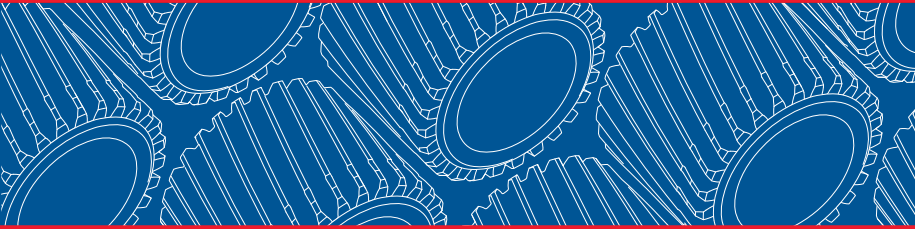




Allison
Transmission®



User Guide

Allison DOC™ For PC–Service Tool Version 7.0.0

GN3433EN

User Guide

2007 MARCH

GN3433EN

Allison Transmission

Allison DOC™ For PC–Service Tool

Version 7.0.0



**Allison
Transmission**

Allison Transmission, Inc.

P.O. Box 894 Indianapolis, Indiana 46206-0894

www.allisontransmission.com

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1.0 ALLISON DOC™ FOR PC-SERVICE TOOL

1-1. INTRODUCTION

The Allison DOC™ (Diagnostic Optimized Connection) For PC-Service Tool is a diagnostic system designed for use with Allison's 3000/4000 Product Families transmissions, 1000/2000 Product Families transmissions, and transmissions using CEC2/CEC1 controls. This PC-based diagnostic program is capable of communicating with Allison 4th Generation Control System Module TCMs, WTEC II and WTEC III Electronic Control Units (ECU), 1000/2000 (Pre-Allison 4th Generation Controls) TCMs, CEC2, and CEC1 Electronic Control Units (ECU).

Allison DOC™ For PC-Service Tool performs the following:

- Monitors 3000/4000 Product Families Transmission Control Module (TCM) data
- Monitors 1000/2000 Product Families Transmission Control Module (TCM) data
- Monitors CEC2 Electronic Control Unit (ECU) data
- Monitors CEC Electronic Control Unit data, using a proprietary protocol and the Allison CEC translator device
- Displays multiple transmission parameters
- Displays a graphical instrument panel with analog and digital gauges
- Displays a graphical strip chart
- Records and plays back diagnostic sessions
- Prints diagnostic reports
- Reprograms selected TCM parameters (requires completion of Allison Transmission training).

Allison DOC™ For PC-Service Tool provides the following features:

- A Microsoft Windows®/PC look and feel
- Security measures to control reprogramming TCM/ECU parameters
- Integrated Help with training videos
- Diagnostic Trouble Code information with a direct link to 3000/4000 Product Families Troubleshooting Manuals

- Diagnostic Trouble Code information with a direct link to the 1000/2000 Product Families Troubleshooting Manual
- Diagnostic Trouble Code information with a direct link to CEC2 Troubleshooting Manuals
- A demo mode using prerecorded data
- SmartConnect for detecting the PC-to-vehicle translation device and communication link
- Communication troubleshooting wizard for those cases where the tool is unable to connect to a control module
- Allison DOC™ For PC–Service Tool is compliant with applicable TMC Recommended Practices, GM Online Standards, SAE Standards, and CE Standards
- Allison DOC™ For PC–Service Tool is RP1210A compliant

1–2. WARNINGS AND NOTES



WARNING: To avoid personal injury, the vehicle operator must not use or read the diagnostic tool while the vehicle is moving. Doing so may result in loss of vehicle control, which may cause personal injury and vehicle damage.



WARNING: Personnel other than the vehicle operator must use the diagnostic tool.



WARNING: The vehicle operator must maintain control of the vehicle while an assistant performs the diagnostic evaluations.



NOTE: Allison DOC™ For PC–Service Tool users are assumed to have a basic working knowledge of the Microsoft® Windows 2000® Professional/XP® Professional®/Vista® Home Basic Operating System(s) and Adobe Acrobat Reader®.



NOTE: During a TCM/ECU reprogramming event, make sure the transmission controller has continuous power and ignition voltage supplied at all times.

Trademark Information

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Adobe Acrobat® is a registered trademark of Adobe Corporation.

Allison DOC™ is a trademark of General Motors Corporation.

InstallShield® is a registered trademark of InstallShield Software Corporation.

1-3. USER GUIDE ORGANIZATION

This user guide for Allison DOC™ For PC–Service Tool is organized with information pertaining to the most current control system, Allison 4th Generation Controls, appearing in the main body of the user guide. The functions and features described are similar for all control systems except where indicated. Information specific to an earlier control system is presented in a section devoted to that control system.

1-4. TEXT CONVENTIONS USED IN THIS GUIDE

The following text conventions are used in this Guide to more clearly describe using Allison DOC™ For PC–Service Tool:

- Screen button and keyboard key names are in bold capitals—**OK, RETURN**.
- Menu names are presented as displayed—File, Edit, etc.
- Menu items are presented as displayed—Exit.
- File names that may change with use are in lowercase italics—*snapshot.ad*.
- File names, usually system files, that do not change are in initial capitals—Acrobat.pdf.
- Titles of windows are as they appear in the window.

1-5. SYSTEM REQUIREMENTS

- Microsoft® Windows XP® Professional, Windows 2000® (SP4 or later) Professional, and Windows Vista® Home Basic (or better)
- 20 GB Hard Drive, (40 GB or greater recommended)
- 600 MB free hard drive space required to install the program (after software installation, the operating system requires sufficient free hard disk space to run the program)
- 1GHz (or greater) 32-bit (x86) or 64-bit (x64) processor

- 512MB of RAM system memory (1GB recommended)
- One available USB port—USB 1.1 (USB 2.0 recommended)
- A serial port is required if connecting legacy CEC1 controllers, or if using the J 44652-A - SPX J1850-VPW (Class 2) translator device
- 16x CD-ROM, (48x or greater recommended)
- **Full administrative privileges are required to install, use, and update the Allison DOC™ For PC–Service Tool**
- Internet connection capability (Internet Explorer® 5.0.1 or greater)
(NOTE: A broadband internet connection is recommended for receiving updates and file downloads)
- Windows® Media Player® is installed by default
- Adobe® Acrobat Reader® is installed by default

1-6. ALLISON DOC™ FOR PC–SERVICE TOOL SOFTWARE INSTALLATION

This section explains how to install the Allison DOC™ For PC–Service Tool software on your PC from the Allison DOC™ For PC–Service Tool CD-ROM. Before attempting to install this software, make sure that:

- Your computer satisfies the PC Platform requirements listed on the “System Requirements” section.
- You have **full PC Administrator privileges**.
- For more information, see your network administrator.



