

ServiceRanger™ 4

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Powering Business Worldwide

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SUPPORT

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Welcome!

Eaton has become an innovator and leader in diagnostic and service tools for the commercial vehicle market. ServiceRanger™ is the only recommended tool for servicing an unbeatable combination of the best drivetrain, hybrid power and safety solutions from Eaton Corporation.

ServiceRanger is a computer-based electronic service and diagnostic program that provides access to your Eaton electronic products. With ServiceRanger, you can increase uptime, save money, perform accurate repair procedures, all while increasing productivity and profits.

Some of the major benefits of using ServiceRanger:

- View information about the connected ECUs
- View active and inactive diagnostic fault codes
- View data parameters in real time
- View the current configuration of a product
- Change product configurations
- Program (reflash) product software
- Print reports and diagnostic results

Introduction to ServiceRanger

ServiceRanger is a computer software program developed by Eaton to diagnose and service commercial vehicle components manufactured by Eaton. ServiceRanger is designed to communicate with vehicle component controllers via the vehicles diagnostic link connection. ServiceRanger complies with the SAE surface vehicle recommended practices for J1587 and J1939 vehicle communications, as well as the TMC RP1210-B communications standard developed for vehicle link adapter communications.

The following products are supported:

- Eaton AutoShift/UltraShift™ Gen2 Transmissions
- Eaton Lightning Transmissions
- Eaton AutoShift/UltraShift™ Gen3 Transmissions
- Eaton UltraShift *PLUS* Transmissions
- Eaton Hybrid Electric Systems
- Eaton Hydraulic Launch Assist
- Fuller Advantage™ Series

Important: The license you purchased determines what products are supported by your copy of ServiceRanger. Please consult your invoice or order information for more information.

Notes:

- Eaton AutoShift Gen1 and Bendix VORAD EVT-300 are not supported by ServiceRanger 4. ServiceRanger 2 is required for servicing these products.
- Bendix VORAD VS-400 system is no longer supported by ServiceRanger. Contact your Bendix representative for more information.

Getting Started

System Requirements

To successfully install and operate ServiceRanger, your computer must meet the following system requirements:

- Platform: IBM or 100% Compatible
- Operating System (32 and 64-bit versions):
 - Microsoft Windows® XP with Service Pack 3
 - Microsoft Windows® Vista®
 - Microsoft Windows® 7
 - Microsoft Windows® 8.x
- Processor: 1.8 GHz or greater, dual core or greater
- RAM Memory: 2 GB or greater
- Hard Drive: 40 GB or greater
- Display: SVGA (1024 x 768 pixels) Color
- Internet: Broadband Internet connection required for license validation and updates
- Required Software: Microsoft .Net Framework 4.0

In addition, the computer must meet the system requirements for your communication adapter. For more information about the communication adapter hardware requirements, please contact the communication adapter manufacturer.

Note:

- When installing ServiceRanger, you must have administrator user permissions to install and activate the software on your computer. If you are unsure about your user permissions, consult with your organization's computer support personnel before installing this software.

Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the United States and/or other countries.

Activation

When you purchase a software product from Eaton, you are issued a serial number that represents your license to use that software. You must activate your software product to confirm that each copy of the product is not installed on more than the limited number of computers that is indicated in the software end user license agreement (EULA).

Activation is intended to protect your rights as a consumer to use the license to its full extent, and it is also intended to protect Eaton's rights as a software developer. Only a genuine software license entitles you to critical updates and technical support. You may not be able to use certain versions of this software if it is not activated.

An Internet connection and registration are required for software activation and activation must be completed prior to use of the software product.

When the installation is complete and you start the ServiceRanger program for the first time, the software is locked. To unlock the software you must first enter your serial number you obtained during the product purchase and perform the activation process.

SR Activation

SERVICERANGER 4

Activate your software
In order to continue you must activate your license. Activation verifies you are using a fully licensed version of ServiceRanger and are eligible for updates and support.

During the registration process the activation server will be notified. An active Internet connection is required.

[License Agreement](#)
[Privacy Policy](#)
[Get Help](#)

Name: Joe Smith
Organization: Eaton
Serial Number:
Order Number: 123456
Computer Name: Service Bay #1

Warning: Activating your license on this computer may prevent you from installing the software on additional computers. Please consult your licensing agreement for license usage and restrictions before continuing.

The information you enter is used to make it easier for you to manage your licenses on the customer portal where you purchased your license. The following fields are required for the activation process to be successful:

- Name
- Organization

- Serial Number
- Order number
- Computer name

Failure to properly register and activate this software, or any unapproved distribution or use of this software is strictly prohibited by Eaton Corporation and may be considered a violation of the Software License Agreement.

License Validation

With an active ServiceRanger 4 license, your PC must connect to the Internet at least once every 45 days to re-validate the license.

As the 45 day validation end date approaches, an informational message will be displayed starting at 10 days and then each day until the required validation is performed. If the validation period has passed, ServiceRanger 4 will cease to function and you will be required to connect to the Internet to re-validate the license.

If your PC is connected to the Internet, the license validation will occur automatically and no user interaction is needed. ServiceRanger 4 does not need to be running for the validation process to occur.

Subscription and Renewals

Your license is valid for a period of time based on the package you purchased - most often a 1 year period. This subscription period begins on the day you purchased your license. During the subscription period, you are entitled to any updates and new features that are part of your purchased package free of charge.

You must renew your license within the renewal period, which begins 90 days prior to the expiration date. In addition, there is a 30 day grace period after the expiration in which you can renew your existing license. After this period, you will be required to purchase a new license at full cost.

To renew your subscription, return to your [user account](#) and review your current licenses. Once you have purchased your renewal, ServiceRanger will automatically update the expiration date the next time it connects to the Internet. Your license and subscription information can be viewed in ServiceRanger's settings screen. See "Settings" on page 92

Vehicle Communication Adapters

ServiceRanger complies with the SAE Surface Vehicle Recommended Practices for J1587 and J1939 vehicle communications, as well as the communication standards as defined by the Truck Maintenance Council (TMC) recommended practice RP1210-B for vehicle link adapter communications.

ServiceRanger requires the use of a vehicle adapter that is RP1210B compliant and has device drivers that are compatible with the computers operating system and external communications ports (ie: USB, Serial, etc.). Contact your communication adapter manufacturer for information on driver installation, as well as operating system and ServiceRanger compatibility questions.

Eaton periodically posts information about known communication adapter compatibility issues with ServiceRanger on Roadranger.com.

Eaton Products

ServiceRanger has features that support diagnosing the entire vehicle, but it also has additional features especially for Eaton products. It is important that you understand the difference between an Eaton product and other products installed in the vehicle.

An Eaton product is a product manufactured and sold by Eaton and is designed to work with ServiceRanger (e.g. AutoShift/UltraShift transmission). These products contain special, or proprietary, protocols that allow extra features above and beyond the normal SAE protocols. Examples of these features include special product tests that allow you to turn on and off actuators, or view special diagnostic data such as snapshot and vehicle performance analysis information.

A vehicle component, such as an engine or ABS system, that complies with either the SAE J1587 or J1939 communication link may work with some but not all ServiceRanger functions. Examples include diagnostic fault codes and components data monitor parameters such as road or engine speed.

Getting Started with ServiceRanger

Before connecting to the vehicle with ServiceRanger make sure the vehicle communication adapter is properly connected to the vehicles diagnostic connector and to the computers communication port (e.g. USB, Comm1, etc). Verify the communications adapter is powered. If the adapter does not have a power indicator lamp it may be necessary to use a volt meter to verify the adapter is getting power from the vehicles diagnostic connector. Finally, turn the vehicles ignition key to the on position. Refer to OEM service information for troubleshooting power issues.

Starting ServiceRanger

Once the communications adapter is properly connected to the vehicle and the computer, start ServiceRanger by double-clicking the ServiceRanger shortcut icon located on the computers desktop screen. You can also start ServiceRanger from the shortcut located in the "Eaton | ServiceRanger 4" folder in the Windows Start programs menu.

Working Offline

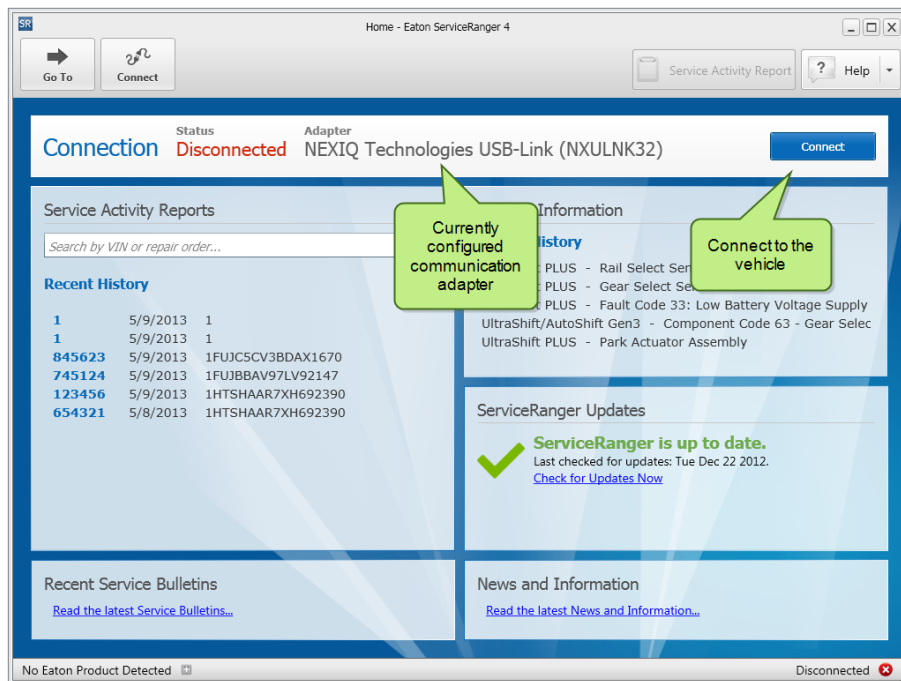
When ServiceRanger has successfully started the main home screen appears. This screen contains quick reference information including links to recent service reports, update information, and service literature. When not connected to the vehicle (offline mode), the following features maybe available, depending on your version of ServiceRanger.

- **Service Reports** - Keep track of service activity automatically and improve communication between you and your customer and with Eaton customer support agents. See "Service Reports Overview" on page 83
- **Product Information** - Find the information you need to quickly troubleshoot, remove and install components on your Eaton products. See "Product Information Overview" on page 78
- **Settings** - Edit your preference settings for ServiceRanger. See "Settings" on page 92

Connecting to the Vehicle

Near the top of the screen is information related to the currently configured vehicle communication adapter and an option to connect to the vehicle. Selecting the **Connect** button automatically starts vehicle communications and begins the product detection process.

Getting Started

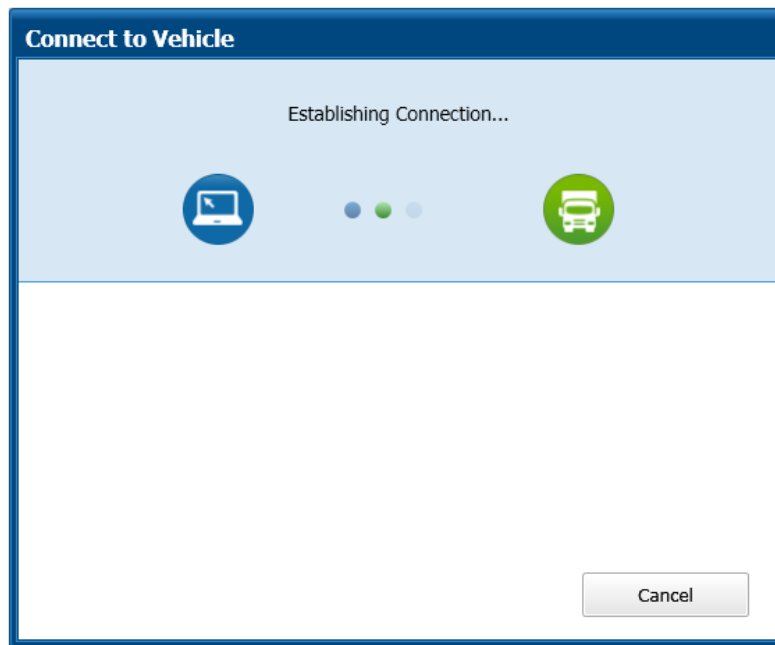


Connections

The connection process is an important first step when using ServiceRanger. The process includes several steps, which are detailed below, that are automatically performed by ServiceRanger. A failure at any point is displayed for quick troubleshooting.

The Connection Process

When you select **Connect**, you will be presented with the following dialog:



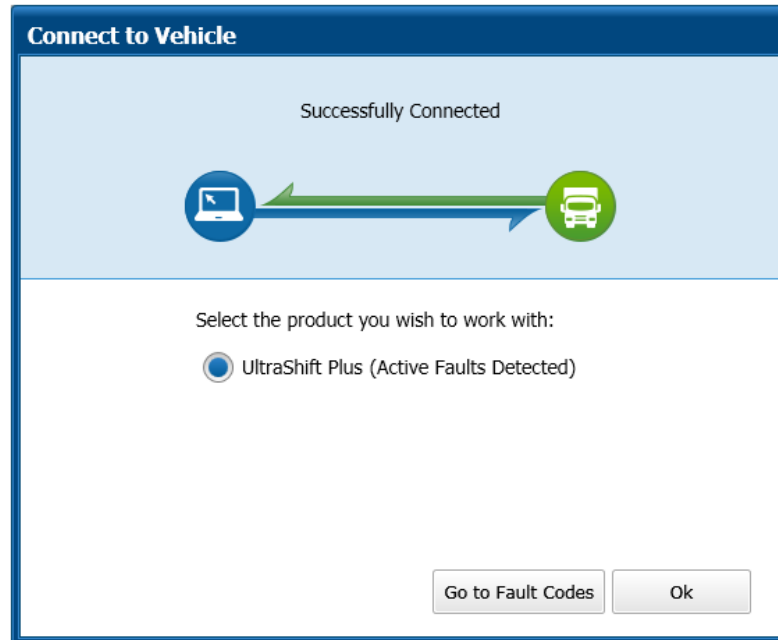
At this time, ServiceRanger is attempting to make a connection to:

1. Communication adapter driver on your computer.
2. Then to the communication adapter hardware,
3. Then to vehicle communication messages,
4. Finally, detection of Eaton products.

Depending on the information received, you will be presented with many different options, each one described below:

Successful Eaton Product Detection

If all steps were successful, then you will be presented with the Product Detection dialog. Depending on your vehicle configuration, each Eaton product detected is displayed.



Select the Eaton product you want to work with, and select **Ok** to return to the previous screen. To view fault codes, select **Go to Fault Codes**.

Note: You can only work on one Eaton product at a time. If you have multiple Eaton products on the vehicle, you must change the active Eaton product by using the Product Connection dialog. See "Eaton Product Connection Status" on page 17

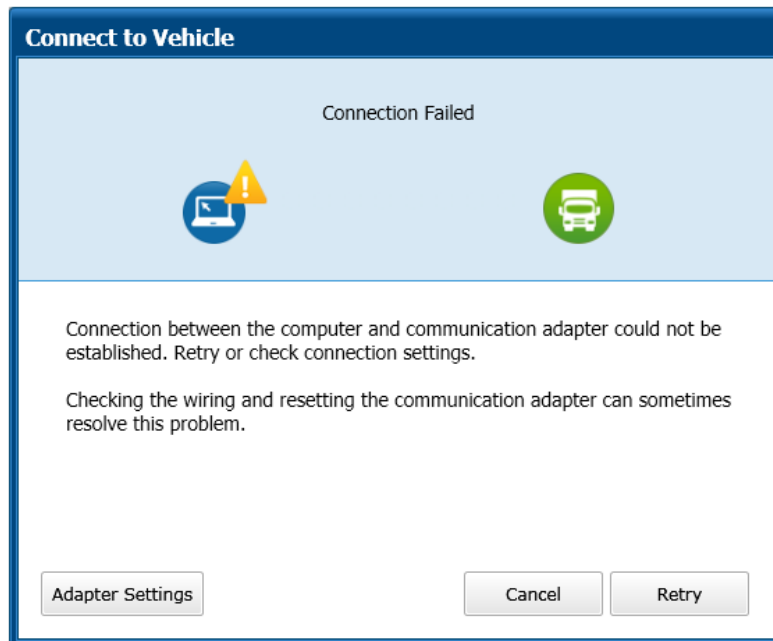
Getting Started

Connection Issues

The failed to connect messages are displayed when you have started the connection process but ServiceRanger was unable to make a connection to the communication adapter, the vehicle, or an Eaton product. Depending on the communication adapter capabilities, several different error messages could be displayed and are detailed below.

Connection Failed - Communication Adapter

When this message is displayed, the issue is most likely to be between your computer and the communication adapter.

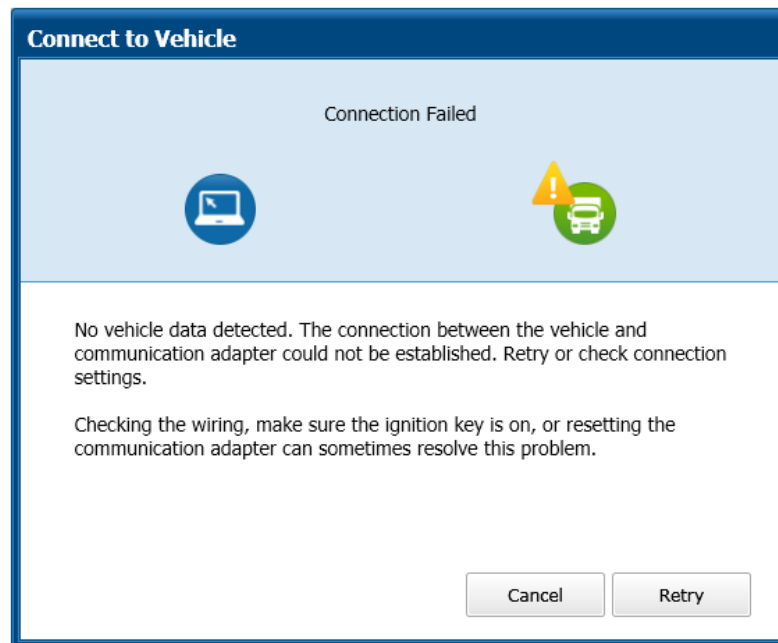


Notes:

- Check the cable connections (e.g.USB cable unplugged).
- Make sure the communication adapter is powered.
- Make sure the correct driver is configured for the adapter you are using.

Connection Failed - No Vehicle Data

When this message is displayed, the issue is most likely between your communication adapter and the vehicle. ServiceRanger was able to make a connection to the communication adapter; however, there were no vehicle messages.



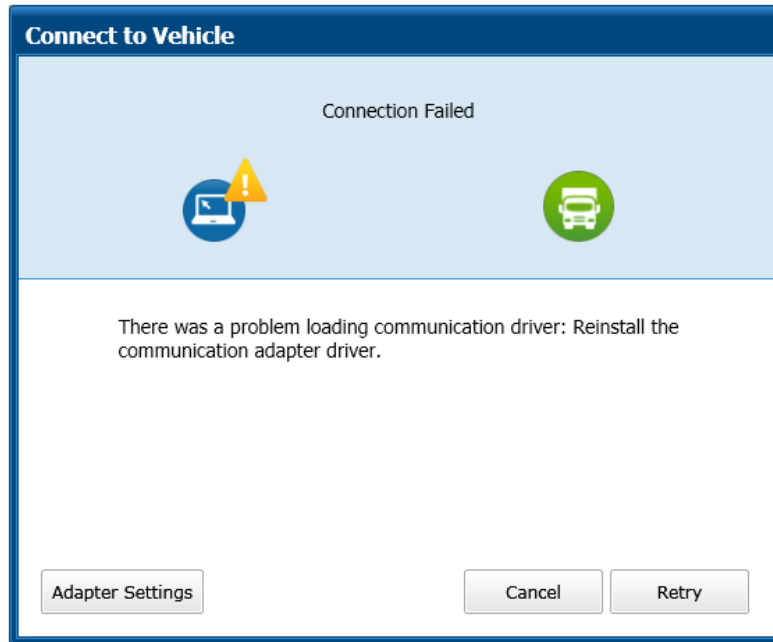
Notes:

- Check to make sure the ignition key is in the ON position.
- Check the vehicle communication data link wiring.

Getting Started

Connection Failed - Communication Adapter Driver

This message indicates ServiceRanger was not able to locate a properly installed RP1210 communication adapter driver.



Notes:

- Reinstall the communication adapter driver that was provided by the manufacturer.
- Make sure ServiceRanger is configured properly for the communication adapter you are using. See "Connection Settings" on page 92

No Eaton Product Detected

This message indicates ServiceRanger successfully connected to the vehicle and was able to read data link messages; however, it did not detect an Eaton product.



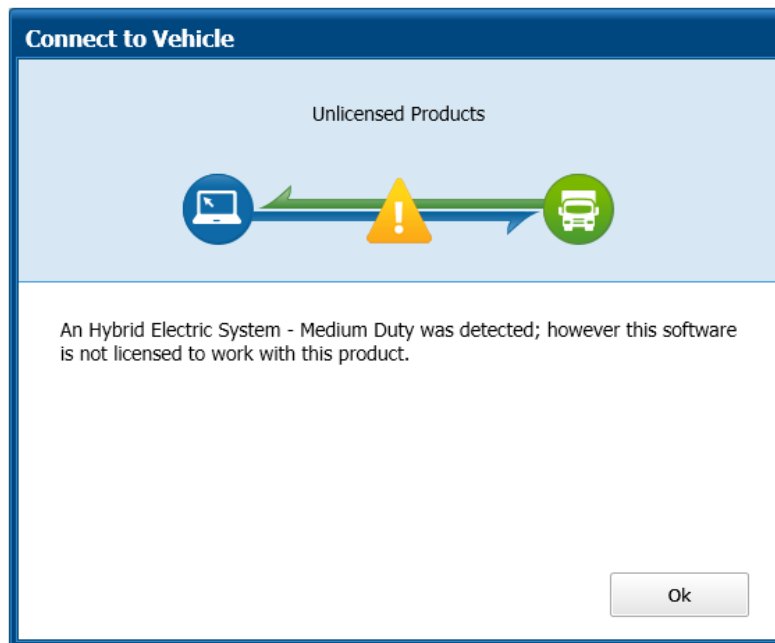
Notes:

- Power and ground issue to the Eaton product.
- Vehicle data link wiring between the Eaton product and diagnostics connector.
- Inoperable Eaton product ECU.
- No Eaton product installed in the vehicle.

Getting Started

Unlicensed Product

This message indicates the vehicle is equipped with an Eaton product that is not supported by this version of ServiceRanger. You will need to upgrade to the correct version of ServiceRanger that supports this product.



Notes:

- Selecting Ok will disconnect ServiceRanger from the vehicle.

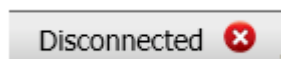
Status Bar Messages

In addition to the main connection dialog, the status bar contains useful information regarding the connection status. The status bar has two important indicators, the vehicle link status and detected Eaton products.

Vehicle Link Status

Disconnected

The disconnected message is displayed when you either first start ServiceRanger and have not yet connected OR you have disconnected manually from the vehicle by selecting **Disconnect** on the navigation menu.



Connected

The connected message is displayed when ServiceRanger has made a successful connection to the vehicle on at least one communication link (J1587 or J1939).

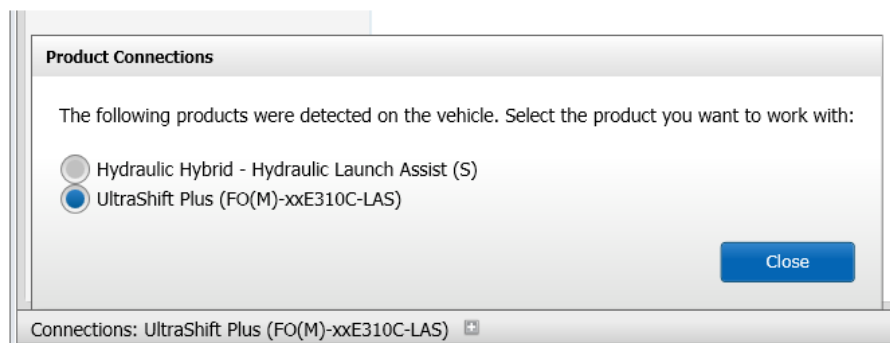


Note:

- You can see a detailed connection message by selecting the connection icon with your mouse pointer.

