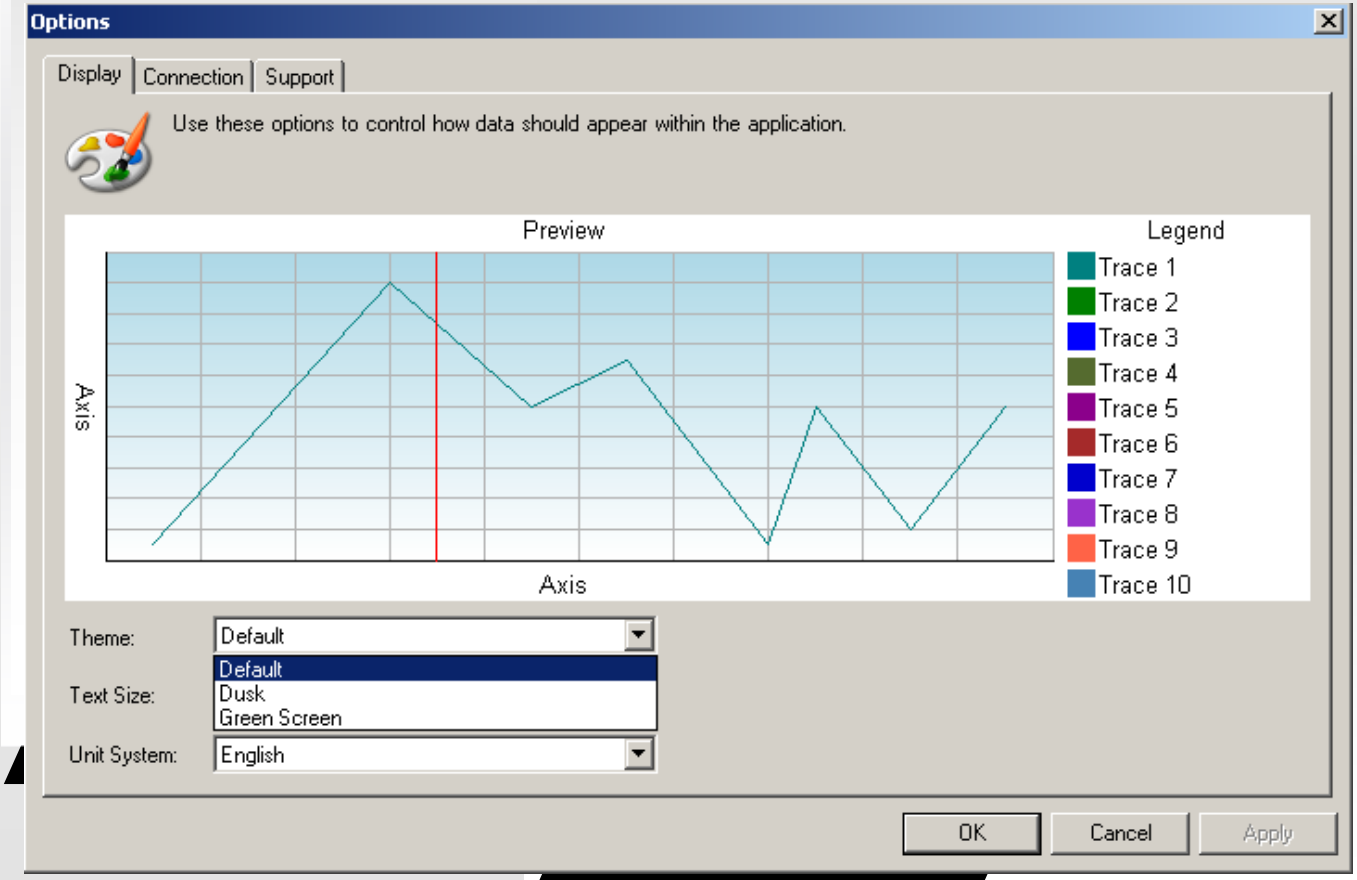
Click on the "Units" selection in the options list and select the type of units you prefer (1), then select the "OK" box to save your choice.