NOTE: The newest version of Allison DOC™ For PC will automatically supersede any previous version of this application. There is no need to uninstall earlier versions of this application. The software authorization (or password requirement) status will be maintained.

To install the Allison DOC™ For PC–Service Tool software on your PC:

1. Insert the Allison DOC™ For PC–Service Tool CD-ROM into your CD-ROM drive. If the installation process does not begin momentarily, select **Start -> Run** from the task bar. Click **Browse**, locate the *Setup.exe* file on the installation CD, and click **OK**.



NOTE: This process may take several minutes; please be patient. Interrupting the installation process could cause issues such as error messages, unable to connect, blank screens, problems during future updates, etc.

2. Follow On-Screen instructions.
3. Finally, the InstallShield® Wizard Complete window displays to indicate that the installation has completed successfully. Select the “**Yes, I want to restart my computer now**” option (default). Click the **FINISH** button to exit the setup process and restart your PC.



NOTE:

- Allison DOC™ For PC automatically installs the RP1210A drivers for the following adapters: (1) DPA4 USB Translator Device (essential-rated tool for Allison Transmission), and (2) SPX J1850 VPW translator Device.
- To use any other RP1210 translator device listed in the latest Allison DOC™ Service Information Letters (SIL), the corresponding device drivers must be installed separately. Make sure to install the drivers before attempting to use the translator device with Allison DOC™ For PC–Service Tool.



NOTE: For more information on installation and troubleshooting procedures when using the Dearborn DPA4 USB adapter, please refer to the “**DPA4 USB Translator Device (J-47943) Quick Reference Guide**” document available at www.allisontransmission.com | Service | Electronic Tools | Translator Devices.

1-7. ALLISON DOC™ FOR PC–SERVICE TOOL OVERVIEW

Allison DOC™ For PC–Service Tool has been designed to aid you, the technician, in troubleshooting and maintaining Allison transmissions equipped with Allison 4th Generation Controls, WTEC II, WTEC III, CEC2, CEC1, and 1000/2000 (Pre-Allison 4th Generation Controls) systems. Allison DOC™ For PC–Service Tool can be used with a desktop PC or with a laptop PC in the cab of a vehicle.



WARNING: To avoid personal injury, the vehicle operator must not use or read the tool while the vehicle is moving. Doing so may result in loss of vehicle control, which may cause personal injury and property damage.

Allison DOC™ For PC–Service Tool aids you by providing:

- Displays of real-time and prerecorded transmission operating data.
- The ability to display and record user-selectable transmission data.
- The ability to display and record data bus traffic.

- The ability to clear transmission trouble codes.
- Automatic recording of failure records.
- Automatic triggering of snapshot recording when a DTC is detected.
- Access to TCM configuration data.
- With Allison Transmission approved training, the ability to change TCM/ECU configuration such as I/O functions and CMCs (this calibration configuration change is called Reprogramming).
- A graphic data display.
- Strip chart data graphing.
- A variety of reports such as:
 - ◇ Failure Records
 - ◇ Autodetect Information
 - ◇ Shift Inhibits
 - ◇ I/O Functions
 - ◇ TRANSHEALTH™ Report
 - ◇ Diagnostic Data
 - ◇ Customer Modifiable Constants (CMC)
 - ◇ Trouble Codes
 - ◇ DTC Test



NOTE: Contact your nearest Allison Distributor for additional Allison DOC™ For PC–Service Tool training. Allison Distributors are listed on the Allison web site at www.allisontransmission.com.

1–8. ALLISON DOC™ FOR PC–SERVICE TOOL NAVIGATION, CONTROLS, AND STATUS INFORMATION

Allison DOC™ For PC–Service Tool displays the following navigation, control, and status information items regardless of what is displayed in the main Allison DOC™ For PC–Service Tool window.

Status Bar

The status bar provides information about the connection between Allison DOC™ For PC–Service Tool and the controller. It is located in the upper portion of the main Allison DOC™ For PC–Service Tool window. The fields in the status bar are not labeled, but their content adequately indicates their purpose.

Allison DOC™ For PC–Service Tool Status Bar



Allison DOC™ For PC–Service Tool Connect Time Display

Connect Time 0:02:00

Allison DOC™ For PC–Service Tool Status Bar Fields:

- Control System Information
 - ◇ Transmission Control System, Calibration Identification Number, and software level, example: 1K2K—120004A002K / D71
- Application Status
 - ◇ Connected—Allison DOC™ For PC–Service Tool is actively connected to a control system and receiving live data.
 - ◇ Off-Line—Allison DOC™ For PC–Service Tool is not actively connected to a control system and it's not receiving live data.
 - ◇ Playback—The displayed data is part of a snapshot or Demo file previously recorded.
 - ◇ Recording—Displayed data is live data and is being recorded.
- Event Status (during a live connection)
 - ◇ Diagnostic—Diagnostic data is being displayed.
 - ◇ Shift Inhibit—Diagnostic data is being displayed, and a shift inhibit is currently present.
 - ◇ Action Request—Diagnostic data is being displayed, and the user is commanding an action request.
 - ◇ Reprogramming—the Reprogramming screen is being displayed.
- Event Status (during Playback)
 - ◇ Diagnostic—Diagnostic data is being displayed. No action requests were being performed at the time of the recording and no shift inhibits were present.
 - ◇ Shift Inhibit—Diagnostic data is being displayed. A shift inhibit was active at the time of the recording.
 - ◇ Action Request—Diagnostic data is being displayed which was recorded while an action request was being performed.
- DTC Status
 - ◇ Active Codes—One or more Active DTCs are present. Inactive DTCs may also be present.
 - ◇ No Active Codes—No Active DTCs are present. Inactive DTCs may be present.

Menus

The menu bar at the top of the Allison DOC™ For PC–Service Tool window, above the Status bar, displays the following drop-down menus:

File

- TCM Reflash (PCCS)—Opens up the TCM Reflash (PCCS) application, only if it's installed in the PC.
- Data Bus Viewer—Opens up the Data Bus Traffic Viewer. This option is disabled during a live connection of the tool.
- Exit—Exits the Allison DOC™ For PC–Service Tool program

Reprogram

- When enabled, displays the TCM/ECU Reprogramming section. Users need special training to enable this section of the tool.

