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# ***HYSTER***

## **PC Service Tool**

### **Installation and Use Guide**

**August 7, 2012  
Hyster Company**

## **Notice**

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## **About this Guide**

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### ***Introduction***

PC Service Tool is a Windows based service application that is used to communicate with the truck's internal control systems. It can be used to monitor the status and condition of the various subsystems running within the truck. With this capability, PC Service Tool can be used to monitor component operation, or determine if abnormal events have occurred in the truck, and assist with their diagnosis and correction

### ***Purpose***

The purpose of this guide is to describe the PC Service Tool, which accesses the truck's internal communications network via various CAN adapters. The tool works with the range of Hyster® ICE and Electric Rider trucks. It is also compatible with the newest Electric Warehouse products.

### ***Scope***

The scope of this document is to provide detailed information about:

- Installing PC Service Tool
- Launching PC Service Tool
- Using Menus

### ***Target Audience***

This guide is intended for technicians and service personnel who will be using the tool to access Hyster® ICE and Electric Rider trucks, and new Electric Warehouse products.

### ***Assumption***

It is assumed that the reader possesses a basic understanding of the Windows operating system as well as familiarity with terminology associated with Hyster® trucks.

## Glossary

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While it is assumed the user has a basic understanding of PC and Truck terminology, the following glossary may provide useful guidance:

Term	Definition
1-8 Ton	Term historically used to describe trucks using an internal combustion power source (gas, propane, diesel).
CAN	Acronym for "Controller Area Network". A standard describing an interface bus, originally conceived for automobiles, but extended to trucks, that allows various electronics modules in a vehicle to exchange information.
CANopen	A software protocol that works with the CAN hardware bus allowing extensive exchange of information within a vehicle. Also used to describe the general family of electric trucks, including the Electric Rider and newest Electric Warehouse products
CDF	A file used by the VSM to configure the operation and performance of internal truck functions.
Command Line	Used in computer systems with simple text – type interfaces (i.e. DOS, UNIX). Allows operator to send commands into computer via typed text messages. In Context of PCST, this would be a text message or string, which is automatically sent to a 3 <sup>rd</sup> party application when it is started.
Configuration file	In the context of the PCST, this is an XML based file that allows engineers and other knowledgeable individuals to change the operation and appearance of the PCST to meet specific needs.
Decimal	A base 10 numbering system, commonly used to express numerical values. "Natural" system for 10 fingered humans.
ECU	"Electronic Control Unit" – an electronic assembly, containing a microprocessor, memory and interfaces used to control the truck or truck subsystems.
Electric Warehouse	General term for electrically powered products used in warehouse operations. General, operator stands or walks with equipment
ER	Abbreviation for "Electric Rider" – an electrically powered truck with a seat for the operator.
FMI	"Failure Mode Indicator" – a general indicator used by a J1939 system to indicate a type of fault, such as "voltage above normal". Also called Fault Mode Indicator. See also SAE J1939.
Hex / Hexadecimal	A base 16 numbering system, used to express numerical values associated with digital and computer systems. "Natural" system for binary computers.
ICE	Acronym for Internal Combustion Engine. Used to describe using an internal combustion power source (gas, propane, diesel).
Log	For PCST, a computer file used to record information or events. May, or may not be, human readable.
Model	Common name for a particular truck.
Password	Coded word needed to use the PCST. Provided by dealer / service network. Different levels available to access different features of PCST.

PCST	Acronym for Personal Computer Service Tool – a tool used to display information from a truck. Includes send / receive capability and diagnostic features.
PGN	“Parameter Group Number” – used in a J1939 system to describe a particular element of data used in a system. See also SAE J1939.
RP1210	An industry standard programming interface (API) that allows general purpose programs (such as the PC Service Tool) to send and receive data from a wide variety of CAN bus adaptors. Without this interface standard, a custom version of the PCST would be needed for each type of adaptor. Variants include the “A” and “B” version of the interface.
SA	“Source Address” – used in J1939 to identify an ECU in a truck.
SAE J1939	A set of standards from the SAE (Society of Automotive Engineers) that provides a protocol working with the CAN hardware bus to allow exchange of information within an industrial vehicle. Includes many standard capabilities / definitions, and allows for proprietary information exchange.
SDO	“Service Data Object”. This is the terminology used in the CAN Open spec to describe an item of data stored in an internal truck module. See also CANopen.
SPN	“Suspect Parameter Number”. This is the terminology used in the J1939 spec to describe a truck parameter that appears to be exhibiting a problem. See also SAE J1939, FMI.
Unit Code	A 4 digit code used by the manufacturer to indicate a series of trucks with similar functionality. Makes up first 4 digits of truck serial number.
VSM	The central control module of the truck. Note that some truck models do not utilize a dedicated VSM
Zip or .zip	Name for a type of PC file typically used to distribute applications. Used because it provides high compression of a file, shortening storage requirements and download time.

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## Installing and running PC Service Tool

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To install PC Service tool, you need to obtain the file Hyster PC Service Tool v4.7.zip. Using an unzip utility, expand this file to find a program named setup.exe, along with additional useful documents. Proceed to install the software as described in subsequent sections of this guide.

### System Requirements

The following table lists the minimum configuration requirement for installing PC Service Tool on the target system:

Software Requirements	Hardware Requirements	Vehicle Adapter Requirements
<ul style="list-style-type: none"> <li>• Microsoft Windows XP Professional (U.S. Version), Service Pack 2, with Internet Explorer v6.0 and above - or -</li> <li>• Microsoft Windows Vista (Professional equivalent), with Internet Explorer v7.0 and above - or -</li> <li>• Microsoft Windows 7 (Professional equivalent), with Internet Explorer v7.0 and above</li> </ul> <p>Note: 64 bit operation has only been tested for Microsoft Windows 7</p> <ul style="list-style-type: none"> <li>• Adobe Acrobat Reader version 8.0 or higher</li> <li>• Microsoft .net Framework version 4.0</li> </ul>	<ul style="list-style-type: none"> <li>• Pentium class processor, 1.6 GHz or faster (notebook computer)</li> <li>• 512 MB of RAM</li> <li>• Hard disk of 20 GB</li> <li>• CD or DVD drive</li> <li>• USB port</li> <li>• High Speed Internet strongly suggested for download</li> <li>• "Netbook" type processors also supported – Atom processor, 1GB RAM.</li> </ul>	<ul style="list-style-type: none"> <li>• RP1210 compliant CAN communications adapters, such as iFak isCAN USB, or Vector CAN XL.</li> </ul> <p>Note: Electric Warehouse products require an adapter that supports the RP1210B interface standard</p>

## **Installation Procedure**

1. Note that installation requires “administrative” level permissions on the target computer. Windows 7 may require the additional step of “install as administrator”. Consult your IT resources for questions on installation.
2. Double-click the icon of the *setup.exe* file. This initiates the installation process. The installation program, Install Shield, will show some initial screens that may not be localized.
3. The installation program will pause and provide a language selection screen. Select a language and click >>>.

Note: The language chosen during this step becomes the default language for the PC Service Tool application. If desired, a different language may be chosen at a later time from the **Application Configuration** window.

4. To proceed with installation, accept the license agreement.
5. The application will be installed in C:\Program Files\ Hyster\PC Service Tool (32 bit machines) or C:\Program Files (x86)\ Hyster\PC Service Tool (64 bit).
6. It is possible that you may need to install additional software on your machine, such as that called out in the Software Requirements section, or for your particular CAN adapter. Please install these additional components before proceeding.

*Note: Drivers for supported CAN / RP1210 truck communications adapters are required and must be installed according to the adapter's installation instructions. Generally, these drivers require administrative level permissions. Windows 7 may also require the additional step of “install as administrator”. Consult your IT resources for questions on installation.*

## ***Launching the PC Service Tool***

After you have successfully installed PC Service tool on the target machine, you are ready to start using the tool.

You can launch PC Service Tool by:

- Clicking the Start Menu >> Programs >> Hyster PC Service Tool.

Or

- Double-clicking the Hyster PC Service Tool icon on your desktop.



*Figure 1: PC Service Tool Shortcut Icon*

## **Application Login screen**

After you have launched the PC Service tool, you are ready to start using the application for service purposes. When you launch the application, the Login screen is displayed as depicted in Figure 2:

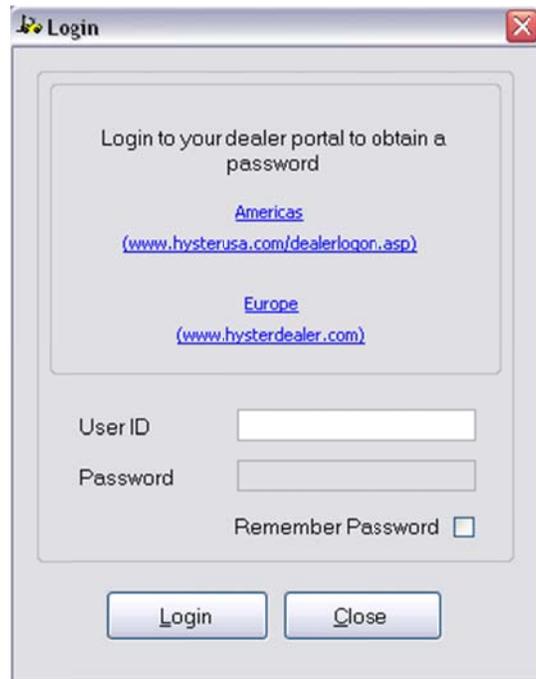


Figure 2: Login Screen

1. Enter your user ID and password (this must be previously obtained from a Hyster dealer or Hyster service organization; click the links on the login page for contact)
2. Select the *Remember Password* checkbox to have the application remember your password for future logins.
3. Click **Login** to proceed.

You will be notified if your password is within five days of expiring.

To be able to access the Truck Configuration or Programming menus, you will need a password that provides permission for higher level access.

Warning: PC Service Tool employs a password validation feature utilizing the current date. Do not launch PC Service Tool with the computer system date set incorrectly. Doing this may prevent you from logging into PC Service Tool.

# Main Screen

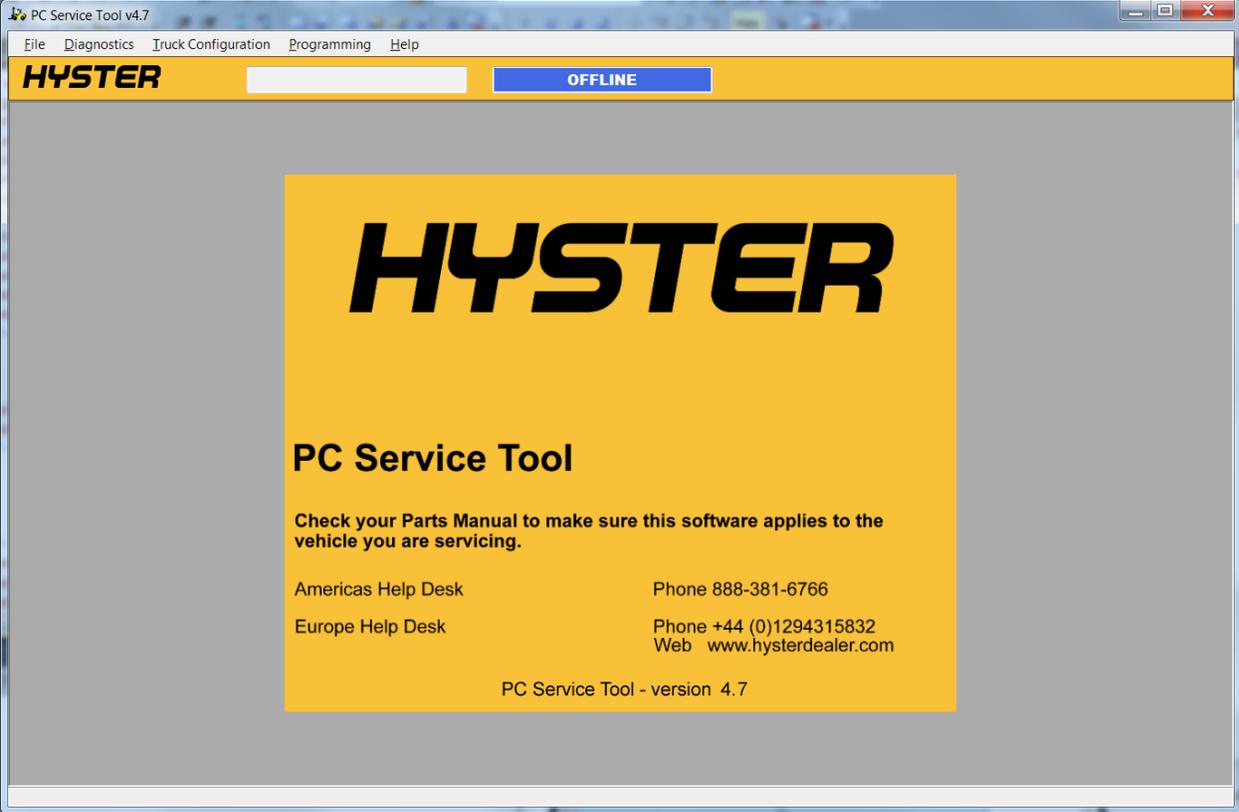


Figure 3: Main Screen

The main screen displays various data such as support websites and version information. Three connection-specific boxes are also shown at the top of the window: truck serial number (only during active connections), on line and off line status, and the state of diagnostic trouble codes.

## File Menu

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The File menu contains the following items:

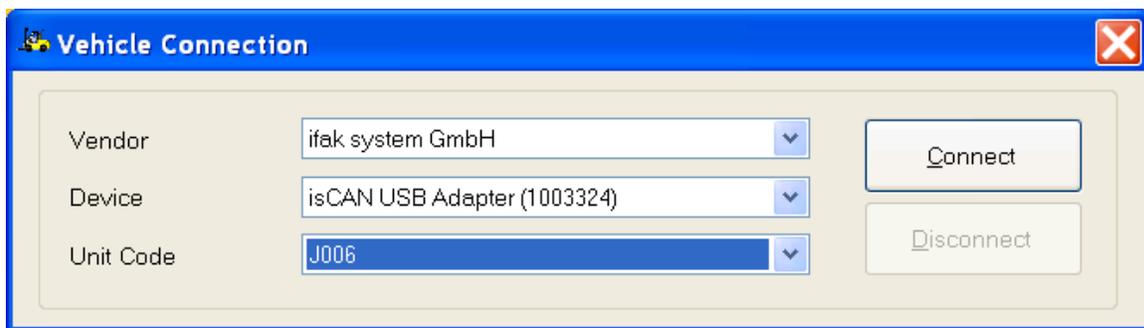
- Connect
- Application Configuration
- Reports
- Run
- Exit

### ***Connect***

To monitor your truck, you need to connect your vehicle with this service application using an RP1210-compliant adapter.

To connect your vehicle with the application, execute the following procedure.

1. Select **File >> Connect**. This displays the **Connection Dialog** box, as depicted in the figure below.



*Figure 4: Connection Dialog*

2. Select the required vendor from the **Vendor** drop-down menu.
3. Select the adapter from the **Device** drop down menu.

Note: The Device drop-down menu items are populated based on the information provided in the vendor-specific RP1210 initialization file.

4. Select the truck model number from the **Unit Code** drop down-menu.
5. Click **Connect**.

On establishing a successful connection, you are taken to the Fault Monitor screen, as shown in the Figure 5:

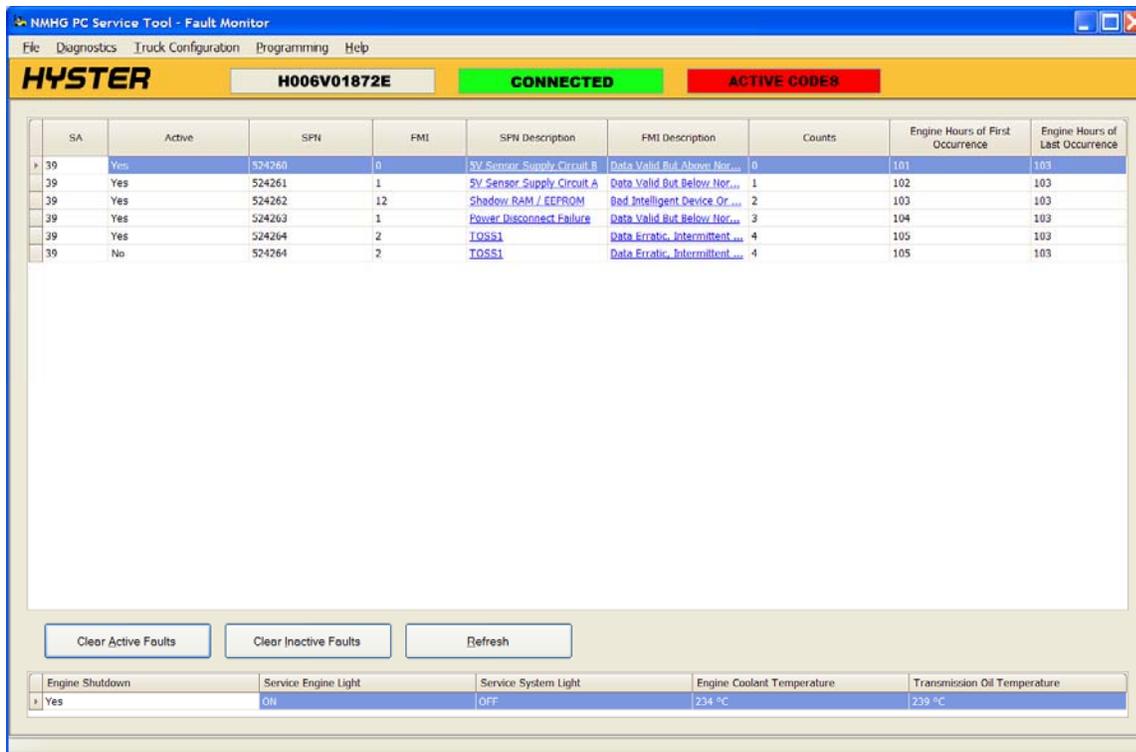


Figure 5: ICE Fault screen displayed after establishing a connection

Note that Figure 5 depicts a truck with some active and inactive fault codes. Your truck may not display fault codes.

## Application Configuration

You can use Application Configuration to change language and some software settings of the PC Service Tool.