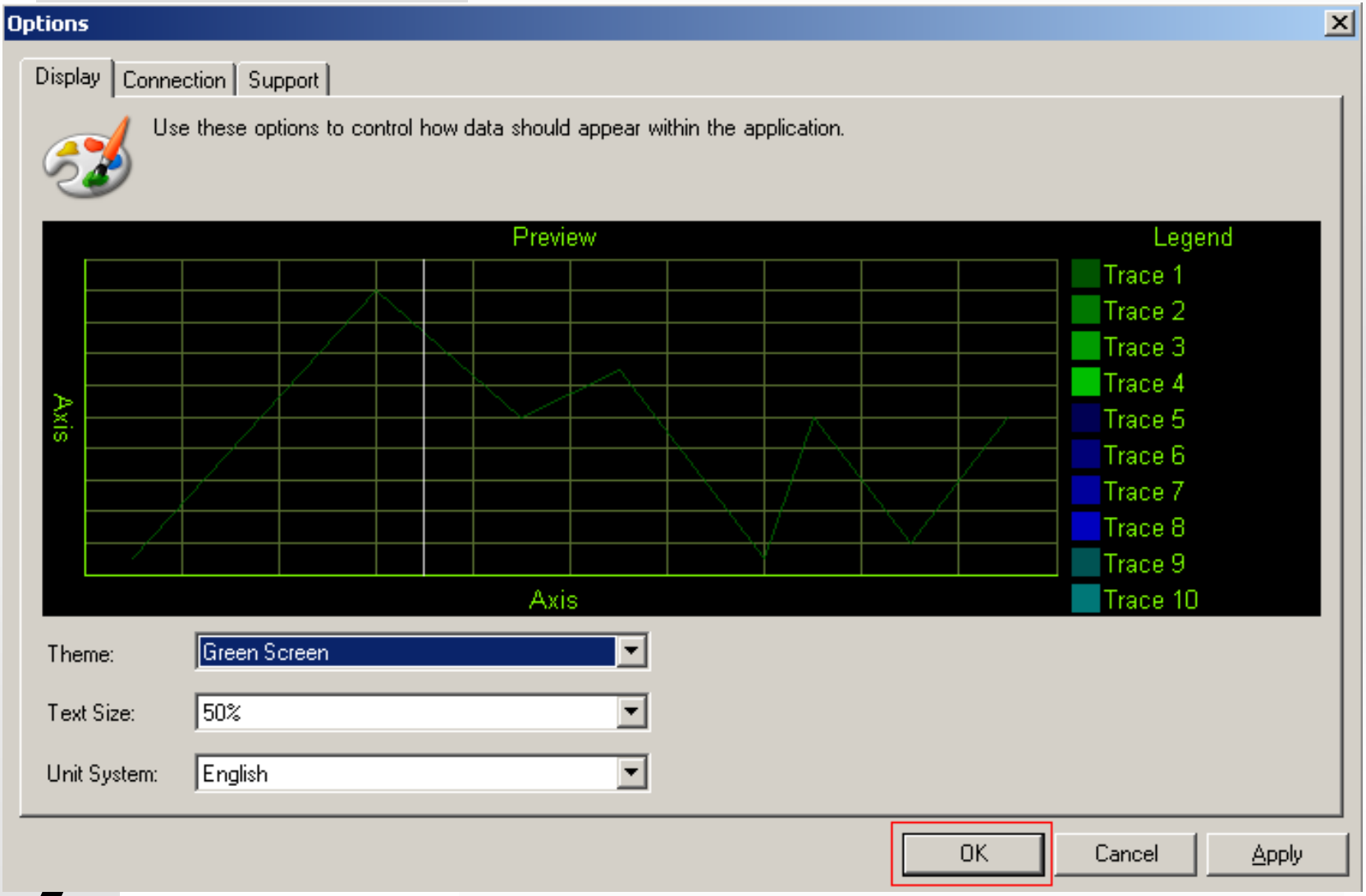
A user may select different background color schemes and font sizes.

From the “Tools” drop-down menu select “Options”



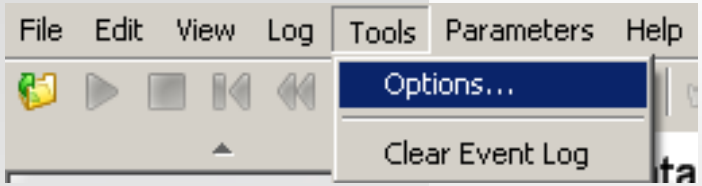


Choose the “Display” tab to reveal the choices available.