Action Items

- Clutch Test Enabled—For Allison 4th Generation Control systems and 1000/2000 (Pre-Allison 4th Generation Controls) systems, it displays the Clutch Test floating tool bar. For all other control system (i.e. WTEC II, WTEC III, and CEC2), it controls the Clutch Test mode.
- Solenoid Test...—Displays the Solenoid Test screen (not available for WTEC II/III, CEC1, and CEC2).
- Reset Adaptive Shift Parameters—(not available for WTEC II/III, CEC1, and CEC2) Displays the Reset Adaptive Shift Parameters window, where transmission adaptive data can be reset to factory values per shift.
- Reset Unadapted Shifts—(only available for WTEC II and WTEC III) Resets all transmission adaptive data to factory values.
- Reset Fast Adaptive—(not available for 1000/2000 Pre-Allison 4th Generation Controls and CEC2 systems) Activates the Fast Adaptive logic in the TCM/ECU.
- Reset Full Throttle Calibrations (TPS only)—(not available for WTEC II, WTEC II, and CEC2 control systems) Resets upper limit of the TPS calibration.
- Reset Closed Throttle Calibrations (TPS only)— (not available for WTEC II, WTEC II, and CEC2 control systems) Resets the lower limit of the TPS calibration.
- Reset Throttle Calibration—(only available for WTEC II, WTEC III, and CEC2) Resets the throttle position sensor calibration.
- Transmission Fault Lamp Test—(only available for Allison 4th Generation Controls systems) Enables the transmission Fault Lamp Test.

- Reverse Warning Lamp Test—(only available for Allison 4th Generation Controls systems) Enables the Reverse Warning Lamp Test.
- Reset Auto-Detect—(not available for the 1000/2000 Pre-Allison 4th Generation controls system) Clears and resets the TCM auto-detect information.
- Reset Auto-Detect Retarder—(only available for the 3000/4000 Allison 4th Generation Controls system) Clears and resets auto-detection of transmission retarder.
- Reset SEM Auto-Select—(only available for Allison 4th Generation Controls systems) Clears and resets auto-selection of Shift Energy Management.
- Engineering Calculations—Provides means to calculate converter speed ratio, vehicle speed, and acceleration in g's.

Snapshot

- Record
 - ◇ Record Options—Displays the recording options window.
 - ◇ Stop Recording—Halts recording.
 - ◇ Add Bookmark—Displays the bookmark window.
- Playback
 - ◇ Open Playback File—Displays the Open window and the content of the Log folder.
 - ◇ Play—Plays a recorded data file.
 - ◇ Rewind—Starts the playback at the beginning.
 - ◇ Stop—Stops a playback.
 - ◇ Fast forward—Plays a recorded data file at four times the normal speed.
 - ◇ Continuous—Plays a recorded data file continuously, a looped playback.
- Email—Displays the Compose Email window. This section requires the user to fill out some networking information that might require the assistance from the user's IT department.
- Export—(only available for Allison 4th Generation Controls system) Exports data from a playback file for inclusion into a spreadsheet.

Reports

- Diagnostic Reports—displays the Report Sections window. Refer to Section 7-1 for more information.
- TRANSHEALTH™ Report— (not available for Allison 4th Generation Controls systems) when available, it displays the TRANSHEALTH™ feature. Refer to Section 7-2 for more information.

Software Configuration

- Displays the Software Configuration dialog box.

Help

- Help Topics—displays the Help Topics window.
- Video-based Training Materials
 - ◇ Allison DOC™ Training Videos—displays the new/enhanced software training videos
 - ◇ Circuit Checks—Displays the Circuit Checks training video with Microsoft® Media Player®
 - ◇ Circuit Basics—Displays the Circuit Basics training video with Microsoft® Media Player®
- Demo—displays the Choose Demo window
- DTC Lookup—displays the Trouble Code Lookup window for various control systems
- Troubleshooting Manuals
 - ◇ WTEC III—opens up the WTEC III Troubleshooting Manual
 - ◇ 3000/4000 (4th Gen)—opens up the 3000/4000 (Allison 4th Generation Controls) Troubleshooting Manual
 - ◇ 1000/2000 (Pre-4th Gen)—opens up the 1000/2000/2400 Series™ Troubleshooting Manual
 - ◇ 1000/2000 (4th Gen)—opens up the 1000/2000 (Allison 4th Generation Controls) Troubleshooting Manual
 - ◇ WTEC II—opens up the WTEC II Troubleshooting Manual
 - ◇ CEC2 Off-Highway—activates the Adobe Acrobat reader to display the CEC2 Troubleshooting Manual
- Access to Allison Transmission Web Site—Connects to the ALLISON TRANSMISSION web site, www.allisontransmission.com
- Hydraulic Schematics
 - ◇ 3000/4000 (4th Gen)—displays the Allison 4th Generation Controls 3000/4000 hydraulic schematics
 - ◇ 1000/2000 (4th Gen)—displays the Allison 4th Generation Controls 1000/2000 hydraulic schematics
 - ◇ 1000/2000 (Pre-4th Gen)—displays 1K2K (Pre-Allison 4th Generation Controls) hydraulic schematics
 - ◇ WTEC III—displays WTEC hydraulic schematics
- Allison Transmission Calc—displays the Allison Transmission Calculation application.
- About Allison DOC—displays information about this version of Allison DOC™ For PC—Service Tool

Print Screen

- Prints the displayed screen

Button and Keyboard Shortcuts

The following buttons are always available in the primary Allison DOC™ For PC–Service Tool window. Clicking the button or pressing the associated function key displays the listed menu.

F1–Help

- Accesses the Help system

F2–TRANSHEALTH™

- Displays the TRANSHEALTH™ feature. Refer to Section 7–2 for more detailed information.

F3–DTC Lookup

- Displays the Trouble Code Lookup window for various control systems

F4–Connect (or F4–Disconnect)

- Connect (F4–Connect) to or disconnect (F4–Disconnect) from an ECU or TCM

F5–Trigger Recording

- Triggers the recording session of a snapshot and also inserts a trigger point in the data stream. This constitutes the faster way to initiate a snapshot recording session.
- If used during a recording session, inserts “bookmarks” in the data stream of the log file. Bookmarks are sequentially numbered by the system when F6–Bookmark # is used.

F6–Stop Recording

- Stops a snapshot recording.