To navigate to the Application Configuration main screen, select **File >> Application Configuration**. This displays the Application Configuration window, as depicted in figure 6:

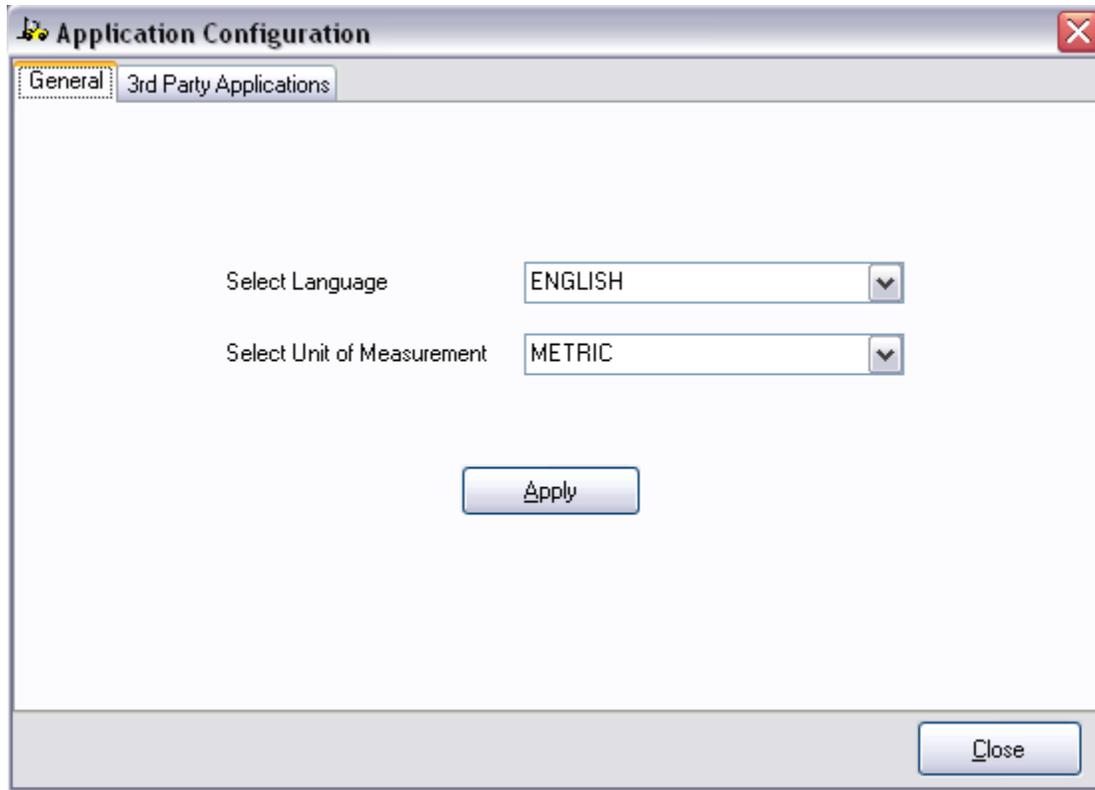


Figure 6: Application Configuration Window

The Application Configuration main screen contains the following two tabs:

- **General:** Used to change the operating language of the application or the unit of measurement
- **3<sup>rd</sup> Party Applications:** Used to add a 3<sup>rd</sup> party application in the File menu of PC Service tool. Also used to add and associate the truck programming applications with the tool.

Note: Ensure that you are in the OFF Line mode (not connected to the vehicle), before changing the configuration settings of the application. If you are connected to the vehicle you must disconnect before the settings will be applied.

## General Tab

To change the current operating language of the application, or the measurement units, execute the following procedure:

1. Select **File >> Application Configuration**.
2. Select the **General** tab.
3. Select the desired language from the available **Select Language** drop-down list.
4. Select the desired measurement unit from the available **Select Unit of Measure** drop-down list.
5. Click **Apply**, to accept the changes.

6. Click **Close**, to close the Application Configuration dialog.

### 3<sup>rd</sup> Party Applications

To add a 3<sup>rd</sup> party application, and make it available in the File and Programming Menus, execute the following procedure:

1. Select **File >> Application Configuration**.
2. Select the **3<sup>rd</sup> Party Applications** tab. This displays the options available in the 3<sup>rd</sup> Party Application table, as depicted in Figure 7:

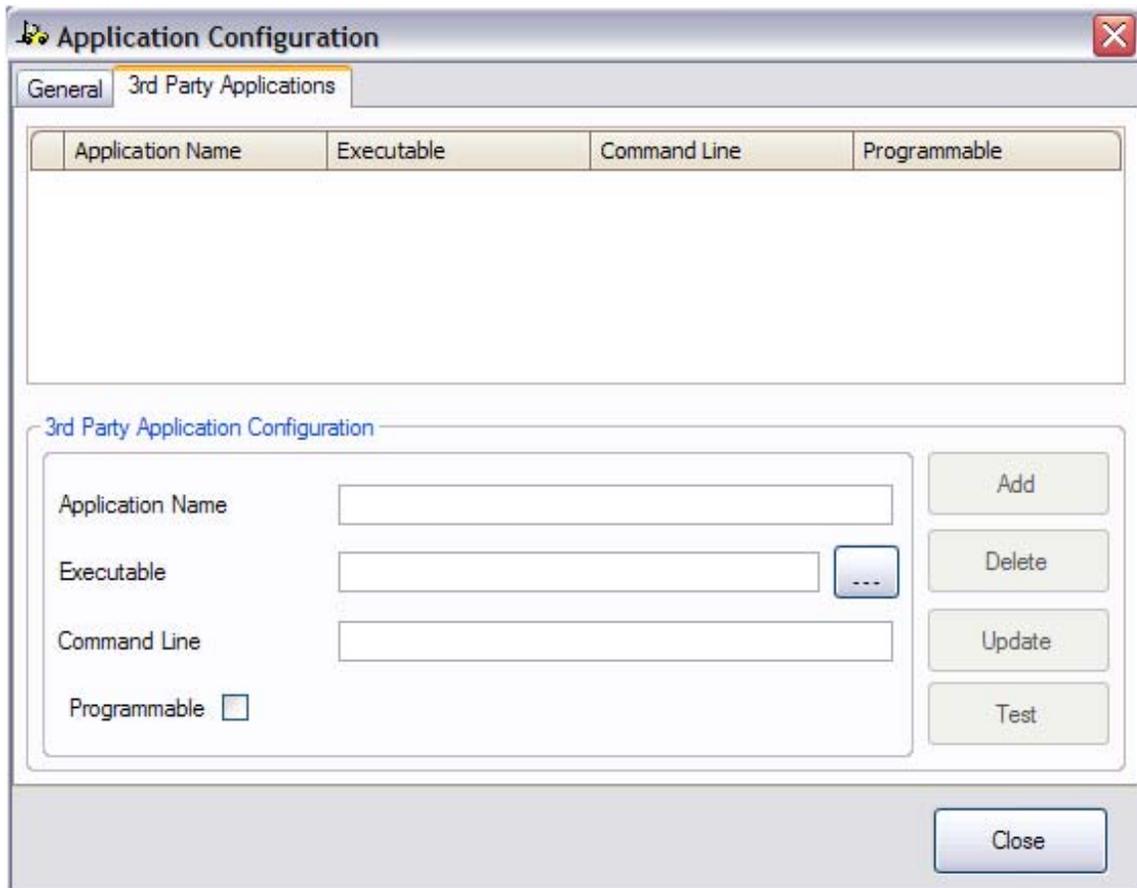


Figure 7: Active 3<sup>rd</sup> Party Application tab in the Application Configuration window.

3. Enter the name of the application that needs to be added in the **Application Name** field.
4. Click , to locate the executable file of the application.
5. Define the command line option in the **Command Line** field (if applicable; this can be left blank).
6. If the application allows programming of truck parameters, or updating of truck software, check the "Programmable" box.
7. Click **Add**, to add the application.

Based on your requirements, you can also perform the following tasks:

<b>Task</b>	<b>Action</b>
Delete	To delete the application: 1. Select the desired application name from the list displayed at the top of Application Configuration section. 2. Click <b>Delete</b> , to delete the selected application.
Update	To update an existing application: 1. Select the desired application name from the list displayed at the top of Application Configuration section. 2. Update the <b>Application Name</b> , <b>Executable</b> path and <b>Command Line</b> parameter. 3. Click <b>Update</b> , to update an existing application.
Test	To test an existing or added application: 1. Select the desired application name from the list displayed at the top of Application Configuration section. 2. Click <b>Test</b> , to launch the selected application.

8. Click **Close**, to exit from the **Application Configuration** window.

Note: Adding a 3<sup>rd</sup> Party Application causes it to be listed in the **File >> Run** menu. Adding an application with the "Programmable" box checked causes it to be listed in the **Programming >> Truck Programming** menu.

## ***Reports***

This allows you to generate a report to capture truck information and status

Reports can include:

- Detailed truck information and truck setup parameters
- A list of faults that may have occurred inside the truck
- Diagnostic Data that can be useful in correcting problems

To generate report, execute the following procedure:

1. Select **File >> Reports**. This displays the **Reports** Window, as depicted in Figure 8:

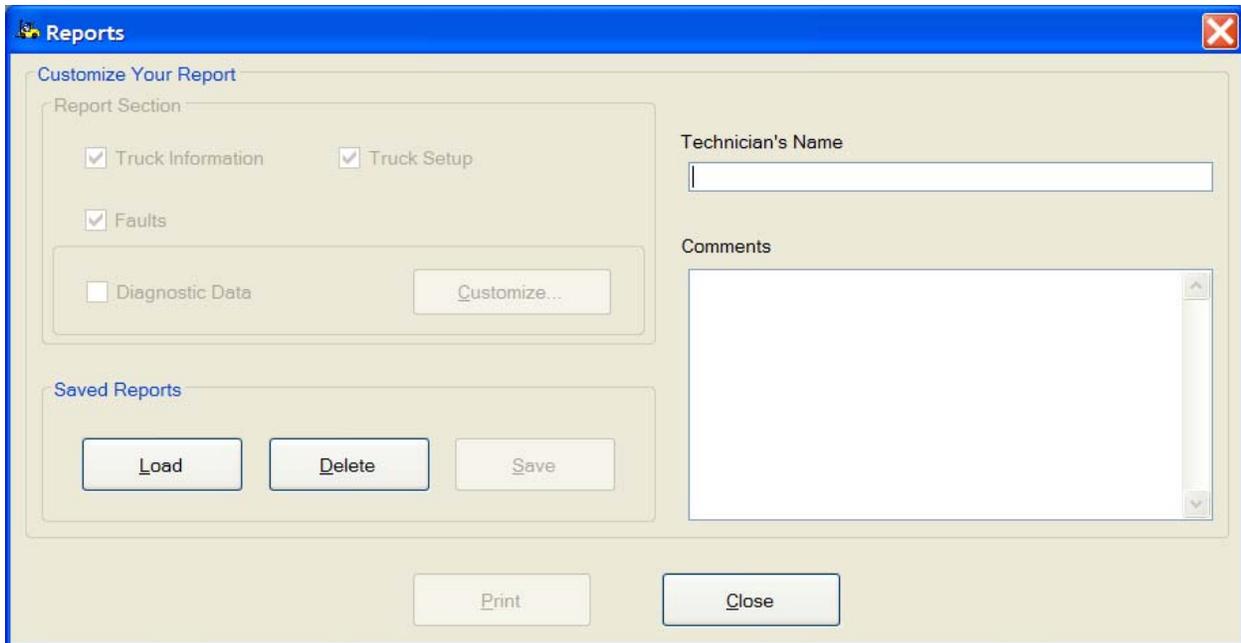


Figure 8: Reports Window

Note: If the application is not connected with the truck, then only **Load** and **Delete** buttons are enabled.

2. Enter your name in the **Technician's Name** field (optional).
3. Enter comment text (this text can be reminders or issues) for your reference, in the **Comments** field (optional).

If you wish to print your report, click **Print**, to print the generated report

If you wish to close the **Report** screen, click **Close**, to exit.

The **Diagnostic Data** section allows you to pick specific items from a wide range of truck data specific to your troubleshooting needs. To select specific data items, Select **Diagnostic Data** and then click **Customize**

This displays the **Custom Data Monitor** selection window, as depicted in Figure 9:

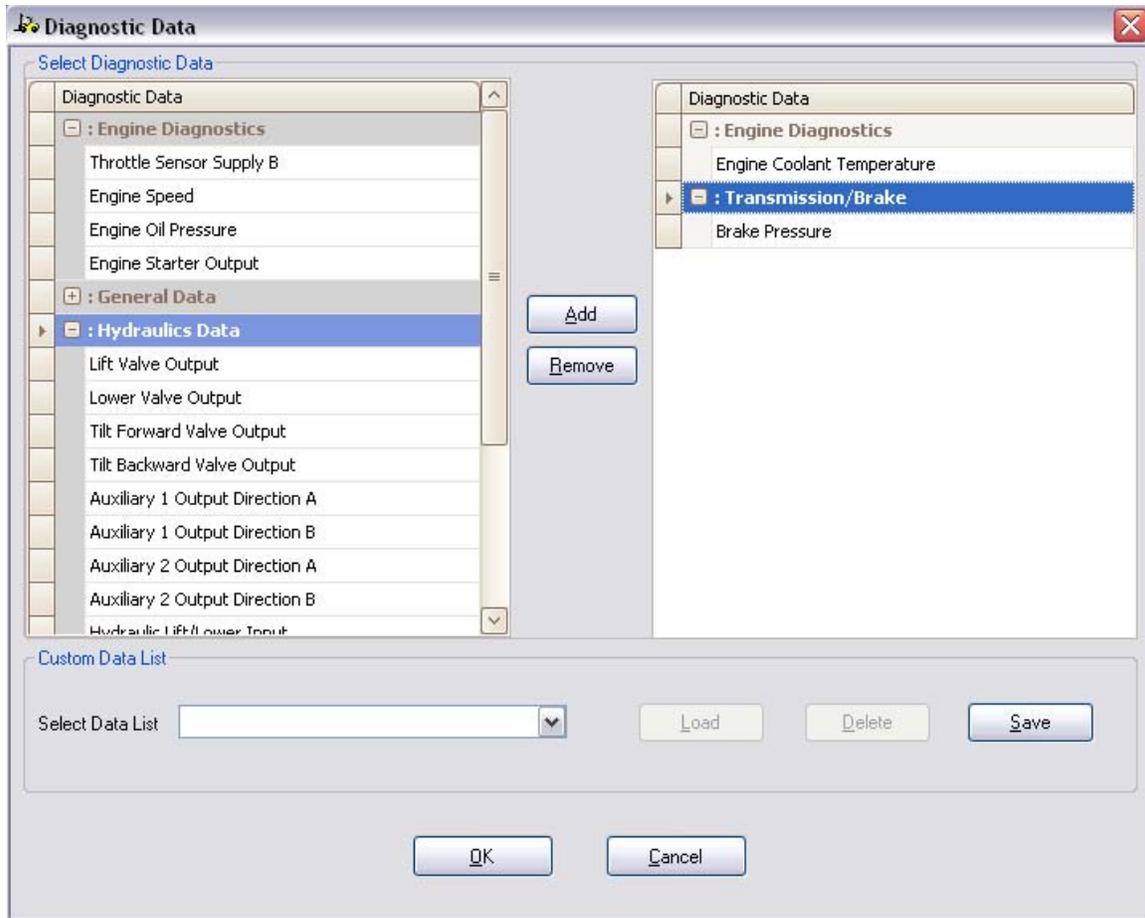


Figure 9: Custom Data Monitor Window

This screen displays the “available” data items on the left. To select these items for a custom report, highlight them on the left side, click **Add**, and they will be moved to the right side, and included in your report.

Note: The customized data list persists only as long as the connection is maintained.

If you wish to save your custom list, use the **Save** button:

1. Click **Save**. This invokes the **File Save As** dialog box. Specify the location where you want to store the report.

The following table summarizes **Load / Delete / Save** button operation; the buttons work similarly from the **Reports** screen or the **Diagnostic Data** screen.

Load	<p>Allows you to load an existing custom data list that you wish to use for generating the current report.</p> <p>To load an existing custom data list:</p> <ol style="list-style-type: none"> <li>1. Select <b>File &gt;&gt; Reports</b>.</li> <li>2. Click <b>Load</b>. This invokes the <b>File Selection</b> dialog box. Locate the report that needs to be viewed.</li> <li>3. Click <b>Open</b>.</li> </ol>
Delete	<p>Allows you to delete an already saved report.</p> <p>To delete:</p> <ol style="list-style-type: none"> <li>1. Select <b>File &gt;&gt; Reports</b>.</li> <li>2. Click <b>Delete</b>. This invokes the <b>File Selection</b> dialog box. Locate the report that needs to be deleted.</li> <li>3. Click <b>Open</b>.</li> </ol>
Save	<p>Allows you to store the report at a desired location for future reference.</p> <p>To save:</p> <ol style="list-style-type: none"> <li>2. Select <b>File &gt;&gt; Reports</b>.</li> <li>3. Select the desired option from the <b>Report Sections</b> section.</li> <li>4. Click <b>Save</b>. This invokes the <b>File Save As</b> dialog box. Specify the location, where you want to store the report.</li> <li>5. Click <b>Save</b>.</li> </ol>

Note: Due to file protection changes implemented in Windows 7, the default directory for the **Save As** dialog box is a Desktop folder named "PCST Data". This is a change from earlier versions of the PC Service Tool.

**File** menu, continued:

### ***Run***

If a 3<sup>rd</sup> Party (non-programming) application has been loaded via the **Application Configuration** window, you can launch the application from this menu.

To launch the 3<sup>rd</sup> Party Application, execute the following procedure:

1. Select **File >> Run**.
2. Select the application from the available list. This launches the selected application in the service application window.

### ***Exit***

To close the application, select **File >> Exit**.

## Diagnostic Menu

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The Diagnostic menu contains the following items:

- Fault Monitor
- Truck Information
- Custom Data Monitor
- Strip Chart
- Diagnostic Tests
- Activity Logs
- Load Strip Chart
- No Run Mode
- Databus Viewer

The usage of each menu item is described in the subsequent sections.

Note: Due to file protection changes implemented in Windows 7, the default directory for many of the **File Save** operations has changed from earlier versions of the PC Service Tool. The default location is now a Desktop folder named "PCST Data". Look on your Desktop to find these files from outside the PC Service Tool.