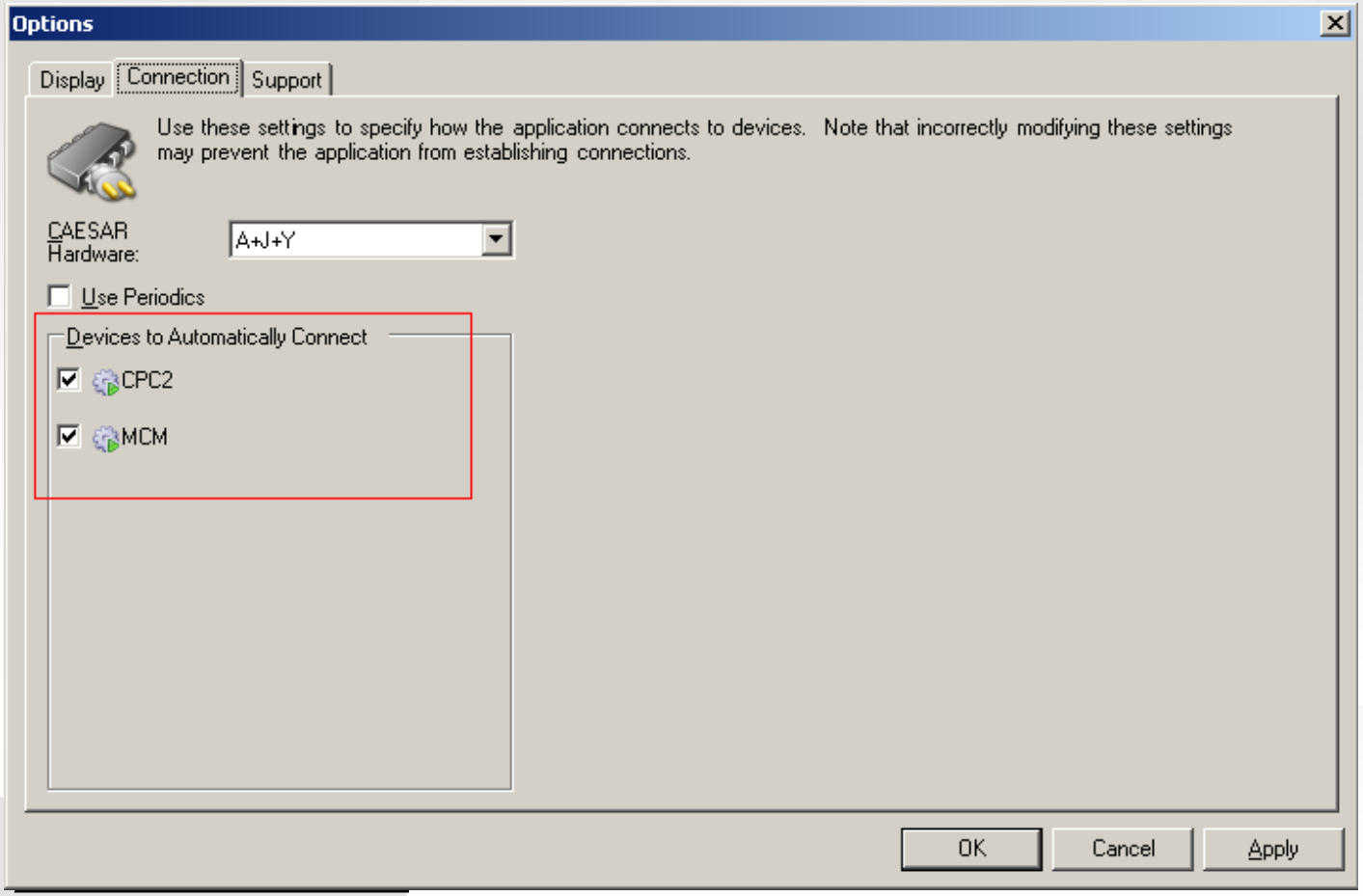


You may choose from different color schemes and font sizes although it is recommended that the default theme and 50% text size be used.

Once you have made your selections click on the "OK" box.



You may alter the settings for making an automatic or a manual connection by going to the “Tools” drop-down menu,and selecting “Options”.



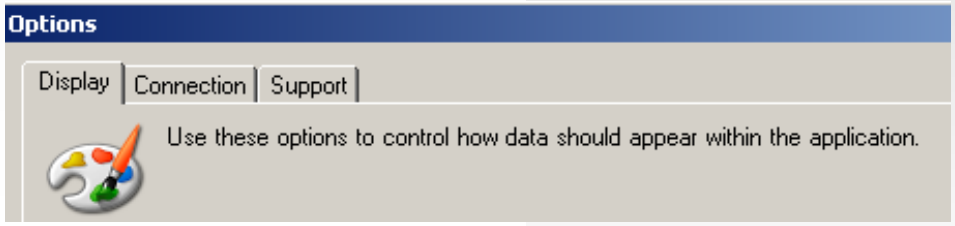
The settings may be changed on the “Support” tab by checking the or checking the appropriate boxes,and applying the changes.