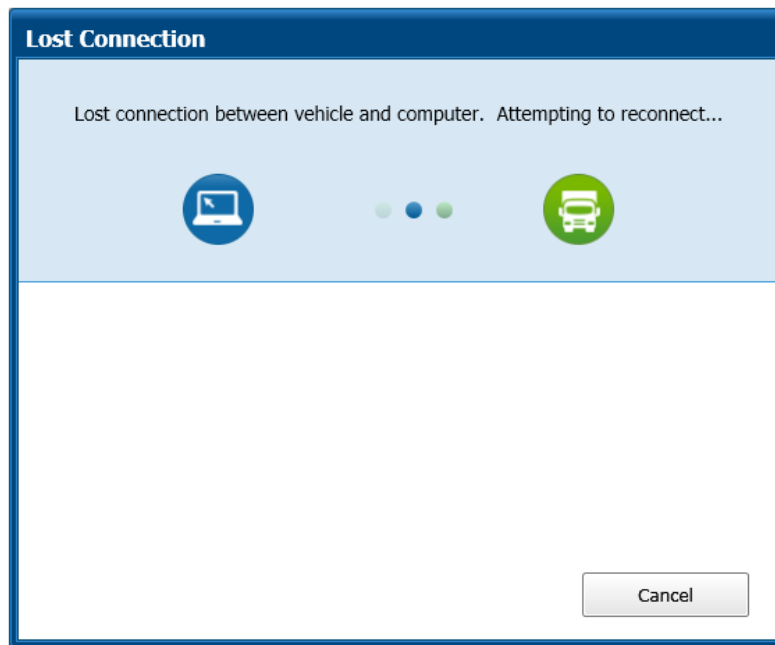
Eaton Product Connection Status

The product connection status is displayed on the lower left corner of the status bar and indicates the product and model that is currently selected. In addition to displaying the current product, you can select the product description to view more information and change the current selected product.



Lost Connection

The lost connection message is displayed when a valid connection was established to the vehicle and then lost. The most likely cause lies between the communication adapter and vehicle.



Note:

- ServiceRanger automatically retries to establish the connection to the vehicle.

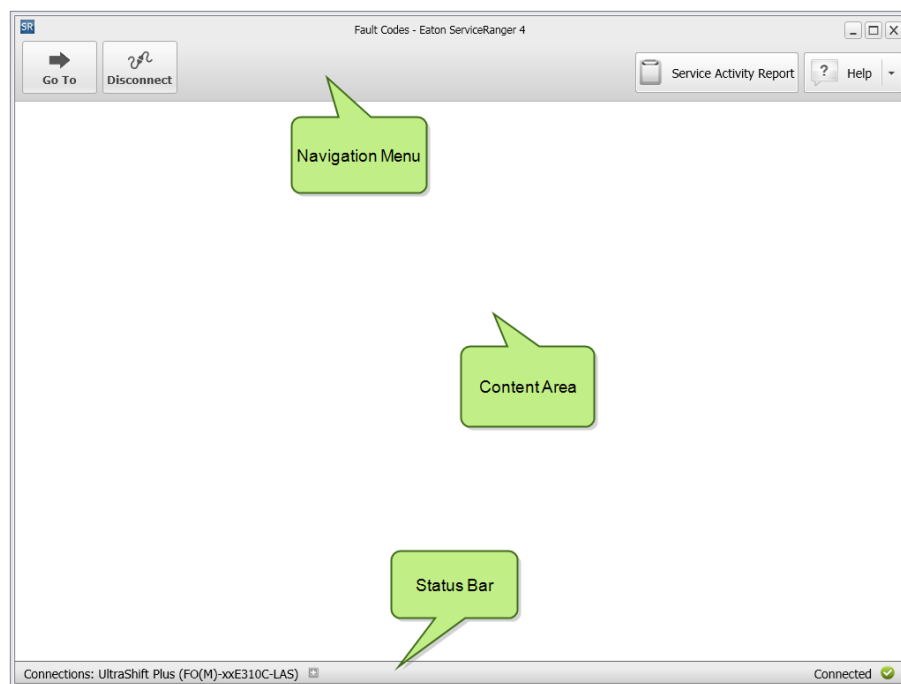
Tour of the Workspace

Workspace

ServiceRanger's workspace is a flexible, modern user interface and gives you several options allowing you to work the way that you want. It is important that you become familiar with the application. The more you learn about its potential, the better you can take advantage of its features, tools, and options.

The user interface consists of the following three major sections:

- **Navigation Menu** - Located on the top of the interface, it allows you access to the main functions of the software. Examples include fault code viewing, data monitor and changing configuration settings just to name a few.
- **Content Area** - This area displays the content associated with each shortcut on the navigation menu. This is the main work area where you will be accomplishing your tasks. For example, this is the area where fault codes or product software are displayed.
- **Status Bar** - At the very bottom of the interface is a status bar. The most notable use for the status bar is to see the vehicle connection status.



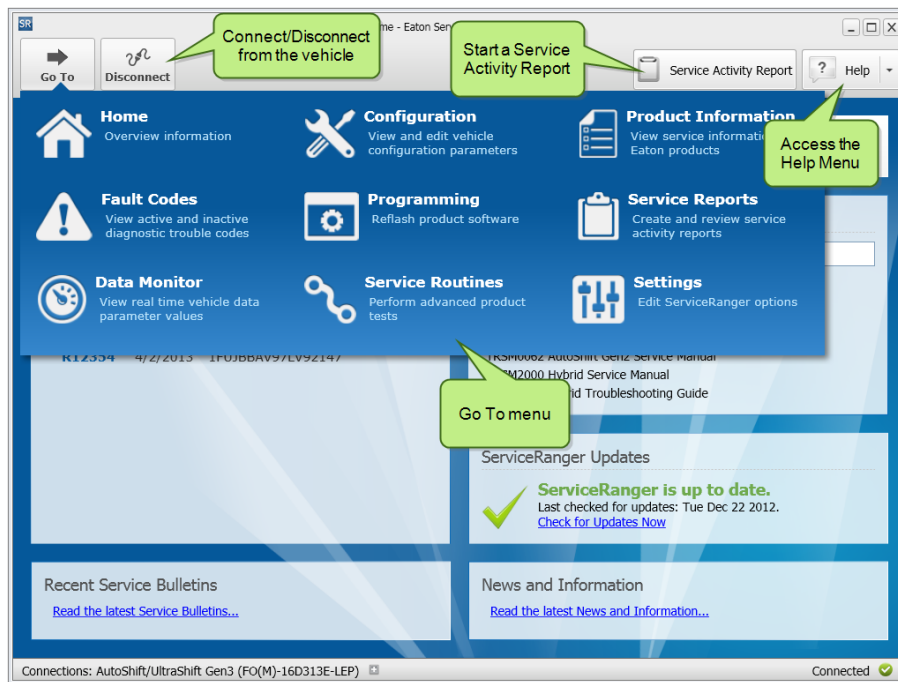
Tour of the Workspace

Navigation Menu

The ServiceRanger user interface includes a navigation menu at the top of the application window containing several menu options. Many menu items are similar to what you might find in other diagnostic service tools, such as fault codes and data monitor.

Go To Menu

The Go To button opens the main navigation menu. It has several shortcuts, or links, to the various features of ServiceRanger.



Home	Overview information - See "Home" on page 26
Fault Codes	View active and inactive diagnostic codes - See "Fault Codes Overview" on page 28
Data Monitor	View real time vehicle data parameter values - See "Data Monitor Overview" on page 34
Configurations	View and edit vehicle configuration parameters - See "Configuration" on page 1
Programming	Reflash product software - See "Programming Overview" on page 48
Service Routines	Perform advanced product tests - See "Service Routines Overview" on page 52
Product Information	View service information for Eaton products - See "Product Information Overview" on page 78

Service Reports	Create and review service activity reports - See "Service Reports Overview" on page 83
Settings	Edit ServiceRanger options - See "Settings" on page 92

Notes:

- Not all options are available, depending on your purchased license.
- Some functions may be disabled (grayed out) if the function is not currently available or does not apply to the function being performed.

Connect/Disconnect Button

The Connect/Disconnect button begins the connection process to the vehicle. For more information, See "Connections" on page 10

Service Activity Report Button

The Service Activity Report button opens a new report to record service activity you perform while using ServiceRanger. This allows you to reference vehicle information, fault codes, and Eaton product information at a later time and share with Eaton support representatives. For more information, See "Service Reports Overview" on page 83

Help Menu

ServiceRanger Help	Opens the help file.
Roadranger Online	Opens your default Internet browser and displays Roadranger.com.
Contact Support	Opens your default Internet browser and displays support webpage. Note: Should only be used when directed by Eaton support representative.
System Info	Provides information about your computer and installation of ServiceRanger to aid in troubleshooting an software issue with the call center.
About ServiceRanger	Displays information about the current version of ServiceRanger.

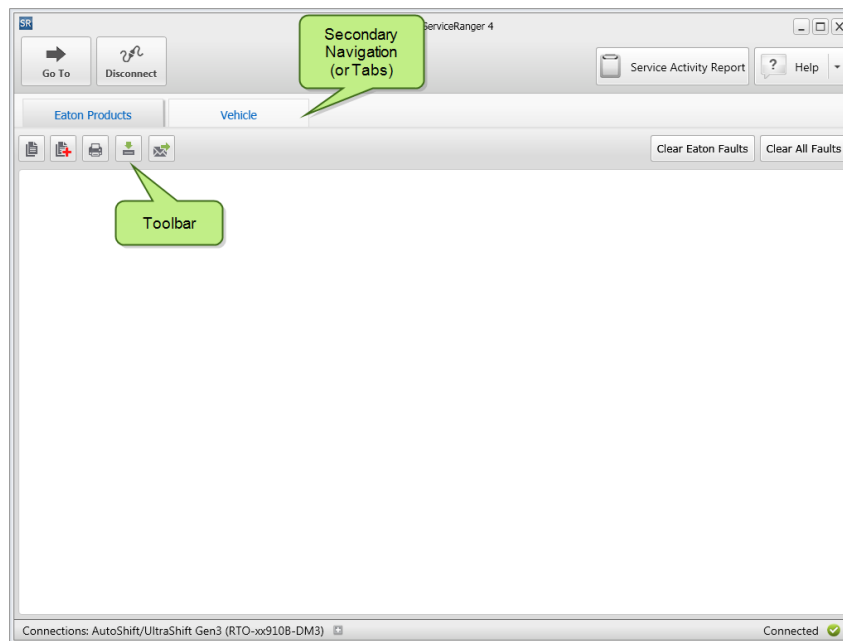
Tour of the Workspace

The Main Content Area

The ServiceRanger user interface includes a main content area. This is where information is displayed, and where most of your interactions with the program will occur. For example, in the Fault Code feature, ServiceRanger displays Eaton product and vehicle fault code information along with various functions, such as clearing and printing, that you can perform. Many items are similar to what you might find in other diagnostic service tools.

Secondary Navigation

When ServiceRanger loads a feature in the content area, secondary navigation options become available. Secondary navigation uses tabs similar to other applications such as web browsers. For example, in the image below, the fault code feature has two secondary navigation options - Eaton Products and Vehicle.










Toolbars

Located near the top of the content area, and just below the tab navigation, are toolbars that provide various buttons which you can use to do your work.






These toolbars are intended for a particular feature or function. For example, the fault code viewer contains a toolbar that allows you to clear faults, print, and copy the contents of the fault code table. Most viewers and functions in ServiceRanger contain at least one toolbar. The following section details each of them.

Vehicle Fault Codes

	Clear All Faults - Clears fault codes from all vehicle component ECUs.
---	---







	Clear Eaton Faults - Clears fault codes from the connected Eaton product ECUs.
	Copy - Copies the selected fault code and sends it to the computers clipboard.
	Copy All - Copies the contents of the fault code table and sends it to the computers clipboard.
	Print Preview - Creates a diagnostic report and opens the report preview window.
	Export - Creates a diagnostic report and saves it to your computers hard drive as a pdf file.
	Email - Creates a diagnostic report and opens and attaches the report to the default email client.

Vehicle Data Monitor





	Pause - Freezes the data being displayed from the vehicle.
	Play - Restarts, or unfreezes, the display to be updated with data.
	Open - Displays a dialog of available parameter files.
	Save - Saves the currently selected list of data monitor parameters to a file on your computers hard drive.
	Clear List - Removes all selected parameters from the current view.

Tour of the Workspace

Product Configurations

	Open - Displays a dialog of available configuration templates.
	Save - Saves the current list of configuration settings as a template on your computer.
	Clear Pending - Clears any pending changes from the new value column.
	Export - Creates a diagnostic report and saves it to your computers hard drive as a pdf file.
	Print Preview - Creates a diagnostic report and opens the report preview window.
	Email - Creates a diagnostic report and opens and attaches the report to the default email client

Service Activity Report

	Print Preview - Creates a diagnostic report and opens the report preview window.
	Email - Creates a diagnostic report and opens and attaches the report to the default email client.
	Export - Creates a diagnostic report and saves it to your computers hard drive as a pdf file.
	Delete - Removes the service activity report from your computer.

Notes:

- Not all options are available, depending on your purchased license.
- Some functions may be disabled (grayed out) if it is not currently available or does not apply to the action being performed.

About the Status Bar

The status bar is located at the bottom of every document window and displays useful information—such as the current connection status and brief instructions. The most notable information is the current connection status between ServiceRanger and the vehicle. For more information, See "Connections" on page 10

Features

Using ServiceRanger Overview

Main Functions

The following information provides an overview of each major feature of ServiceRanger:

Fault Codes

The Fault Code function displays all active and inactive SAE fault messages being broadcast by all Eaton products on the vehicle data links, along with their Eaton product fault codes.

Data Monitor

The Data Monitor function allows you to monitor parameter values from different vehicle component ECUs.

Configurations

The Configuration function allows you to view and change the current configuration of the detected Eaton products on the vehicle.

Programming

The Programming function allows you to update, or reflash, the products ECU application software.

Service Routines

Service Routines are functions that apply to a specific Eaton product family. Some functions include utilities to extract data files or to perform functional tests.

Product Information

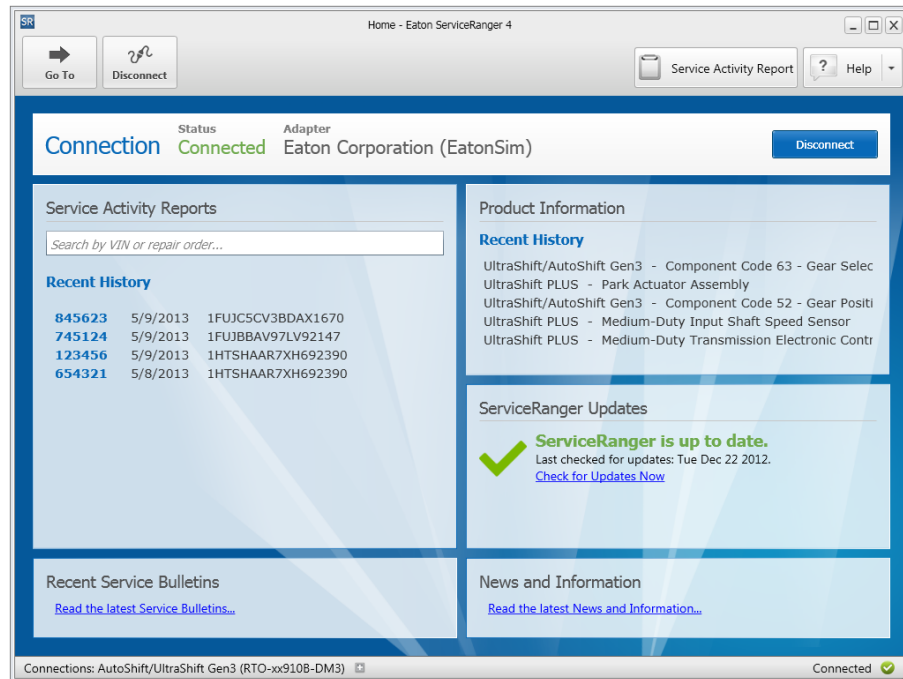
The Product Information functions allows you to look up service information, such as product service manuals and troubleshooting guides for Eaton products. In addition, the troubleshooting guide is linked directly to the fault code information screen allowing quick and easy access to information to perform quick repairs.

Service Reports

The Service Report features allows you to record service activities performed on a vehicle for future reference.

Home

When ServiceRanger first opens, you see the Home screen. The Home screen is a handy window consisting of four sections which contain high-level information.



- **Connection** - The Connection section displays information about the currently configured communication adapter and the status of the connection.
- **Service Reports** - Service Reports allows you to view the most recent reports you may have created. It also allows you to perform a quick search based on VIN or Repair Order.
- **Product Information** - Product information allows you to view the most recent service manuals you may have viewed. It also allows you to perform a quick search
- **ServiceRanger Updates** - This area displays information regarding the last time ServiceRanger checked for an update and if an update was found.

Vehicle fault codes

Fault Codes Overview

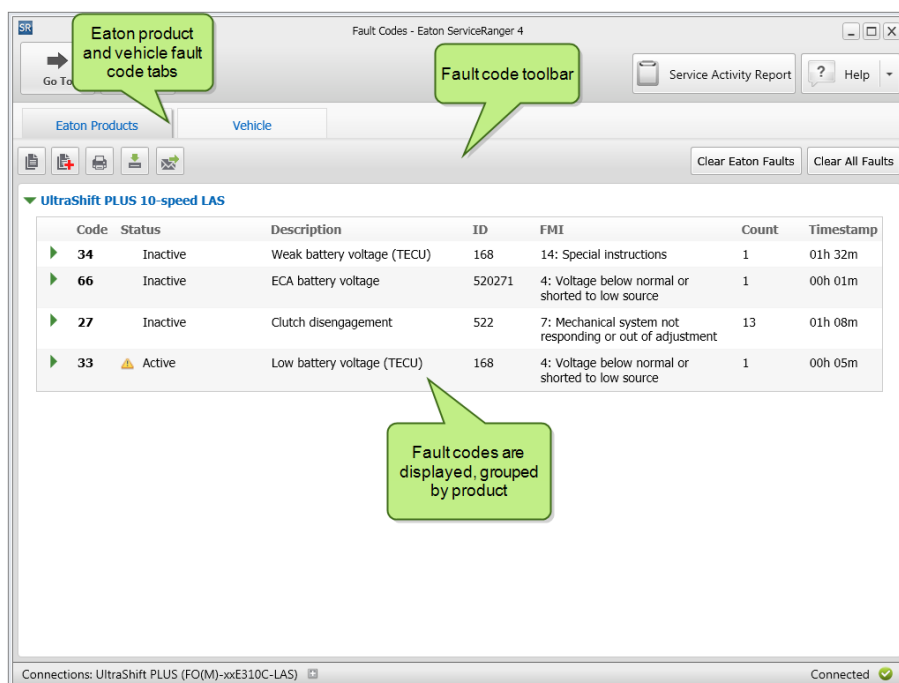
The Fault Code function in ServiceRanger displays all active and inactive SAE fault messages being broadcast by all component ECUs on the vehicle data links. The function is split into two separate sections - Eaton Product fault codes and Vehicle fault codes. Each type of fault codes is described below.

Eaton Product Fault Codes

Eaton product fault codes are displayed for each Eaton product detected in the vehicle. The fault codes are separated into groups and listed by Eaton products names.

The following information is displayed:

- Product Description - The Eaton Product name, each fault code is displayed below this information.
- Code - The Eaton fault code assigned to the ECU broadcasted fault message. ServiceRanger only displays fault codes for supported Eaton products. This field is blank for unsupported components or unrecognized fault messages.
- Status - Status of the fault (Active or Inactive).
- ID - Fault Identifier (J1587 PID\SID or J1939 SPN).
- Description - Eaton description of the fault.
- FMI - Failure Mode Identifier and description of the failure mode.
- Count - The number of times the product has detected the transition of a fault from active to inactive and back to active status.
- Timestamp - The time, in runtime of the product (e.g. key on time) since the fault code was detected. Example: 0h 32m - indicates the last active fault code status was 32 minutes of runtime ago.
- Link - The vehicle data link on which the fault message is being broadcast (J1587 or J1939).



Notes:

- If no fault codes are detected, ServiceRanger displays "No Faults."
- Selecting each fault code opens a secondary information view below the fault code, including a link to the troubleshooting guide. See "Viewing Troubleshooting Information" on page 31

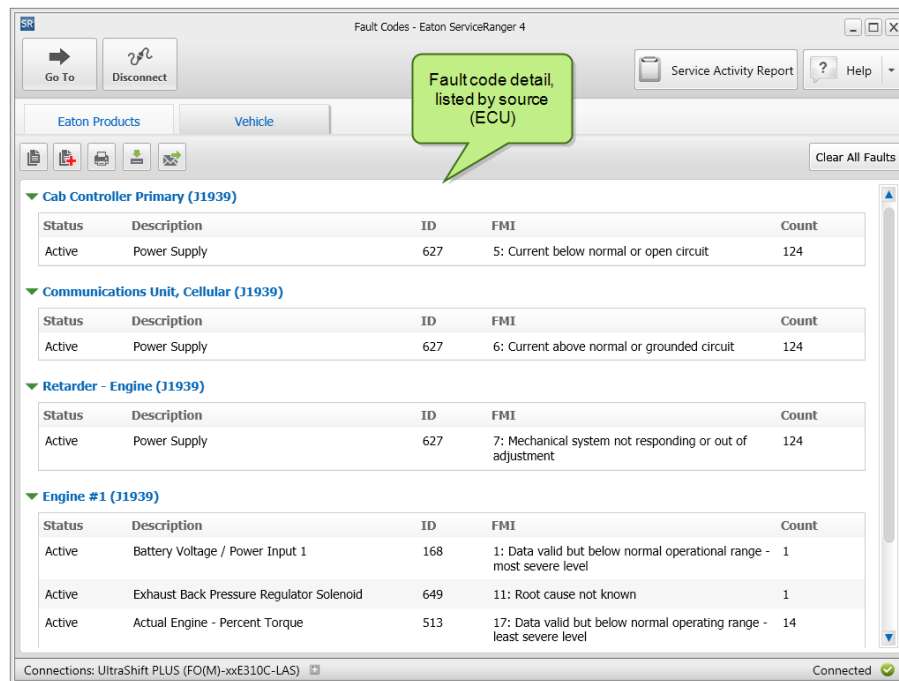
Vehicle Fault Codes

Vehicle fault codes displays fault information for all vehicle ECUs communicating to ServiceRanger.

The following information is displayed:

- Component Description - The SAE description and communication link of the component, each fault code is displayed below this information
- Status - Status of the fault (Active or Inactive)
- ID - Fault Identifier (J1587 PID\SID or J1939 SPN)
- Description - SAE description of the fault
- FMI - Failure Mode Identifier and description of the failure mode
- Count - The number of times the product has detected the fault condition transition from active to inactive and back to active status

Features



Note:

- If no fault codes are detected, ServiceRanger displays "No Faults."

Clearing Fault Codes

This command clears (erases) fault codes from the currently connected components, or ECUs.

Clearing all vehicle fault codes:

1. View fault codes.
2. Select **Clear All Faults** button from the Fault Code toolbar.
3. Select **Ok** to confirm.
4. All fault codes are cleared.

Notes:

- This option may not be displayed for all products and model years depending on the level of OBD compliance.
- This command clears all fault codes from all vehicle ECUs.
- Active fault codes may reappear if the ECU detects the fault condition again.
- Not all vehicle component manufactures support the SAE clear fault command.

Clearing Eaton fault codes:

1. View fault codes.
2. Select **Clear Eaton Faults** button from the Fault Code toolbar.
3. Select **Ok** to confirm.
4. All fault codes from Eaton products are cleared.

Notes:

- This command clears fault codes from only Eaton products. It does not clear fault information from other vehicle ECUs.
- Active fault codes may reappear if the ECU detects the fault condition again.

Copying Fault Codes

You can copy the contents of the fault code display to the computers clipboard. This allows you to easily transfer the information to other software applications such as a shop maintenance system, word processor, or spreadsheet.

Copying a selected fault code:

1. View fault codes.
2. Select a fault code displayed in the table.
3. Select **Copy** icon from the Fault Code toolbar.
4. The selected fault code is copied to the computers clipboard.

Notes:

- The contents are copied as a tab-separated list.

Copying all fault codes:

1. View fault codes.
2. Select **Copy All** icon from the Fault Code toolbar.
3. All fault codes are copied to the computers clipboard.