### ***Fault Monitor***

This feature allows the technician to view faults that have occurred in the vehicle for diagnostic purposes.

To obtain the fault(s) occurred in the vehicle, execute the following procedure:

1. Select **Diagnostic >> Fault Monitor**. This displays a list of faults detected by the vehicle controller. These faults can be current (active) or detected, but no longer active (inactive, or previously active).

The appearance of the Fault Monitor screen will vary based on the vehicle selected (ICE or CANopen).

## Fault Monitor for ICE Trucks

SA	Active	SPN	FMI	SPN Description	FMI Description	Amber Warning	Malfunction Indicator	Counts	Engine Hours of First Occurrence	Engine Hours of Last Occurrence
39	Yes	522760	4	Ignition 1 Voltage	Voltage Below Normal, Or Shorted To Low Source	ON	OFF	11	79721.45	79721.45
39	Yes	522762	4	Ignition 3 Voltage	Voltage Below Normal, Or Shorted To Low Source	ON	OFF	11	79721.45	79721.45
39	Yes	2236	12	Source Address 236	Bad Intelligent Device Or Component	ON	OFF	10	79721.45	79721.45
39	Yes	523780	4	Park Brake Position Per...	Voltage Below Normal, Or Shorted To Low Source	ON	OFF	11	79721.45	79721.45
39	Yes	522764	3	Ignition 1 Driver	Voltage Above Normal, Or Shorted To High Source	ON	OFF	10	79721.45	79721.45
39	Yes	522766	3	Ignition 3 Driver	Voltage Above Normal, Or Shorted To High Source	ON	OFF	10	79721.45	79721.45
39	No	524263	1	Power Disconnect Failure	Data Valid But Below Normal Operational Range - ...	ON	OFF	7	0	0
39	No	2023	12	Source Address 23	Bad Intelligent Device Or Component	ON	OFF	3	0	0

Engine Shutdown	Service Engine Light	Service System Light	Engine Coolant Temperature	Transmission Oil Temperature
No	OFF	ON	2 °C	3.2 °C

Figure 10: Fault Monitor window for ICE Trucks

This **Fault Monitor** window for ICE provides the following information:

- Source Address (SA)
- Active or Inactive status of the fault
- Suspect Parameter Number (SPN)
- Failure Mode Indicator (FMI)
- SPN description
- FMI description
- Count of faults occurred
- Engine Hour at first occurrence of the fault
- Engine Hour at last occurrence of the fault

The bottom section of the window displays quick status for some key indicators the operator may see on the truck display.

Note: To view the troubleshooting information associated with a specific SPN/FMI, click the relevant text in the description field. This opens the Troubleshooting Manual in the Adobe® Reader application.

To update the Troubleshooting Manual, see the section titled “Troubleshooting Manual”, under the Help Topics section of this guide.

Note: If you are a Windows 7 user, it may be necessary for your system administrator to update files in the “Program Files” directory.

## Fault Monitor for CANopen Trucks

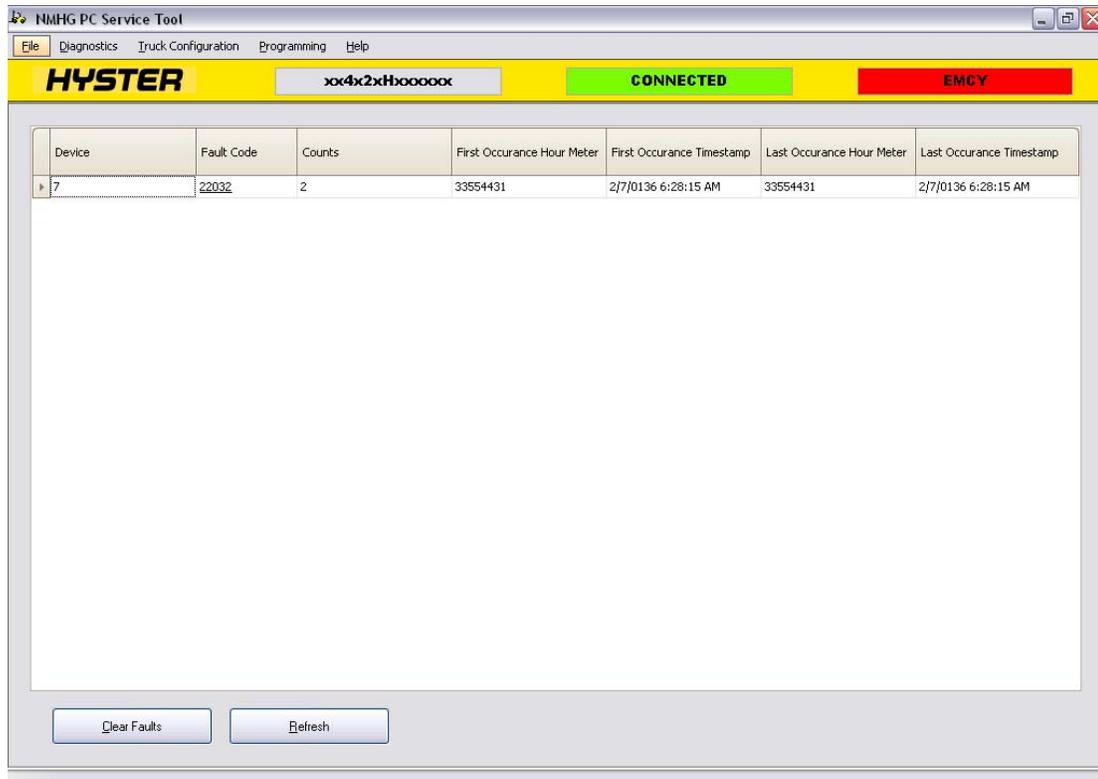


Figure 11: Fault Monitor Window for CANopen trucks

This **Fault Monitor** window for the CANopen trucks provides the following listed information

- Name of the device
- Fault code
- Error count
- Hour meter at First occurrence of the fault
- Time stamp at First occurrence of the fault
- Hour meter at Last occurrence of the fault
- Time stamp at Last occurrence of the fault

Note: the following step would typically only be executed once all fault causing conditions have been repaired or resolved, as this action erases fault information from the truck’s internal memory.

- For ICE trucks, click **Clear Active Faults** or **Clear Inactive Faults** to clear faults. With CANopen trucks, click **Clear Fault**, to clear the fault list. The tool will acknowledge the **Clear** operation, and refresh the screen to show fault status.
- Click **Refresh**, to clear the fault list and get updated fault status. This causes an immediate re-display of fault status.

## Truck Information

Using the Truck Information feature, you can identify the type of truck and its components for servicing purposes.

To view the truck information, execute the following procedure:

- Select **Diagnostic >>Truck Information**. This displays the Truck Information screen as depicted in Figure 12:

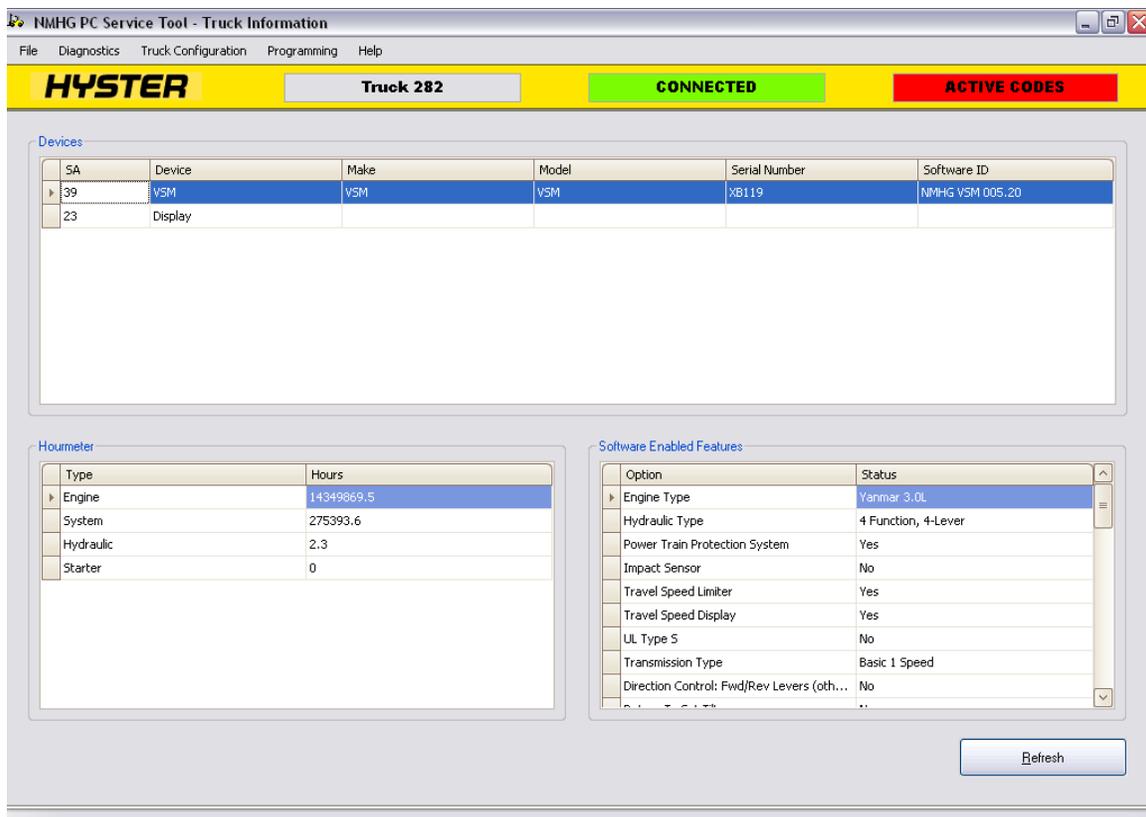


Figure 12: Truck Information Window

This screen provides the following listed information:

- Source Address (SA), or Node
- Name of the device, if available
- Hardware version, if available
- Software ID for the device, if available
- Serial number for the device, if available
- Software enabled features
- Hour Meter(s)

### ***Custom Data Monitor***

Using the **Custom Data Monitor** Window, you can choose the data items that you want to view onscreen.

To create a customized list, execute the following procedure:

1. Select **Diagnostics >> Custom Data Monitor**. This displays a screen like the one depicted in Figure 13.
2. Data is shown clustered in groups of like functionality, such as Engine, Hydraulics, etc.
3. By clicking +, you will expand the number of data items in a functional category. Clicking – will present only the single category name.

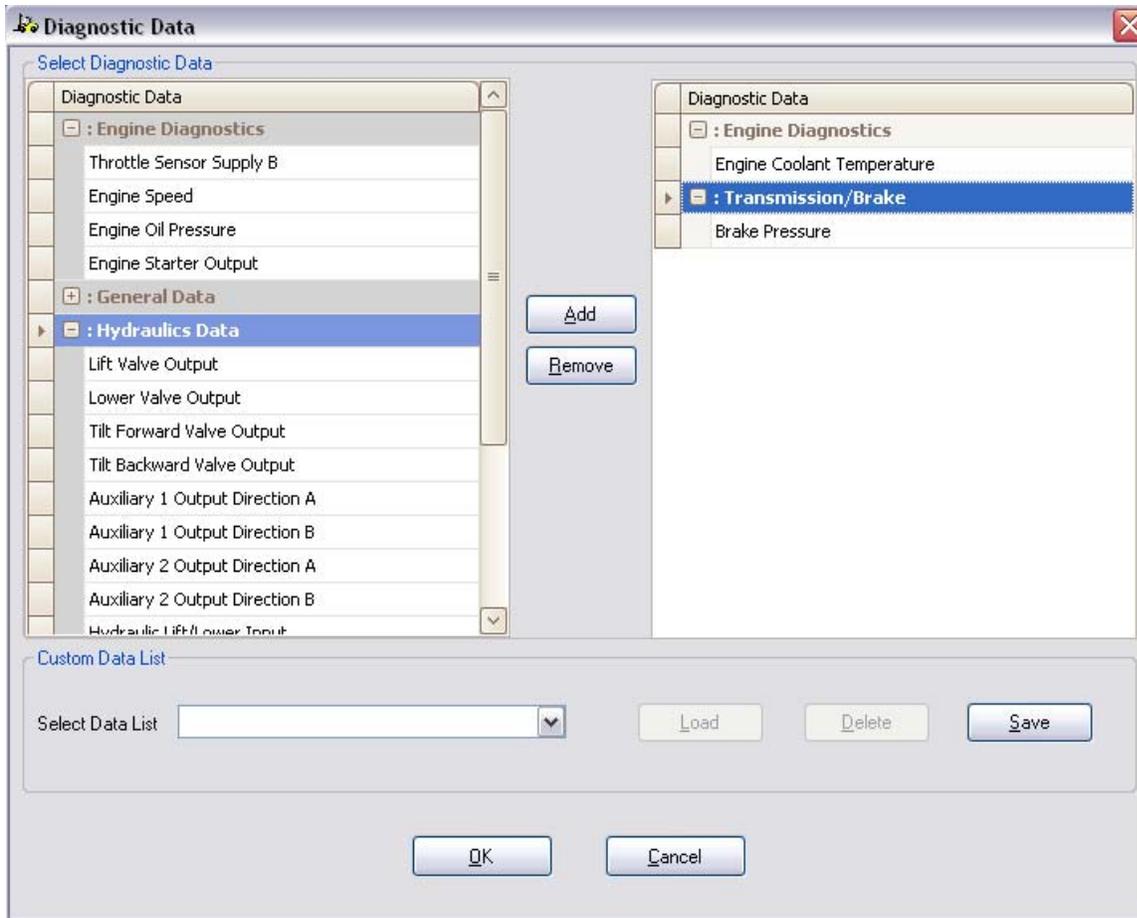


Figure 13: Select Custom Data Monitor Window

Items listed in the Select Diagnostic Data panel are the available list items that can be added to the custom diagnostic data list. Items listed in the right panel indicate the diagnostic data currently being monitored.

Based on your requirements, you can perform these tasks:

Task	Action
Add >	<ul style="list-style-type: none"> <li>Select any item or group from the left panel and click Add &gt;.</li> <li>or</li> <li>Click and hold the left mouse button on any item or group on the left and drag that item(s) to the right.</li> <li>or</li> <li>Double-click any item or group on the left. This adds the group or item in the custom data list.</li> </ul>
< Remove	<ul style="list-style-type: none"> <li>Click any item or group on the right and click &lt; <b>Remove</b> to remove that item or group from the</li> </ul>

	<p>custom list.</p> <p>or</p> <ul style="list-style-type: none"> <li>• Drag any item(s) from the right to the left to remove it from the custom list.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• Double-click any item or group on the right. This deletes the group or item from the selected custom data list.</li> </ul>
Save	1. Click <b>Save</b> . This displays the dialog box depicted in Figure 14.

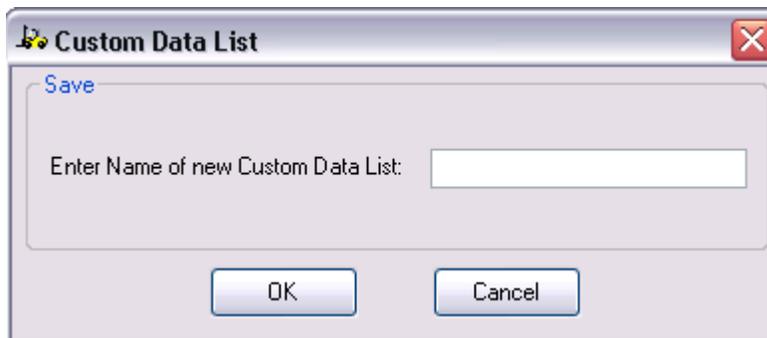


Figure 14: Custom Data List dialog box

Save, cont'd	<ol style="list-style-type: none"> <li>2. Enter the name for the custom data list in the dialog box.</li> <li>3. Click <b>OK</b>, to save the custom data list.</li> <li>4. Click <b>Cancel</b>, to close the <b>Custom Data List</b> dialog box.</li> </ol>
Load	<ol style="list-style-type: none"> <li>1. Select <b>Diagnostics &gt;&gt; Custom Data Monitor</b>.</li> <li>2. Select the desired custom data list from the drop down menu.</li> <li>3. Click <b>Load</b>.</li> </ol>
Delete	<ol style="list-style-type: none"> <li>1. Select <b>Diagnostics &gt;&gt; Custom Data Monitor</b>.</li> <li>2. Select the desired list from the Custom Data List drop down menu.</li> <li>3. Click <b>Delete</b>.</li> </ol>

4. Click **OK** after selecting the desired data items. The Custom Data Monitor screen is displayed showing the items that were selected (as in Figure 15).
5. Click **Cancel** to close the Custom Data Monitor Window.

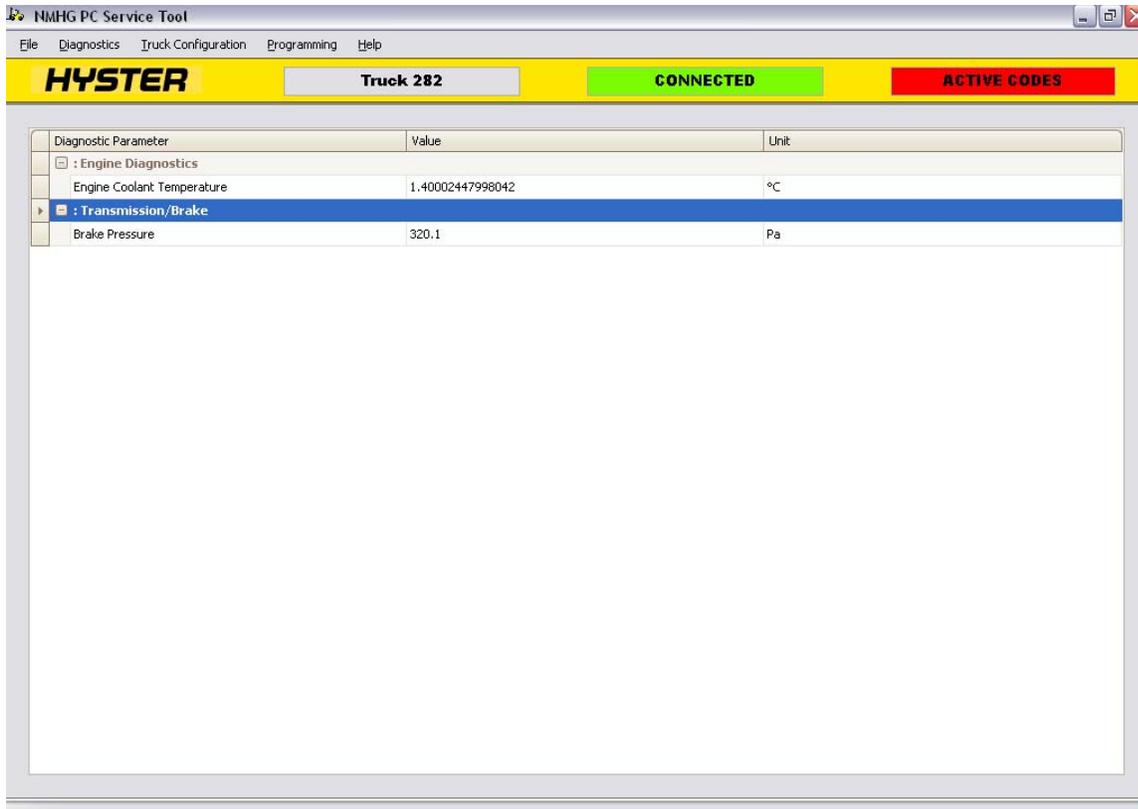


Figure 15: Custom Data Monitor Window

Note: The application displays an error message if you click **Load** or **Delete** without selecting any data list.