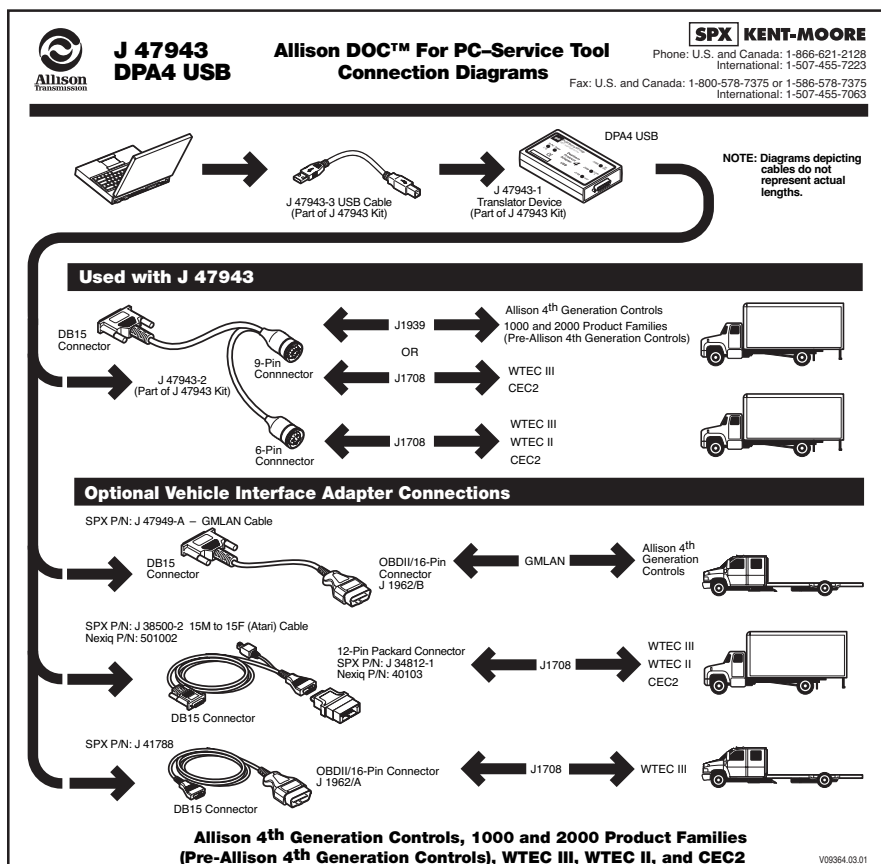
Accelerator Keys—On screen buttons have shortcuts known as accelerator keys. An underlined character in the button text identifies the button’s accelerator keyboard key. Pressing the accelerator key activates the function associated with the button. For example, on the button below, the P keyboard key is the accelerator key. Dropdown menu items accelerator keys require pressing ALT before pressing the accelerator key. After pressing the ALT/ACCELERATOR KEY combination that menu displays.

Print

When this button is visible, press ALT+ P to activate a print function.

2.0 CONNECTING THE PC TO THE CONTROL SYSTEM

The diagram below illustrates the hardware connections between the PC hosting Allison DOC™ For PC–Service Tool, the data translator, and the vehicle control system diagnostic connector.





**J 44652-A
J1850-VPW**

**Allison DOC™ For PC-Service Tool
Connection Diagrams**

SPX KENT-MOORE

Phone: U.S. and Canada: 1-866-621-2128
International: 1-507-455-7223
Fax: U.S. and Canada: 1-800-578-7375 or 1-586-578-7375
International: 1-507-455-7063



NOTE: "MODIFIED" must be on the label.

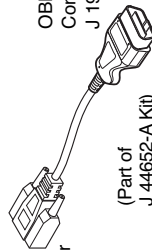
J 44652-A
Translator Device J1850-VPW
(Part of J 44652-A Kit)

NOTE: Diagrams depicting cables do not represent actual lengths.

Used with J 44652-A



DB9
Connector



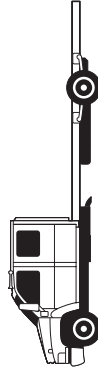
OBDII/16-Pin
Connector
J 1962/A



J1850



1000 and 2000
Product Families
(Pre-Allison 4th
Generation Controls)



GM Applications Using 1000 and 2000 Product Families (Pre-Allison 4th Generation Controls)

V09365.01.02



**Allison
Transmission
CEC Translator
Device**

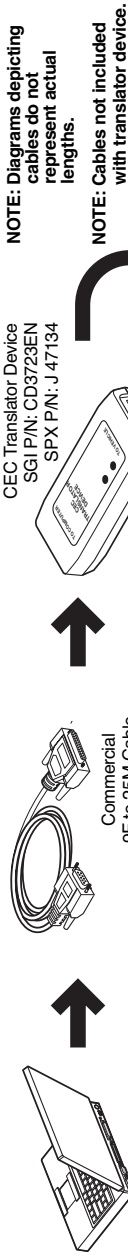
Allison DOC™ For PC-Service Tool Connection Diagrams

For Purchase Contact:

SGL, Inc. or **SPX/Kent-Moore**

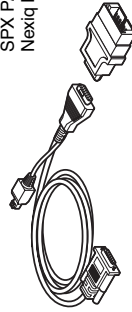
Phone: 1-888-666-5799

Fax: 1-317-471-4996



Used with CEC Translator Device

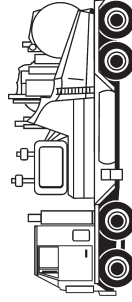
15M to 15F (Atari) Cable
SPX P/N: 38500-2
Nexiq P/N: 501002



12-Pin Packard Connector
SPX P/N: J 34812-1
Nexiq P/N: 40103



Allison
Transmission
Proprietary
Protocol



CEC1

V09366 01.03

A fully RP1210A compliant PC-to-vehicle translator device is required to establish communication with the TCM/ECU. Allison DOC™ For PC–Service Tool currently supports the Dearborn Protocol Adaptor DPA4 USB (SPX P/N J47943) and other devices listed in the latest Allison DOC™ Service Information Letter (SIL), available on the Allison Transmission Extranet.



NOTE: For more information on installation and troubleshooting procedures when using the Dearborn DPA4 USB adapter, please refer to the “*DPA4 USB Translator Device (J-47943) Quick Reference Guide*” document available at

[www.allisontransmission.com/Service/Electronic Tools/Translator Devices](http://www.allisontransmission.com/Service/Electronic%20Tools/Translator%20Devices).

In order to communicate with the CEC control system, Allison DOC™ For PC–Service Tool requires the Allison Transmission CEC Translator Device. Refer to the above diagrams for P/Ns and contact information. The drivers must be installed from the Allison DOC™ For PC–Service Tool CD-ROM, located in the Noregon RP1210A API folder.