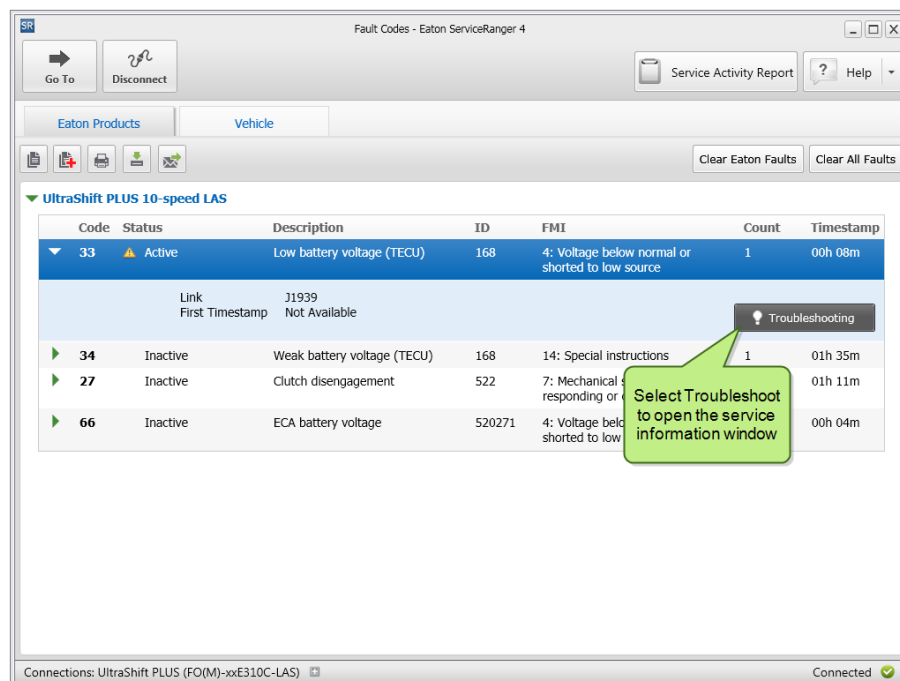
Notes:

- The contents are copied as a tab-separated list.

Viewing Troubleshooting Information

You can quickly view troubleshooting information for Eaton fault codes within ServiceRanger.

Features



Viewing product troubleshooting information:

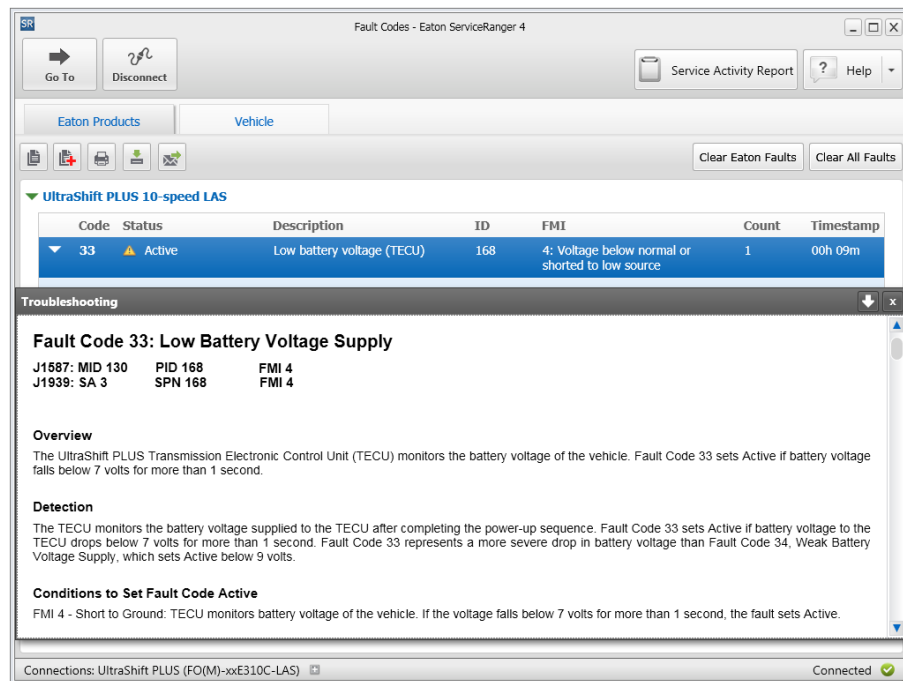
1. View Eaton fault codes.
2. Select a fault code displayed in the table to view detailed information.
3. Select **Troubleshoot**.
4. The fault code troubleshooting information is displayed.

Notes:

- If ServiceRanger can not determine what troubleshooting book to open automatically, it asks you for input as to what information to display.

Working with the product information window

When you open the product information window from the fault code screen, it is displayed in a window floating above ServiceRanger. This allows you to minimize the window and continue to use ServiceRanger. The window is available near the bottom of the screen allowing you quick access to the information you were viewing.



Minimizing the window:

1. Select **Troubleshoot** from the fault code screen.
2. Select the **minimize** button.
3. The window is displayed along the bottom of ServiceRanger near the status bar.

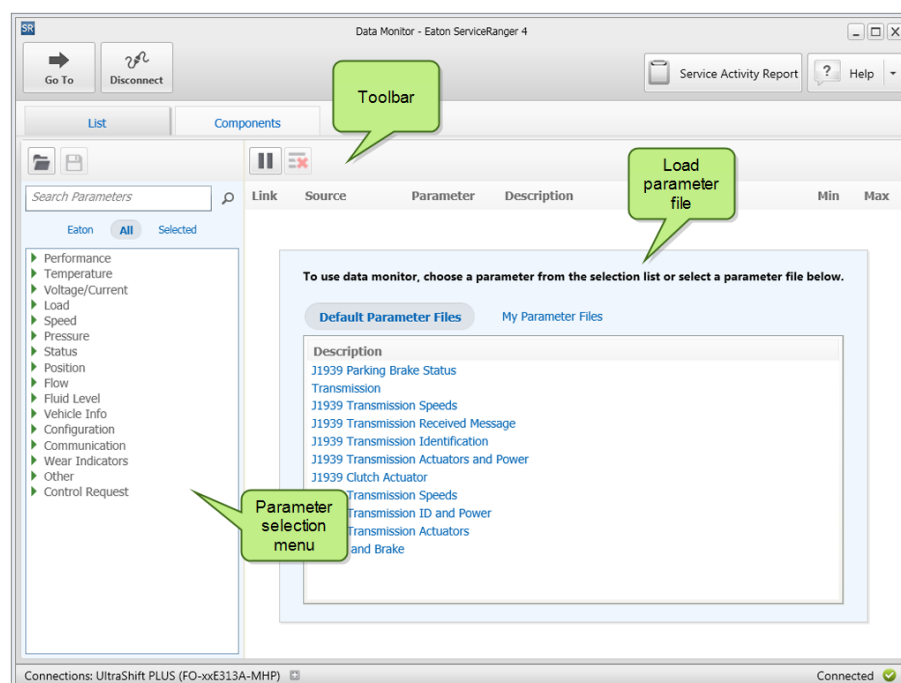
Note:

- You can maximize the window at anytime while using ServiceRanger.

Vehicle data monitor

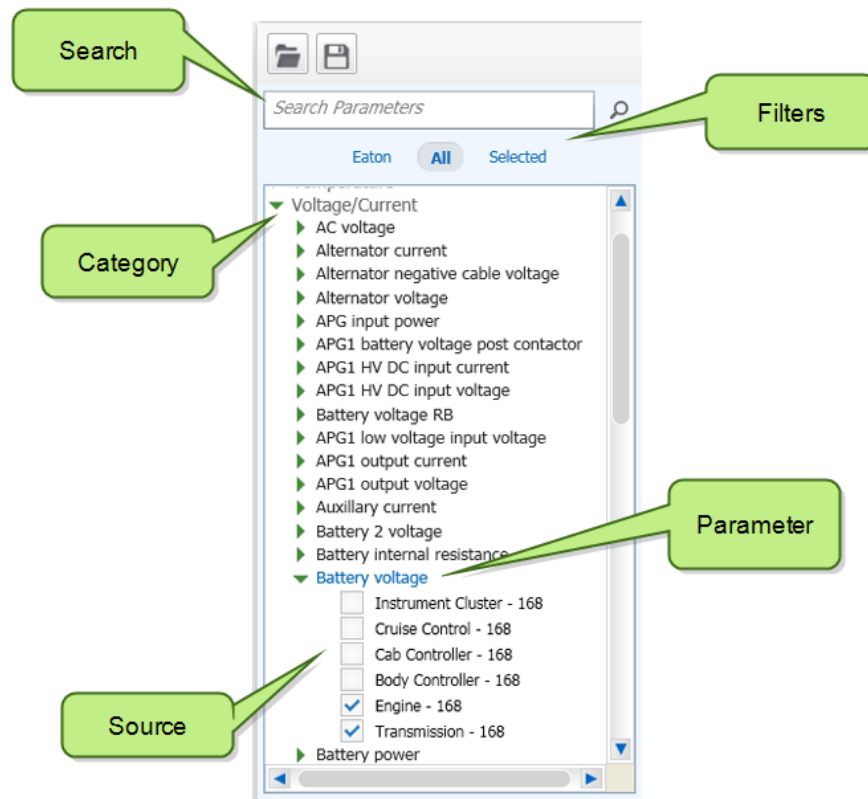
Data Monitor Overview

The Data Monitor function allows you to monitor parameter values from different vehicle component ECU's. Examples of parameters are input shaft speed, engine throttle position, and road speed.



Viewing Parameters

The selection of parameters to be added to the list view is easily accomplished in ServiceRanger. Each parameter is included in the selection menu and is located in a group, or category. Examples of a category would be Speed or Position. The speed category would contain parameters such as road speed, engine speed, or output shaft speed. The parameter viewing list is shared across the different views such as the chart and list.



Selecting a parameter:

1. Select **Data Monitor** from the navigation menu.
2. From the parameter selection menu, select a **Category**.
3. The available parameters in that category is displayed.
4. Select the **Source** for the parameter.
5. The parameter appears selected and is added to the viewing list.

Notes:

- The selection menu can be filtered by All parameters, Eaton only parameters, or selected parameters.
- You can search for parameters by using the search feature at the top of the selection menu.
- If a parameter is not available from the vehicle, it appears faded, or grayed out.
- If a component is unable to determine the value of a parameter, ServiceRanger displays the parameter value as "error."

Removing a parameter from the view:

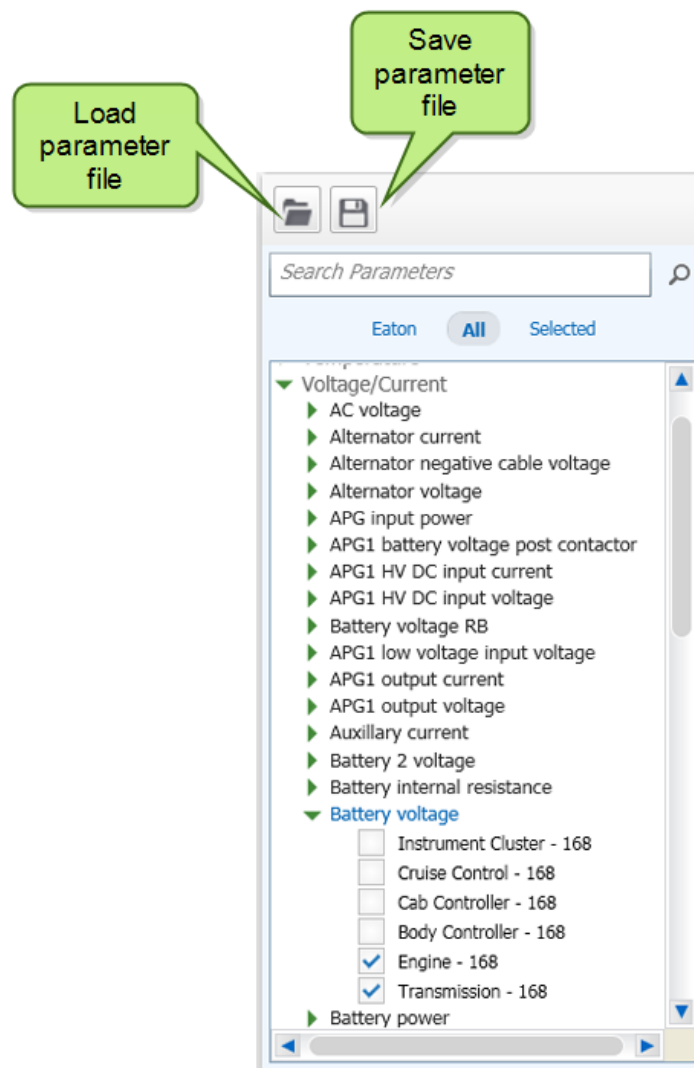
1. Select **Data Monitor** from the navigation menu.
2. From the parameter selection menu, select a **Category**.
3. The available parameters in that category are displayed.
4. De-select, or un-check, the **Source** for the parameter.
5. The parameter is removed from the viewing list.

Notes:

- Optionally, you can filter the list and only display the currently selected parameters to quickly remove a parameter from the view.
- Up to thirty (30) parameters can be viewed at one time.

Parameters Files

Data Monitor parameter files allow you to save a set of parameters for use at a later time. This is useful if you find yourself looking at the same set of parameters on several vehicles. In addition to creating your own parameters files, each Eaton product has a pre-defined parameter file associated with it.

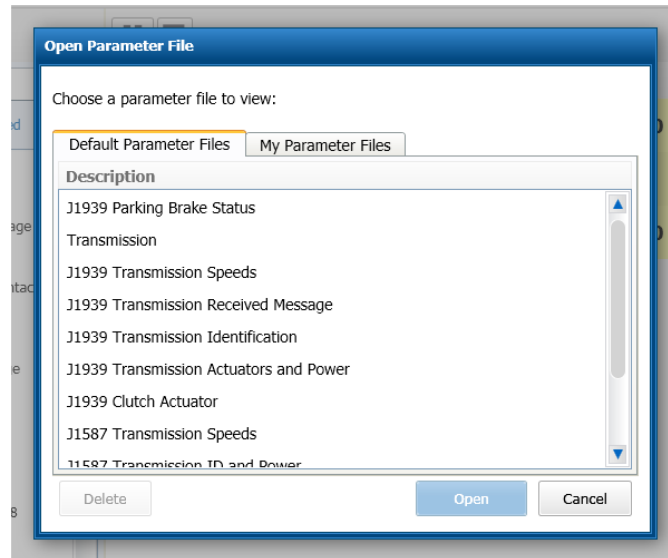


Saving a parameter file:

1. Select **Data Monitor** from the navigation menu.
2. Select parameters from the parameter selection menu.
3. Select **Save** icon from the toolbar.
4. Enter a name for the parameter file and select **Save**.
5. The parameter file is saved.

Notes:

- Up to thirty (30) parameters can be viewed at one time.

**Opening a parameter file from the menu:**

1. Select **Data Monitor** from the navigation menu.
2. Select **Open** icon from the toolbar.
3. Select the parameter file in the list and select **Open**.
4. The parameter file opens and displays in the view.

Notes:

- Up to thirty (30) parameters can be viewed at one time.
- The parameters in the file replace the selected parameters currently being viewed.

Deleting a parameter file:

1. Select **Data Monitor** from the navigation menu.
2. Select **Open** icon from the toolbar.
3. Select the parameter file in the list and select **Delete**.
4. The parameter file is deleted.

Notes:

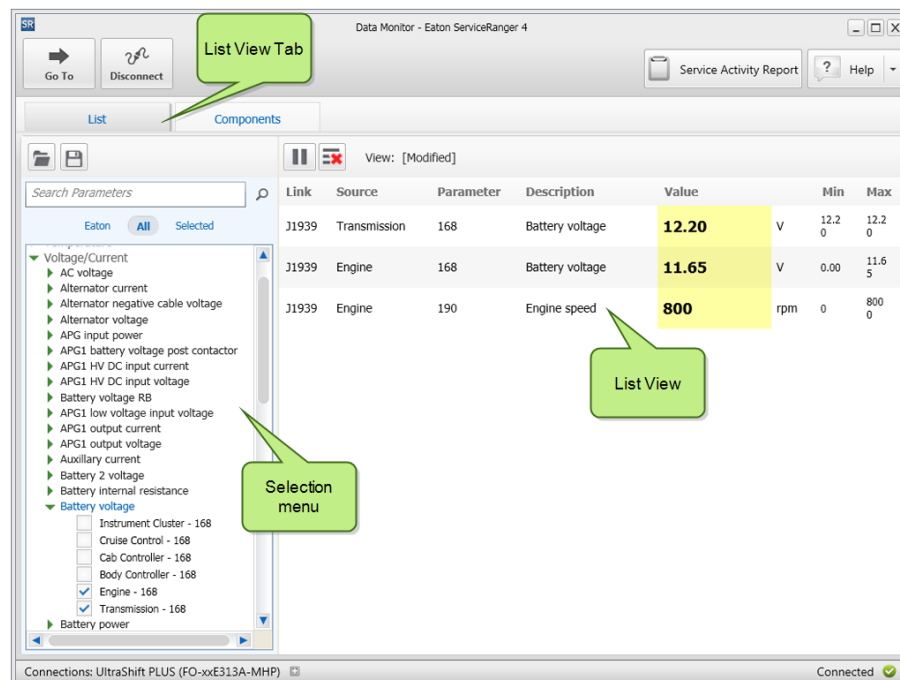
- The file is permanently deleted and can not be undone.

Data Monitor List

The list view allows you to see parameters in a data grid. This allows you to quickly see and compare many parameters at one time.

The following information is displayed:

- Link - The data link the parameter message is being broadcast (J1587 or J1939).
- Source - The source, or vehicle component ECU, sending the data.
- Parameter - Parameter ID value (PID, SID, or SPN).
- Description - SAE or Eaton description of the parameter.
- Value - Value of the parameter.
- Units - Units that the parameter is being displayed.
- Max\Min - The maximum and minimum parameter value recorded.



Notes:

- If a parameter is selected but not available from the vehicle, it appears faded, or grayed out.

Removing all parameter from the view:

1. Select **Data Monitor** from the navigation menu.
2. Select **Clear Parameter list** icon from the toolbar
3. The parameter is removed from the viewing list.

Pausing Display

The display can be paused allowing you to evaluate data parameters that maybe updating rapidly.

Pausing the display:

1. Select **Data Monitor** from the navigation menu.
2. Select **Pause** icon from the data monitor toolbar.
3. The data monitor parameters stop updating their values.

Notes:

- After pausing the display, you can re-enable the display by selecting the pause icon again.

Components Tab

The Vehicle Components function is used to view basic information about each component on the vehicle that is detected by ServiceRanger. This function can be used to determine if all vehicle components are powered up and on which data links each component is communicating.

The following information is displayed:

- Link - the data link the component is communicating on (J1587 or J1939). Most vehicle components are detected on both data links.
- Source Address - Source address of the component (J1587 MID or J1939 Source Address).
- Component Description - SAE Component Description of the component's source address.
- Make, Model, Serial Number, and Software Version - This is the component identification information provided by the component ECU manufacturer. Not all component manufacturers support broadcasting component identification information. If one or more of these fields are blank, then the component does not support it.

Link	Source Address	Component	Make	Model	Serial Number	Software Version
J1939	3	Transmission	EATON	FO_xxE310C_LAS	K0852414	5569899 *E113.e002* ✓
J1939	67	Clutch/Converter Unit	N/A	N/A	N/A	✓
J1939	0	Engine #1	PCAR	MX	A068585	PC22_1201R07_* ✓
J1939	11	Brakes - System Controller	BNDWS	EC60-adv	N/A	BB41062* BB41065* ✓
J1939	49	Cab Controller Primary	PACCAR	N/A	N/A	PC22_1201R07_ ✓
J1939	74	Communications Unit, Cellular	Qualcomm	MCP110	106033652	AA0922 ✓
J1939	15	Retarder - Engine	Paccar	N/A	N/A	PC22_1201R07_ ✓

Connections: UltraShift Plus (FO(M)-xxE310C-LAS) Connected ✓

Notes:

- A component is grayed out if it does not communicate with ServiceRanger every ten seconds.
- Some components broadcast on multiple links and as a result, ServiceRanger displays those components twice.

Calibrations and configurations

Calibration and Configuration Overview

The configuration and calibration function allows you to view and change settings of the connected Eaton products in the vehicle. Configurations allow you to tailor the vehicle to the driver's preferences. Options like default start gear or PTO options are examples of configurations. Product calibrations are similar to configurations, however calibrations can change the behavior of the control and diagnostic functions of a system without updating the software. This allows a product to be adapted to the specific OEM chassis and engine make and models.

Caution: Take care changing any configurations or updating software as all Eaton products are configured by the vehicle OEM for optimal performance.

Configurations

The main screen in Configurations is split into two sections, configuration groups and available product configurations.

Configuration groups

Configuration groups are displayed along the side of the application. Groups allow similar or related configurations to be displayed together. For example, all PTO configuration options are grouped under a category called 'PTO'.

Note:

- Each Eaton product has its own set of configuration groups.

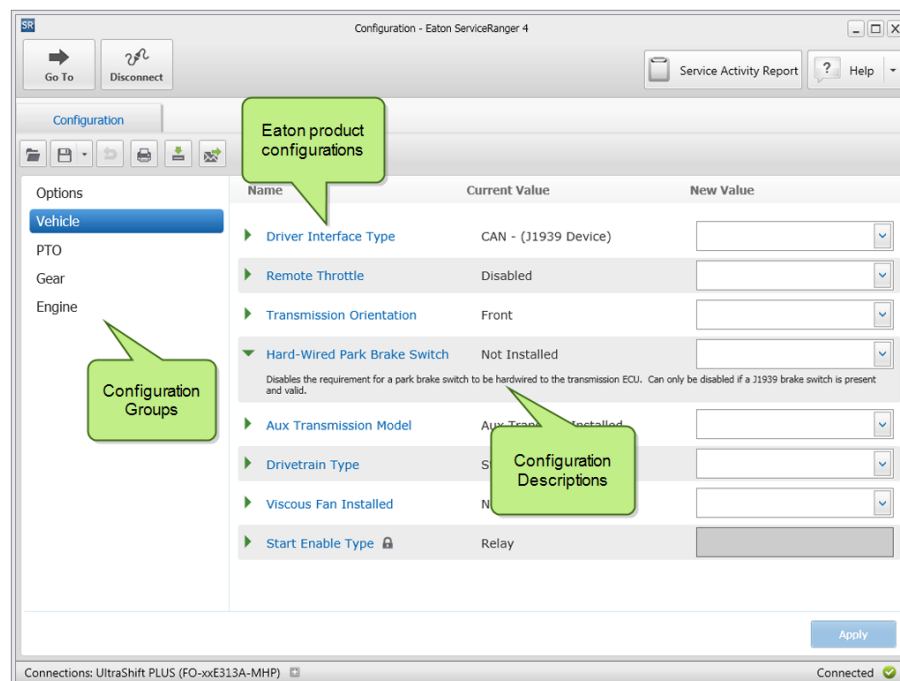
Product configuration

The Product Configuration section displays specific information about the product ECU configuration settings. The Current Setting column displays how the ECU is currently configured and the New Setting column provides optional configuration selections that may be available for the product.

Note:

- Not all configurations can be changed, a lock icon will be displayed indicating they are read only.

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Calibrations

The main screen in Calibrations is split into four sections, current settings, available updates, vehicle information, and available product calibrations.

Note:

- Each Eaton product has its own set of calibrations.
- Not all Eaton products support calibrations. You may not see the calibrations tab if the connected product does not support calibrations.

Calibration types

Available product calibrations are displayed along the side of the application. Each Eaton product has different calibrations available and the display may be different than the image below.

Available updates

Available updates for the selected calibration type will be displayed near the top of the calibration screen. If there are no updates for the current calibration, then a "Your product is up-to-date" message will be displayed.

Note:

- You can show older revisions of the same calibration by selecting 'Show older revisions'.
- Only calibrations that are compatible with the current software will be shown.

Vehicle information

ServiceRanger filters the list available calibrations to only show you the calibrations for your vehicle. The vehicle information section displays the information from the vehicle that is being

used for filtering.

Note:

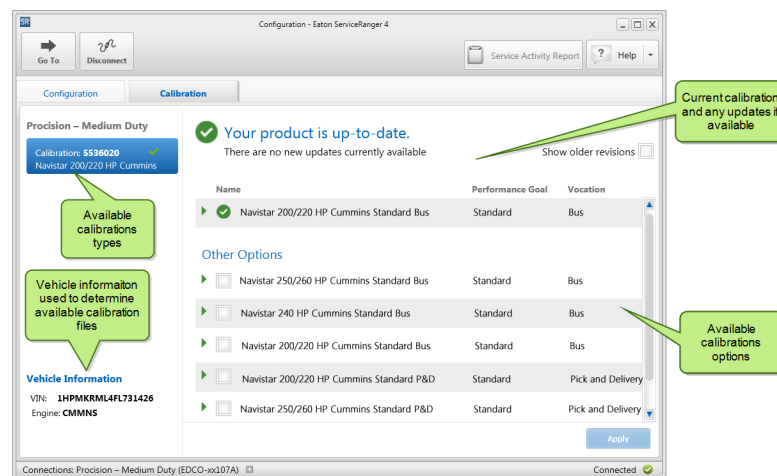
- Filtering information varies for each Eaton product and calibration type. The information on your screen may be different from the image below.