*Note: The update rate of the PC Service Tool will decrease as more data items are added. For the fastest update rates only display the data items necessary for the current diagnostic task.*

## Strip Chart

You can view the data associated with a particular parameter using a graphical strip chart. The parameters plotted in the graph are displayed in the legend on the left with an associated scale. The strip chart supports up to 15 parameters to display on a graph.

To view the strip chart, execute the following procedure:

1. Select **Diagnostics >> Strip Chart**. This displays the Strip Chart window as depicted in Figure 16.

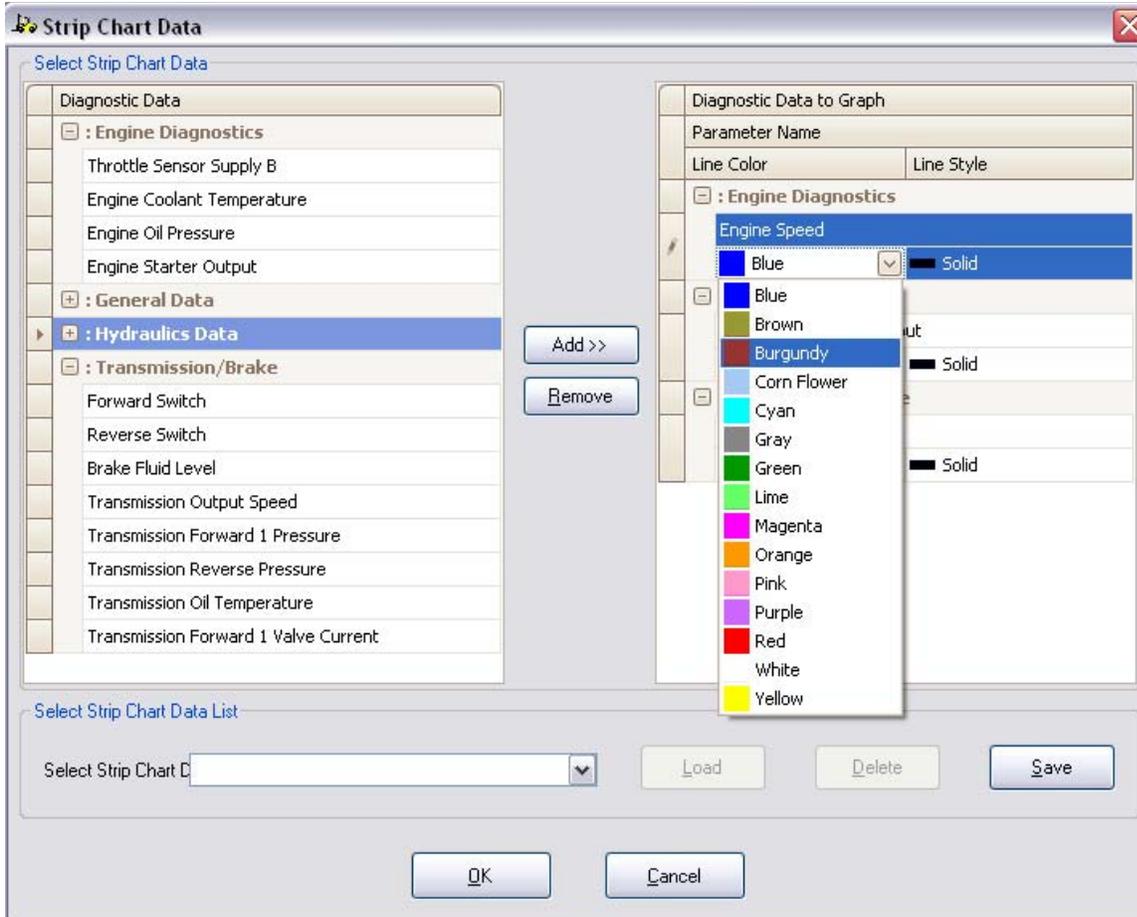


Figure 16: Select Strip Chart Window

The strip chart selection dialog allows the selection of data to be displayed on the Strip Chart.

Items listed in the left panel are the available list items that can be added to strip chart. The items shown in the right panel denote items already listed for display.

Each item appearing in the strip chart is represented with a unique color. You can choose the color from the available color list.

Based on your requirements, you can perform any of the following tasks:

Task	Action
Add >	<ul style="list-style-type: none"> <li>Select any item or group from the left panel and click Add &gt;.</li> <li>or</li> <li>Click and hold the left mouse button on any item or group on the left and drag that item(s) to the right.</li> </ul>

Task	Action
	<p>or</p> <ul style="list-style-type: none"> <li>• Double-click any item or group on the left. This adds the group or item in the custom data list.</li> </ul>
< Remove	<ul style="list-style-type: none"> <li>• Click any item or group on the right and click &lt; <b>Remove</b> to remove that item or group from the strip chart.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• Drag any item(s) from the right to the left to remove it from the strip chart.</li> </ul> <p>or</p> <ul style="list-style-type: none"> <li>• Double-click any item or group on the right. This deletes the group or item from the strip chart.</li> </ul>
Save	<ol style="list-style-type: none"> <li>1. Click <b>Save</b>.</li> <li>2. Enter the name for the strip chart in the dialog box.</li> <li>3. Click <b>OK</b>, to save the strip chart.</li> <li>4. Click <b>Cancel</b>, to close the Strip Chart dialog box.</li> </ol>
Load	<ol style="list-style-type: none"> <li>1. Select <b>Diagnostics &gt;&gt; Strip Chart</b>.</li> <li>2. Select the desired custom data list from the drop down menu.</li> <li>3. Click <b>Load</b>.</li> </ol>
Delete	<ol style="list-style-type: none"> <li>1. Select <b>Diagnostics &gt;&gt; Strip Chart</b>.</li> <li>2. Select the desired strip chart from the drop down menu.</li> <li>3. Click <b>Delete</b>.</li> </ol>

2. Click **OK**, after selecting the desired data items, to display the strip chart windows, as depicted in Figure 17
3. Click **Cancel** to close the **Strip Chart** window.

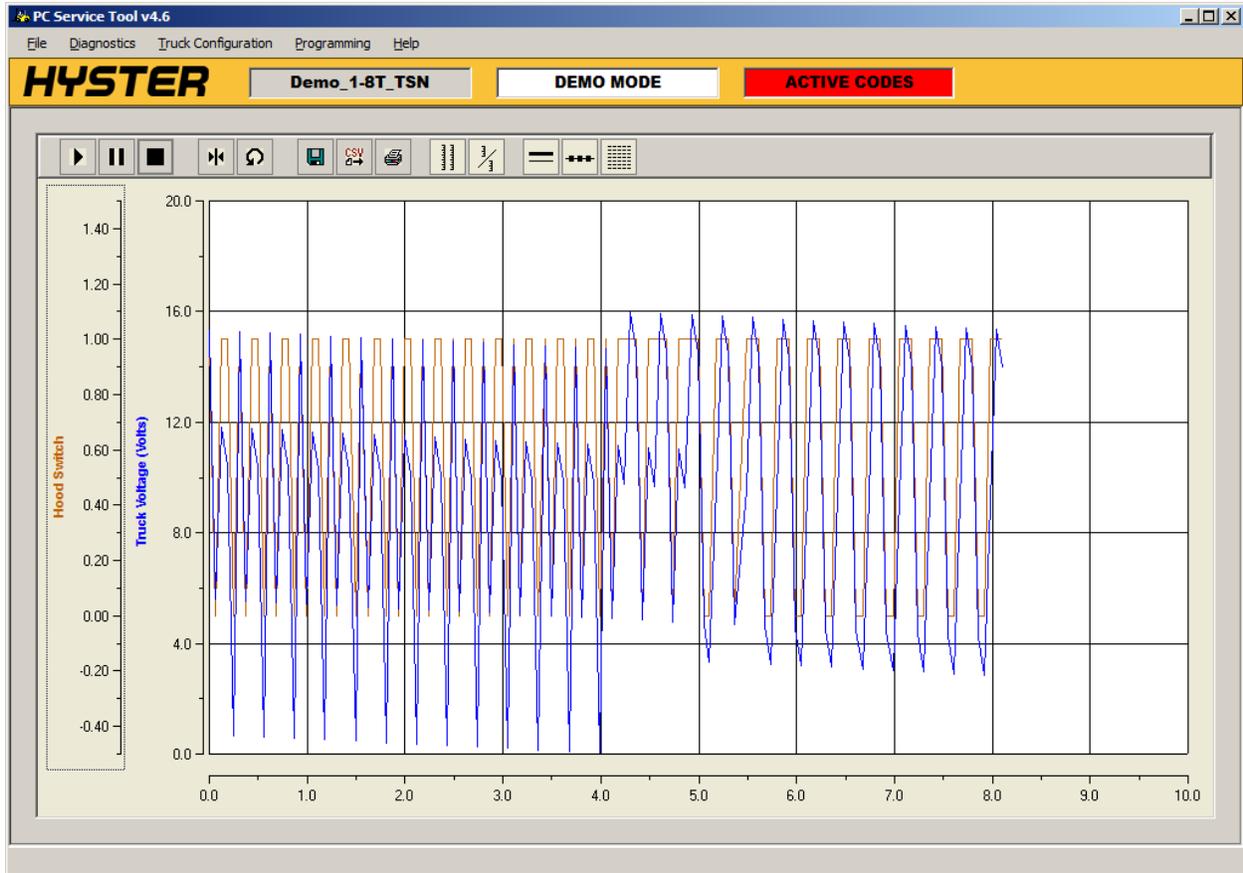


Figure 17: Strip Chart Window

*Note: The update rate of the PC Service Tool will decrease as more parameters are added. For some truck parameters, there can be a significant delay, as much as one second, for the truck controllers to respond. This causes the strip chart to “jump” rather than display smoothly. For these parameters, it is suggested that they be displayed in the Custom Data Monitor. Furthermore, for the fastest update rates only display the parameters necessary for the current diagnostic task.*

The Strip Chart Window (again, refer to Figure 17) has several controls associated with the display of chart information.

In the top left corner, the display contains a toolbar with the following functions (from left to right):

-  Start plotting
-  X-axis scroll pause (N/A first 10 seconds)
-  Stop plotting
-  Toggle Cursor View
-  Restore default zoom levels
-  Save buffer as .rec file (usable via Load Strip chart; see note below)
-  Save buffer to .csv file (comma separated text; see note below)
-  Print the current graph
-  Stack Axes
-  Split Axes
-  Thick/Thin Lines
-  Toggle data points
-  Toggle minor grid lines

It should be noted that the 'Pause' button in the toolbar does not stop the gathering of data – it merely prevents the x-axis from scrolling so data can be momentarily analyzed. Clicking the 'pause' button again will resume the x-axis scroll. Also, note that the pause button has no effect for the first 10 seconds of data.

The "Toggle Cursor" option is useful to measure a specific parameter at a specific point on the waveform. Turning on this feature will display numeric information about a parameter, along with a legend, along the right hand side of the graph.

The Strip Chart can be used to save diagnostic data gathered in the graph in two file formats: ".rec" files and ".csv" files. The .rec files are in a PCST specific format and can be used by the Load Strip Chart feature in PCST to replay the stored data. It's important to note that .rec files saved by PCST v4.6 are not backward compatible with older versions and vice-versa. The .csv files are generic comma separated text that can be viewed in Excel or any text editor.

*Note: Due to file protection changes implemented in Windows 7, the default directory for the .rec and .csv files is a Desktop folder named "PCST Data". This is a change from earlier versions of the PC Service Tool.*

The "Stack Axes" button is useful for displaying multiple waveforms on a single timescale. The individual axes on the left will reflect the scaling and color code for the parameter being plotted.

The "Split Axes" button is useful for displaying a waveform on an individual scale. This allows waveforms to be viewed in a less cluttered graph.

The "Stack" and "Split" buttons can be combined, making it possible to display two separate graphs with two waveforms each, for instance.

"Toggle Data Point" allows the user to see the actual data points, or an interpolated graphic of the data.

The "Toggle Minor Grid Lines" button allows a grid with smaller divisions to be displayed, perhaps aiding measurement accuracy.

At the initial zoom level, the graph displays the last 10 seconds of data.

The Y-axis is automatically scaled to display the maximum value for any parameter on the graph.

Any axis can be dragged to move the plot within the graph and right-clicking on any axis launches the Zoom dialog:

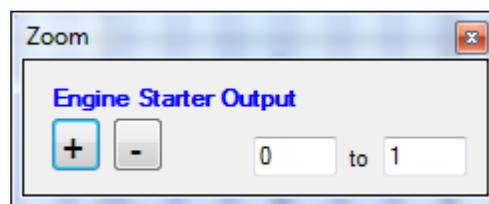


Figure 18: Zoom Dialog

To close the graph, click on another top level menu item.

## ***Diagnostic Tests***

See Appendix F.

## ***Activity Logs***

This feature is used to read logs of important activities that occur during the operation of the truck.

*Note: the log feature is only available on trucks equipped with these options*

The logs created include:

- Impact Events
- Password Log
- Operator Checklist Log

## **Impact Events**

To view impact events:

1. Select **Diagnostics >>Activity Logs >>Impact Events**. This displays the Impact Events window, showing details such as Impact type, Password, Time Stamp and Traction Hour Meter (Traction Hour Meter is not populated for ICE Trucks).

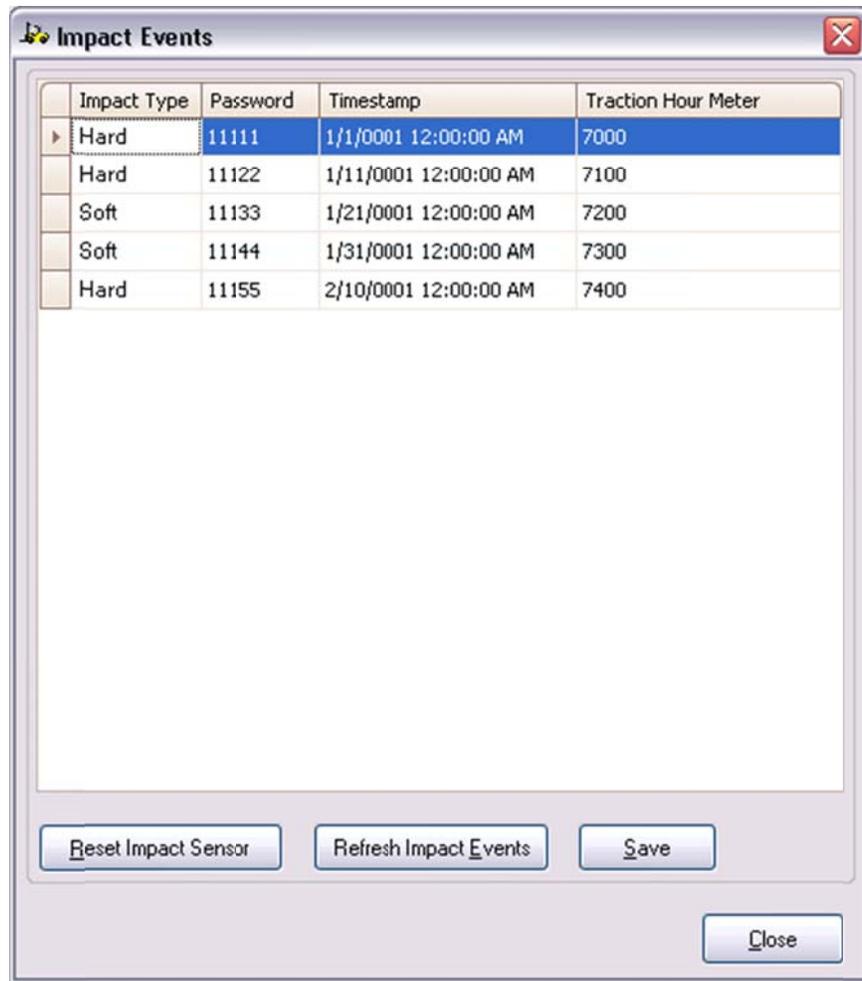


Figure 19: Impact Event Window

2. Click **Reset Impact Sensor**, to clear the event data from the application.  
or
3. Click **Refresh Impact Events**, to refresh the **Impact Events** window with the latest impact events from the truck.  
or
4. Click **Close**, to exit the *Impact Events* screen.

## Password Log

To view the password log:

1. Select **Diagnostics >>Activity Logs >> Password Log**. This loads the log from the truck and displays the **Password Log** window. Some trucks will show only a date in the timestamp column; some may add time of access.