To communicate with 1000/2000/2400 Series™ transmissions using the J1850 communication protocol (with OBDII trapezoidal diagnostic connector), Allison DOC™ For PC–Service Tool requires the SPX J1850 VPW translator device. Refer to the above diagrams for P/Ns and contact information. The translator device drivers are automatically installed with Allison DOC™ For PC–Service Tool.

3.0 STARTING ALLISON DOC™ FOR PC-SERVICE TOOL

3-1. STARTING THE PROGRAM

There are two ways to start Allison DOC™ For PC-Service Tool:

Double-click the Allison DOC™ For PC-Service Tool icon  on your PC desktop,

or,

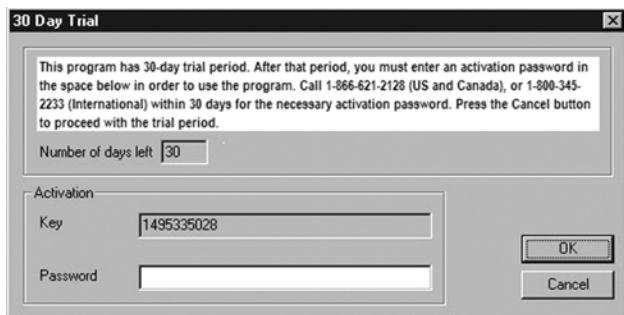
From your PC's Start menu, select Programs --> Allison Transmission --> Allison DOC™ For PC-Service Tool. If you stored Allison DOC™ For PC-Service Tool is in another location, follow the path to that location and select Allison DOC™ For PC-Service Tool.

3-2. 30-DAY TRIAL

A 30-Day trial is included as part of Allison DOC™ For PC-Service Tool. The 30-day trial window appears each time Allison DOC™ For PC-Service Tool is started, unless the activation password has been entered. The 30-day trial window displays the number of days remaining in the trial period. At any time before the trial period ends you may enter the activation password. The Allison DOC™ For PC-Service Tool application will not function after 30 days if a valid activation password has not been entered. Contact SPX Kent-Moore (US and Canada: 1-866-621-2128, International: 1-800-345-2233) to obtain the product activation password.

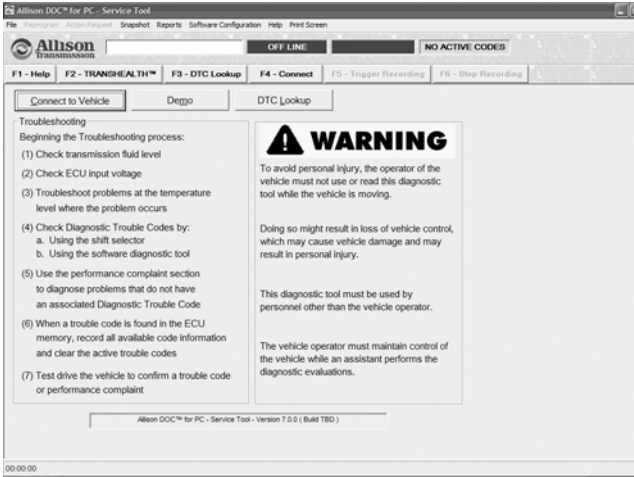
Once you have the password, enter it into the Password field of the 30-Day Trial window and press **OK**.

During the 30-day trial period, press **CANCEL** to run the Allison DOC™ For PC-Service Tool program.



3-3. AT START-UP

When you start Allison DOC™ For PC–Service Tool, the Warning window displays (if the activation password has been entered, otherwise the 30-Day Trial window displays). The Warning window lists basic transmission troubleshooting tasks and outlines basic safety considerations (see Warnings and Notes). The **CONNECT TO VEHICLE** button initiates the software connection to a vehicle and the **DEMO** button starts Allison DOC™ For PC–Service Tool Demos. The **DTC LOOKUP** button displays the Trouble Code Lookup window for various control systems. The Allison DOC™ For PC–Service Tool version and build are displayed at the bottom of the Warning window.



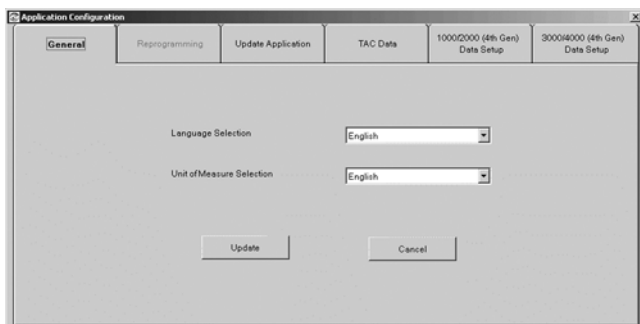
4.0 CONFIGURING AND UPDATING ALLISON DOC™ FOR PC–SERVICE TOOL

4–1. APPLICATION CONFIGURATION

The Software Configuration function allows you to tailor Allison DOC™ For PC–Service Tool to your specific situation and to update the Allison DOC™ For PC–Service Tool application.

From Software Configuration main menu option you can:

- Change languages—select a language that was initially selected during the installation of the program
- Change units of measure—English or Metric
- Enter ECU/TCM Reprogramming authorization
- Update the Allison DOC™ For PC–Service Tool application
- Enter TAC Data Collection authorization
- Change the Data Configuration—select 1000/2000 and 3000/4000 4th Generation Controls system transmission parameters to be reported by the TCM.



NOTE: If the Reprogramming tab is “grayed-out” or disabled, the Reprogramming section has already been authorized.

Tabs in the Application Configuration window are:

- General—the default tab
- Reprogramming
- Update Application
- TAC Data Collection
- 1000/2000 (4th Gen) Data Setup
- 3000/4000 (4th Gen) Data Setup

Access configuration items by clicking on the corresponding tab in the Application Configuration window. An Allison logo displays next to the active tab's title.

General Tab

From the General tab you can:

- Select a language
- Select either English or Metric units of measure.

Language Selection

1. Click on the down arrow in the Language field.
2. Click on a Language.
3. Click the **UPDATE** button—all text in Allison DOC™ For PC–Service Tool is changed to the language selected.

Units of Measure Selection

1. Click on the down arrow in the Units of Measure field.
2. Click on either English or Metric.
3. Click the **UPDATE** button—all measurements in Allison DOC™ For PC–Service Tool are changed to either English or Metric units.