Other options

The other options section will display other calibrations that may be available for your vehicle. From here you can choose calibrations that change the behavior of the transmission, for example a performance or economy calibration.

Note:

- Not all configurations can be changed, a lock icon will be displayed indicating they are read only.
- You can filter the available calibrations using the table column names (e.g. performance goal and vocation)



Changing a Product Configuration

To change a configuration value, first select a configuration group to view the available configuration options. Then, in the new setting column, select or enter the new configuration setting using the selection control or drop down list provided by ServiceRanger.

If no options are displayed, then either there are no new options for that configuration or you do not have the necessary privilege to change the configuration. When the new configuration is successfully downloaded, ServiceRanger reads the updated configurations from the vehicle.

To change a product configuration:

1. Select **Configuration** from the navigation menu.
2. Select a **Configuration Group**.
3. Review the current settings.

Features

4. In the **New Value** column, select a new value for the configuration(s) you are changing.
5. When all new settings are complete, select **Apply**.
6. A confirmation dialog is displayed.
7. Review and confirm the new configuration settings, select **Apply**.
8. The new configuration(s) settings are downloaded to the Eaton product.

Notes:

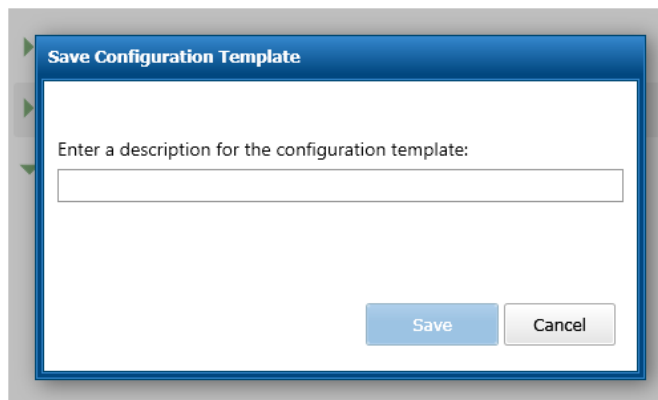
- You should check for updates to ServiceRanger often, as new configurations may become available.
- Not all configurations can be changed, a lock icon will be displayed indicating they are read only.
- Some configurations contain rules restricting the allowable settings. For example, you can not set default start gear higher than maximum start gear. ServiceRanger displays any rule violations.

To clear pending changes

1. Select **Configuration** from the navigation menu.
2. Select a **Clear Pending Changes** icon from the toolbar.
3. The new value column is cleared of any pending changes.

Templates

Templates allow you to save a set of configurations for a vehicle on your computer. This allows you to quickly apply the same set of configuration settings to multiple vehicles.



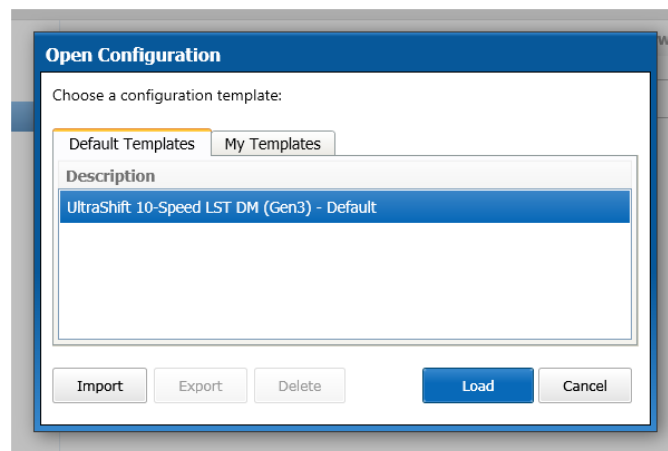
To save a configuration template:

1. Select **Configuration** from the navigation menu.
2. Do one of the following:
 - Select **Save | Current Values** from the toolbar.
 - Select **Save | Pending Values** from the toolbar.

3. The Save Configuration Template dialog is displayed.
4. Enter a name for the configuration template.
5. Select **Save**.
6. The new configurations template is saved to your computer.

Notes:

- Configuration templates are saved to your computer hard drive. If you have multiple computers, you need to create a template for each computer separately.
- Not all configurations can be saved to a template. Examples include serial number and transmission model.
- Current values will store all of the vehicle current configuration settings to the template.
- Pending values will store only the pending values you have selected in the new value column.

**To load a configuration template:**

1. Select **Configuration** from the navigation menu.
2. Select the **Open** icon from the toolbar.
3. Select the template from the available list.
4. Select **Load**.
5. The template configuration settings are loaded into the new settings column. Review the changes and apply them to the Eaton product.

Notes:

- Only configuration templates that match the Eaton product and model currently connected to ServiceRanger are displayed as an available template.
- As software versions change over time, new configurations may be added that do not match your configuration template. In this case, only the configurations that match between the software versions are loaded into the new settings column.

Importing and exporting templates:

It may be useful to share templates between computers. The import and export template feature allows you to save a template to a file on your local computer hard drive. You can then move the file to another computer and import the file.

To export a configuration template

1. Select **Configuration** from the navigation menu.
2. Select the **Open** icon from the toolbar.
3. Select a template from the available list.
4. Select **Export**.
5. Select a folder on your computer hard drive.
6. Select **Save**.
7. The template file is saved to your hard drive allowing you to transfer it to another computer.

Notes:

- Only configuration templates that match the Eaton product and model that is currently connected is displayed as an available template.
- A template file can be exported directly to a portable drive.

To import a configuration template:

1. Select **Configuration** from the navigation menu.
2. Select the **Open** icon from the toolbar.
3. Select **Import**.
4. Navigate to your computers folder to locate the template file.
5. Select **Ok**.
6. The template is imported into ServiceRanger and is available to be selected.

Notes:

- Only configuration templates that match the Eaton product and model that is currently connected is displayed as an available template.

Changing a Product Calibration

To change a calibration, first select a calibration type to view the available options. Then either select the update (if available) or the new calibration from the list. You can review information about the calibration including intended engine make and model, vocation, performance goal or release notes. ServiceRanger automatically determines the list of available calibrations based on information received from the vehicle.

To change a product calibration:

1. Select **Configuration** from the navigation menu.
2. Select a **Calibration tab**.
3. Select a **Calibration type** from the left menu.
4. Review the current settings.
5. In the **Other options** area, select a new calibration.
6. When all new calibration(s) are chosen, select **Apply**.
7. A confirmation dialog is displayed.

8. Review and confirm the new calibration setting(s), select **Apply**.
9. The new calibration(s) files are downloaded to the Eaton product.
10. Key off and let the system power down to commit the changes.

Notes:

- You should check for updates to ServiceRanger often, as new calibrations may become available.
- Not all calibrations can be changed, a lock icon will be displayed indicating they are read only.
- Some calibrations are intended only for specific engine and vehicle models. ServiceRanger will filter calibrations based on the VIN and engine model detected during the connection process.

To update a product calibration:

1. Select **Configuration** from the navigation menu.
2. Select a **Calibration tab**.
3. Select a **Calibration type** from the left menu.
4. Review the current settings, if a new version the calibration is available it will displayed near the top of the calibration screen.
5. Select the available update.
6. When all new settings are complete, select **Apply**.
7. A confirmation dialog is displayed.
8. Review and confirm the new calibration(s), select **Apply**.
9. The new calibration(s) files are downloaded to the Eaton product.
10. Key off and let the system power down to commit the changes.

Notes:

- If a new update is not available, ServiceRanger will display "Your product is up-to-date" message.

Programming

Programming Overview

The Programming function allows you to update the component ECU application software over the vehicle diagnostic data link. ServiceRanger automatically detects which data link, J1587 or J1939, is supported by the component for re-programming.

Before programming Eaton products, the components of the product programming and their functions should be understood. The product programming is comprised of two components, they are the Application Software and Configuration software.

Application software

Application software is the main software that makes the product work. It contains the shift logic, self diagnostic functions, and communication functions.

Configuration software

Configuration software tailors the product to the vehicle. Examples of configuration parameters are default start gear, maximum start gear, and shift points. Available configurations differ for each product. For more information, See "Calibration and Configuration Overview" on page 41

There is typically an application program and a configuration program for each ECU on a product. The Eaton AutoShift Gen2 series of transmissions has two controllers, therefore the AutoShift has two sets of software. One for the Shift Control and another for the Transmission Controller each of which may needed to be updated.

Important: Only use a communications adapter that has been tested and recommended by Eaton before attempting to program application software. Some communication adapters and all with wireless connection methods are not well suited for application software programming and could result in permanent damage to the ECU.

Updating Product Software

When the Product Programming function is selected, ServiceRanger displays the current software versions (or levels) for the selected product and any updates that it determines are available.

Some Eaton products have multiple ECUs that act together as a system. As such, it is important that each ECU is up to date and are all compatible with each other. ServiceRanger automatically determines the software updates available for each ECU and displays them to you as package.

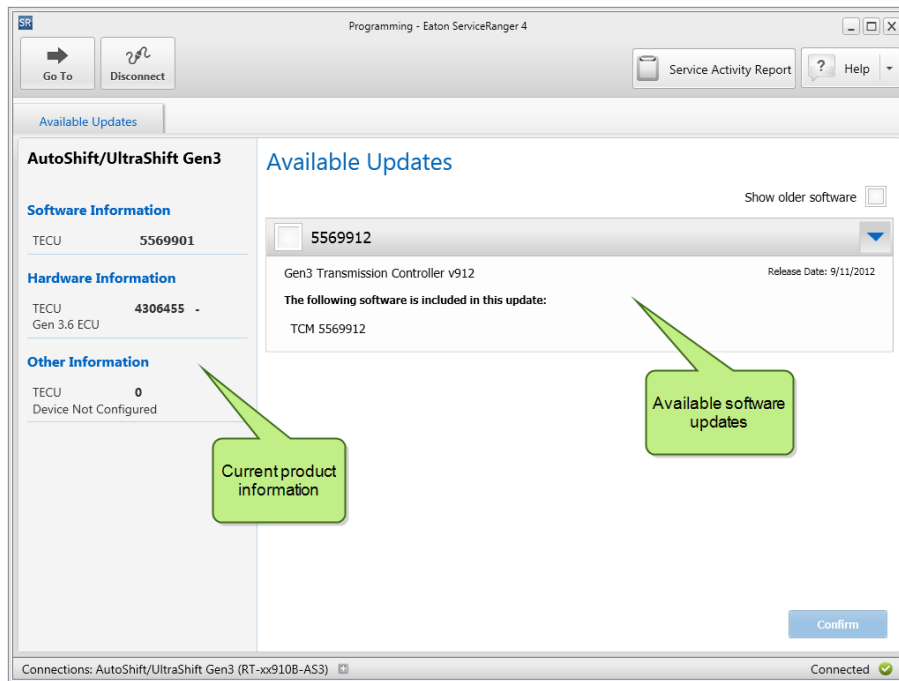
Downloading the Application File

Select the software update you want to program into the product by selecting the update in the list. You can review information about the software package including the software versions.

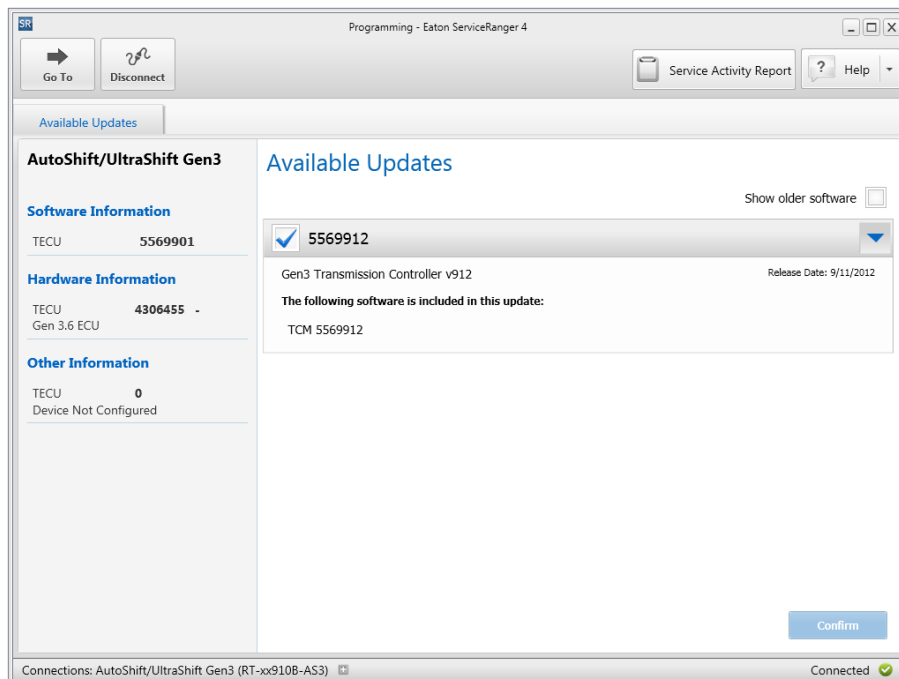
Caution: Interrupting the ECU download process once it has begun can result in permanent damage to the ECU.

To Update Product Software:

1. Select **Programming** from the navigation menu.
2. Select a software update from the main content window.

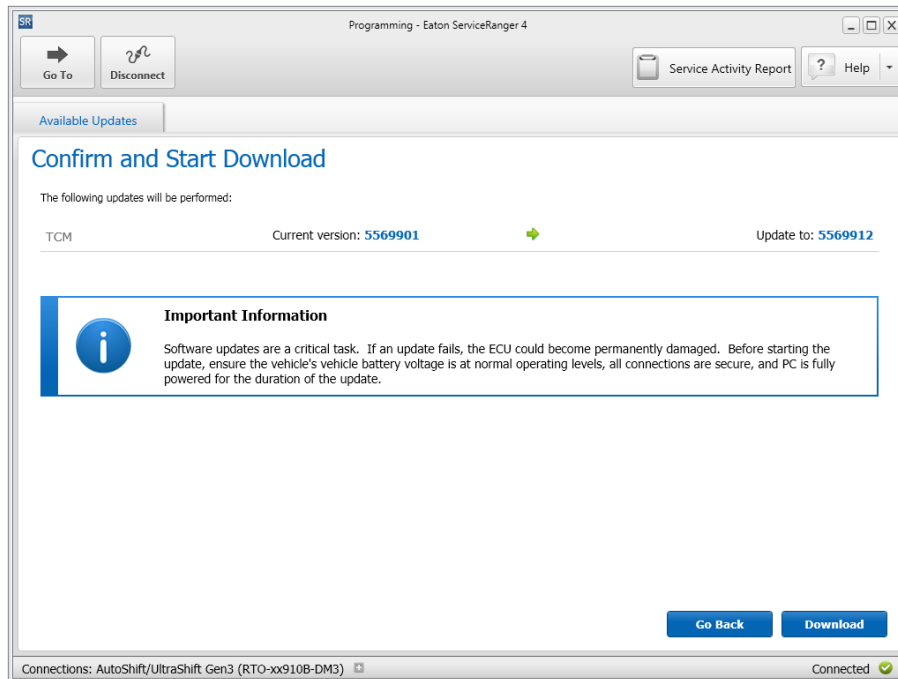


3. Select **Confirm**.

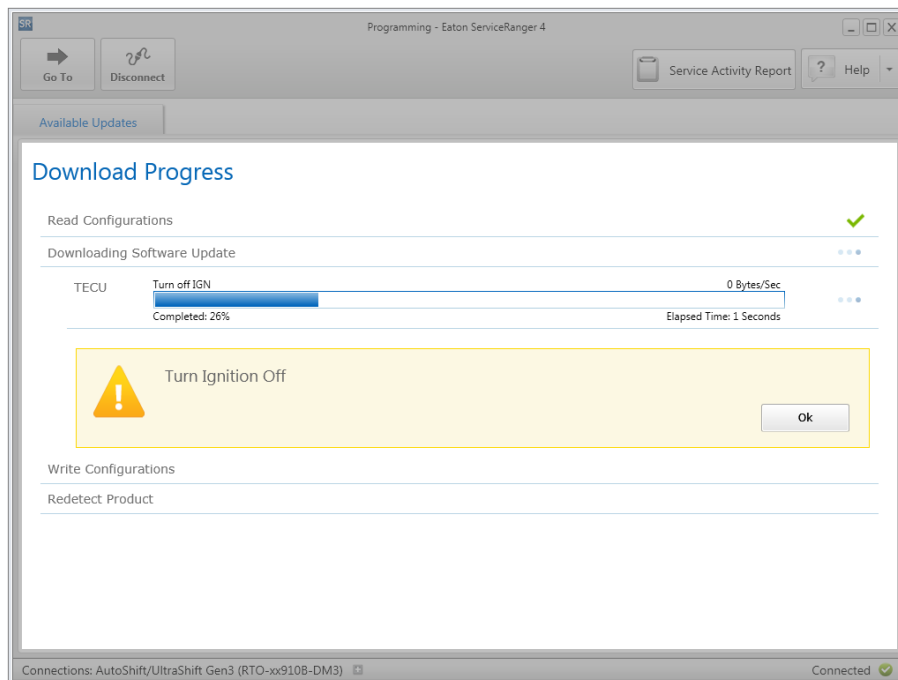


4. Review the information and select **Download**.

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5. The update process begins, showing each step of the programming sequence.
 - Depending on the product, you may be asked to cycle the ignition key. Follow the on screen prompts to continue.

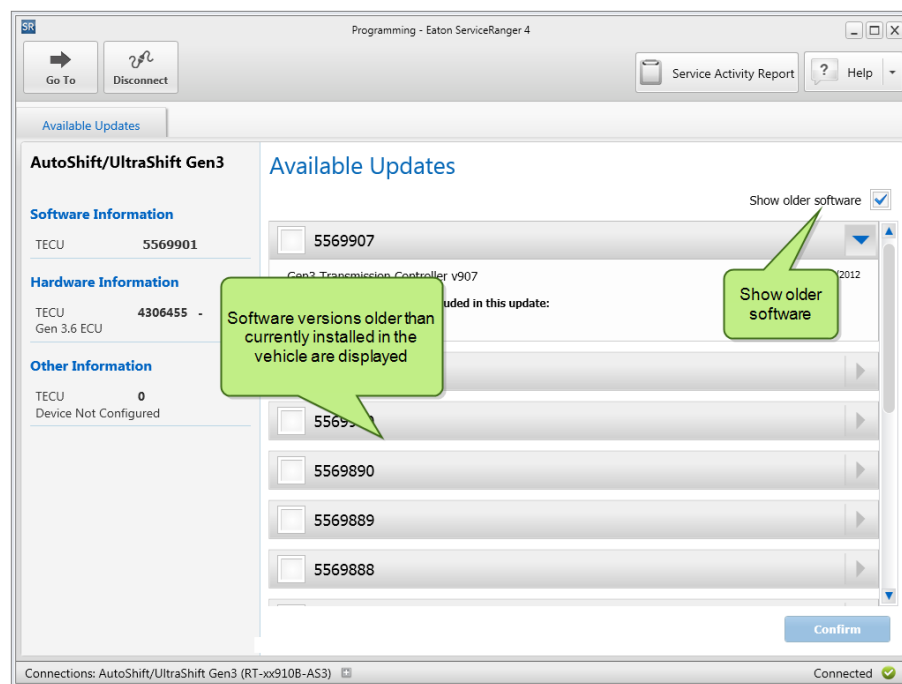


Notes:

- If ServiceRanger detects that the component has the most current application software compared to the files that are stored in the ServiceRanger product database, ServiceRanger displays that no files are available for the selected product.
- Make sure vehicle battery voltage is at normal operating levels.
- Verify 'good' wiring connections between the computer, communication adapter and vehicle.
- Make sure the computer has sufficient battery power, or is plugged in, for the entire duration of the programming steps.

Show older software

While this is not recommended, there may be times reverting to an older software version may be needed.



Showing older software:

1. Select **Programming** from the navigation menu.
2. The Available updates screen is displayed.
3. Select **Show older software**.
4. Older software packages are displayed.

Service routines

Service Routines Overview

A Service Routine extends the functionality of ServiceRanger beyond normal everyday service procedures. Some of the routines include uploading data from a vehicle ECU, running a product test, or recalibrating an sensor attached to the product ECU.

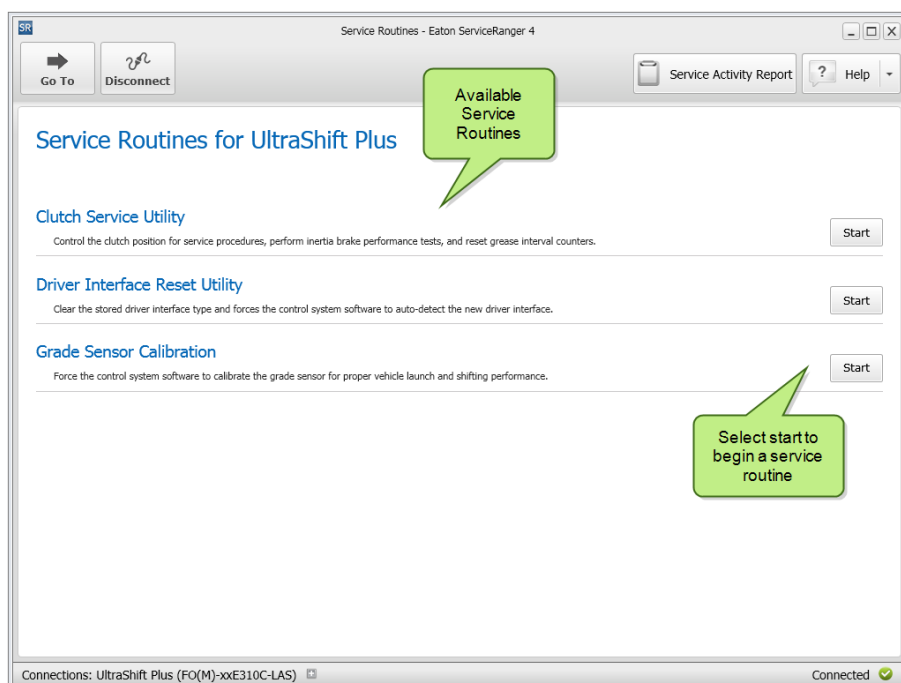
When connected to a vehicle, ServiceRanger displays a list of service routines available for the currently selected Eaton product. The following APFs are available by product family:

- UltraShift Gen2
 - [Clutch Abuse Utility](#) (DM and ASW models)
- AutoShift/UltraShift Gen3
 - [Clutch Service Utility](#) (DM and ASW models)
 - [Park Pawl \(T-Handle\) Calibration](#)
 - [Driver Interface Reset Utility](#)
- UltraShift *PLUS*
 - [Clutch Service Utility](#)
 - [Low Capacity Inertia Brake Test](#)
 - [Grease Interval Reset](#)
 - [Grade Sensor Calibration](#)
 - [Driver Interface Reset Utility](#)
- Procision
 - [Product Diagnostic Test](#)
 - [Clutch Cooling](#)
 - [Grade Sensor Calibration](#)
 - [TRS Shift Device Calibration](#)
 - [Clutch Disable Valve Test](#)
 - [Clutch Touch Point Calibration](#)
 - [Clutch Pressure Calibration](#)
 - [Rail Calibration](#)
 - [Line Pressure Calibration](#)
 - [Line Pressure Test](#)
- Electric Hybrid Powertrain
 - [Hybrid Output Override Test](#)
 - [Grade Sensor Calibration](#)
 - [Park Pawl \(T-Handle\) Calibration](#)

Each Service Routine consists of an introductory 'Description and Instructions' section. This section displays important information regarding the service routine and steps to perform. This section is followed by the product functions and any pass or fail results.

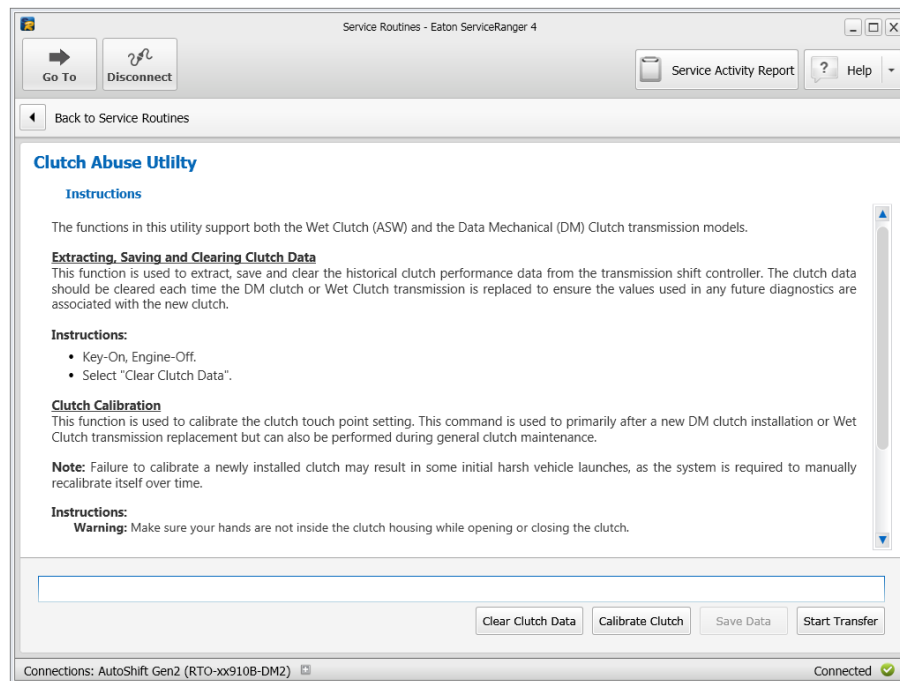
Launching a Service Routine

1. Select **Service Routines** from the navigation menu.
2. List of available service routines for the connected product is displayed.
3. Review the list and select **Start**.
4. The service routine is opened.