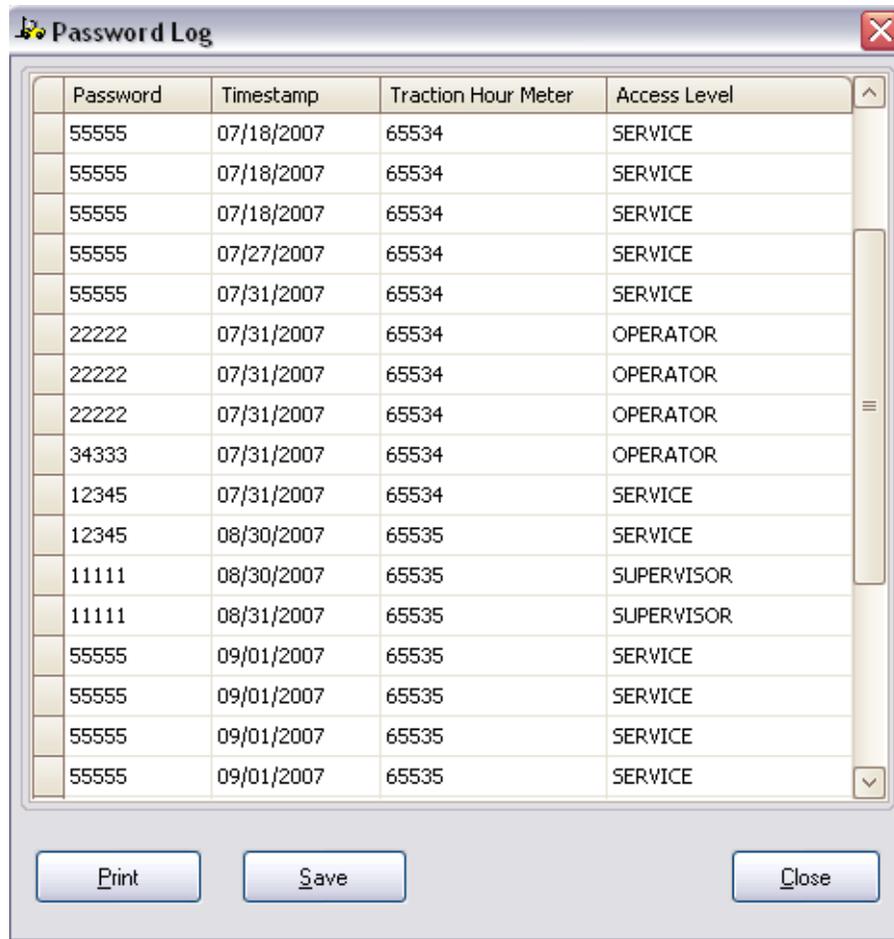


Figure 20: Password Log window

2. Click **Save** to save the log file on the computer. As noted previously, the default folder location has changed from earlier versions of PCST, and is now in a Desktop Folder called PCST Data\Password Logs\...]. The default filename is “[Truck Serial Number]\_Passwords\_[mmddyyyy]\_[hhmmss].log”, where mmddyyyy corresponds to month, day and year.  
or
3. Click **Print**, to print the log.  
or
4. Click **Clear Log**, to erase passwords in the log (Note: this is only available for some CANopen equipment).  
Or
5. Click **Close**, to exit from the **Password Log** window

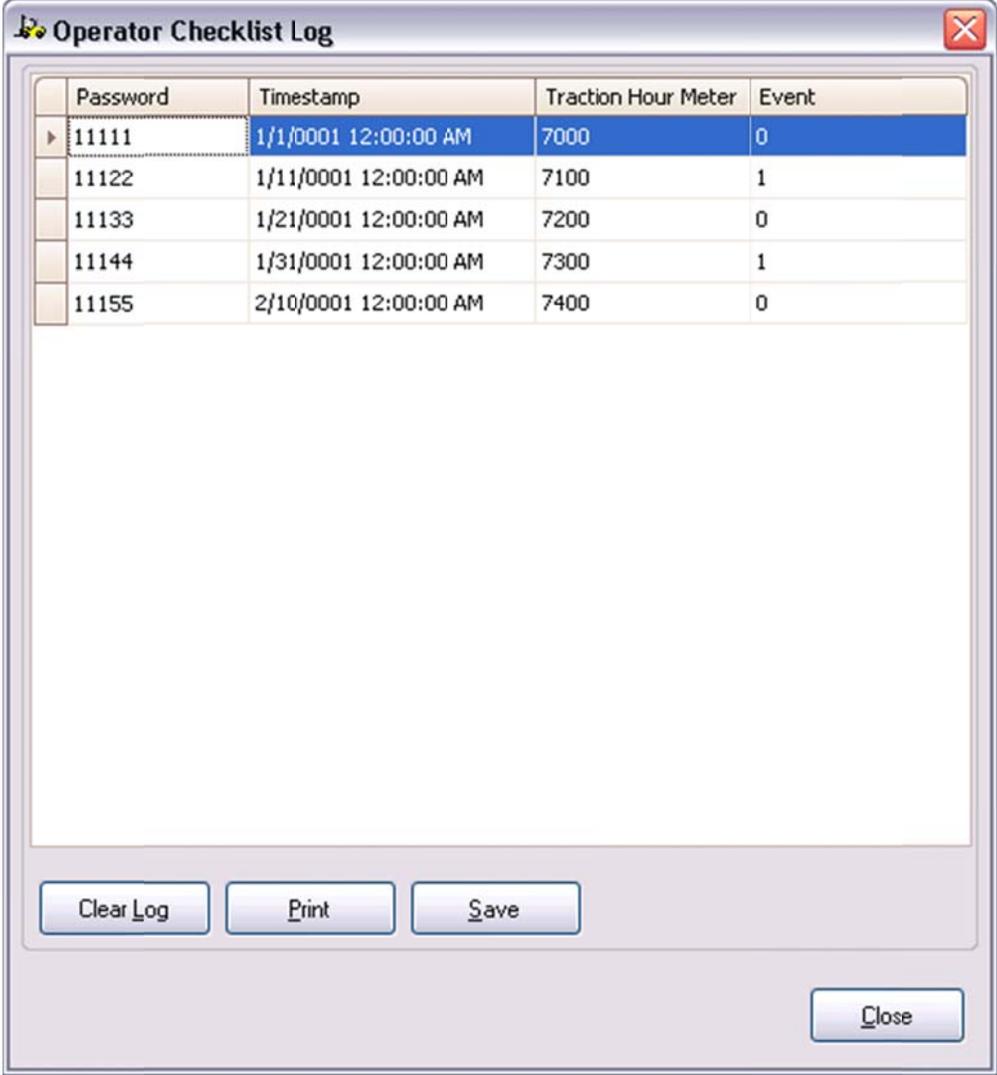
## Operator Checklist Log

The Operator Checklist log is used to view, print, save and clear the operator checklist log.

To view the operator checklist log:

1. Select **Diagnostics >>Activity Logs >>Operator Checklist Log**. This displays the Operator Checklist Log window after verifying that Operator Checklist is enabled on the truck. The window for Operator checklist may vary depending upon the selected truck.

For CANopen trucks, the following screen is displayed:



Password	Timestamp	Traction Hour Meter	Event
11111	1/1/0001 12:00:00 AM	7000	0
11122	1/11/0001 12:00:00 AM	7100	1
11133	1/21/0001 12:00:00 AM	7200	0
11144	1/31/0001 12:00:00 AM	7300	1
11155	2/10/0001 12:00:00 AM	7400	0

Figure 21: Operator Checklist Log for CANopen Trucks

- For ICE trucks, the following screen is displayed:

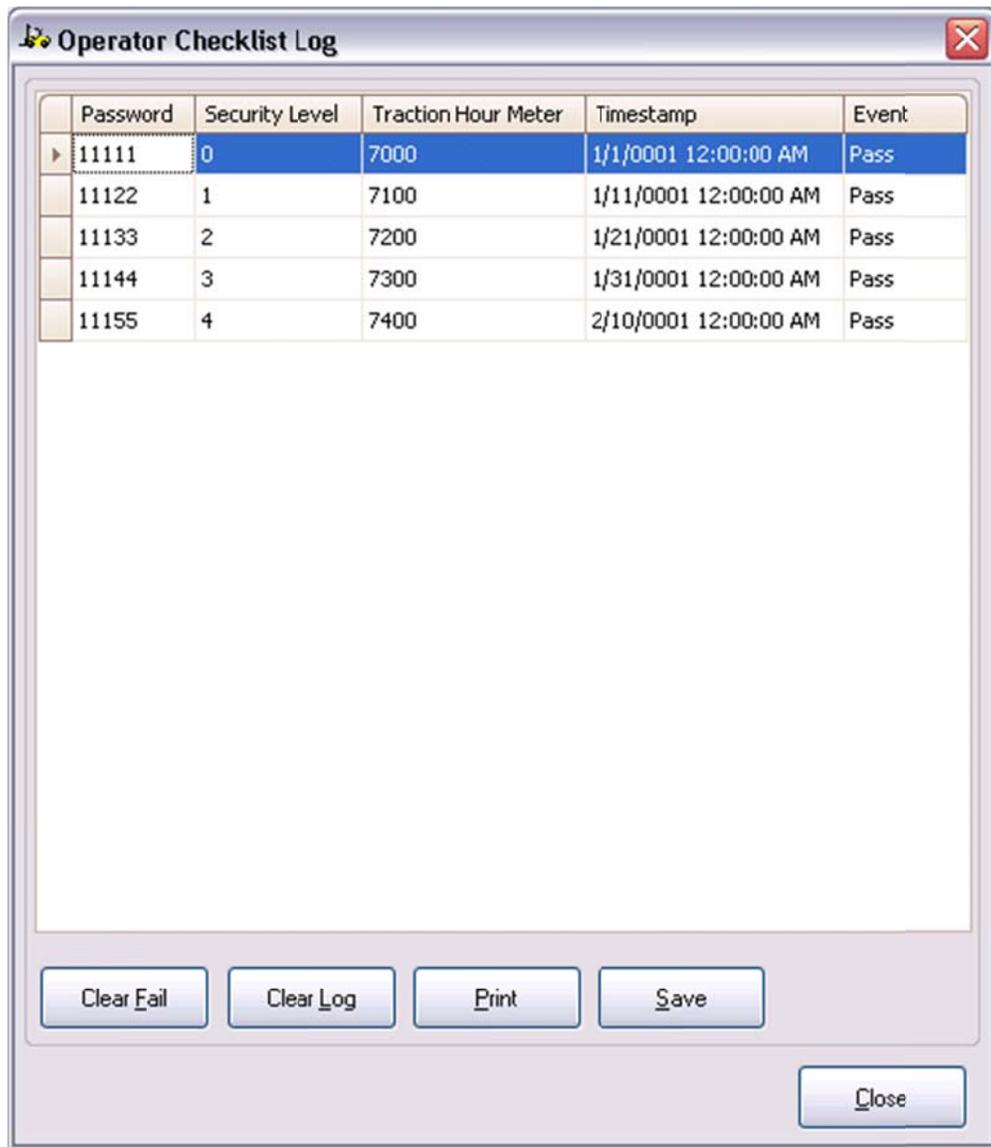


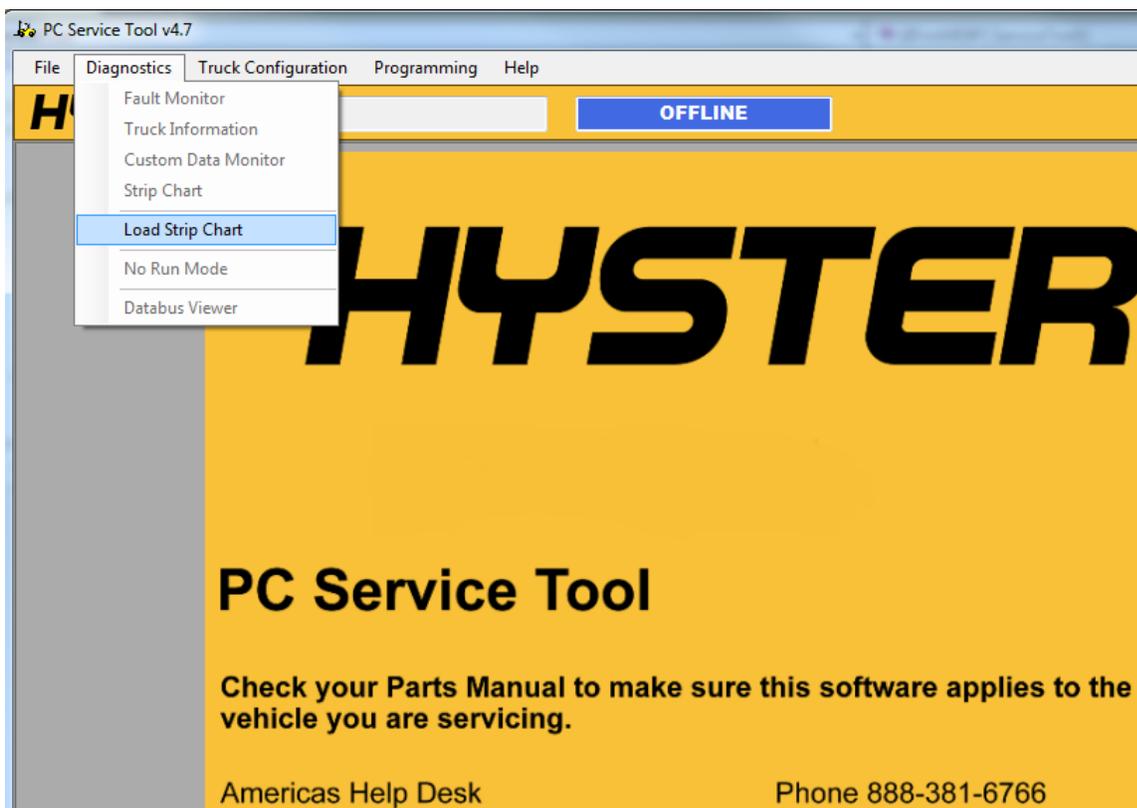
Figure 22: Operator Checklist Log for ICE Trucks

2. Click **Clear Fail**, to clear any Operator Checklist failures.  
Note: This is only applicable to ICE trucks.  
or
3. Click **Clear Log**, to delete the displayed data.  
or
4. Click **Print**, to print the log displayed.  
or
5. Click **Save**, to save the log (default location is now on the Desktop, in the PCST Data folder).

- or
6. Click **Close**, to exit from the **Operator Checklist Log** window.

## **Load Strip Chart**

This feature replaces the “Playback Data” option in previous versions of PCST. Files saved from the Strip Chart (non-csv) can be loaded into PCST and reviewed using the ‘Load Strip Chart’ menu item. Choose *Load Strip Chart* from the Diagnostics menu. The saved Strip Chart is loaded statically and can be navigated by the user. It is not necessary to be connected to a truck to load a strip chart.



*Figure 23: Load Strip Chart menu item*

Note: previous version of PCST used the “Playback Data” feature for review of not only Strip Charts, but Custom Data Monitor parameters, Truck Info and Faults. The latter 3 items are now most easily saved by including them in a “Truck Report” – see that section under the “File” menu.

## **No Run Mode**

This menu is used to disable truck traction and hydraulics operation and is only applicable on some CANopen equipment. It is principally used for sensor diagnosis.

To disable the truck operations:

1. Select **Diagnostics >> No Run Mode**.

With "No Run" selected, if the user clicks disabled feature, a message box is displayed that states "Vehicle is now in No Run Mode", and a status box appears at the top of the screen indicating this mode.

2. Click **OK**, to close the message box.

To enable the truck operations:

1. Select **Diagnostics >> No Run Mode**.

A message box is displayed, "Vehicle is now operational".

2. Click **OK**, to close the message box.

*Note: if PCST is closed while a "No Run" mode is in effect, the truck will remain in this mode until the user re-connects and then steps through the No Run enable / disable sequence again.*

## **Databus Viewer**

This part of the tool can be used to gather detailed, low level information about the messages / communication being passed on the CAN bus. It is not recommended that this part of the tool be used except in unusual situations, by highly technical users. Construction of the "data request" messages and interpretation of the returned data is complex. This functionality is included only for circumstances where a service engineer may be interacting with a technician. Hence, no further explanation of this feature is provided.

## Truck Configuration Menu

---

The Truck Configuration menu contains the following items:

- Password Management
- Operator Checklist
- Truck Setup

The usage of each menu item is described in the subsequent sections.

*Note: To access features under the Truck Configuration menu, you must have a password with higher level access enabled.*

### Password Management

The Password Management menu contains the following items:

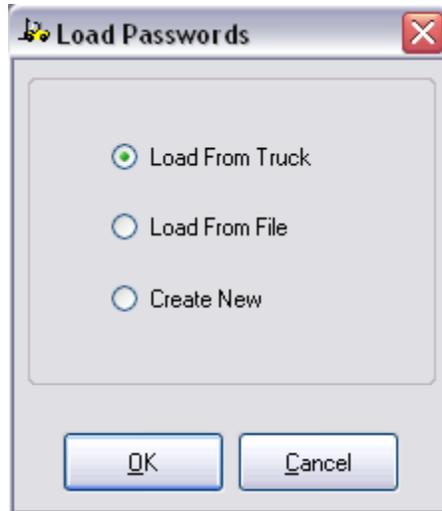
- Manage Passwords
- Set Number Wrong to Disable
- Operator Password Settings

*Note: some CANopen trucks do not support the password option, hence no management is available.*

### *Manage Password*

This menu is used to create, edit and delete passwords to access the truck information. You can manage the passwords using the following procedure:

1. Select **Truck Configuration >> Password Management >> Manage Password**. This displays the **Load Password** dialog box, allowing you to load passwords from the truck.



*Figure 24: Load Passwords dialog box*

2. Select option and click **Ok**. This displays the **Manage Passwords** dialog box.



Figure 25: Manage Passwords dialog box

Security levels and passwords are loaded from the location chosen in the previous dialog, and displayed in the Passwords section of Figure 25. If the Create New option was selected, the password list is blank.

3. To add a password, select a security level from the drop down box and enter a password in the password field.
4. Click **Add**. The password is added to the password list.

Note: In the case of CANopen trucks, the window lists up to 250 passwords. In the case of ICE trucks, the window lists up to 100 or 250 passwords, depending upon the truck model.

or

5. To change the security level or password of an existing item, select the row in the password list and modify the security level from the drop down box or change the password in the password field. Click **Update**. The row in the password list is updated to reflect the changes.  
or
6. To delete an existing item from the password list, select the row and click **Delete**. The row in the password list is removed.  
or
7. Click **Save To Truck**, to save the password list to the truck's onboard memory. If the save is successful, a dialog box is displayed asking if the password list should also be saved to a file. Click **Yes** to save the password list to a file as well. **Note:** Because ICE and CANopen trucks share the same password file types, it is possible to confuse one type for the other. Use a descriptive file name to ensure these files are clearly separate from another. Do not load an ICE file and save it to a CANopen truck, or vice-versa. File corruption can result, which is difficult and time consuming to recover from.  
or
8. Click **Save To File**, to save the password list to a file. The filename of the saved file is assigned by default using the truck's serial number, the current date, and the current time.  
or
9. Click **Print**, to print a list of all security levels and passwords in the password list.  
or
10. Click **Close**, to close the Manage Passwords window.