Reprogramming Tab

TCM/ECU Reprogramming Authorization

You must obtain reprogramming authorization to reprogram TCM/ECU information. Accessing the TCM/ECU reprogramming features of Allison DOC™ For PC–Service Tool requires an appropriate training certificate, a password, and the Allison DOC™ For PC–Service Tool product serial number. Contact SPX Corporation Kent-Moore Service Solutions (US and Canada: 1-866-621-2128, International: 1-800-345-2233) for the necessary password. The product serial number is on the installation CD-ROM jewel case.

To enter Reprogramming authorization information:

1. Select the Options drop-down menu.
2. Select Application Configuration menu item.
3. Click the **Reprogramming** tab—the Product Authorization window displays.
4. Enter Password information as provided by SPX Corporation and the Allison DOC™ For PC–Service Tool Product Serial Number.
5. Click the **APPLY** button. Since this is a one-time enabling process, once the TCM/Reprogramming section has been authorized, the Reprogramming tabs becomes disabled (grayed out).

Update Application Tab

Allison DOC™ For PC–Service Tool Updates

Allison DOC™ For PC–Service Tool updates are stored on Allison’s Service Tool Update Server.



NOTE: To receive updates over the Internet, your PC or laptop must be connected to a telephone line or to some other means of accessing the Internet. A broadband Internet connection is highly recommended.

The Update Application function allows you to:

- Determine if an update is available.
- Download the new version and update Allison DOC™ For PC–Service Tool.
- Download the new version to your hard drive and update Allison DOC™ For PC–Service Tool at a later time.

Checking For An Allison DOC™ For PC–Service Tool Update

Allison DOC™ For PC–Service Tool checks the Update Server for the latest version of the software. You must have an Internet connection to access the Update Server.

1. Click on the Options Menu.
2. Select the Application Configuration menu item.
3. Click on the **Update Application** tab—the Application Update window displays.
4. Click on **CHECK FOR UPDATE**—Allison DOC™ For PC–Service Tool accesses the Update Server by way of the Internet. If a newer version of Allison DOC™ For PC–Service Tool than the one you are using is found on the update server, the newer version can be applied to your current Allison DOC™ For PC–Service Tool or downloaded to your hard drive. If a newer version is not found on the server, Allison DOC™ For PC–Service Tool checks your hard drive for a newer version.

If an update is available, either from the server or your hard drive, the **CHECK FOR UPDATE** button changes to **APPLY UPDATE**.

If your Allison DOC™ For PC–Service Tool is up-to-date, a message displays indicating you do not need to update.

If the update server is not available and an update is not stored on your PC hard drive, a message displays providing the reason for an update not being available.

Applying An Allison DOC™ For PC–Service Tool Update

Click the **APPLY UPDATE** button—the Update Processing window displays.

The latest version of Allison DOC™ For PC–Service Tool is loaded, either from the update server or from your PC hard drive.



NOTE: If the tool is unable to penetrate the user's Internet firewall, click on the displayed URL and download the applicable update.

TAC Data Collection

This function shall only be used/enabled at the request of the Allison Transmission Technical Assistance Center (TAC) to collect WTEC II/III transmission data. The TAC Data Collection tab is only accessible after the TCM/ECU Reprogramming section is enabled. If the TAC Data tab is disabled (grayed-out), either the user hasn't been authorized for the Reprogramming feature, or the TAC Data has already been enabled.

Enabling TAC Data Collection

1. Click the **TAC Data** tab—the TAC Data authorization dialog box displays with a key number.

Application Configuration

General Reprogramming Update Application **TAC Data** 1000i2000 (4th Gen) Data Setup 3000i4000 (4th Gen) Data Setup

Allison Engineering Use Only

Authorization

Key 1000196736

Password

Apply Cancel

2. After determining that you are required to use this feature in Allison DOC™, an Allison TAC representative will contact you to enable this section based upon the Authorization Key data.
3. Enter the password in the Password field.

- Click the **APPLY** button—TAC Data collection may now be accessed from the Action Request menu.



NOTE: Unlike the Reprogramming section, the TAC Data Collection requires re-authorization once the technician uses the limited number of exercisable data collections. TAC determines the number of times the technician can use this feature when the authorization password is generated.

1000/2000 Setup and 3000/4000 Setup Tabs

PID	Description	Size	Assign
1141	Ignition Voltage	1	FC
1159	Battery Voltage	1	FB
11A1	Engine Run Time	2	F5
11A2	Number of Current Malfunctions	1	F4
1901	Transmission Information #1	1	F9
1903	Transmission Information #3	1	F7
1907	Transmission Information #7	1	F4
1908	Transmission Input States #1	2	F9
1909	Transmission Input States #2	2	F9
190A	Transmission Input States #3	2	F9
190B	Transmission Output States #1	2	F6
1923	Transmission Engine Torque M	4	F4
...	...	...	...

Description	Size	Frequency
FE	7	Fast
FD	7	Fast
FC	7	Medium
FB	7	Fast
FA	7	Fast
F9	7	Medium
F8	7	Fast
F7	7	Fast
F6	7	Medium
F5	5	Slow
F4	7	Slow
F3	0	Not Requested
...	...	...

The **1000/2000 and 3000/4000 (4th Gen) Data Setup** tabs allow you to individually select the transmission data parameters to be requested from an Allison 4th Generation Controls system and, consequently, displayed on Allison DOC™. The selected data is assigned to Data Packet Identifiers (DPIDs), which are identified by an F (e.g. FE, F9, etc.). A configuration may be saved for future use. Limiting the amount of data to request from a TCM greatly increases the rate of data refresh. In other words, the fewer transmission data parameters you configure the tool to request, the faster the TCM will be able to send those parameters to the tool. This is particularly important when the user needs to closely monitor certain transmission parameters at higher rates.

On all 4th Generation screens and reports, data that is not being requested by DPID configuration is displayed as “Not Available.” In the graphics monitor, controls associated with unavailable data are disabled. In the selection dialogs for the custom data monitor, Excel export and strip chart parameters that are unavailable will not be displayed for selection.

Anatomy of a DPID

A DPID contains one or more Parameter Identifiers (PID). A PID identifies a specific transmission data parameter. The PID description is the designated name of the PID. The PID size indicates how many bytes the PID uses. A DPID can only hold up to seven bytes of data. A two-character ID, starting with an F, identifies a DPID. Fifteen DPIDs are available: FE, FD, FC, FB, FA, F9, F8, F7, F6, F5, F4, F3, F2, F1, and F0.