Clutch Abuse Utility

The transmission ECU maintains information about the history and performance of the UltraShift Gen2 DM and ASW models. This data can be viewed, downloaded, or cleared using the clutch abuse utility. When an UltraShift clutch is replaced, clearing the clutch data is part of the clutch replacement procedure.



Available Functions:

Start Transfer

Downloads the clutch data from the transmission ECU and display it on the screen.

Save Data

Allows you to save the extracted data to a text file on your computer. The default file name is in year-month-day time format. (example: 20091203-082059 is Dec 03, 2009 08:20:59 AM)

Clear Clutch Data

Clears the clutch data from the transmission ECU.

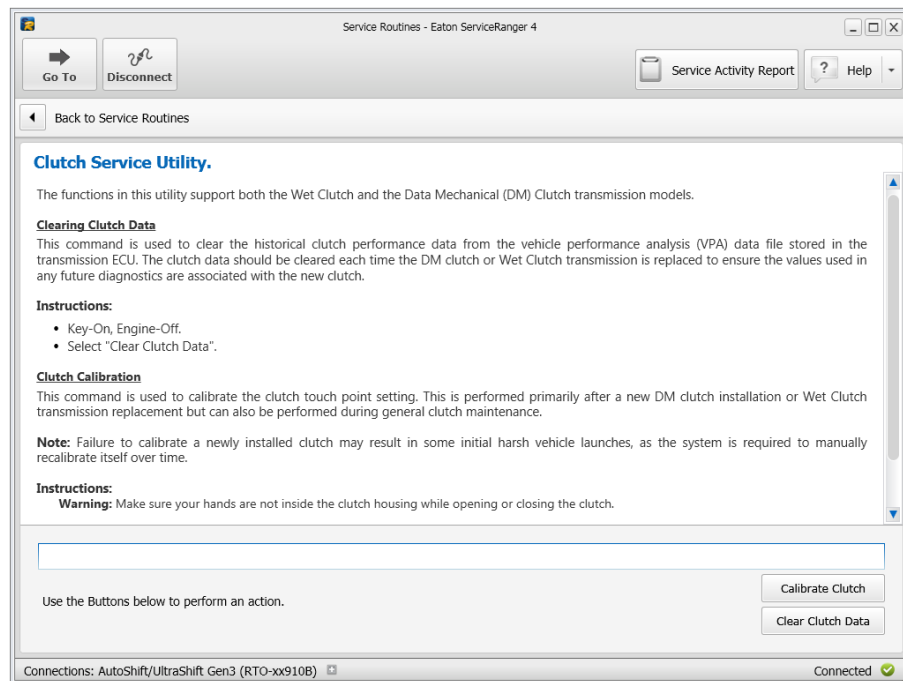
Calibrate Clutch

Activates the clutch calibration routine.

Note: The command should be used after a new clutch installation. Failure to calibrate a newly installed clutch may result in some initial harsh vehicle launches until the system manually recalibrates itself over time.

Clutch Service Utility

The clutch service utility is used to calibrate the clutch and clear clutch information from the vehicle performance analysis (VPA) data. This procedure is usually done when replacing the clutch but can also be done when performing general clutch maintenance.



Calibrate Clutch

Starts the calibration routine within the transmissions control system.

To calibrate the clutch:

1. Key on with engine off.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Calibrate Clutch** and follow on-screen prompts.

Clear Clutch Data

Requests the clutch data to be cleared from the transmission's VPA data.

To clear clutch data:

1. Key on with engine off.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Clear Clutch Data** and follow on-screen prompts.

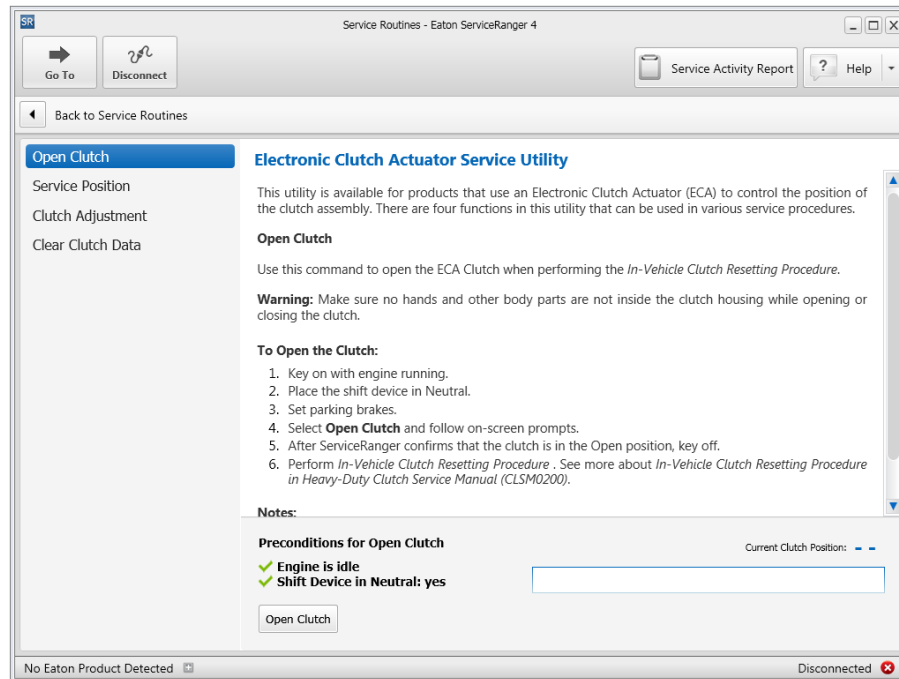
Notes:

- This routine is only available for ASW and DM transmission models.

Electronic Clutch Actuator (ECA) Clutch Service Utility

Features

This utility is available for products that use an Electronic Clutch Actuator (ECA) to control the position of the clutch assembly. There are four functions in this utility that can be used in various service procedures.



Open Clutch

Use this command to open the ECA Clutch when performing the *In-Vehicle Clutch Resetting Procedure*.

Warning: Make sure no hands and other body parts are not inside the clutch housing while opening or closing the clutch.

To Open the Clutch:

1. Key on with engine running.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Open Clutch** and follow on-screen prompts.
5. After ServiceRanger confirms that the clutch is in the Open position, key off.
6. Perform *In-Vehicle Clutch Resetting Procedure*. See more about *In-Vehicle Clutch Resetting Procedure* in *Heavy-Duty Clutch Service Manual (CLSM0200)*.

Notes:

- When clutch service is complete, the ECA Clutch will close the next time the ignition is turned on.

Service Position

Use this command to rotate the release fork away from the release bearing, allowing removal of the transmission from the vehicle.

Warning: Make sure no hands or other body parts are not inside the clutch housing while opening or closing the clutch.

Caution: Install the 4 shipping bolts before removing the ECA clutch from the engine flywheel. Failure to install the shipping bolts will damage the clutch.

Important: Warranty claims with damage to the clutch caused by failure to install the shipping bolts will be denied.

To move the Clutch to Service Position:

1. Key on with engine off.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Move to Service Position** and follow on-screen prompts.
5. After ServiceRanger confirms that the clutch is in Service position, key off.
6. Remove transmission for required service.

Notes:

The release fork remains in the Service position until another clutch command is performed.

Request Clutch Adjustment

Use this command to signal the Electronic Clutch Actuator (ECA) to actuate the clutch and set the new adjustment after the ECA clutch is reset, replaced, or a new Transmission Electronic Control Unit (TECU) is installed. Fault Code 26 or 27 indicate the clutch may be out of adjustment. See more about Fault Code 26 and 27 in Troubleshooting Guide TRTS0930.

Important: A clutch adjustment should always be performed after a clutch replacement.

Warning: Make sure no hands or other body parts are not inside the clutch housing while performing clutch adjustment.

To adjust the Clutch:

1. Key on with engine running.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Request Clutch Adjustment** and follow on-screen prompts.
5. ServiceRanger displays Success or Fail result.
6. After a successful a clutch adjustment, drive the vehicle to allow the ECA to fine tune clutch engagement.

Clear Clutch Data

Use this command to clear the historical clutch performance data from the Vehicle Performance Analysis (VPA) data file stored in the Transmission Electronic Control Unit (TECU).

Features

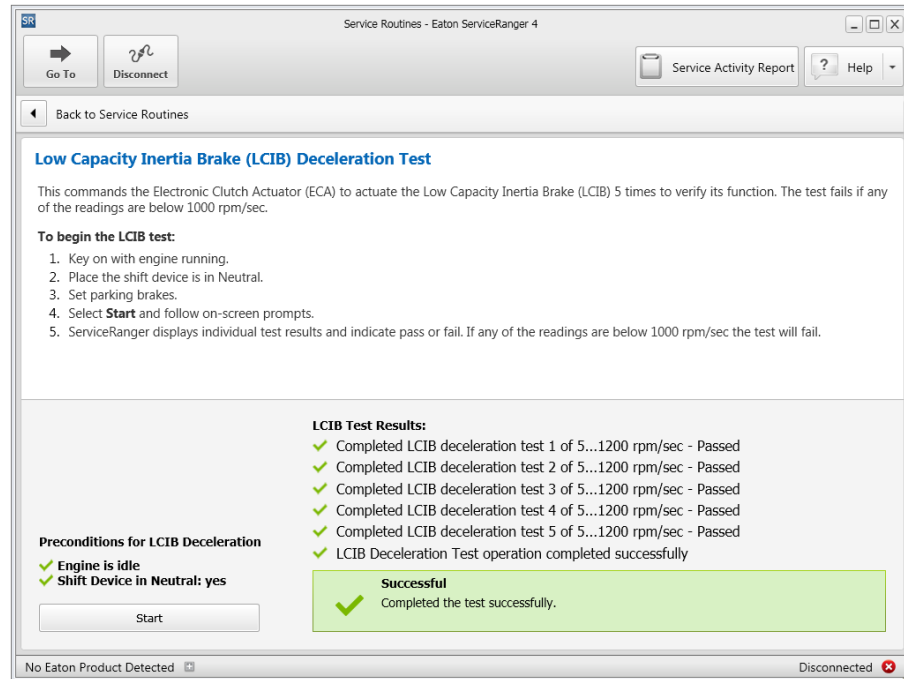
Important: Clear the clutch data each time the clutch is replaced to ensure the values used in future diagnostics are associated with the new clutch.

To clear clutch data:

1. Key on with engine off.
2. Select **Clear Clutch Data**.

Low Capacity Inertia Brake (LCIB) Deceleration Test

This commands the Electronic Clutch Actuator (ECA) to actuate the Low Capacity Inertia Brake (LCIB) 5 times to verify its function. The test fails if any of the readings are below 1000 rpm/sec.

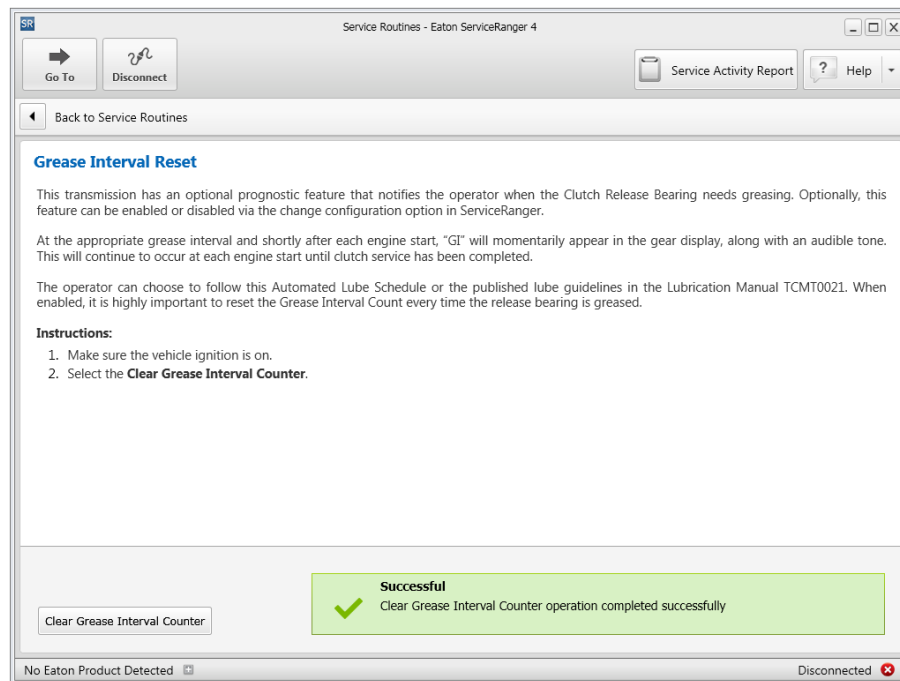


To begin the LCIB test:

1. Key on with engine running.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Start** and follow on-screen prompts.
5. ServiceRanger displays individual test results and indicate pass or fail. If any of the readings are below 1000 rpm/sec the test will fail.

Grease Interval Reset

This command signals the transmission ECU to reset its clutch release bearing grease interval counter.



To clear the grease interval counter:

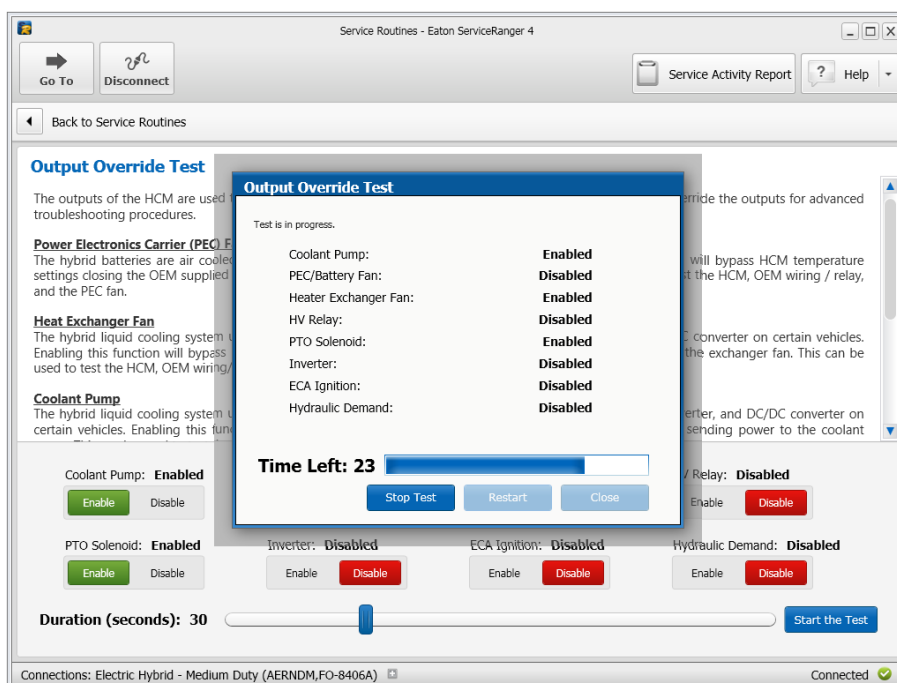
1. Key on with engine off.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Clear Grease Internal Counter** and follow on-screen prompts.

Notes:

- Optionally, this feature can be enabled or disabled via the product configuration option in ServiceRanger.
- At the appropriate grease interval and shortly after each engine start, "GI" momentarily appears in the gear display, along with an audible tone. This continues to occur at each engine start until the clutch service has been completed and the grease interval has been reset.
- The operator can choose to follow the Automated Lube Schedule or the published lube guidelines in the Lubrication Manual TCMT-0021. When enabled, it is very important to reset the grease interval count every time the release bearing is greased.

Hybrid Output Override Test

This product uses several outputs of the Hybrid Control Module (HCM) to control various functions of the Hybrid system. This test allows you to override the outputs for advanced troubleshooting procedures.



Available Functions:

Available Outputs

Power Electronics Carrier (PEC) Fan

The Hybrid batteries are air cooled using a 12 or 24-volt fan. Enabling this function bypasses the HCM temperature settings closing the OEM supplied relay, sending power to the fan located in the PEC. This test can be used to test the HCM, OEM wiring / relay and the PEC fan.

Heat Exchanger Fan

The Hybrid liquid cooling system utilizes a heat exchanger fan to cool the motor/generator, inverter and DC/DC converter on certain vehicles. Enabling this function bypasses the HCM temperature settings closing the OEM supplied relay, sending power to the exchanger fan. This can be used to test the HCM, OEM wiring/relay and the exchanger fan.

Coolant Pump

The Hybrid liquid cooling system utilizes an electric pump to circulate coolant through the motor/generator, inverter and DC/DC converter on certain vehicles. Enabling this function bypasses the HCM temperature settings closing the OEM supplied relay, sending power to the coolant pump. This can be used to test the HCM, OEM wiring/relay and the coolant pump.

PTO Solenoid

Engages the PTO on systems utilizing analog controlled ePTO activation. This can be used to test the HCM, OEM / equipment manufacture wiring and the PTO solenoid.

Duration

Features

The duration selection determines how long the override mode activates after selecting **Start**.

Start Test

Overrides the selected outputs until the selected time interval has elapsed.

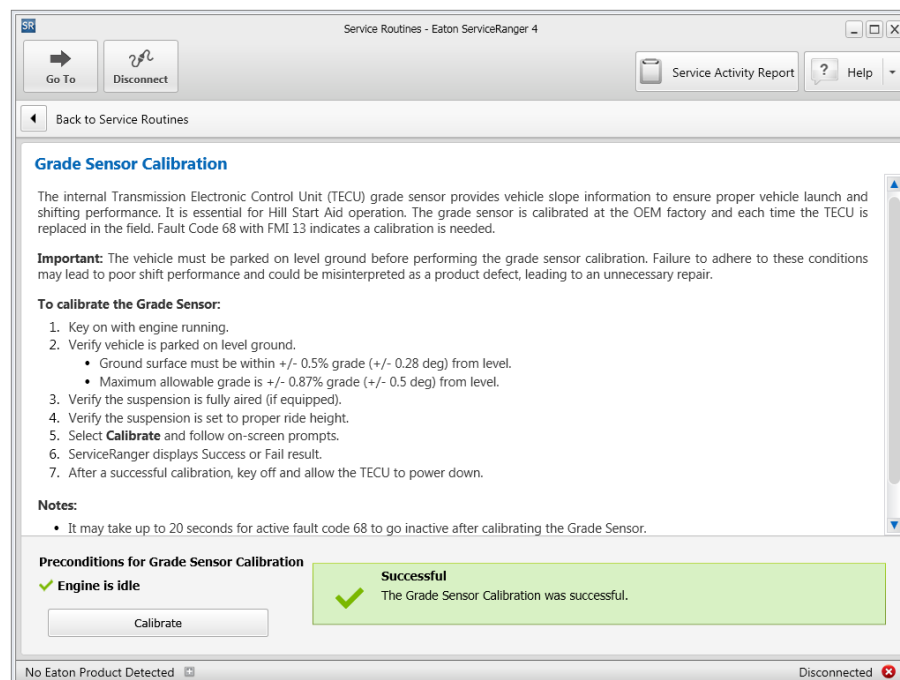
Warning: Make sure that the shift device is in neutral, the vehicle parking brake is set, and engine is not running before activating an output. All outputs are reset to their normal states if you cycle the ignition.

Stop

Returns the outputs to their normal state, canceling the override mode selected.

Grade Sensor Calibration

The internal Transmission Electronic Control Unit (TECU) grade sensor provides vehicle slope information to ensure proper vehicle launch and shifting performance. It is essential for Hill Start Aid operation. The grade sensor is calibrated at the OEM factory and each time the TECU is replaced in the field. Fault Code 68 with FMI 13 indicates a calibration is needed.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To calibrate the Grade Sensor:

1. Key on with engine running.
2. Verify vehicle is parked on level ground.

- Ground surface must be within $\pm 0.50\%$ grade (± 0.28 deg) from level.
 - Maximum allowable grade is $\pm 0.87\%$ grade (± 0.50 deg) from level.
3. Verify the suspension is fully aired (if equipped).
 4. Verify the suspension is at proper ride height.
 5. Select **Calibrate** and follow on-screen prompts.
 6. ServiceRanger displays Success or Fail result.
 7. After a successful calibration, key off and allow the TECU to power down.

Notes:

- It may take up to 20 seconds for active fault code 68 to go inactive after calibrating the Grade Sensor.
- TECU power down could take up to 2 minutes.

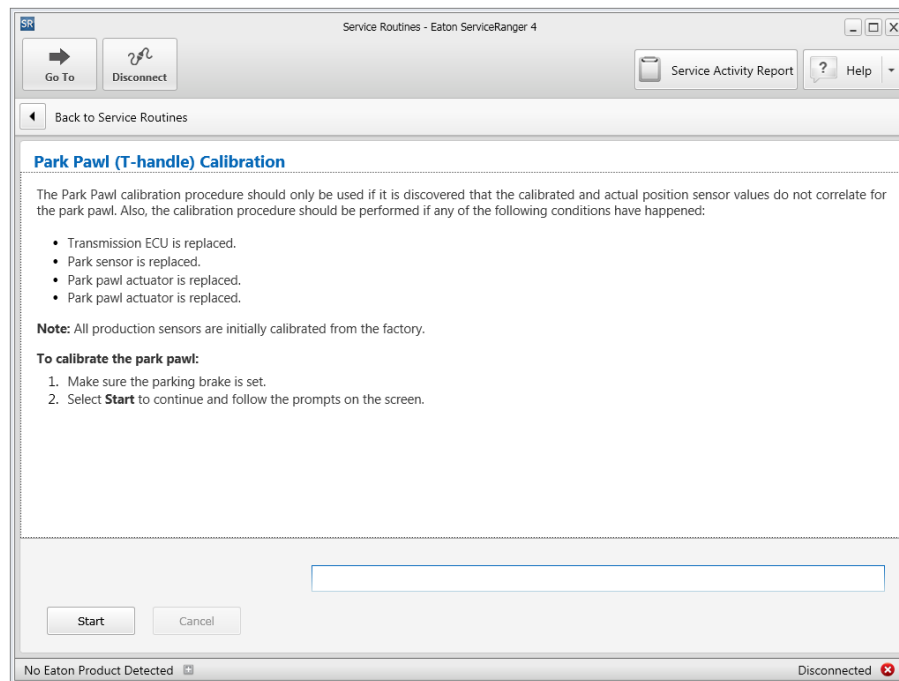
Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Park Pawl (T-handle) Calibration

The park pawl, or T-handle, calibration procedure should only be used if it is discovered that the calibrated and actual position sensor values do not correlate for the park pawl. This could have been caused if any of the following conditions have happened:

- Transmission ECU is replaced.
- Park sensor is replaced.
- Park pawl actuator is replaced.
- If there is an active fault code 84.

Note: All production sensors are calibrated from the factory.



Available Functions:

The park pawl calibration procedure consists of several step-by-step procedures presented to you in a wizard style interface. It will ask you to perform a step and select 'Next' button to move on to the next step in the sequence. It is important that you follow the procedure exactly as described to you on the screen.