Note: the Performance Mode may be programmed for CANopen trucks, but it is set to 4 for ICE trucks, and cannot be modified

### *Set Number Wrong to Disable*

Note: This is only applicable for some ICE trucks.

1. Select **Truck Configuration >> Password Management >> Set Number Wrong to Disable**. The Set Number Wrong to Disable dialog box is displayed (Figure 26).

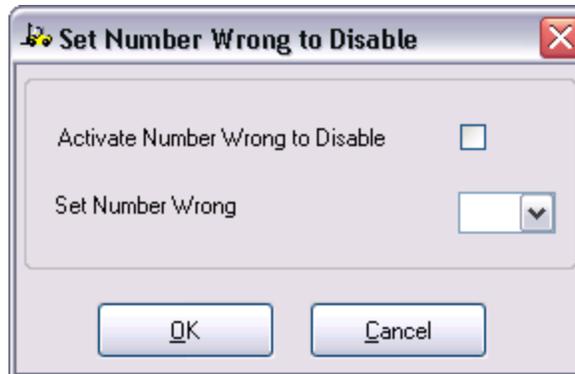


Figure 26: Set Number Wrong to Disable dialog box

2. Select **Activate Number Wrong to Disable**, to enable this feature.
3. Specify the number of wrong password attempts before disabling using the **Set Number Wrong** dropdown box.
4. Click **OK**, to save changes.  
or
5. Click **Cancel**, to discard the changes made.

## Operator Password Settings

Note: This is only applicable for ICE trucks.

The operator password settings function sets the activation/deactivation status of the Operator Password feature and allows the technician to set the Password Time-Out Delay for Operator passwords. Operator passwords are a feature that requires operators to enter valid passwords in order to operate the truck or specific truck features. The Password Time-Out Delay setting determines the period during which an operator is allowed to re-start the truck without re-entering a password.

1. Select **Truck Configuration >> Password Management >> Operator Password Settings**. This displays the dialog box shown in Figure 27:



Figure 27: Operator Password Settings dialog box

2. Select or Unselect **Active Operator Passwords** to set the activated/deactivated status of the Operator Password feature.
3. Specify the time, in minutes, for a time-out delay.
4. Click **OK**, to accept changes.

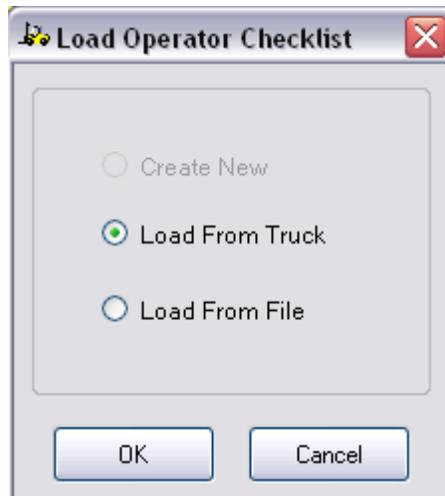
### ***Operator Checklist***

This menu is used to manage the operator checklist. The **Operator Checklist** window varies depending upon the type of truck selected.

*Note: some CANopen trucks do not support the operator checklist option, hence no management is available.*

### **Manage Operator Checklist**

1. Select **Truck Configuration >> Operator Checklist >> Manage Operator Checklist**, to edit the Operator Checklist for the truck. The **Load Checklist dialog** box is displayed.



*Figure28: Load Checklist dialog box*

Note: **Create New** option is disabled for ICE trucks and **Load From Truck** option is disabled for CANopen trucks.

2. Select whether to load the checklist from the truck or from a file.
3. Click **OK** to proceed.

In the case of an ICE truck, the following screen is displayed (Figure 29):

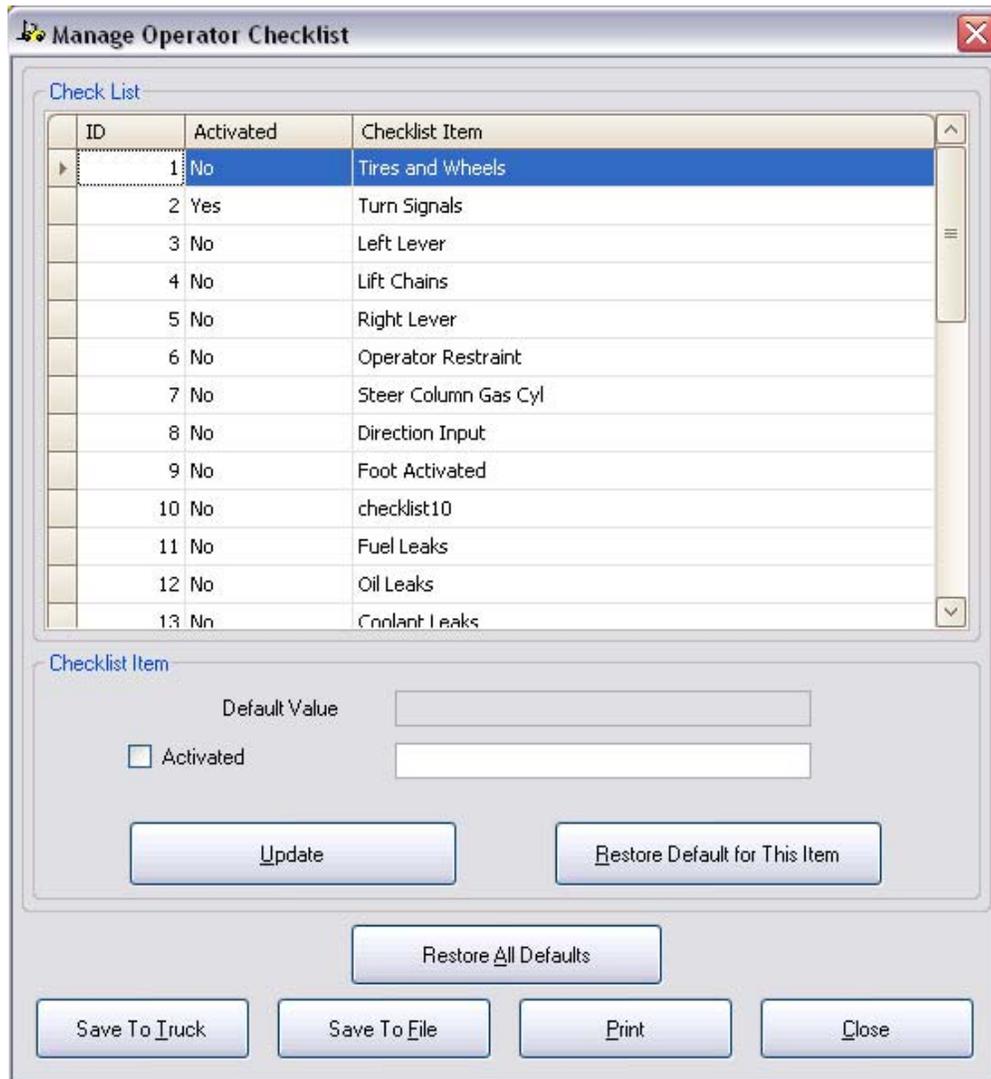


Figure 29: Manage Operator Checklist Window for ICE Trucks

1. To activate or deactivate a selected operator checklist item, check the **Activated** checkbox to activate that checklist item. Uncheck the checkbox to deactivate the checklist item.
2. To customize the checklist item description, select the item and type the new description in the text box provided in the **Checklist Item** block. Select **Update** to update the main list.
3. Click **Restore Default for This Item**, to return the selected checklist item to its factory default state.
4. Click **Restore All Defaults**, to return all checklist items to their factory default state.
5. Click **Save To Truck**, to save all checklist items to the truck.

6. Click **Save To File**, to save all checklist items to a file. The filename of the saved file is assigned by default using the truck's serial number, the current date, and the current time. **Note:** Because ICE and CANopen trucks share the same checklist file types, it is possible to confuse one type for the other. Use a descriptive file name to ensure these files are clearly separate from another. Do not load an ICE file and save it to a CANopen truck, or vice-versa. File corruption can result, which is difficult and time consuming to recover from.
7. Click **Print**, to print the operator checklist.
8. Click **Close**, to close the Manage Operator Checklist window.

In the case of CANopen trucks, the following screen is displayed:

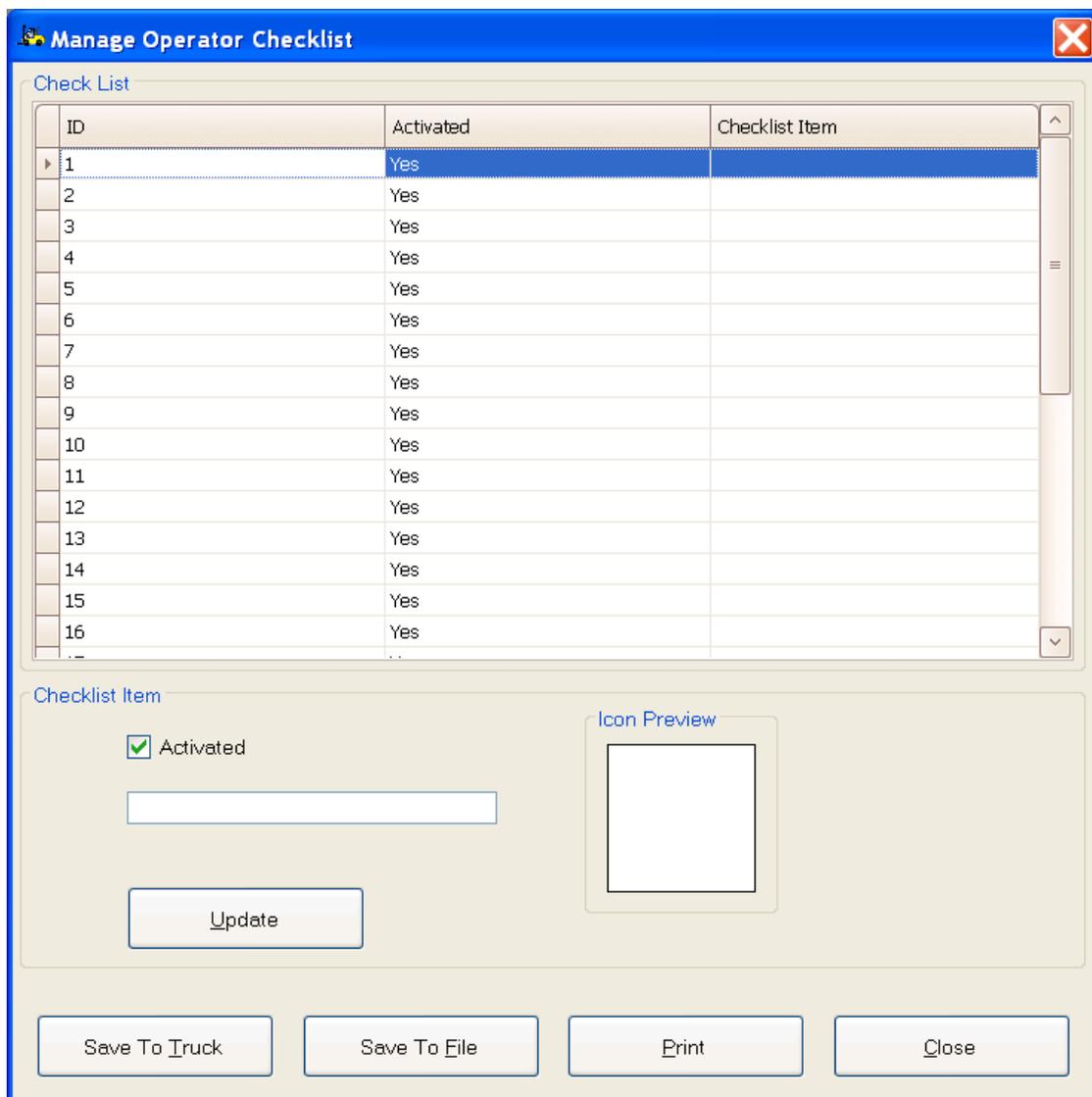


Figure 30: Manage Operator Checklist Window for CANopen Trucks

*Note: the ER truck uses an iconic system to display operator checklist tasks. The PCST does not generate icons, but does assist in the process of adding to, or replacing icons, allowing truck customization. These added or replacement items can be edited and described in this screen, then saved for later transfer to the truck as part of an overall checklist item editing process.*

1. To customize the checklist item description, select the item and type the new description in the text box provided in the **Checklist Item** block. Select **Update** to update the main list.
2. Click **Save To Truck**, to save edited checklist items to the truck.
3. Click **Save To File**, to save checklist items to a file. The filename of the saved file is assigned by default using the truck's serial number, the current date, and the current time.
4. Click **Print**, to print the operator checklist.
5. Click **Close**, to close the Manage Operator Checklist window.

## Operator Checklist Settings

Note: This is only applicable for some ICE trucks.

To turn the operator check list on or off (shows as "Off-On Mode"):

1. Select **Truck Configuration >> Operator Checklist >> Operator Checklist Settings**. This displays the **Operator Checklist Settings** dialog box, as shown in Figure 31.

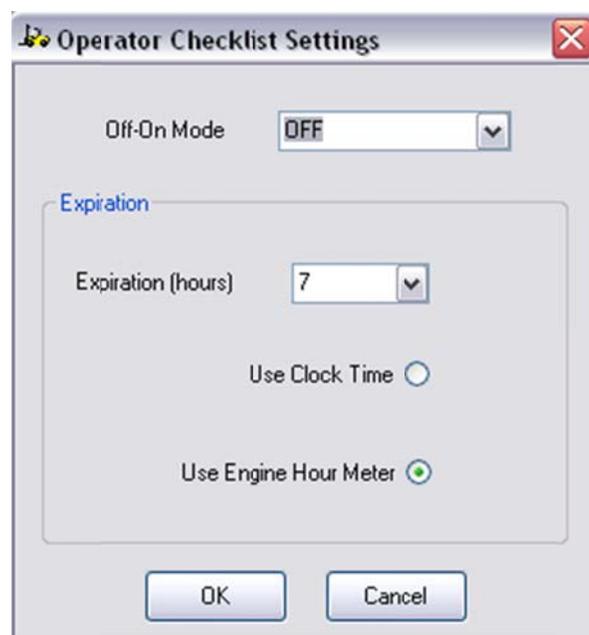


Figure 31: Operator Checklist Settings dialog box

2. Select the mode from the Off-On-Mode dropdown box.
3. Specify the expiration time by selecting the number of hours until expiration by using the Expiration (hours) dropdown box.
4. Specify whether to use **Clock Time** or **Engine Hour Meter** time.
5. Click **OK**, to proceed.

### ***Truck Set-up***

*Note: In the case of ICE trucks, the engine must be off to perform the set-up functions.*

*Note: In the case of some CANopen trucks, the motors must not be active to perform the set-up functions, otherwise the values may not be saved properly*

The screen appearance and data content of the truck set-up menus are defined by a configuration file generated at the factory. This is done to allow special set-up screens to be developed for specialized truck functionality. Because of this, the actual set-up screens you see may vary from the general example given next. It is the goal of the factory engineers to make any customized set-up screens intuitive and self-explanatory. Where this is not the case, additional instructions will be provided.

To perform the truck set-up functions:

1. Select **Truck Configuration >> Truck Set-Up**. This displays the **Truck Set-up** Window, as shown in Figure 32:

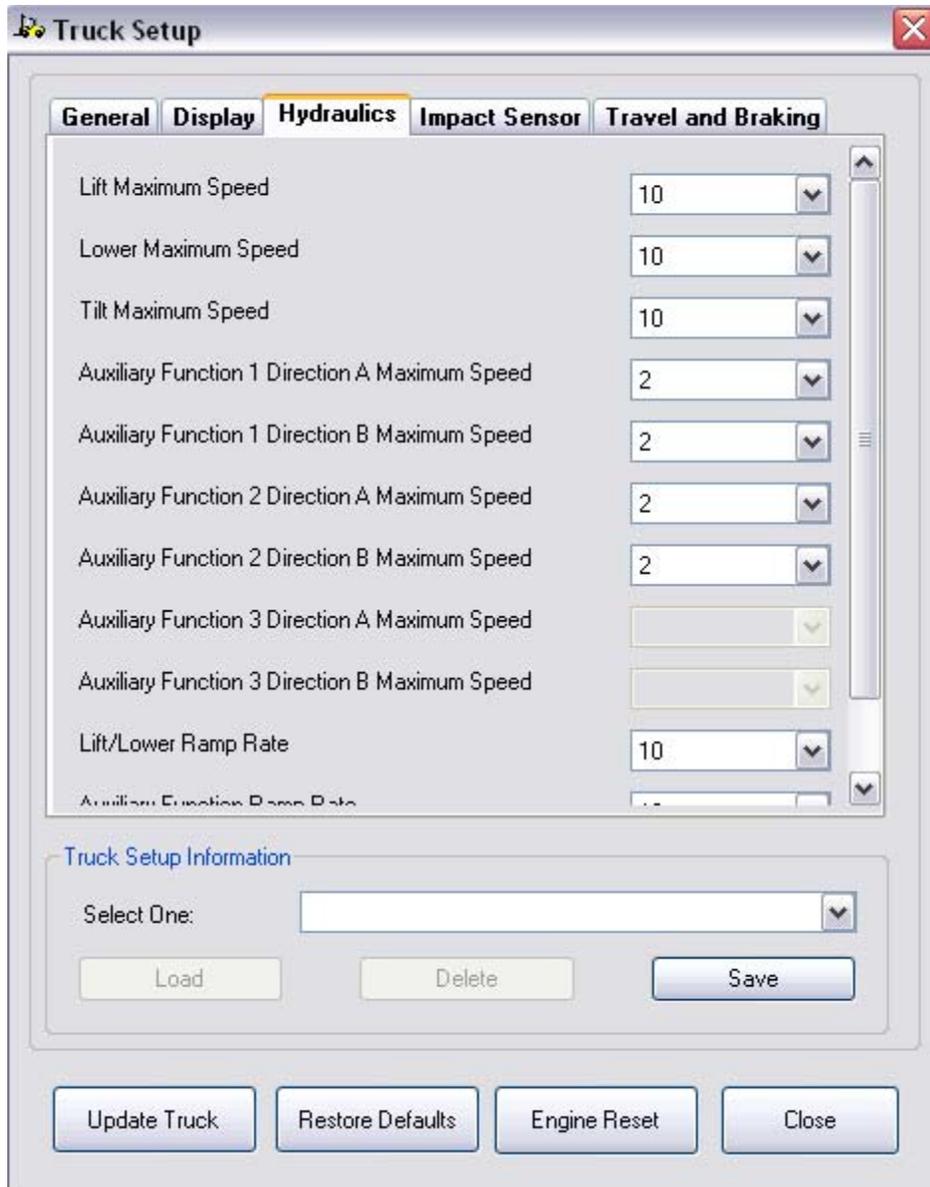


Figure 32: Truck Set-up window

This window generally contains five tabs for ICE trucks: General Items, Display, Hydraulics, Impact Sensor, and Travel and Braking. However, the number of tabs and their names can be configured differently depending on the equipment. In particular, CANopen equipment may have many different tabs and settings.