Required PID

Some PIDs are assigned by default to a DPID. The pre-assigned PIDs **must always** be selected in order for certain Allison DOCTM features to work correctly. The Allison DOCTM For PC–Service Tool allows the required PIDs to be reassigned from their default DPID, but does not allow them to be unassigned. A message displays if the required PIDs are not assigned to DPID. The following table lists the required transmission data parameters (with their PID and size).

PID	Description	Size in Bytes
19D4	Turbine Speed	2
1941	Input Speed	2
1942	Output Speed	2
190B	Transmission Input States #1	2
1909	Transmission Input States #2	2
190A	Transmission Input States #3	2
3037	GPO Wire On/Off State	1
3036	GPI Wire On/Off State	1
190B	Transmission Output States #1	2
3032	Transmission Output States #2	2
199A	Current Gear	1
1A66	Gear Commanded	1
3038	Output Speed Acceleration	2

This feature contains the following sections:

Transmission Parameters List

A list of all selectable transmission parameters with relevant information:

PID	Description	Size	Assignm...	
190B	Transmission Output States #1	2	F6	
1923	Transmission/Engine Torque M...	4	F4	
1926	TCC State	1	F8	
1940	Trans Fluid Temperature (TFT)	1	F5	
1941	Transmission Input Shaft Speed	2	FE	
1942	Transmission Output Shaft Spe...	2	FE	
194F	Transmission PRNDL Range	1	F6	
195B	Diagnostic Transmission Gear ...	2	F7	
195C	Previous Gear	1	F7	
195E	Driver Demand Engine Torque	2	FD	
1991	TCC Slip Speed	2	FD	
199A	Current Gear	1	F7	

- PID (Parameter Identifier)—a number that identifies the transmission parameter
- Description—the actual designated name of the transmission parameter to select

- **Size**—the size in bytes of each parameter. The size is important to determine the maximum number of transmission parameters that can be included in one DPID.
- **Assignment**—indicates the current DPID assignment for the most recently used configuration.

DPID Configuration Section

Allows users to select the DPID in which they will include or remove transmission parameters. There are fifteen

DPIDs available. Users can also clear all DPID assignments .



NOTE: Each DPID can accept a maximum of 7 bytes of data. The size of all transmission parameters assigned to a single DPID may not exceed 7 bytes. In order to maximize the efficiency of this feature use all 7 bytes in each DPID.

Current Configuration and Request Rate Setup

Displays the current DPID configuration, and allows users to set the request rate for each DPID.

Description	Size	Frequency
☒ FB	7	Fast
Main Mod Solenoid com...	2	
Pressure control sol 2 co...	2	
Pressure control sol 1 co...	2	
Battery Voltage	1	
☒ FA	7	Fast
☒ F9	7	Medium
☒ F8	7	Fast
☒ F7	7	Fast
Gear Commanded	1	
Gear Selected	1	
Current Gear	1	

- **Description**—lists configured DPIDs. Each DPID can be expanded to display the included PIDs.
- **Size**—indicates the number of bytes in each DPID and, when expanded, displays the byte size of each PID. A DPID can contain no more than 7 bytes.
- **Frequency**—determines how often transmission data is reported. Fast reports the transmission data every 25 milliseconds, Medium every 300 milliseconds, and Slow every 1 second.



NOTE: Regardless of the DPID frequency selected, the tool refreshes the screen display 10 times per second.

The Description column contains Transmission Information #1, Transmission Information #3, and Transmission Information #7 lines. Each Transmission Information line represents a group of transmission parameters. The transmission parameters in each Transmission Information group are:

Transmission Information #1:

- Cruise Enabled
- Internal Mode Switch A
- Internal Mode Switch B
- Internal Mode Switch C
- Internal Mode Switch P

Transmission Information #3:

- Internal Mode Switch NS
- Pressure Switch Manifold 1
- Pressure Switch Manifold 2
- Pressure Switch Manifold 3
- Pressure Switch Manifold 4
- Shift Solenoid 1
- Shift Solenoid 2
- Shift Solenoid 3

Transmission Information #7:

- Normal Shift Pattern
- Cold Shift Pattern
- Trans Hot Mode
- Trail/Haul Shift Pattern

Action Buttons

Contains the following command buttons:



- Load—loads previously saved configurations.
- Delete—deletes previously saved configurations.
- Save—saves currently displayed configurations.
- Reset To Default—resets current configuration to default, which requests all transmission parameters for selected 4th Generation transmission family.
- Apply—applies displayed configuration

Setting up a New Data Configuration:

1. Select Options and Application Configuration from the main menu.
2. Click on the **1000/2000 (4th Gen) Setup** tab, or the **3000/4000 (4th Gen) Setup** tab.
3. Click on the **Clear All Assignments** command button.
4. Choose a DPID from the DPID configuration combo box.
5. Select the PID from the list and click on **Assign to DPID** button.
6. Repeat step 5 until seven or fewer bytes are assigned to the DPID selected in step 4.
7. Repeat steps 4 through 6 until all required transmission parameters are selected.
8. For each DPID, select the frequency at which you want the TCM to report values for the selected PIDs.
9. Click on the **APPLY** button.
10. Close the Application Configuration dialog box.

Loading a Saved Configuration:

1. Select Options and Application Configuration from the main menu.
2. Click on the 1000/2000 (4th Gen) Setup tab, or the 3000/4000 (4th Gen) Setup tab.
3. Select one configuration from the Saved DPID Configuration drop-down list.
4. Click on the **LOAD** button.
5. Click on the **APPLY** button.
6. Close the Application Configuration dialog box.

Loading Default Configuration:



NOTE: The Service Tool automatically resets to default configurations when Allison DOC™ is closed.

1. Select Options and Application Configuration from the main menu.
2. Click on the 1000/2000 (4th Gen) Setup tab, or the 3000/4000 (4th Gen) Setup tab.
3. Click on the **Reset to Default** button.
4. Click on the **APPLY** button.
5. Close the Application Configuration dialog box.

5.0 USING ALLISON DOC™ FOR PC–SERVICE TOOL

5–1. CONNECTING/DISCONNECTING

Connecting



NOTE: Allison DOC™ For PC–Service Tool supports only RP1210A compliant devices.

The Connect/Disconnect window establishes the software connection between Allison DOC™ For PC–Service Tool and the transmission controller through a PC-to-controller translation device (data translator). For Allison DOC™ For PC–Service Tool to read information from the transmission controller, both the vehicle ignition and the PC-to-vehicle translator must be powered on. Upon successful connection, the DTC and General Information window automatically displays. Any logged Diagnostic Trouble Code information is displayed in that window.