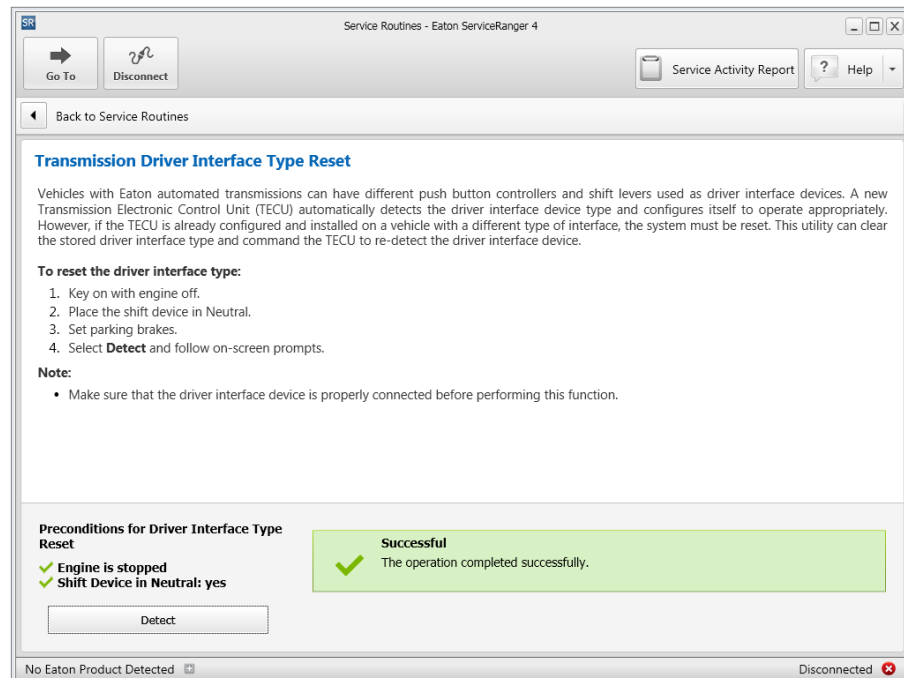
To perform the Park Pawl (T-handle) Calibration:

Engage emergency brake before starting the calibration procedure.

1. Select **Start**.
2. Put the gear selector into the Park position, then select **next**.
3. Put the gear selector into the Reverse position, then select **next**.
4. Put the gear selector into the Neutral position, then select **next**.
5. Put the gear selector into the Drive position, then select **next**.
6. Put the gear selector into the Hold position, then select **next**.
7. Put the gear selector into the 1st gear position, then select **next**.
8. Put the gear selector into the Hold position, then select **next**.
9. Put the gear selector into the Drive position, then select **next**.
10. Put the gear selector into the Neutral position, then select **next**.
11. Put the gear selector into the Reverse position, then select **next**.
12. Put the gear selector into the Park position, then select **next**.
13. Put the gear selector into the 1st gear position, then select **next**.
14. Put the gear selector into the Park position, then select **next**.
15. Calibration is complete, select **finish**.

Driver Interface Type Reset Utility

Vehicles with Eaton automated transmissions can have different push button controllers and shift levers used as driver interface devices. A new Transmission Electronic Control Unit (TECU) automatically detects the driver interface device type and configures itself to operate appropriately. However, if the TECU is already configured and installed on a vehicle with a different type of interface, the system must be reset. This utility can clear the stored driver interface type and command the TECU to re-detect the driver interface device.



To reset the driver interface type:

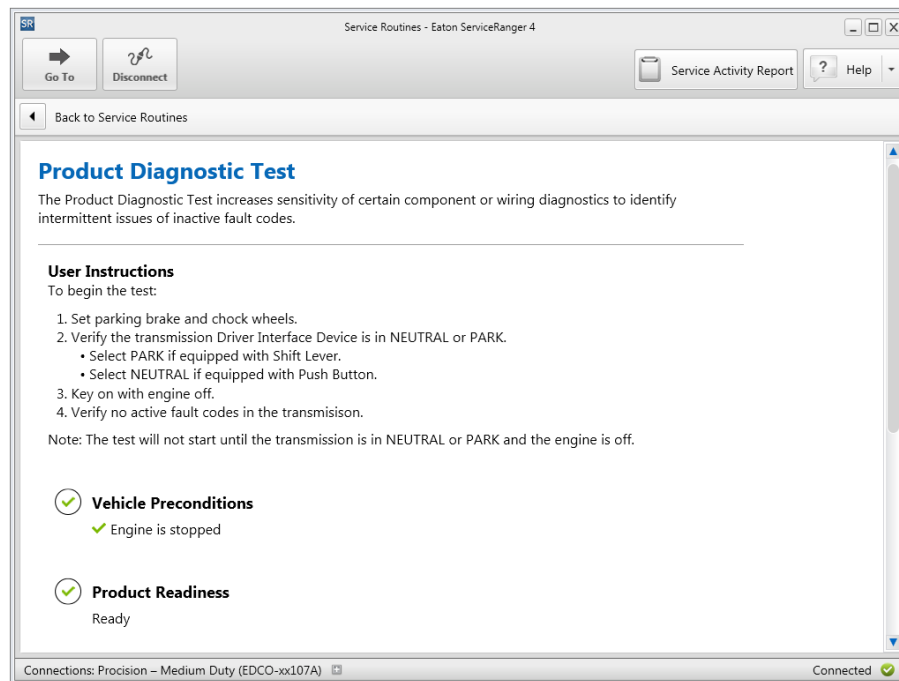
1. Key on with engine off.
2. Place the shift device in Neutral.
3. Set parking brakes.
4. Select **Detect** and follow on-screen prompts.

Note:

- Make sure that the driver interface device is properly connected before performing this function.

Diagnostic Test

Product diagnostic test increases sensitivity of certain component or wiring diagnostics to identify intermittent issues of inactivity fault codes.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To run the Product Diagnostic Test:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Key on with engine off.
4. Verify no active fault codes in the transmission.
5. Select **Confirm** and follow on-screen prompts.
6. ServiceRanger displays the success or failure result and any related detailed information.

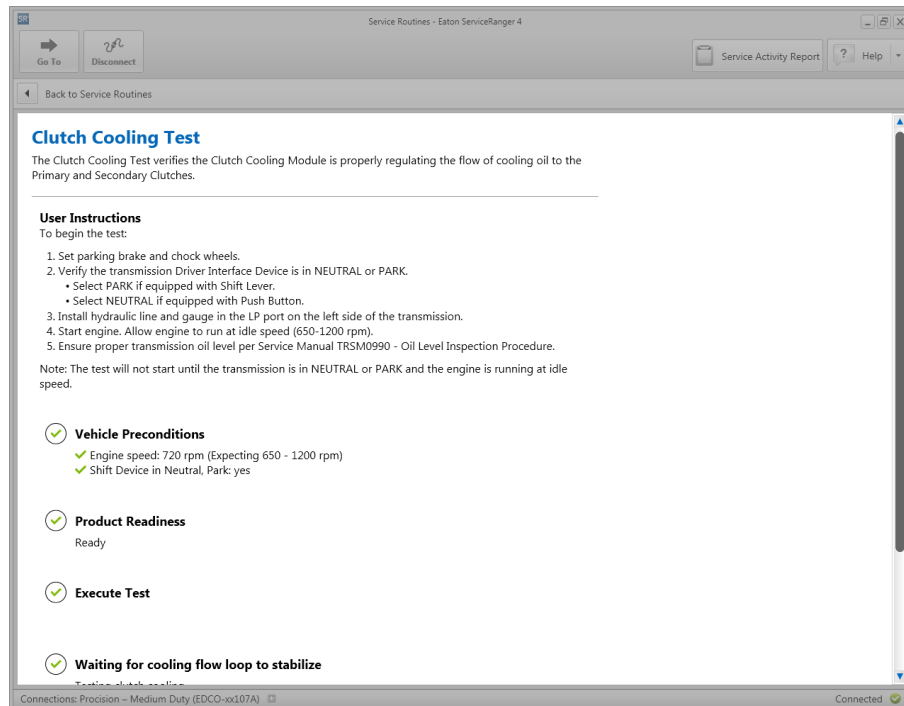
Notes:

- The test will not start until the transmission is in PARK or NEUTRAL and the engine is off.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Clutch Cooling

The Clutch Cooling Test verifies the Clutch Cooling Manifold is properly regulating the flow of cooling oil to the Primary and Secondary Clutches.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To run the Clutch Cooling Test:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Install hydraulic line and gauge in the LP port on the left side of the transmission.
4. Start the engine. Allow engine to run at idle speed (650-1200 RPM).
5. Ensure proper transmission oil level per Service Manual TRSM0990 - Oil Level Inspection Procedure.
6. Select **Begin** and follow on-screen prompts.
7. ServiceRanger displays the success or failure result and any related detailed information.

Notes:

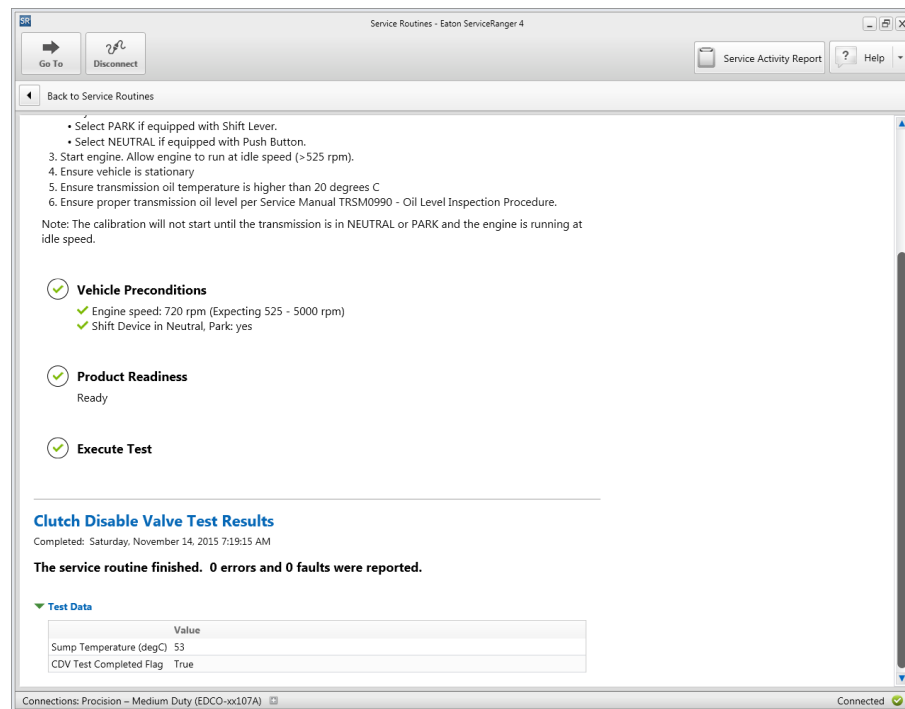
- The test will not start until the transmission is in either Neutral or Park and the engine is running at idle speed.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Clutch Disable Valve Test

Features

The Clutch Disable Valve (CDT) Test verifies the ability of the control system to control the oil flow to the Primary and Secondary Clutches.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To run the Clutch Disable Valve Test:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Start the engine. Allow engine to run at idle speed (greater than 525 RPM).
4. Ensure the vehicle is stationary.
5. Ensure the transmission oil temperature is higher than 20 C.
6. Ensure proper transmission oil level per Service Manual TRSM0990 - Oil Level Inspection Procedure.
7. Select **Confirm** and follow on-screen prompts.
8. ServiceRanger displays the success or failure result and any related detailed information.

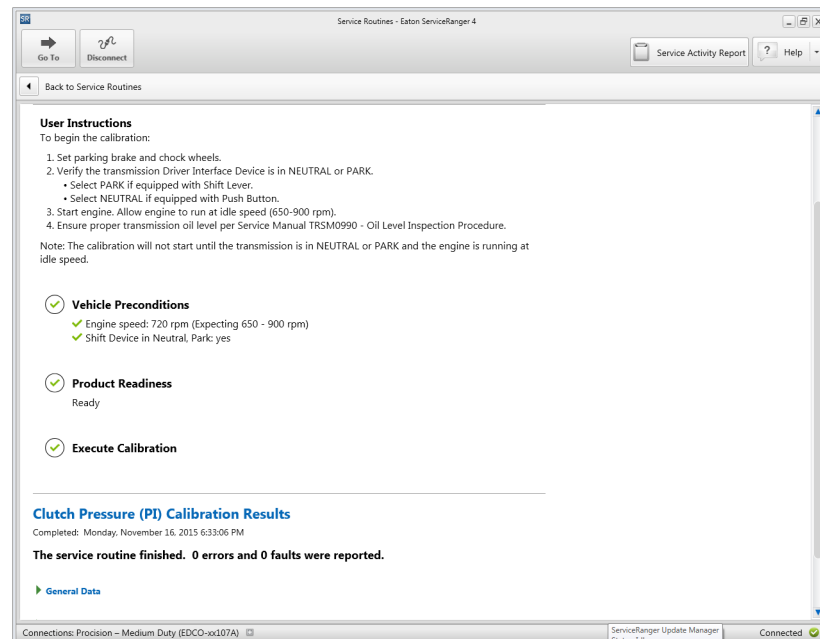
Notes:

- The test will not start until the transmission is in either Neutral or Park and the engine is running at idle speed.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Clutch Pressure Calibration

The Clutch Pressure Calibration compensates for the minor variations of the transmission system to command and hold oil pressure to engage the Primary and Secondary Clutches. This calibration is required after any replacement of the Clutch Module, Triple Pressure Sensor (TPS), Pressure Control Primary Solenoid (PCPS) or Pressure Control Secondary Solenoid (PCSS). This calibration is also required any time Fault Code 225 with FMI 0, 1, 7, 15 or 17 is set Active or Fault Code 240 with FMI 0,1,7,15 or 17 is set Active.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To calibrate the Clutch Pressure system:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Start the engine. Allow engine to run at idle speed (650-900 RPM).
4. Ensure proper transmission oil level per Service Manual TRSM0990 - Oil Level Inspection Procedure.
5. Select **Confirm** and follow on-screen prompts.
6. ServiceRanger displays the success or failure result and any related detailed information.

Features

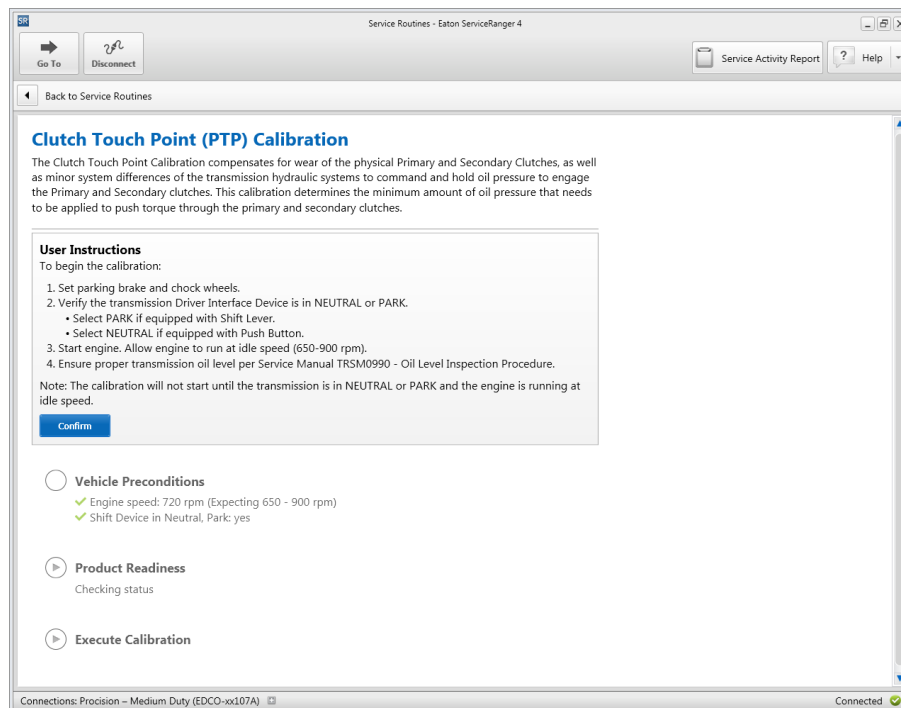
Notes:

- The test will not start until the transmission is in PARK or NEUTRAL and the engine is running at idle speed.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Clutch Touch Point Calibration

The Clutch Touch Point Calibration compensates for wear of the physical Primary and Secondary Clutches, as well as minor system differences of the transmission hydraulic systems to command and hold oil pressure to engage the Primary and Secondary clutches. This calibration determines the minimum amount of oil pressure that needs to be applied to push torque through the primary and secondary clutches.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To calibrate the Clutch Touch Point:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Start the engine. Allow engine to run at idle speed (650-900 RPM).

4. Ensure proper transmission oil level per Service Manual TRSM0990 - Oil Level Inspection Procedure.
5. Select **Confirm** and follow on-screen prompts.
6. ServiceRanger displays the success or failure result and any related detailed information.

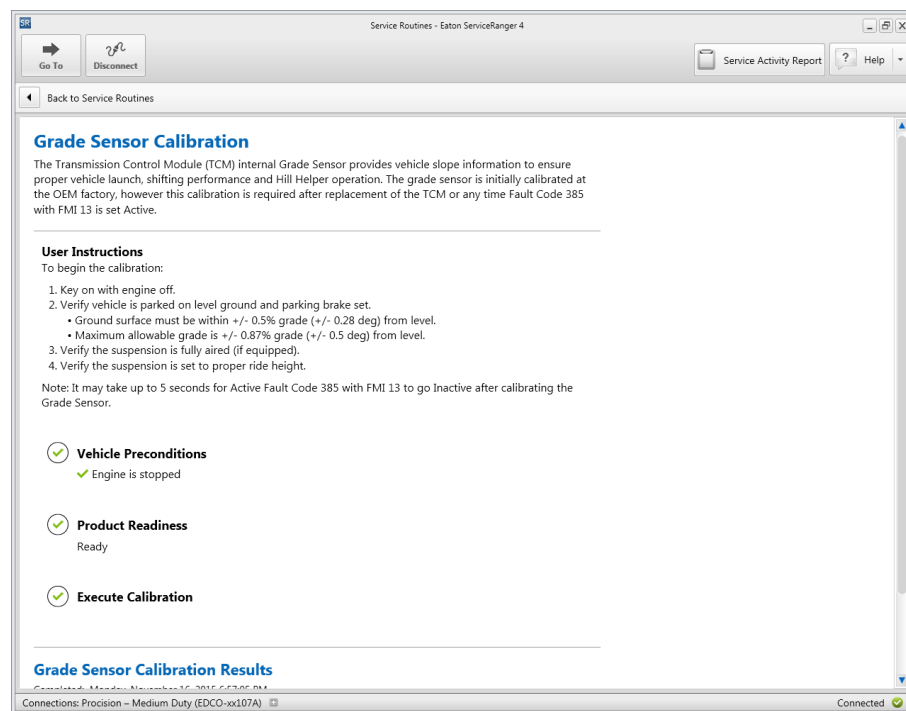
Notes:

- The test will not start until the transmission is in PARK or NEUTRAL and the engine is running at idle speed.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Grade Sensor Calibration

The Transmission Control Module (TCM) internal Grade Sensor provides vehicle slope information to ensure proper vehicle launch, shifting performance and Hill Helper operation. The grade sensor is initially calibrated at the OEM factory, however this calibration is required after replacement of the TCM or any time Fault Code 385 with FMI 13 is set Active.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To calibrate the Grade Sensor:

1. Key on with engine off.
2. Verify vehicle is parked on level ground.

Features

- Ground surface must be within $\pm 0.50\%$ grade (± 0.28 deg) from level.
 - Maximum allowable grade is $\pm 0.87\%$ grade (± 0.50 deg) from level.
3. Verify the suspension is fully aired (if equipped).
 4. Verify the suspension is at proper ride height.
 5. Select **Confirm** and follow on-screen prompts.
 6. ServiceRanger displays Success or Fail result.
 7. After a successful calibration, key off and allow the TCM to power down.

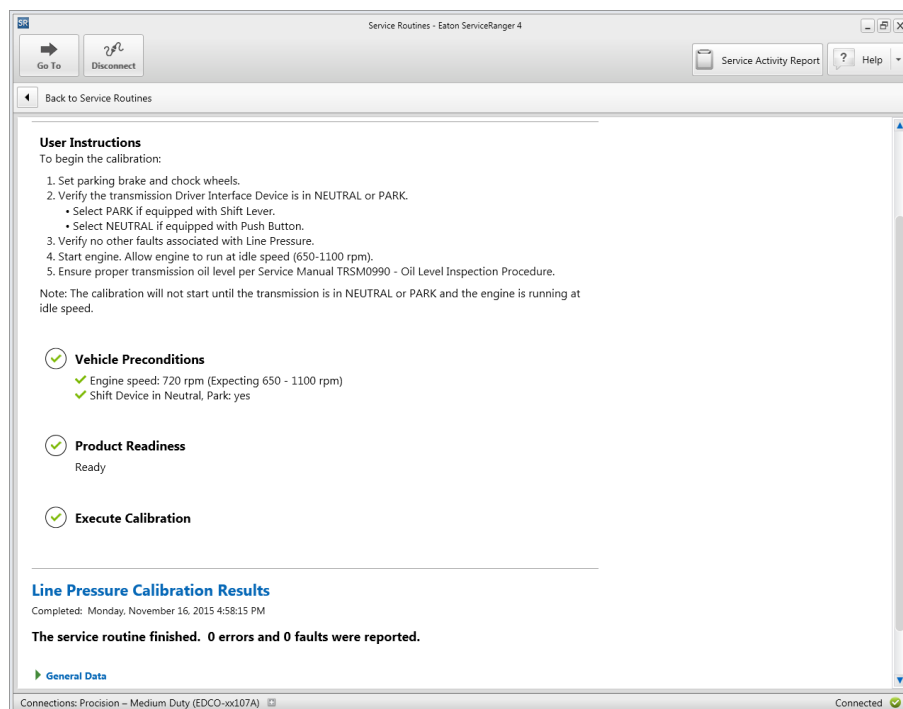
Notes:

- It may take up to 5 seconds for active fault code 385 FMI 13 to go inactive after calibrating the Grade Sensor.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Line Pressure Calibration

The Line Pressure Calibration adjusts for variances of the transmission system to command and hold supply oil line pressure across a range of pressure values. This calibration is required after any replacement of the Transmission Control Module (TCM), Triple Pressure Sensor (TPS), Line Pressure Solenoid (LPS) or Pump Assembly (PA) or any time Fault Code 210 with FMI 13 is set Active.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To calibrate Line Pressure:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Verify no other faults associated with Line Pressure
4. Start the engine. Allow engine to run at idle speed (650 - 1100 RPM).
5. Ensure proper transmission oil level per Service Manual TRSM0990 - Oil Level Inspection Procedure.
6. Select **Confirm** and follow on-screen prompts.
7. ServiceRanger displays the success or failure result and any related detailed information.

Notes:

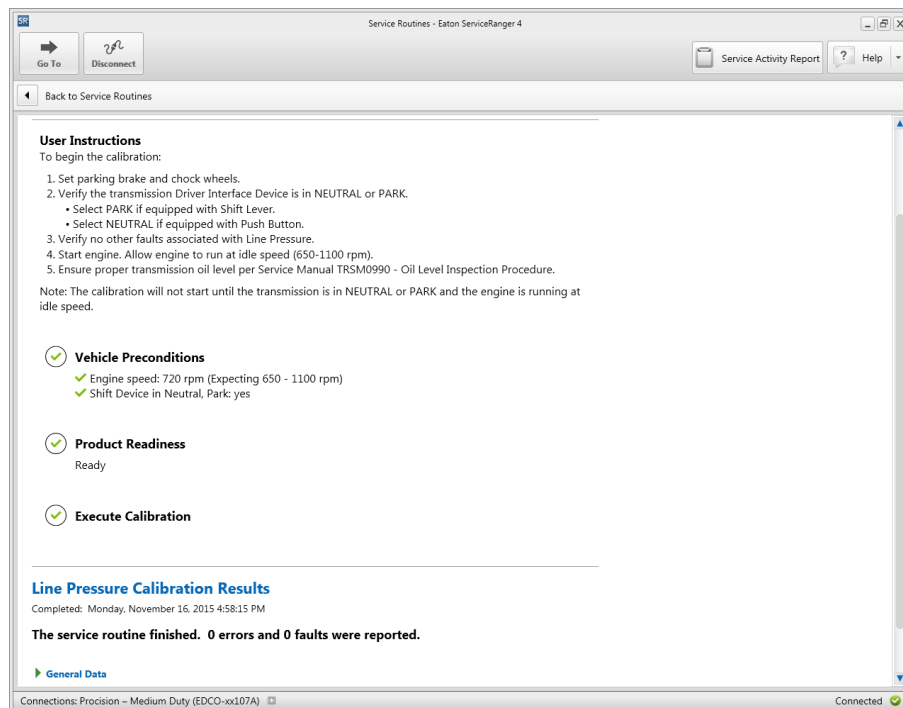
- The test will not start until the transmission is in PARK or NEUTRAL and the engine is running at idle speed.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Line Pressure Test

The Line Pressure Test sends commands from the Transmission Control Module (TCM) to the Line Pressure Solenoid and compares the current to hydraulic pressure feedback with the stored values in the TCM.