2. Specify the parameter values by using the dropdown boxes associated with each parameter.
3. To load a previously saved set-up configuration, select a configuration from the drop down box (in the Truck Setup Configuration block) and Click **Load** button.  
or

4. To delete a previously saved set-up configuration, select a configuration from the drop down box and Click **Delete** button.  
or
5. To save the values in the truck set-up configuration, enter a name for the configuration in the dialog box and Click **Save** button.
6. Click **OK**.  
or
7. Click **Update Truck**, to store all configured values to the truck.  
or
8. Click **Restore Defaults**, to restore all parameters to the truck's default values.  
or
9. Click **Engine Reset**, To reset all engine parameters for ICE trucks equipped with GM engines.  
or
10. Click **Close**, to close the **Truck Set-Up** window.

Note: in some cases, a Setup parameter may appear blank. This indicates that the factory provided configuration file did not include a setting, generally because this option is not available on a particular truck.

To set the date and time of the truck:

1. Select **Truck Configuration >> Truck Set-up**.
2. Select **Display** tab from the **Truck Configuration** window. This displays the screen shown in Figure 33:

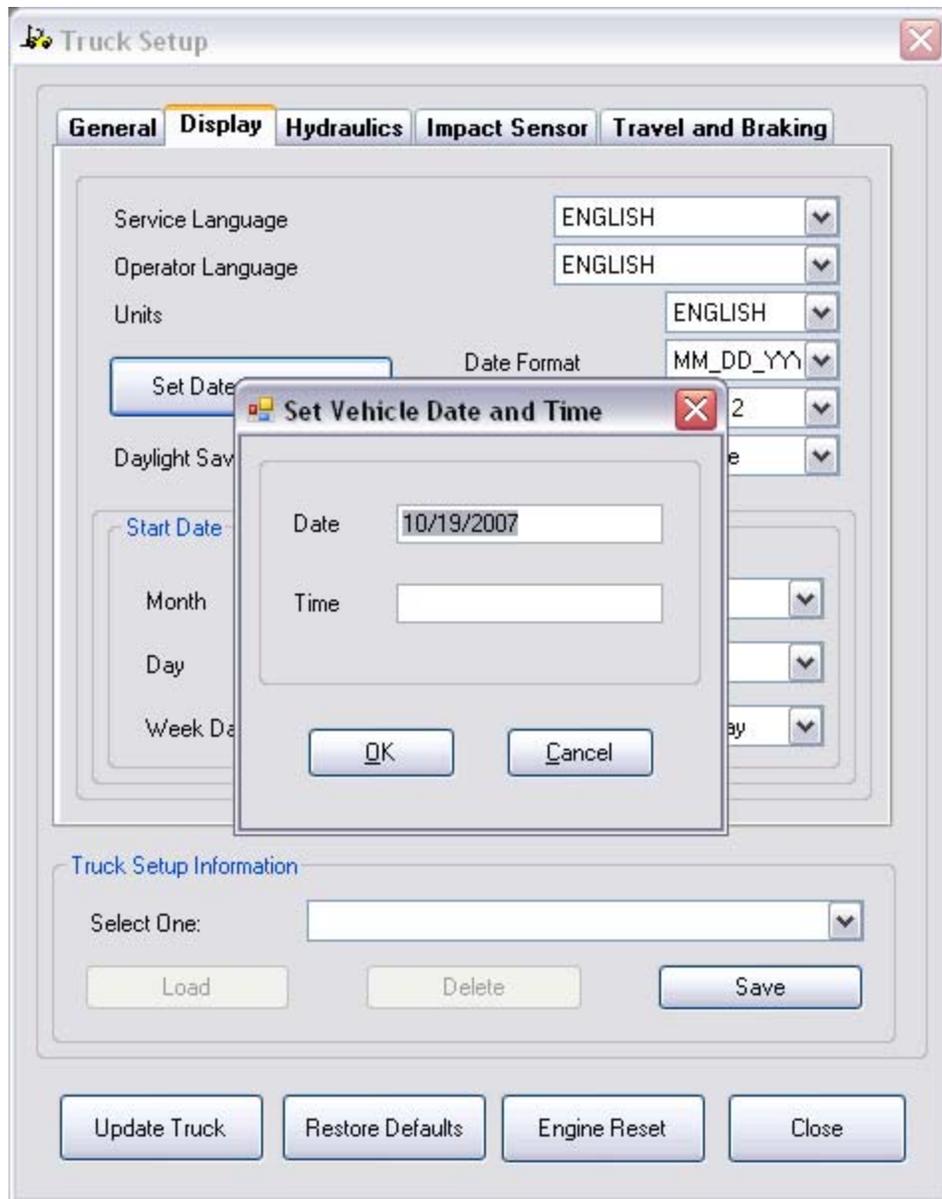


Figure 33: Truck Set-up window highlighting the Display tab

3. Click **Set Date and Time**.
4. Select the desired date from the **Date** field.
5. Specify the time from the **Time** field.
6. Click **OK**.

## Programming Menu

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The Programming menu will display any auxiliary programs that have been added to enable programming of various truck models. These programs are added via the Application Configuration menu.

*Note: To access features under the Programming menu, you must have a password with higher level access enabled.*

The PC service Tool will transition to an "Off-Line" state when the user launches a programming application.

Please see the "Truck Reprogramming Guide" for further information on these applications. This is located in the "Docs" folder in the PCST installation folder.

### ***Manufacturer Specific***

See Appendix G.

## Help Menu

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The Help menu contains the following items:

- Help Topics
- Troubleshooting Manual
- Demo Mode
- About

### ***Help Topics***

To view on-line help for the PC Service Tool, select **Help >> Help Topics** from the Help menu. Help contains a summary of the tool's features, and is useful for quick reminders about operation of the tool.

### ***Troubleshooting Manual***

To view the troubleshooting manual for a particular truck with the PC Service Tool, select **Help >> Troubleshooting Manual** menu. Note that you must be connected to a truck, or running in demo mode for the tool to select and start the correct troubleshooting manual.

The troubleshooting manual for your equipment is not included in the PC Service Tool; it must be purchased separately from your service provider. Once purchased in PDF format it can be downloaded to your computer.

Note: due to access restrictions in Windows Vista and Windows 7, this file cannot be placed in the "Program Files" directory where PCST is installed *if* it is downloaded from a client application, such as Internet Explorer. It is necessary to download the file to a temporary folder (or the desktop) and then separately move it into the "Docs" folder as noted below. You may need administrative privileges on your computer to do this.

Note: To save or update a Troubleshooting Manual, replace the file named "<Truck Type>-TMXX.pdf" located in the PC Service Tool's "Docs" folder where <Truck Type> is 1-8Ton, NGElectric, or other type, and XX is the language identifier. The default location for the "Docs" folder is "C:\Program Files\Hyster\PC Service Tool\Docs".

The following are some examples of Troubleshooting manual filenames; your truck type may have a different filename due to a different Truck Type:

<b>Truck Type</b>	<b>Language</b>	<b>Troubleshooting manual filename</b>
ICE – 1-8 Ton Premium	English	1-8Ton-TMEN.pdf
ICE – 1-8 Ton Premium	French	1-8Ton-TMFR.pdf
ICE – 1-8 Ton Premium	German	1-8Ton-TMDE.pdf
ICE – 1-8 Ton Premium	Italian	1-8Ton-TMIT.pdf
ICE – 1-8 Ton Premium	Spanish	1-8Ton-TMES.pdf
CANopen Electric Rider	English	NGElectric-TMEN.pdf
CANopen Electric Rider	French	NGElectric-TMFR.pdf
CANopen Electric Rider	German	NGElectric-TMDE.pdf
CANopen Electric Rider	Italian	NGElectric-TMIT.pdf
CANopen Electric Rider	Spanish	NGElectric-TMES.pdf
Base Truck	English	BaseTruck-TMEN.pdf
Base Truck	French	BaseTruck-TMFR.pdf
Base Truck	German	BaseTruck-TMDE.pdf
Base Truck	Italian	BaseTruck-TMIT.pdf
Base Truck	Spanish	BaseTruck-TMES.pdf
Electric Stand-up	English	3WSTD-TMEN.pdf
Electric Stand-up	French	3WSTD-TMFR.pdf
Electric Stand-up	German	3WSTD-TMDE.pdf
Electric Stand-up	Italian	3WSTD-TMIT.pdf
Electric Stand-up	Spanish	3WSTD-TMES.pdf
Motorized Pallet	English	EUPallet-TMEN.pdf
Motorized Pallet	French	EUPallet-TMFR.pdf
Motorized Pallet	German	EUPallet-TMDE.pdf
Motorized Pallet	Italian	EUPallet-TMIT.pdf
Motorized Pallet	Spanish	EUPallet-TMES.pdf

Motorized Double Pallet	English	EUPDouble-TMEN.pdf
Motorized Double Pallet	French	EUPDouble-TMFR.pdf
Motorized Double Pallet	German	EUPDouble-TMDE.pdf
Motorized Double Pallet	Italian	EUPDouble-TMIT.pdf
Motorized Double Pallet	Spanish	EUPDouble-TMES.pdf
Motorized Step Pallet	English	EUPPESTP-TMEN.pdf
Motorized Step Pallet	French	EUPPESTP-TMFR.pdf
Motorized Step Pallet	German	EUPPESTP-TMDE.pdf
Motorized Step Pallet	Italian	EUPPESTP-TMIT.pdf
Motorized Step Pallet	Spanish	EUPPESTP-TMES.pdf
Small chassis Order Selector	English	ACOSSM-TMEN.pdf
Small chassis Order Selector	French	ACOSSM-TMFR.pdf
Small chassis Order Selector	German	ACOSSM-TMDE.pdf
Small chassis Order Selector	Italian	ACOSSM-TMIT.pdf
Small chassis Order Selector	Spanish	ACOSSM-TMES.pdf
Premium Order Selector	English	ACOSPR-TMEN.pdf
Premium Order Selector	French	ACOSPR-TMFR.pdf
Premium Order Selector	German	ACOSPR-TMDE.pdf
Premium Order Selector	Italian	ACOSPR-TMIT.pdf
Premium Order Selector	Spanish	ACOSPR-TMES.pdf
Straddle Order Selector	English	ACOSST-TMEN.pdf
Straddle Order Selector	French	ACOSST-TMFR.pdf
Straddle Order Selector	German	ACOSST-TMDE.pdf
Straddle Order Selector	Italian	ACOSST-TMIT.pdf
Straddle Order Selector	Spanish	ACOSST-TMES.pdf
Furniture Order Selector	English	ACOSFR-TMEN.pdf
Furniture Order Selector	French	ACOSFR-TMFR.pdf
Furniture Order Selector	German	ACOSFR-TMDE.pdf
Furniture Order Selector	Italian	ACOSFR-TMIT.pdf
Furniture Order Selector	Spanish	ACOSFR-TMES.pdf

### ***Demo Mode***

This feature allows the operation of the PC Service Tool to be displayed and explored without connection to an actual truck. The tool provides simulated data, rather than loading it from the truck.

Select the type of truck you wish to simulate from the Demo mode menu.

## ***About***

Click the *About PC Service Tool* item from the Help menu. Version, build and copyright information are displayed in the About dialog. Click **OK** to close the **About** window.



*Figure 34: About window*

## Appendix A – Licensing Agreement

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## Appendix D – PC Service Tool Troubleshooting Guide

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The PC Service Tool, while designed to be simple to use, does employ some complex PC and data communication technology inside the program. Due to the extremely wide variation among PCs and their configuration, and the wide variety of trucks serviced, some problems could arise that were not seen in the development of the tool.

This Troubleshooting Guide is provided to help address some of the most common problems found when using the tool. For additional questions or issues, please contact your service & support organization.

Problem Seen	Potential Cause / Resolution
Truck not listed in <b>File &gt;&gt; Connection &gt;&gt; Unit Code</b> dialog box	Check again carefully. Note that truck unit code is the first 4 digits of the serial number
PCST displays error dialog that it cannot find or connect to truck	The CAN adapter may not be installed properly. Most of these adapters have complicated installation procedures, involving multiple steps, with the installation of multiple files. Installation is much more involved than a typical USB module on a PC. Follow the directions closely and contact the manufacturer for any model-specific directions.
PCST takes a long time (more than 20 seconds) to connect, open or close certain menus	Depending on the amount of data moving on the truck's internal CAN bus, it can take the PCST quite some time to gather, or write out the data required for diagnosis. This time period can also vary. In some cases, a very extensive amount of data may need to be gathered for thorough diagnosis. A bad or "noisy" connection can extend this time significantly. Ensure a solid mechanical connection to the truck's CAN bus.
PCST stops responding, or seems locked up.	CAN connection interrupted. Ensure solid connection. Remove and re-insert CAN Adapter USB connector. Restart PCST.
Custom Data Monitor or Strip Chart responding very slowly. Strip Chart "jumps" between readings.	Too many items being monitored. Reduce the number of parameters to minimum necessary. Also, some parameters do not respond quickly. It is suggested that these be viewed in the Custom Data Monitor rather than the strip chart.
Links from fault code display to Troubleshooting Manual don't work, or loading Troubleshooting Manual from <b>Help</b> doesn't work	TS manual not loaded on PC, or in wrong directory. See Guide for proper file location.

## **Appendix E – Special Considerations for Windows 7**

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Windows 7 implements a new system for protecting the integrity of files in the “Program Files” folder. In general, this causes files created by programs like PC Service Tool to actually be written in directories other than Program Files. For this reason, some PCST files that were previously saved under the Program Files folder are now saved on the desktop (in a desktop folder called “PCST Data”). However, this behavior, and the location of the files will vary, depending on the user’s access rights.

As an example, if PCST is installed by a System Administrator, but later run by a “Standard User”, some of the files generated by PCST will be placed in a directory other than “Program Files”. Generally, those files will be placed under the “Users” folder, in the directory that corresponds to the “username”. If a particular user’s name was “JohnSmith”, the PCST generated files would be written in the directory C:\Users\JohnSmith\AppData\Local\VirtualStore\Program Files\...

Windows Vista implements some, but not all of these file access changes. Please see your System Administrator for questions regarding the behavior of your specific system.

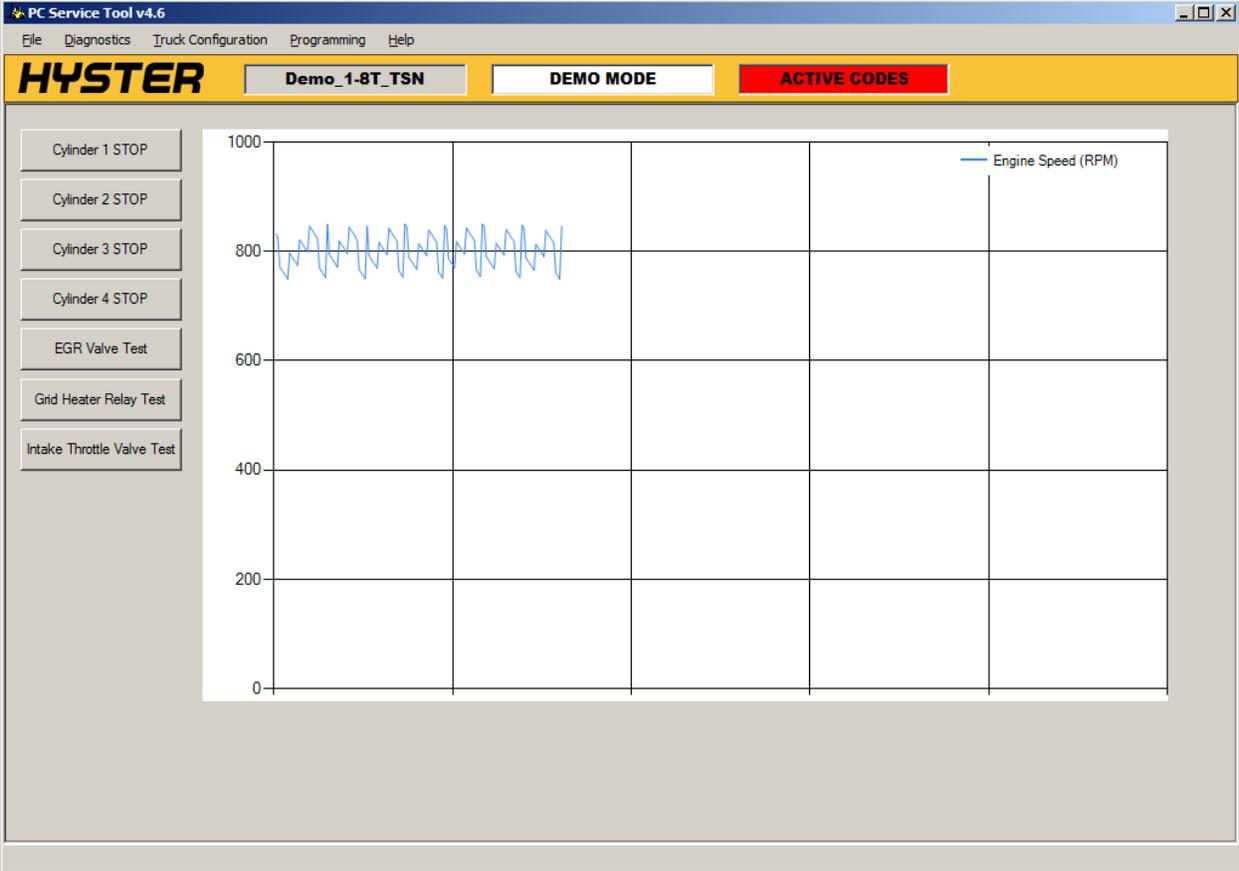
## **Appendix F – Diagnostic Tests**

---

PCST v4.7 includes some diagnostic functionality that can be used with Kubota type diesel engines present in some trucks. The Diagnostic Tests menu item will appear under the Diagnostics menu if the functions are available for the type of truck connected. If the Diagnostic Tests submenu doesn't appear these items are not available.