Configuring DDRS to connect to the DDC Programming Server

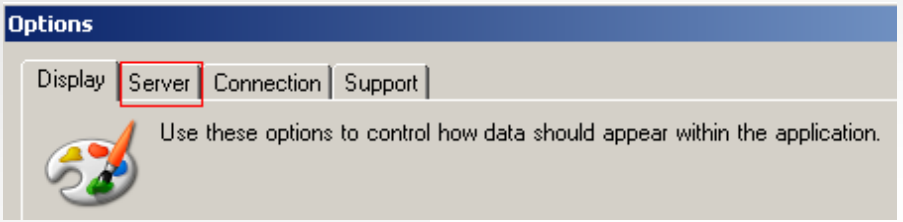
Special Note- In order to use this section you must have a current programming station ID and hardware key.

From the "Tools" drop-down menu select "Options"

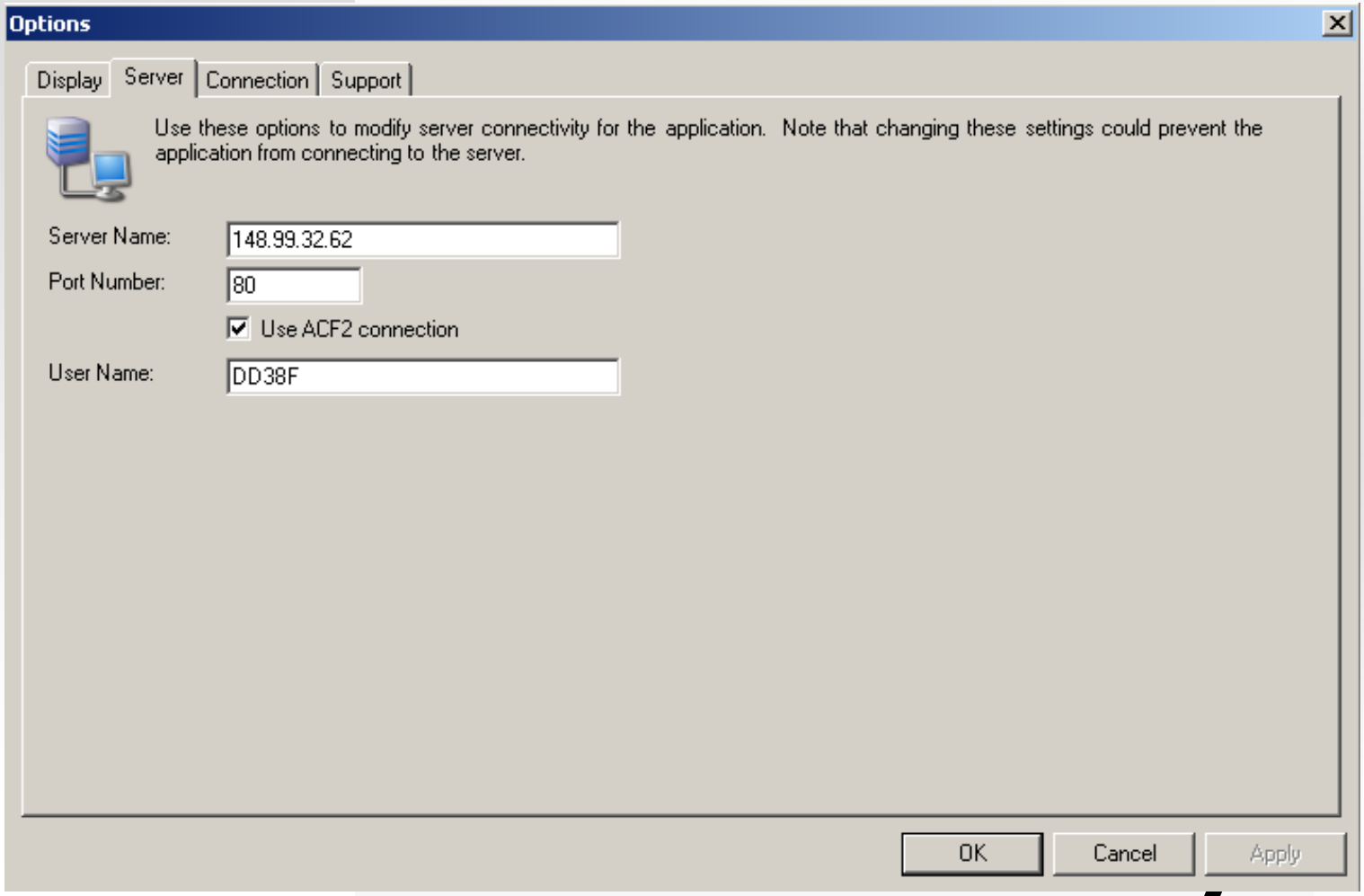
Selections without hardware key present



Selections with hardware key present



Choose the "Server" tab to configure your settings.



The settings that need to be configured in DDRS are similar to connecting with DRS. You may use your current ID, password, and method of connection (Int[redacted]elay). For assistance with these settings call 313-592-5800.

Support for 2007 Settings

Current DRS Connection Type:

DDC LAN Network

Distributor Frame Relay

Dial-up

Server Name: 148.99.32.62

Port Number: 80

Use ACF2 Connection: checked

User Name: Current DRS ID

Accessing the Server Via Internet

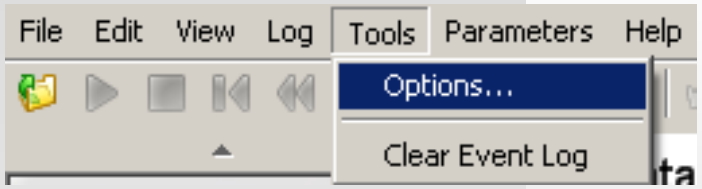
Server Name: ddcapps.detroitdiesel.com

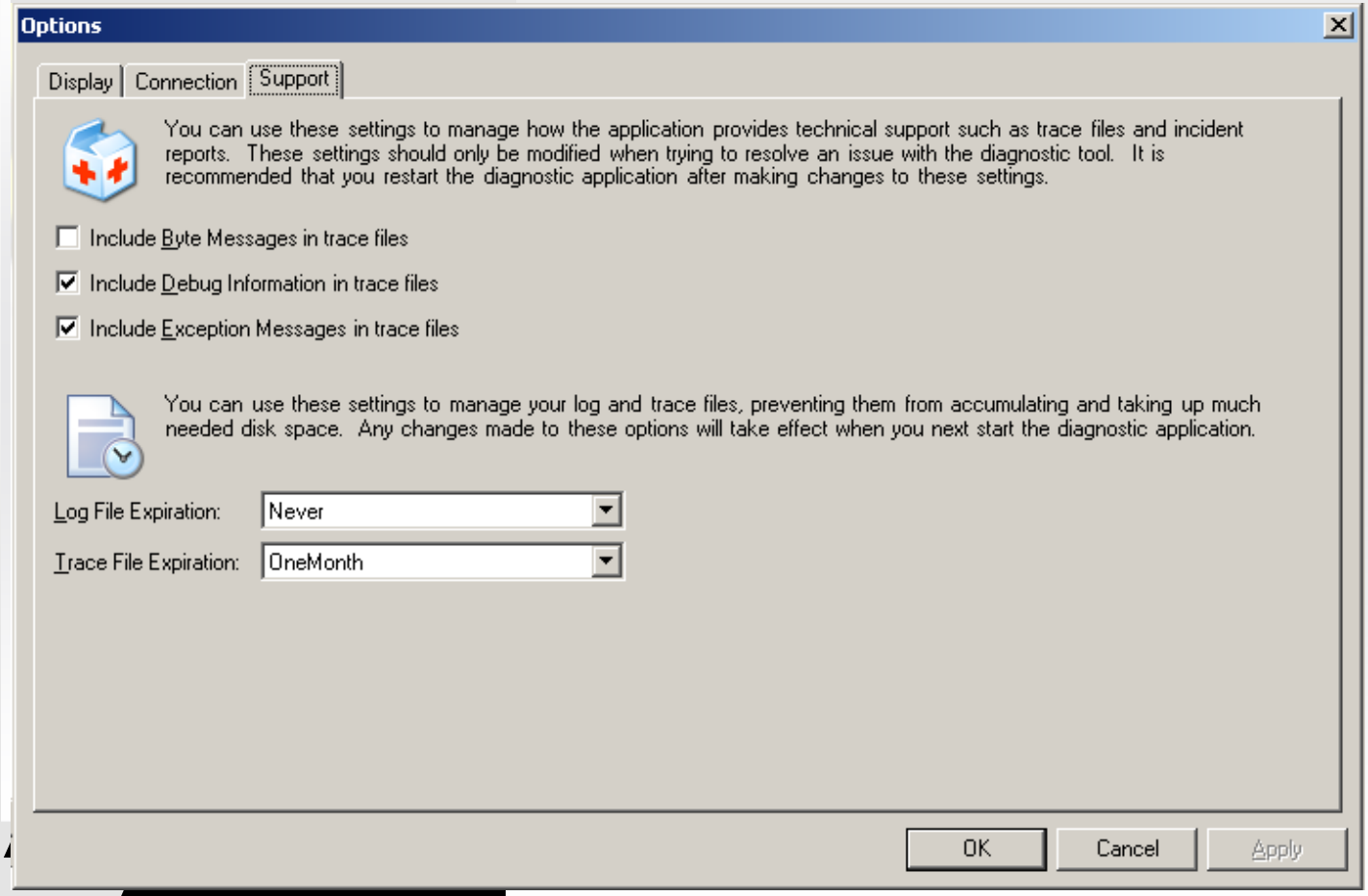
Port Number: 80

Use ACF2 Connection: checked

User Name: Current DRS ID

Additional Miscellaneous Information

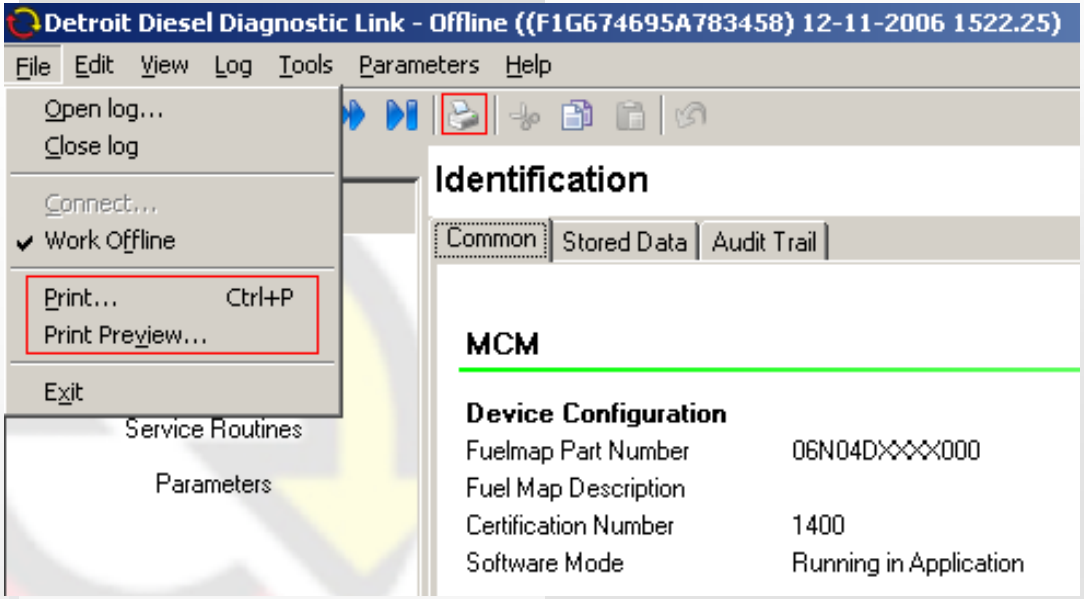




Log files are automatically created whenever DDDL 7.0 is connected to a live controller and stored on the hard drive. Over time these files may accumulate and need to be deleted to save hard drive space. The user may perform this process manually or he may automatically manage these files within DDDL.

Go to the “Tools” drop-down menu and selecting “Options” the user may access the “Support” tab and select settings to automatically delete log files after a given period of time.

Please note the default setting is “Never” so the feature will not work automatically unless configured by the user.



DDDL 7.0 offers the user a variety of options for printing the information contained in various windows of the program. The command to print may be accessed from the "File" drop-down menu (that also contains a "Print Preview" command) and from the printer icon in the icon bar.

The following items may currently be printed in DDDL 7.0:

- **Information in the "Identification" window**
- **Information in the "Fault Code" window**
- **Troubleshooting Guide information**
- **Instrumentation (only the "All Instruments" list at this time**
- **Parameters**

N ation from various service routine windows is not available for printing.

DETROIT DIESEL

Technical Support