Features



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To run the Line Pressure Test:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Verify no other faults associated with Line Pressure
4. Install hydraulic line and gauge in the LP port on the left side of the transmission.
5. Start the engine. Allow engine to run at idle speed (650 - 1100 RPM).
6. Ensure proper transmission oil level per Service Manual TRSM0990 - Oil Level Inspection Procedure.
7. Select **Confirm** and follow on-screen prompts.
8. ServiceRanger displays the success or failure result and any related detailed information.

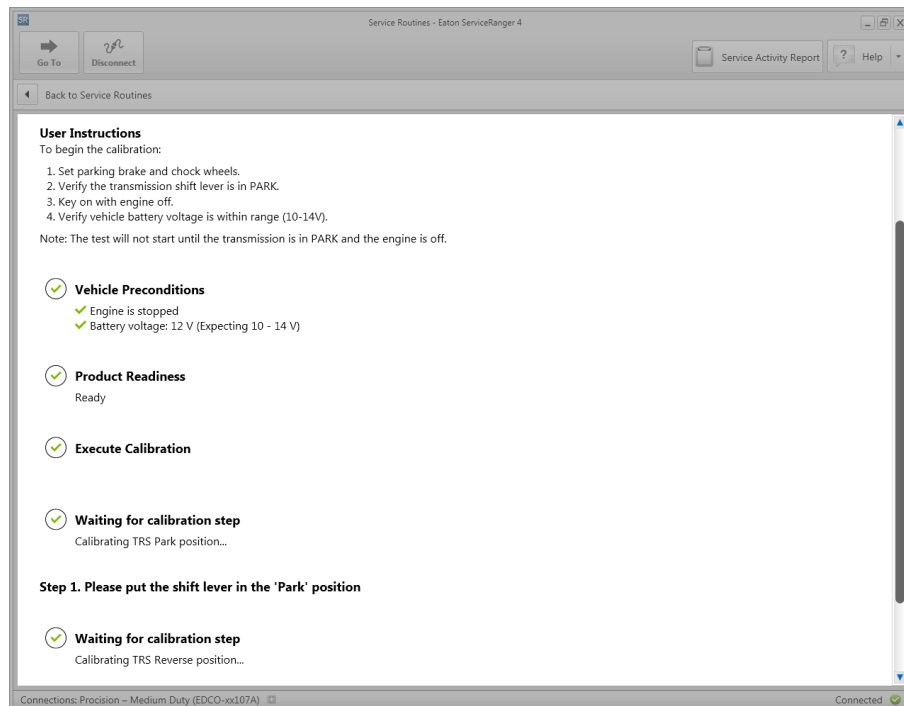
Notes:

- The test will not start until the transmission is in PARK or NEUTRAL and the engine is running at idle speed.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Shift Device Calibration

Transmission equipped with a "T-Handle" style Shift Level uses a cable linkage connected to the Transmission Range Sensor (TRS). The TRS verifies the transmission achieves the requested shift mode. The TRS Calibration is used to compensate for the cable adjustment or minor variances in the TRS. This calibration is required after any installation of a shift cable or replacement of the Transmission Control Module (TCM), "T-handle" style Shift Lever, TRS or shift cable or any time Fault Code 135 with FMI 13 is set Active



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To calibrate the Shift Device:

1. Set parking brake and chock wheels.
2. Verify the transmission Shift Lever is in PARK.
3. Key on with engine off.
4. Verify vehicle battery voltage is within range (10 to 14 volts).
5. Select **Confirm** and follow on-screen prompts.
6. ServiceRanger displays the success or failure result and any related detailed information.

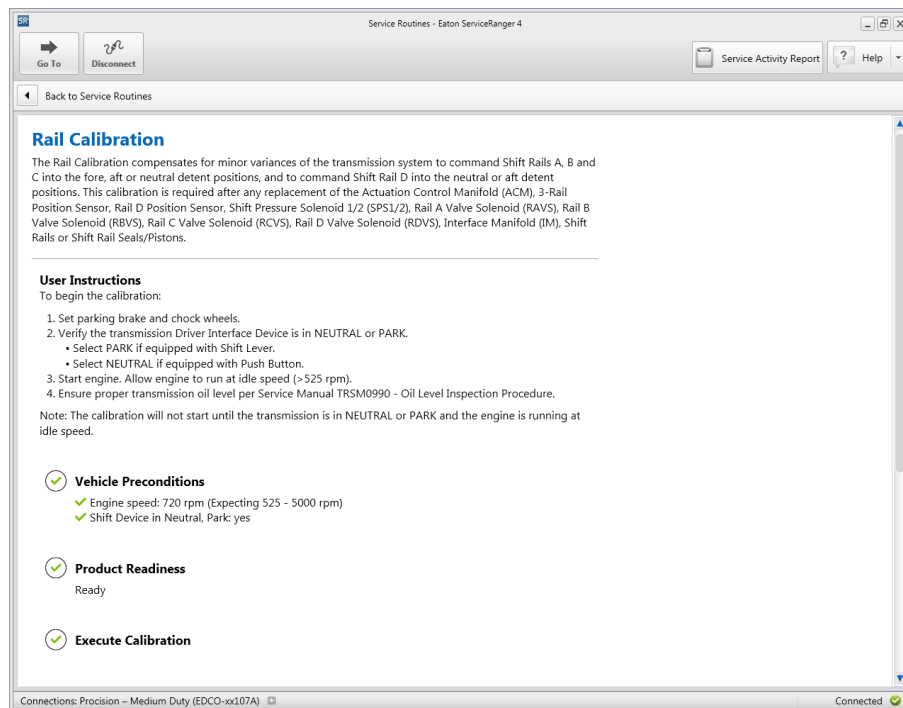
Notes:

- The test will not start until the transmission is in PARK and the engine is off.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Rail Calibration

The Rail Calibration compensates for the minor variances of the transmission system to command Shift Rails A, B and C into the fore, aft or neutral detent positions, and to command Shift Rail D into the neutral or aft detent positions. This calibration is required after any replacement of the Action Control Manifold (ACM), 3-Rail Position sensor, Rail D Position Sensor, Shift Pressure Solenoid 1/2 (SPS1/2), Rail A Valve Solenoid (RAVS), Rail B Valve Solenoid (RBVS), Rail C valve Solenoid (RCVS), Rail D Valve Solenoid (RDVS), Interface Manifold (IM), Shift Rails or Shift Rail Seals/Pistons.



Important: The vehicle must be parked on level ground before performing the grade sensor calibration. Failure to adhere to these conditions may lead to poor shift performance and could be misinterpreted as a product defect, leading to an unnecessary repair.

To calibrate Rail System:

1. Set parking brake and chock wheels.
2. Verify the transmission Driver Interface Device is in NEUTRAL or PARK.
 - Select PARK if equipped with Shift Lever.
 - Select NEUTRAL if equipped with Push Button.
3. Start the engine. Allow engine to run at idle speed (greater than 525 RPM).
4. Ensure proper transmission oil level per Service Manual TRSM0990 - Oil Level Inspection Procedure.

5. Select **Confirm** and follow on-screen prompts.
6. ServiceRanger displays the success or failure result and any related detailed information.

Notes:

- The test will not start until the transmission is in PARK or NEUTRAL and the engine is running at idle speed.

Failure to adhere to ground surface conditions may lead to unsatisfactory shift performance. This condition could be misinterpreted as a product defect and could lead to an unnecessary repair

Product information

Product Information Overview

The Product Information feature allows you to view up-to-date service literature such as troubleshooting and service manuals for Eaton products.

Screen Overview

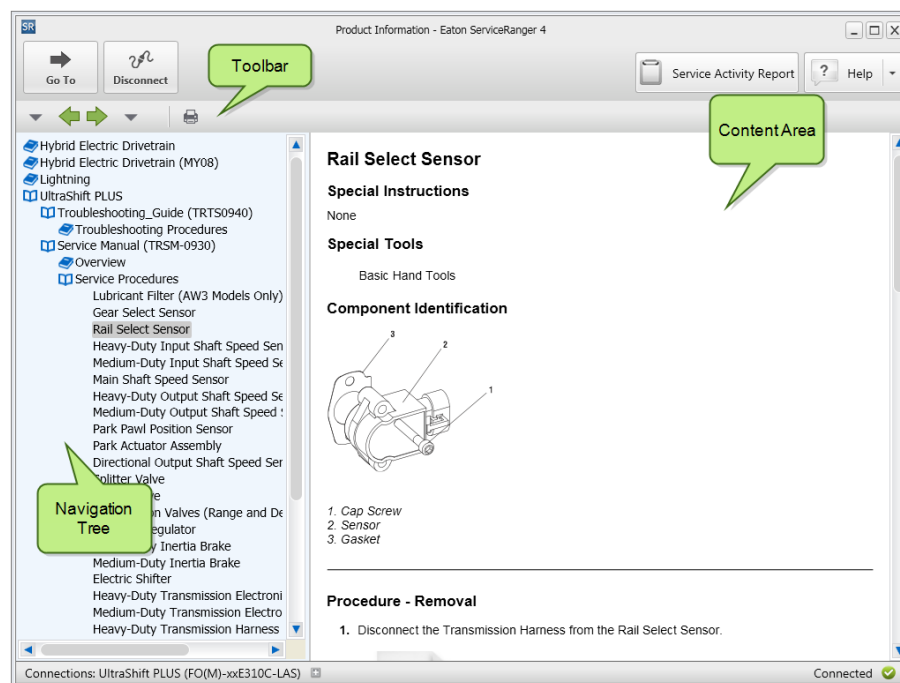
The main screen in Product Information is split into two sections, the navigation tree and the content area.

Navigation Tree

The navigation tree allows you to navigate to a service publication for viewing. It is organized by product family then service manual type (e.g. Troubleshooting Guide or Service Manual).

Content Area

The content area displays the service information once selected in navigation menu.



Viewing Product Information

Viewing product information is very similar to using a web browser to navigate the Internet.

To view product information:

1. Select **Product Information** from the navigation menu.
2. The default home screen is displayed.
3. Review the available products in the navigation tree and select a product name.
4. Review the available chapter names, and select a chapter.
5. Review the available titles, and select a title.
6. The information is displayed in the content area.

Note:

- While viewing content, hyperlinks appear when related content is available. For example, when a troubleshooting procedure indicates to replace a part a hyperlink to the removal and repair procedure in the service manual is displayed.

Videos

When a video is available an icon is displayed in the content area. Selecting the icon opens the video in the default video player.

To view a video:

1. Select **Product Information** from the navigation menu.
2. Select the **video icon** from the content area.
3. The video is opened in the default video player on your computer.

Note:

- Not all content has a video.

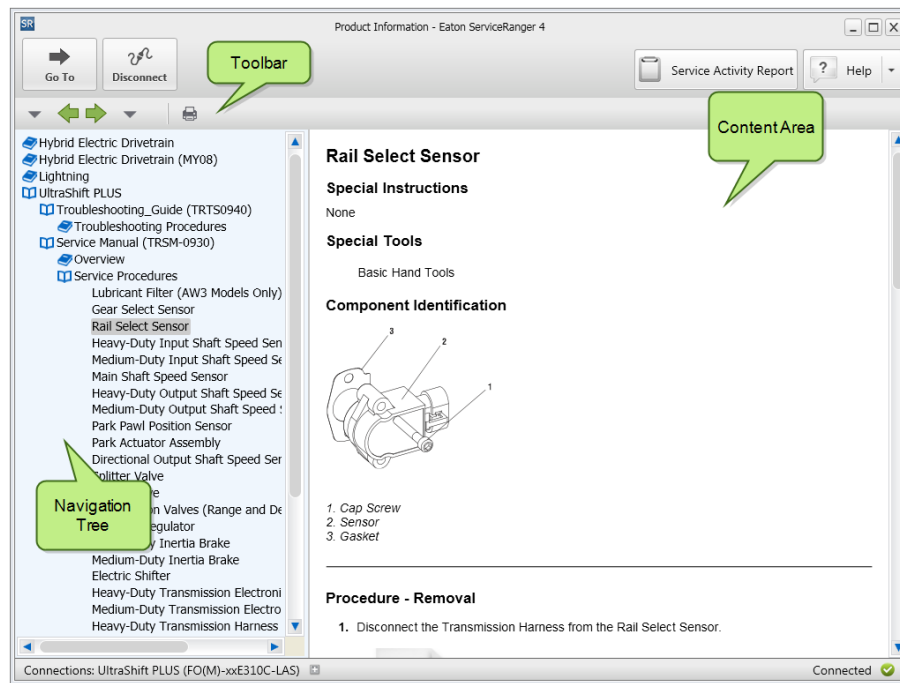
Printing Product Information

Product information content can be printed from ServiceRanger. This allows you to have a paper copy for reference as you perform a service or troubleshooting procedure.

To print product information:

1. Select **Product Information** from the navigation menu.
2. View service information content.
3. Select **Print**.
4. In the Print dialog, complete the options and select **Ok**.

Features



Reports

Reports Overview

ServiceRanger allows you to create reports of vehicle-related service and diagnostic information. This is useful when you need to save information for review at a later time. There are two types of reports, Diagnostic and Service Activity.

Diagnostic Reports

A diagnostic report contains vehicle identification information, fault codes, and current software levels. The report can be printed, saved to PDF, or emailed (using your default email client). The report data comes from the currently connected vehicle, or alternatively a saved Service Activity Report.

Service Activity Reports

Service activity reports contain information on vehicle identification information, fault codes, configuration settings, software levels, troubleshooting steps, and results of service routines. The information is saved within ServiceRanger allowing you to perform searches and share the information with Eaton support representatives. Additionally, the information can be used to create a diagnostic report in either printed or pdf format.

Diagnostic Reports Overview

The diagnostic report feature allows you to quickly create, save, and print information when connected to a vehicle.

Report Overview

The diagnostic report is split into two sections, the report details and the report content area.

Report Header

The report header section provides information on vehicle identification, vehicle mileage, and the date the report was created.

Report Detail Area

The content area displays the information from the vehicle. This includes fault code information, software versions, and any notes you may have entered for example.

The screenshot shows a diagnostic report interface. At the top right is the Eaton logo with the tagline 'Powering Business Worldwide'. Below it, the report title '22946 | Diagnostic Report' and the generation date 'Report Generated 01-21-2013 09:12:11 AM' are displayed. A green callout bubble labeled 'Report Header' points to this top section. Below the header is a box containing vehicle information: VIN ASDF1234567890123, Owner ABCD Truck Inc., and Unit Number 12345. Further down is the 'Service Notes' section with three entries of dummy text. A second green callout bubble labeled 'Report Detail' points to this section. Below the notes are two tables: 'Fault Codes - Eaton Product' (UltraShift Plus) and 'Fault Codes - Vehicle' (Engine). Both tables list fault codes with columns for Code, Status, ID, FMI, Count, Timestamp, and Description.

Code	Status	ID	FMI	Count	Timestamp	Description
61	Active	629	05	18	00h 32m	Rail select motor - Current below normal or open circuit
51	Inactive	P60	02	1	32h 47m	Rail position sensor - Data erratic or intermittent or incorrect
63	Active	55525	05	254	07h 54m	Gear select motor - Current below normal or open circuit

Status	ID	FMI	Count	Description
Active	629	05	18	Rail select motor - Current below normal or open circuit

Printing Diagnostic Report

You can quickly create and print a diagnostic report from ServiceRanger. When you print information, it is displayed in a formatted report. The Print Preview feature allows you to see how a printed report looks and to adjust page orientation, scaling, and margins, etc before printing.

To print a report:

1. View a content area (e.g. fault code, configurations).
2. Select **Print** icon from the toolbar.
3. In the report option dialog, enter any information that you would like to include.
4. Select **Ok**.
5. The print preview dialog is displayed.
6. Select **Print** to send the information to your printer.

Notes:

- The Print Preview window has a number of buttons and other controls enabling you to zoom the display, view different pages, etc.
- The Print Preview window also has options to export and email your information.

- Notes, Fault Codes, Vehicle Components, and Product Configuration information are included into the report.

Export and Email Diagnostic Report

Information displayed in ServiceRanger can be exported, or saved, with a diagnostic report. Fault codes, configuration settings, software versions, and notes can be exported to a PDF file. There is also an option allowing you to easily attach a report and send it by email.

To export a diagnostic report:

1. View a content area (e.g. fault code, configurations).
2. Select the **Export** icon from the toolbar.
3. In the report option dialog, enter any information to be included in the report.
4. In the save file dialog, select the location to save the report on your computer.

Notes:

- A default filename is supplied based on date and time. The filename can be changed.
- By default, the report is saved in the "My Documents" folder.

To export and email a report:

1. View a content area (e.g. fault code, components).
2. Select the **Export and Email** icon from the toolbar.
3. In the report option dialog, enter any information to be included in the report.
4. In the save file dialog, select the location to save the report on your computer.
5. Select **Save**.
6. Your default email program is opened and the report is attached.

Notes:

- A default filename is supplied based on date and time. The filename can be changed.
- By default, the report is saved in the "My Documents" folder.

Service Reports Overview

The service reports feature allows you to create and view reports of vehicle information, fault history, and other service activity and actions you performed when working in ServiceRanger.

Screen Overview

The service report screen is split into two sections, the report details and the report content area.

Report Detail

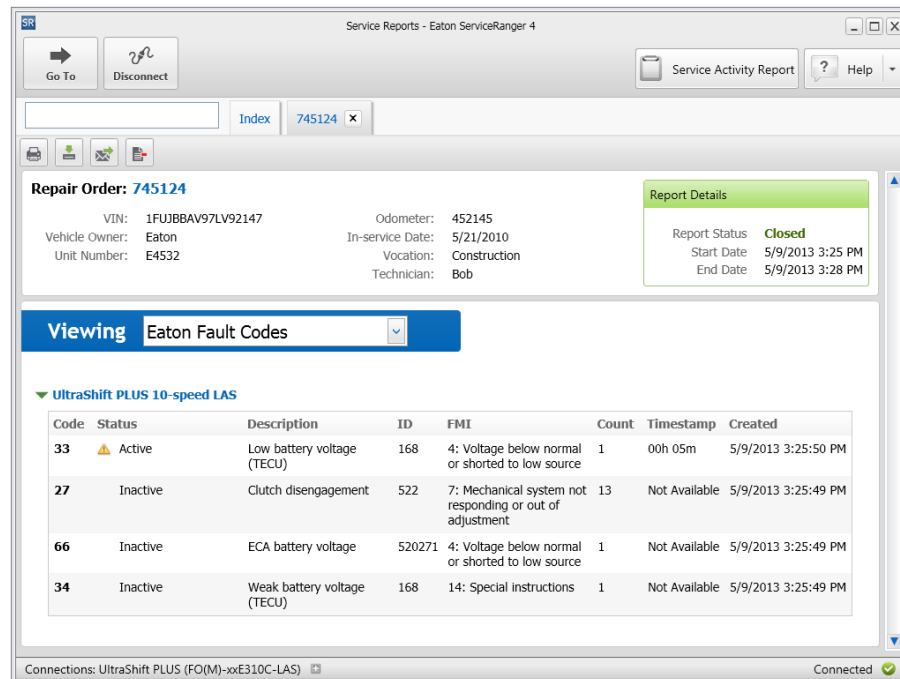
The report detail section provides information on vehicle identification, vehicle mileage, and the date the report was created.

Report Content Area

The content area displays the information ServiceRanger records while connected to the vehicle. This includes fault code information, snapshot data, and any notes you may have entered for

Features

example. Each section of information can be viewed by selecting the Viewing drop down.



Starting a New Service Report

At any point while connected to a vehicle, you can start a Service Activity Report. ServiceRanger asks you to provide some basic vehicle information and then begins the process of retrieving information from the vehicle. Information is added, or appended, to the report as you use ServiceRanger. This allows you to have all the information collected in one report as you work and perform the service troubleshooting and repair activities.

To start a new service report:

1. Select **Service Activity Report** from the navigation menu.
2. Enter the following information:
 - Vehicle Identification Number (VIN) - required
 - Repair Order - required
 - Odometer
 - Owner
 - Vehicle in-service-date
 - Unit Number
 - Vehicle Vocation
 - Technician Name - required
 - Service Notes
3. Select **Start Report**.
4. The system retrieves information from the vehicle, which may take a few minutes.
5. Once completed, the Service Report is created and displayed.

The screenshot shows the 'Service Reports - Eaton ServiceRanger 4' application window. A 'Start Service Activity Report' dialog box is open in the center. The dialog box has the following fields:

- VIN: (text input)
- Repair Order: (text input)
- Vehicle Owner: (text input)
- Vehicle In-service Date: (date picker)
- Unit Number: (text input)
- Vehicle Vocation: (dropdown menu)
- Odometer: (text input)
- Technician: (text input)
- Notes: (text area)

At the bottom of the dialog box are two buttons: 'Start Report' and 'Cancel'. The background application window shows a list of repair orders on the left and a list of vehicles on the right, each with a 'View' button. The status bar at the bottom indicates 'Connections: UltraShift PLUS (FO(M)-xxE310C-LAS)' and 'Connected'.

Notes:

- You can not create a service report while disconnected to the vehicle.
- The system attempts to retrieve the VIN and odometer from the vehicle automatically. If not, you are required to enter the information.
- If you have a saved service report for the current vehicle, the system attempts to auto complete some information such as vocation, unit number, etc.

Resuming a Paused Service Report

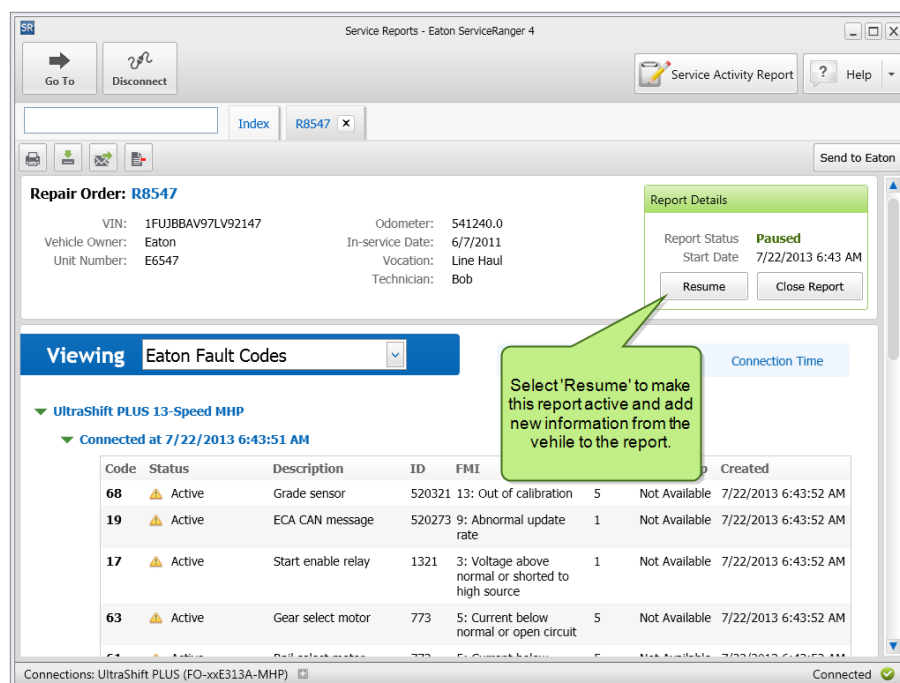
While working on a vehicle it may become necessary to pause a report and resume it at a later date and time to complete the repair. This is useful if you are working on multiple vehicles or waiting for parts on order for example.

If you start a new report, ServiceRanger will attempt to retrieve the VIN from the vehicle. If a report in the paused state contains the retrieved VIN, ServiceRanger will prompt you to either continue the current report or close the existing report and start a new one. However, there are times when the VIN can not be automatically retrieved from the vehicle. Therefore it may be necessary to manually resume a report to add new information.

To manually resume a paused service report:

1. Connect to a vehicle.
2. Select **Service Activity Report** from the navigation menu.
3. Locate the paused report you want to resume.
4. Select **Resume**.
5. The Service Report is updated with the new information and displayed.