Diagnostic Tests contains two submenu items – Diagnostic Toggles and Fuel Pump Learning.

# Diagnostic Toggles



The Diagnostic Toggles form has several buttons that are used to Start/Stop different tests. When a test is activated by pressing a button, the appropriate parametric data items are chosen and begin plotting in the chart area. Each test times-out automatically as appropriate.

Cylinder (1-4) Stop – When active these tests turn off fuel to a cylinder.

EGR Valve Test – When active this test exercises the EGR valve.

Grid Heater Relay Test – When active this test turns the Grid Heater (Glow) relay on and off three times.

Intake Throttle Valve Test – When active this test exercises the intake throttle valve.

## Fuel Pump Learning

Status	Parameter	Value	Target	Unit
●	Vehicle Speed	-1	0	KPH
●	Engine Speed	831	700 - 900	RPM
●	Engine Coolant Temperature	70	50 - 90	°C
●	Fuel Temperature	35	20 - 60	°C
●	Neutral SW	1	1	
●	Accelerator Pedal %	5	0 - 5	%
	ECU Battery Voltage	13	--	Volts
	Fuel Pump Correction Value	0	--	mA
	<b>Fuel Pump Learning Condition</b>	<b>Fuel Pump Learn Complete</b>	--	

Start

The fuel pump used with Kubota engines present on some trucks has the ability to recalibrate (or learn) a setting. This form marshals the process by displaying the conditions necessary to start the operation and report progress. A red lamp indicator next to a parameter indicates that a prerequisite state has not been met – the target column in the form indicates the acceptable range for each parameter. A green lamp indicates that a reading is within range. A parameter without a lamp indicator is informational only and has no target range. When all lamps are green the Start button becomes available and the operation can begin.

## **Appendix G – Manufacturer Specific**

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PCST v4.7 adds more functionality specific to Kubota type diesel engines present in some trucks. The Manufacturer Specific menu item will appear under the Programming menu if the functions are available for the type of truck connected and the user has the correct level of PCST access (Programmer access).

The Manufacturer Specific menu has several submenu items – Injector Compensation, Enable Parked Regen, Injection Timing Correction, and Reset DPF Settings.

## Injector Compensation

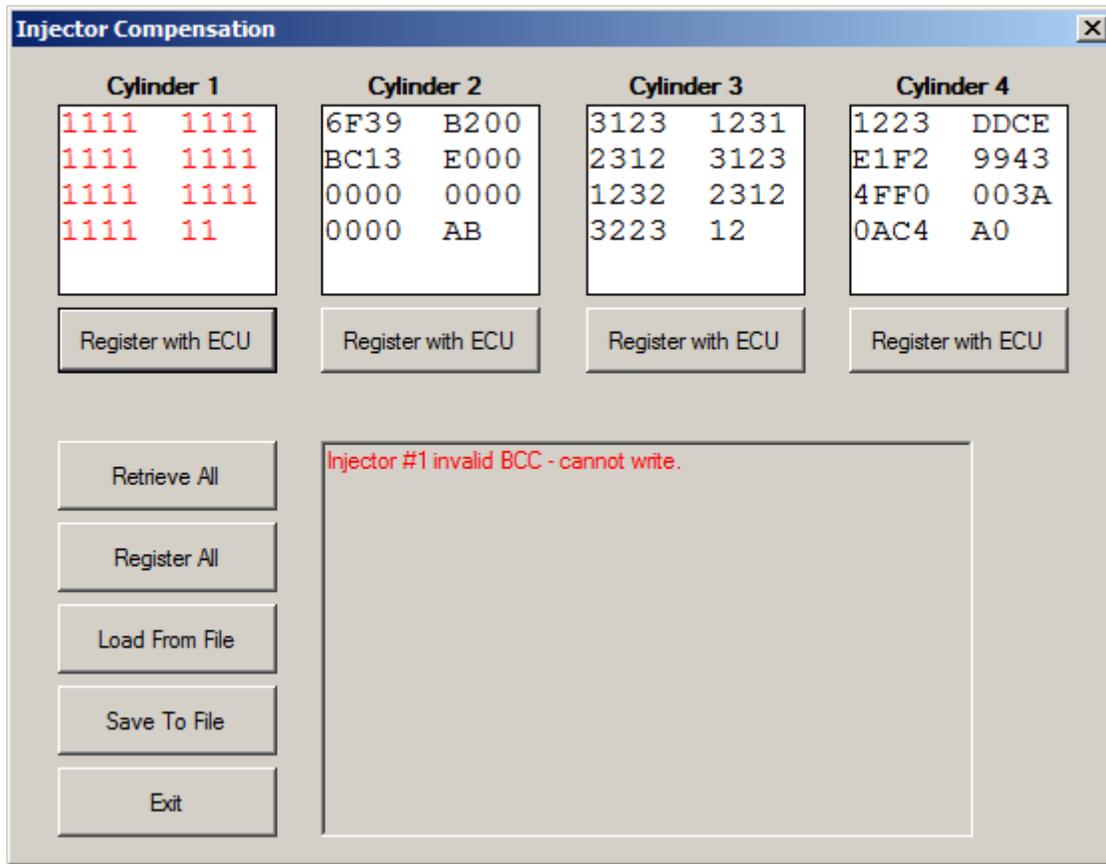
Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
1223 DDCE	6F39 B200	3123 1231	1223 DDCE
E1F2 9943	BC13 E000	2312 3123	E1F2 9943
4FF0 003A	0000 0000	1232 2312	4FF0 003A
0AC4 A0	0000 AB	3223 12	0AC4 A0

Register with ECU Register with ECU Register with ECU Register with ECU

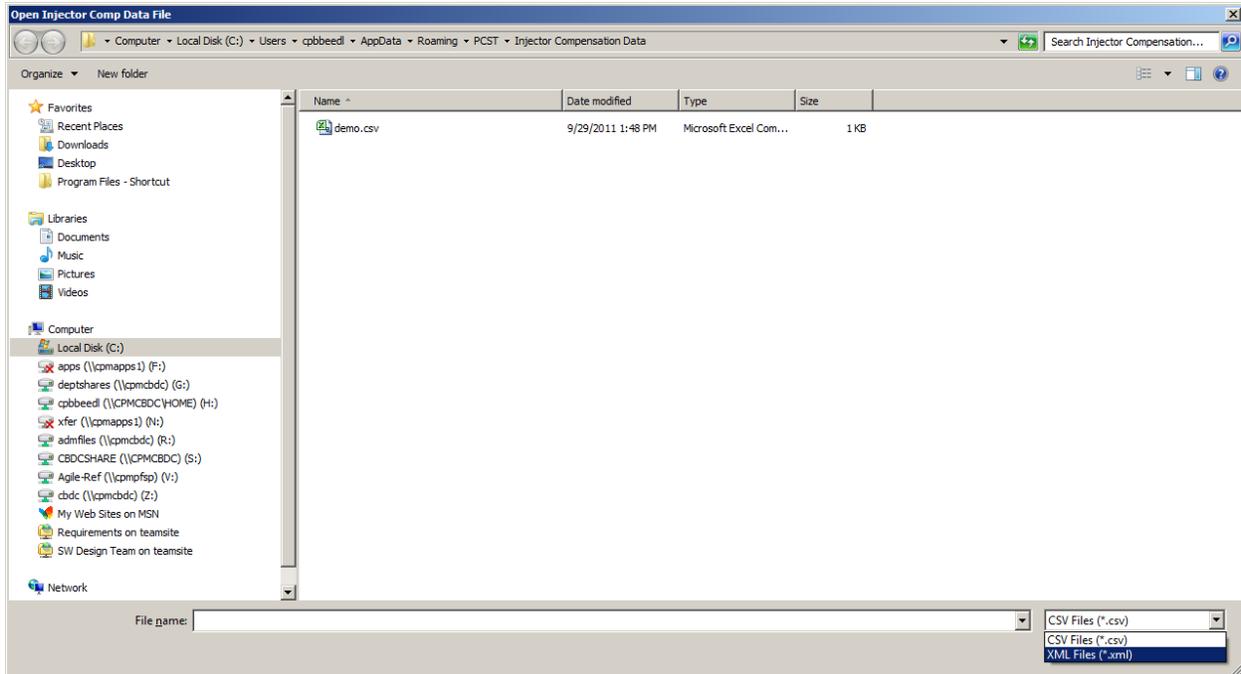
Retrieve All Register All Load From File Save To File Exit

Injector #1 Data Written  
Injector #2 Data Written  
Injector #3 Data Written  
Injector #4 Data Written

Calibration settings specific to each injector are stored in the ECU for Kubota engines. If an injector is changed the settings must be programmed into the ECU with this form. The Register with ECU buttons under each cylinder are used to send the data entered in the box to a specific injector. To send all injectors at once use the Register All button. Retrieve All will read the settings from the ECU. It is possible to save and retrieve the values in the boxes via csv files with the Load and Save buttons.



The data entered in the boxes contains an internal checksum that is analyzed on entry. A box with red text indicates invalid data and will not be written to the ECU.



It is possible to retrieve the original settings in an xml format from the manufacturer. To use one of these files select XML files (\*.xml) from the drop down. The file will load the injector compensation values into the appropriate boxes as well as display version information in the form. The FIT parameter value can be viewed here as well.

**Injector Compensation** [X]

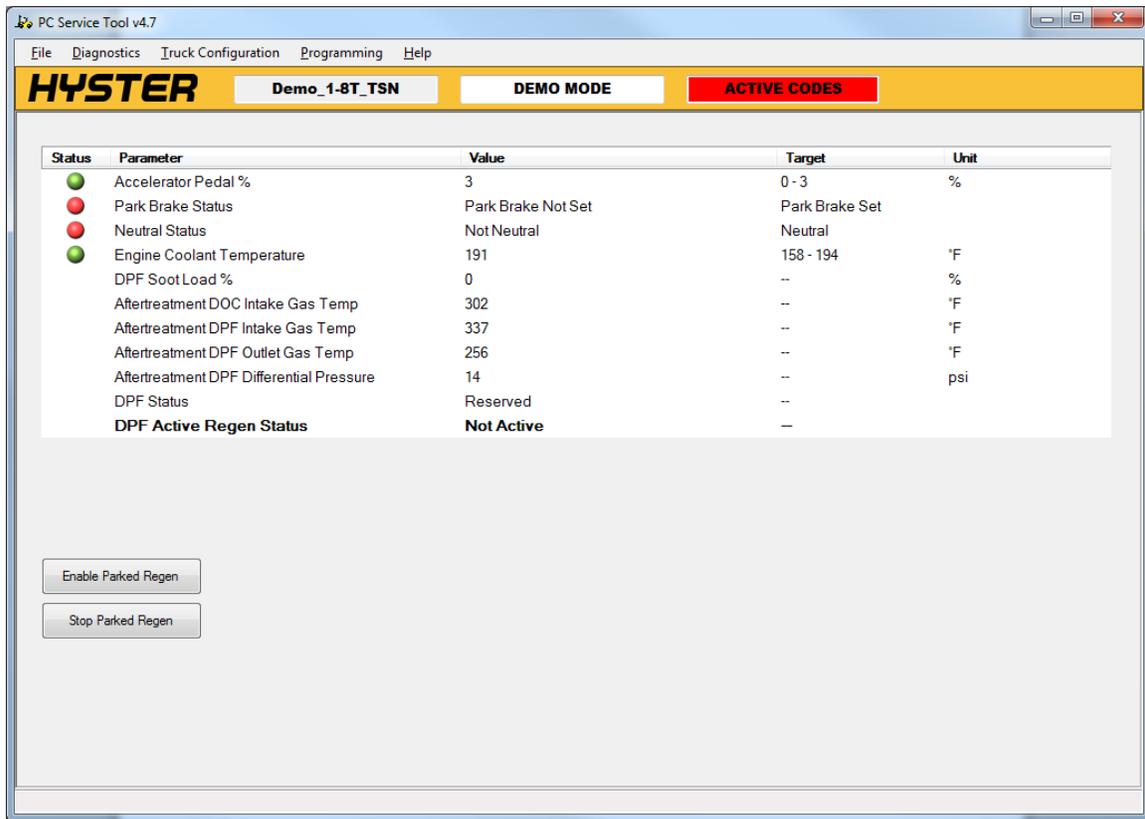
Cylinder 1	Cylinder 2	Cylinder 3	Cylinder 4
6F3D 0000	6F22 0000	6F2A E615	6F00 0000
0014 0000	000D 0000	0017 0000	0000 0000
0000 0000	0000 0000	0000 0000	0000 0000
0000 46	0000 40	0000 A1	0000 6F

```

Injector #3 Data Written
Injector #4 Data Written
**Factory File**
BuildDate: 2011-01-14
SerialNumber: BA1234
ModelName: V38DICR-TIE3-Y2
ModelCode: 1J57421000
QR1: 6F3D0000001400000000000000000046
QR2: 6F220000000D00000000000000000040
QR3: 6F2AE61500170000000000000000A1
QR4: 6F000000000000000000000000006F
FIT: .1
EIN: BA1234

```

## Parked Regeneration



If the truck is configured with an E4 Kubota engine and DPF (particulate filter), the Parked Regen menu item will appear. This form allows for a parked regeneration to be launched if the conditions are met. Red lamps indicate conditions that must still be met before the process can begin. A yellow lamp indicates a recommended target range, but will not prevent the operation from launching. Parameters with no lamp are informational only.

PC Service Tool v4.7

File Diagnostics Truck Configuration Programming Help

**HYSTER** Demo\_1-8T\_TSN DEMO MODE ACTIVE CODES

Status	Parameter	Value	Target	Unit
●	Accelerator Pedal %	3	0 - 3	%
●	Park Brake Status	Park Brake Not Set	Park Brake Set	
●	Neutral Status	Not Neutral	Neutral	
●	Engine Coolant Temperature	169	158 - 194	'F
	DPF Soot Load %	81	--	%
	Aftertreatment DOC Intake Gas Temp	385	--	'F
	Aftertreatment DPF Intake Gas Temp	315	--	'F
	Aftertreatment DPF Outlet Gas Temp	350	--	'F
	Aftertreatment DPF Differential Pressure	24	--	psi
	DPF Status	Regen Not Needed	--	
	<b>DPF Active Regen Status</b>	<b>Not Active</b>	--	

Enable Parked Regen

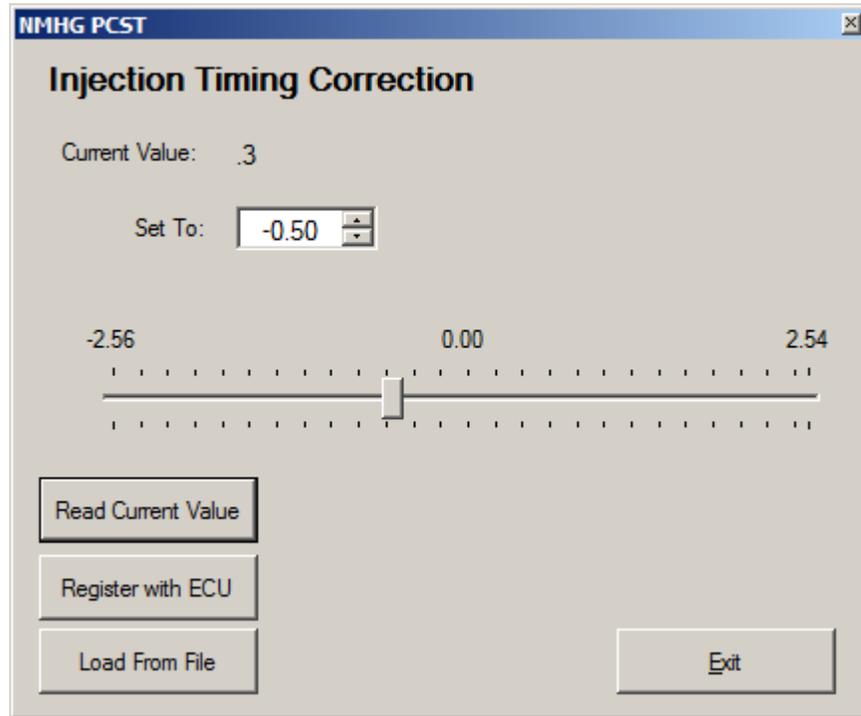
Stop Parked Regen

Press This Display Button To Begin



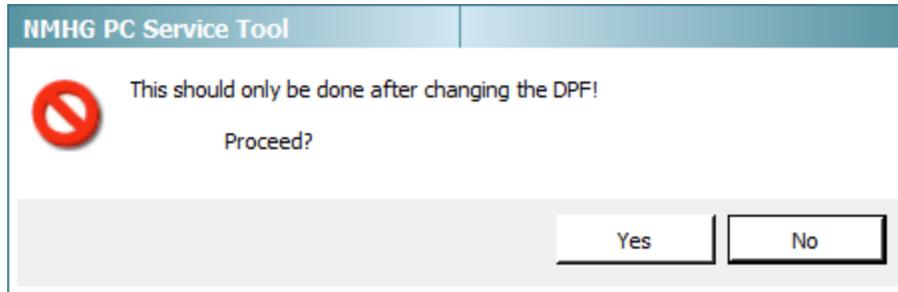
Once conditions have been met and the Start button pressed, the user will be instructed to press a button on the display. After the process has started the user may monitor the operation and/or cancel with the Stop button.

## ***Injection Timing Correction***



Injection timing correction is a parameter that must be set when the crankshaft on a Kubota engine has been changed. See DTM for details on this process. This parameter is known as FIT in the manufacturer file discussed previously.

## Reset DPF Settings



This operation is used after a DPF has been changed and the settings associated with it need to be cleared. See Diagnostic and Troubleshooting Manual for details, but in general this should only be done after changing a DPF.