Features



Notes:

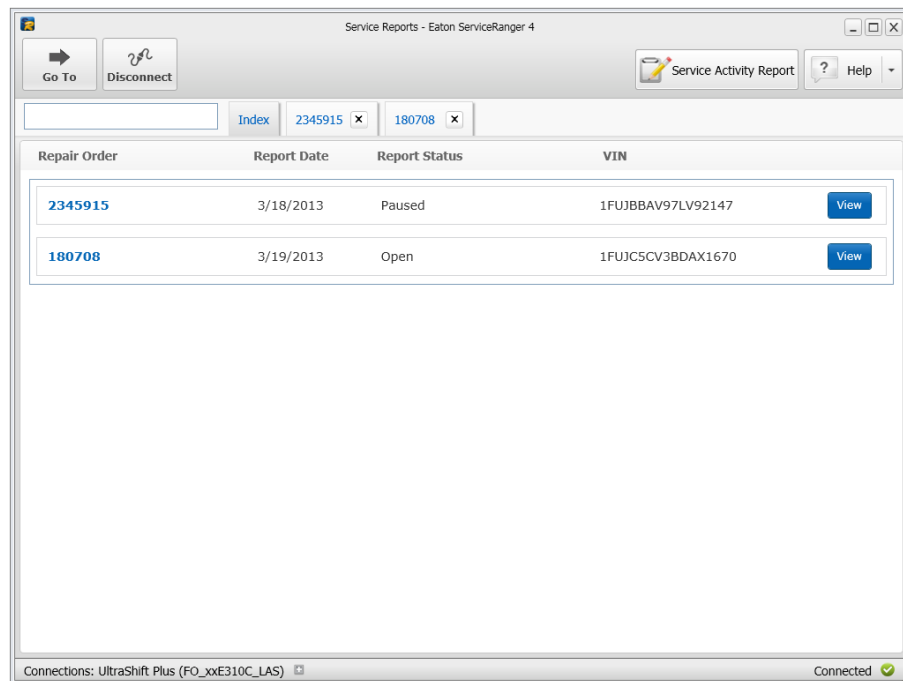
- You can not resume a closed service activity report.
- The system attempts to retrieve the VIN from the vehicle automatically. If the vehicle VIN does not match the VIN in the service activity report, you are prompted to confirm if the report matches the vehicle.

Viewing a Saved Report

You can quickly access saved reports in ServiceRanger by navigating to the main landing screen in the Service Activity Report feature. A list of saved Service Reports is displayed. In addition, there are also features available to search the saved reports by VIN, repair order, and technician name.

To view a saved service report:

1. Select **Service Activity Report** from the navigation menu.
2. The Index page is shown with a list of saved Service Activity Reports, most recent first.
3. Select **View** to view the desired report.
4. The report opens and is displayed in a new tab.



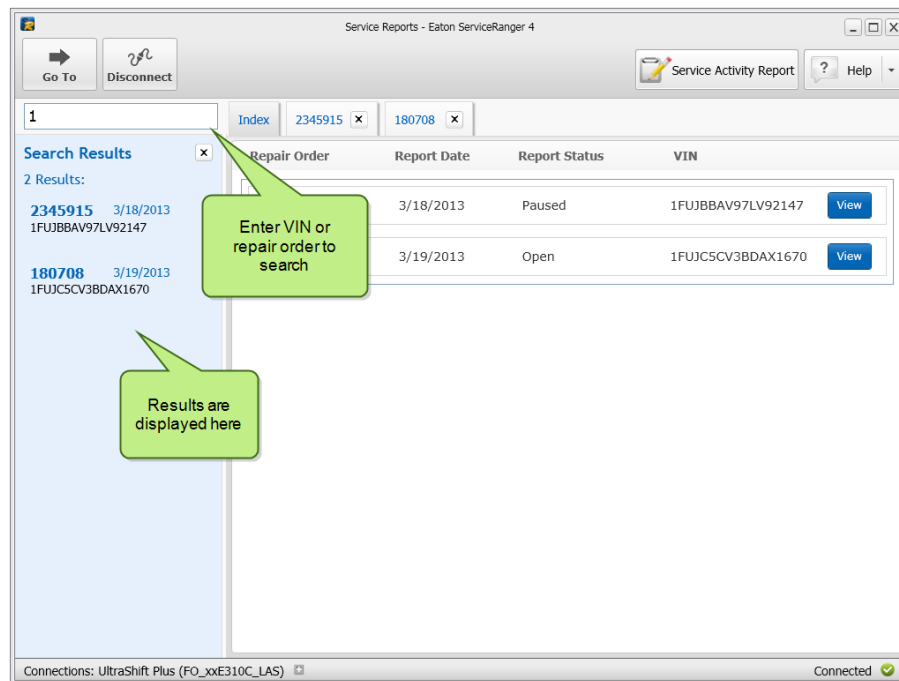
Search

Search allows you to quickly find saved reports. The searched fields include VIN, repair order, and technician name.

To search for a saved service report:

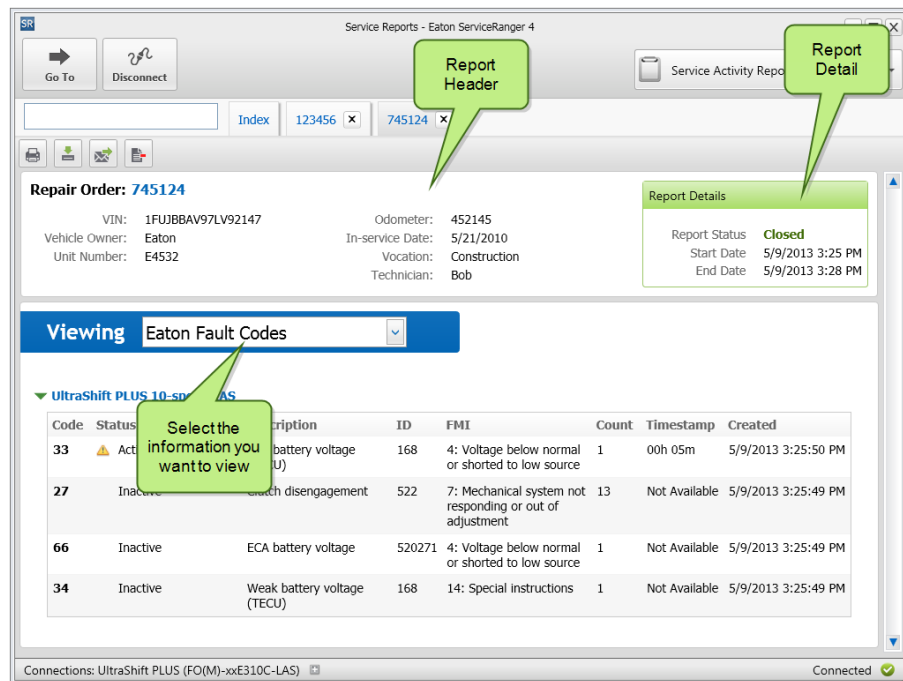
1. Select **Service Activity Report** from the navigation menu.
2. Enter the criteria in the search field.
3. The result of the search is displayed.
4. Select **View** to view the desired report.
5. The report is opened and is displayed in a new tab.

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Working with a Service Report

When you open a service activity report, you will notice several pieces of information. At the top of the report, is the report header. It contains information about the vehicle and the repair. Below the header is the content area. The content area contains information such as fault codes, configuration settings, and snapshot data.



To change the information displayed:

1. Open a Service Activity Report.
2. The report is displayed, with the fault code view as the default information being displayed.
3. Select one of the following from the selection list:
 - Service Notes
 - Eaton fault codes
 - Vehicle fault codes
 - Vehicle components
 - Configurations
 - Programming
4. The selected view is displayed.

Notes:

- The view selection menu changes based on the type of information recorded from the vehicle at the time the report was created. Some of the options may not be present.

To find a related reports:

1. Open a Service Activity Report.
2. The report is displayed.
3. Select **Find Related** from the toolbar.
4. The search dialog is displayed with results that match the VIN of the current report.

To close a open report:

1. Open a Service Activity Report.
2. The report is displayed.

3. Select **Close**.
4. The report is marked closed and can not be re-opened and changed.

Notes:

- Only opened or paused reports can be closed.

To print a report:

1. Open a Service Activity Report.
2. The report is displayed.
3. Select **Print** from the toolbar.
4. The print preview dialog is displayed.
5. Select **Print** to send the information to your printer.

Notes:

- The Print Preview window has a number of buttons and other controls enabling you to zoom the display, view different pages, etc.
- The Print Preview window also has options to export and email your information.
- Notes, Fault Codes, Vehicle Components, and Product Configuration information are included into the report.

To export a report:

1. Open a Service Activity Report.
2. The report is displayed.
3. Select **Export** from the toolbar.
4. In the save file dialog, select the location to save the report on your computer.

Notes:

- A default name is supplied based on date and time. You can change the file name.
- By default, the report is saved in the "My Documents" folder.

How to export and email a report:

1. Open a Service Activity Report.
2. Select **Export and Email** from the toolbar.
3. In the save file dialog, select the location to save the report on your computer.
4. Select **Save**.
5. Your default email program opens and the report is attached.

Notes:

- A default name is supplied based on date and time. You can change the file name.
- By default, the report is saved in the "My Documents" folder.

To delete a report:

1. Open a Service Activity Report.
2. The report is displayed.
3. Select **Delete** from the toolbar.
4. Select **Ok** on the confirmation dialog.
5. The report is deleted from your computer.

Notes:

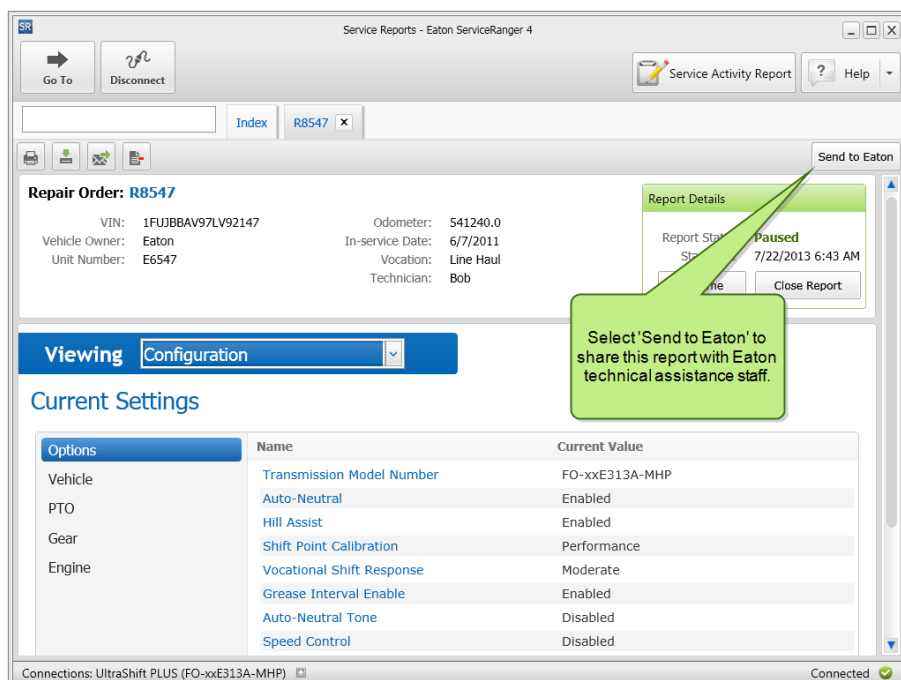
- This operation can not be un-done.

Send Data to Eaton

The send to Eaton feature allows you to easily transfer information to an Eaton representative for advanced troubleshooting help. The information stored in the Service Activity Report, including fault codes, configuration settings, software versions , snapshot and VPA information is uploaded.

To send data

1. Connect to the Internet.
2. View the Service Activity Report you want to share.
3. Select **Send to Eaton** from the menu bar.



Notes:

- The computer must have Internet access for the Data Upload function to work properly.

Settings

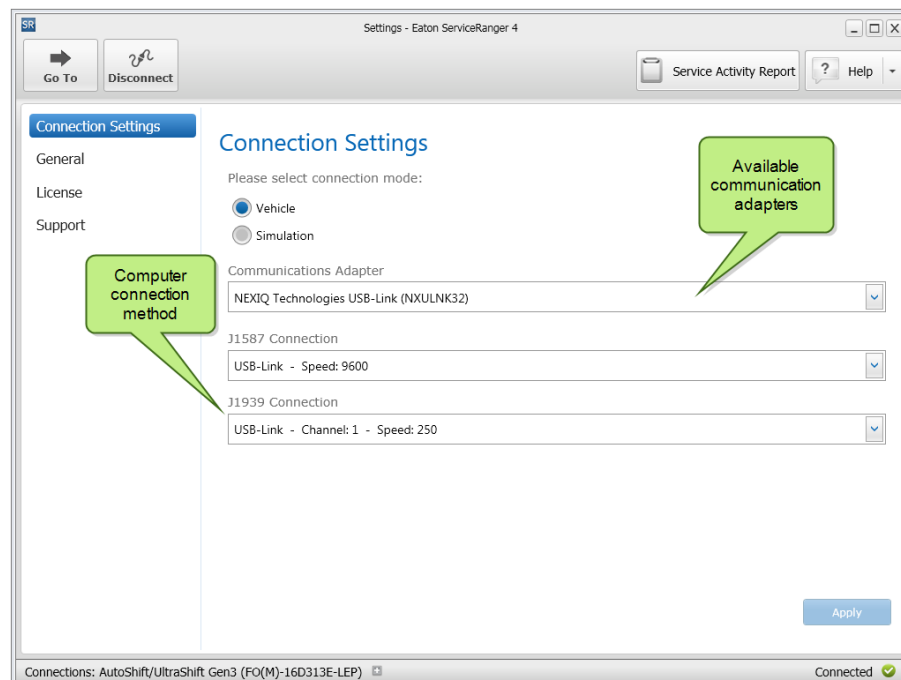
To set preferences on how ServiceRanger operates, you can change various settings to fit your needs.

To open the settings dialog

1. Select **Settings** on the navigation menu.

Connection Settings

The connection settings page allows you to choose either simulation mode or vehicle connection. In the case of vehicle it allows you to choose the vehicle communication adapter you are using to connect to the vehicle. For simulation, it allows you to simulate a particular Eaton product. This is useful for training purposes.



To set simulation mode:

1. Select **Simulation**.
2. Select the product in the drop product selection drop down list (e.g. AutoShift/UltraShift Gen3).
3. Select communication link in the connection links drop down list.
4. Select **Apply**.
5. The system is now configured for simulation mode, as indicated by the red border. You can use the application as if you were connected to the vehicle.

To set vehicle mode and select a communication adapter:

1. Select **Vehicle**.
2. Select the Communication Adapter in the drop down list.

Note: If you do not see the driver for your adapter in this list, your driver may not be installed correctly. If you are unsure about how to install these drivers, or you do not know which driver to select, contact the manufacturer of your communications adapter for more information.

3. Select the computer connection method from the J1587 Device drop down list.
4. Select the computer connection method from the J1939 Device drop down list.

Note: The J1939 list will contain the available connections for your communication adapters. The list is displayed as connection method, then channel, then connection speed. Refer to your vehicle's OEM for more information on the correct connection speed and channel.

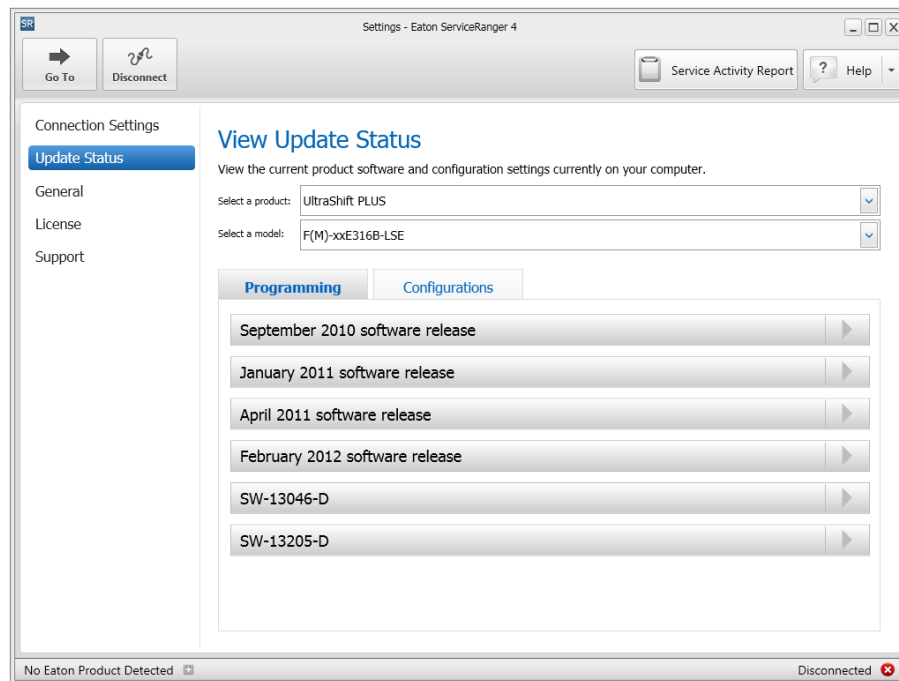
5. Once the connection settings have been made, select **Apply** to save your choices and return to the main screen. ServiceRanger remembers the connection settings each time it is started.

Notes:

- If a vehicle communication adapter is configured and has not been approved by Eaton, programming functions are not allowed to be performed. A message is displayed if you select a communication adapter that is not supported.
- J1939 connection methods vary by OEMs, newer vehicles may require channel 2 to be selected. Refer to Roadranger.com for more information.
- Only select the 'auto' setting if your communication adapter supports the auto baud detection of the link speed. Please refer to your communication adapter manufacturer for more information.

Update Status

The update status page allows you to view the current product configurations and software on your PC. This is useful to verify you have the correct software and configurations before connecting to a vehicle.



To view product software for programming:

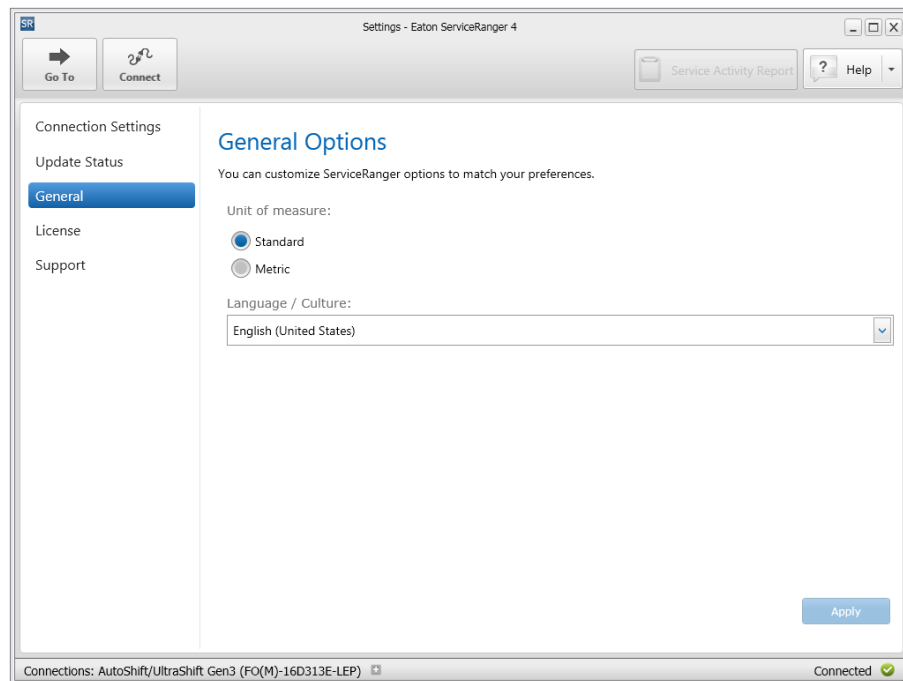
1. Select the product in the drop product selection drop down list (e.g. UltraShift PLUS).
2. Select the model in the drop down list (e.g. FM-xxE310-LAS).
3. Select the **Programming** tab.
4. The available software will be shown.

To view available configurations and settings:

1. Select the product in the drop product selection drop down list (e.g. UltraShift PLUS).
2. Select the model in the drop down list (e.g. FM-xxE310-LAS).
3. Select the **Configurations** tab.
4. The available configurations will be shown.
5. Select the configuration item to display list of available settings.

General

The general page allows you to view and update your viewing preferences.



Selecting a unit of measure for the user interface

You may need to change how data values (e.g. road speed in mph or km/h) are displayed based on unit of measure. ServiceRanger provides two different settings - standard and metric.

To change unit of measure:

1. Select **General** on the setting screen.
2. Select **Standard or Metric**.
3. Select **Apply**.

Notes:

- You will need to restart ServiceRanger for the setting to take effect.

Selecting a language for the user interface

You have the option of viewing the interface in different languages. All of these languages are available from the same version of ServiceRanger (you do not need to purchase different versions for different languages). When you initially launch ServiceRanger, you are asked to select your language preferences. Based on your selection, the user interface is displayed in the appropriate language, with the option to later switch your preferences at any time from the language selection dialog. If, for any reason, a particular element is not available in that language, the element displays in the default language, English.

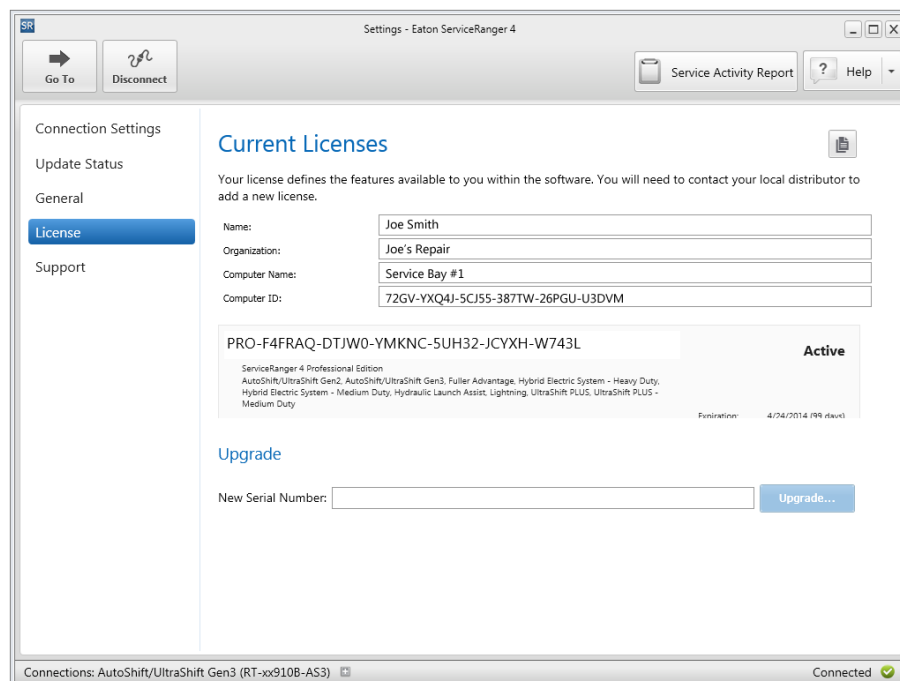
To change displayed language/culture:

1. Select **General** on the setting screen.
2. Select a language and culture setting from the selection list.
3. Select **Apply**.

License

Features

The license page allows you to view and update your license information. Licenses control what features and functions that are available to you. Included in this information is your license status and expiration date.



To upgrade a license:

1. Connect to the Internet.
2. Select **License** on the setting screen.
3. Enter your new upgrade code.
4. Select **Upgrade**.

Notes:

- You must have an Internet connection available when upgrading a license.

To copy license information to the clipboard:

1. Select **License** on the setting screen.
2. Select the **Copy** icon.
3. The information is copied to the clipboard and can be pasted into another software application.

Support

The support page allows you to troubleshoot issues that you may be having with ServiceRanger.

You should only change settings on this page when instructed to by an Eaton representative.

Update Manager

The ServiceRanger update manager provides notifications of updates to ServiceRanger. Keeping your software up-to-date is important and allows you to get the most out of your diagnostic tool. The update service runs in the background of your computer and does not interfere with your daily work.

Check for updates

You can use the check for updates feature to download and install any available updates for ServiceRanger. In order to do this, the computer must be connected to the Internet.

To manually check for updates:

1. Select check for updates:
 - From within ServiceRanger, select **Check for updates now** from the home screen.
 - OR
 - From the system tray, right click on the ServiceRanger update manger icon and select **Check for Updates**.
2. A dialog is displayed while the system connects to the Internet and checks for updates.
3. If an update is found, the Update Manager will automatically download the update.
4. The update is downloaded and the installation is started. Follow the screen prompts to finish the update.

Notes:

- The update service uses standard Internet protocols and ports to check for updates.
- Some firewall and IT services may block the website the update service needs to access to check for updates. Port 80 should be open and the following website should be added to their white list: *serviceranger4.com

Support

Technical Support

Visit Roadranger.com for more information about ServiceRanger, including updates, service bulletins, and other frequently asked questions.

If you need assistance you can call Roadranger Technical Assistance Call Center at 1-800-826-HELP (4357). The following information may be required to help resolve any issues you may be having, so have this information readily available before calling:

- The ServiceRanger software version numbers found in the Help\About ServiceRanger screen.
- Your computer operating system.
- Your Vehicle Communications Adapter make, model, and RP1210 driver version.
- Exact wording of any error or warning message you may have received from the program.
- Sequence of steps you took before any errors occurred.
- Any changes made to your computer recently, including new software or peripherals, and if the ServiceRanger program was running correctly in the past.

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For spec'ing or service assistance, call 1-800-826-HELP (4357) or visit www.eaton.com/roadranger. In Mexico, call 001-800-826-4357.

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