To establish a connection between Allison DOC™ For PC–Service Tool and a transmission controller:

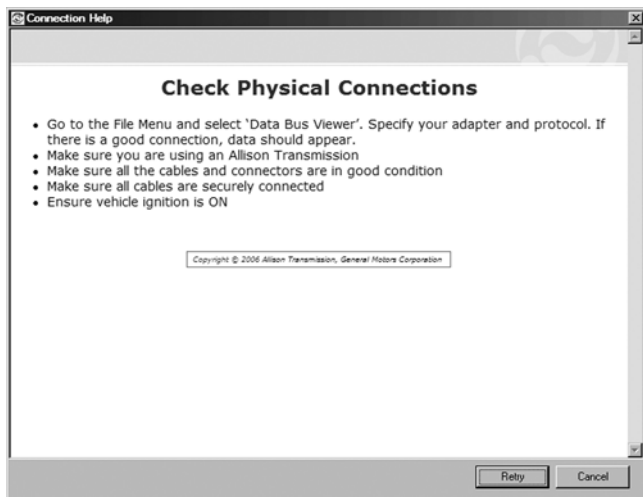
- From the Warnings window of Allison DOC™ For PC–Service Tool, click the **Connect to Vehicle** button, select the F5–Connect button, or press the F5 key—The Connect/Disconnect window displays.

To have Allison DOC™ For PC–Service Tool automatically select the translation device and communication protocol:

1. Click the **SmartConnect** check box.
2. Select a transmission Type from the Connect/Disconnect dialog box.
3. Click the **Connect** button.

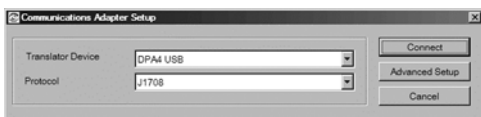


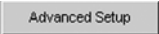
4. Upon successful connection, the DTC and General Information window for the selected transmission controller displays; for CEC1, the CEC1 Data Monitor window displays. If a connection cannot be established the tool displays the Connection Help window with specific instructions on how to troubleshoot the connection.

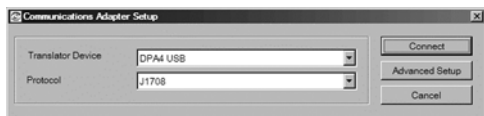


To select a translator device and communication protocol manually:

1. Deselect **SmartConnect**.
2. Select transmission type.
3. Click the  button—the Communications Adapter Setup dialog box displays



4. Select the Translator Device and Protocol from the drop-down lists and Click the  button. Upon successful connection, the DTC and General Information window for the selected transmission controller displays; for CEC1, the CEC1 Data Monitor window displays.
5. If the translator device and protocol does not appear on the list, make sure that the driver software has been installed on your PC and click the  button—the Advanced Communications Adapter Setup window displays. This dialog box displays all adapters as described in the RP1210 files.



6. Select the adapter vendor from the drop-down Vendor list. If the translator device you are using is not in the Vendor list, verify that the driver software has been installed on your PC.
7. Select Vendor, Protocol, and Device from the drop-down list. Use the following table as a reference for Vendor, Protocol, and Device menus.

VENDOR		PROTOCOL	DEVICE
DPA4 USB	DR121032	J1939/GMLAN	DPA4, USB
		J1708	

SPX J1850 vpw	BnB1850	J1850	B&B J1850 Adapter, COMx
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CEC1 Adapter			
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MagiKey®	DX121032	J1939	PDM J1939
		J1708	PDM J1708

Nexiq USB-Link	NXULNK32	J1939/GMLAN	N/A
		J1708	USB-Link J1708
		J1850	USB-Link Allison J1850

Softing CANcard2	SOFTRP32	J1939	Softing CANCard Transmit on Channel x
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Noregon DLA	PCSRP32	J1939	Noregon/Vansco Data Link Adapter
		J1708	

B&B J1708D15	NSIRP32	J1708	BB Electronics J1708D15 Adapter, COMx
Allison Shaw Box			Allison Shaw Box, COMx
Detroit Diesel			Detroit Diesel, COMx
Dana			Dana, COMx
Navistar			Navistar, COMx
Kent Moore			Kent Moore, COMx

8. Click **OK**. Upon successful connection, the DTC and General Information window for the selected transmission controller displays; for CEC1 the CEC1 Data Monitor window displays.

Disconnecting



NOTE: Disconnecting breaks the Allison DOC™ For PC–Service Tool to controller connection; but does not close the Allison DOC™ For PC–Service Tool software.

To break the connection between Allison DOC™ For PC–Service Tool and transmission controller, click on the **F4-Disconnect** button, or press the **F4** key.

Quick Solutions for Unsuccessful Connections

- Verify you are selecting the appropriate Transmission Type.
- Make sure you are meeting all **platform requirements** (Operating System, RAM capacity, Hard Drive space, etc).
- Recycle power to the translator device. Disconnect the translator device from both the PC and the diagnostic connector and then reconnect the translator device to both the PC and the diagnostic connector.
- Close or Exit some “quick launch” applications (shown as icons on the taskbar), located at the lower right side of the desktop screen.
- Make sure all the cable connections (PC, Interface Device, and Vehicle Diagnostic Connector) are correct and firm.
- Verify that you are using the proper adapter’s drive (refer to the “What is the Driver Version of my Translator Device?” and “How Do I Get the Latest Adapter’s Driver Version?” questions from www.allisontransmission.com/Service/Diagnostic Tools/Support/FAQs).
- If you are using a J1939, J1708/J1587, or J1850 to RS232 (Serial Port/COM1/COM2) translator device, make sure that the serial port is not being used by any other application such as HotSync Manager, etc.
- Close the application, disconnect the PC to translation device cable, reboot the PC, and reconnect the cable
- Check www.allisontransmission.com/Service/Diagnostic Tools/Support/FAQs for more information.
- Make sure your laptop’s **Power Scheme** (accessible from Start/Control Panel/Power Options) is set to **Portable/Laptop**.



NOTE: For more information on installation and troubleshooting procedures when using the Dearborn DPA4 USB adapter, please refer to the “**DPA4 USB Translator Device (J-47943) Quick Reference Guide**” document available at www.allisontransmission.com/Service/Electronic Tools/Translator Devices.

5-2. VIEWING DIAGNOSTIC DATA

Diagnostic data can be displayed in different formats. Depending upon the transmission controller, the service tool displays data differently. The various formats appear at the bottom of the screen as selectable buttons or tabs. Access a format by clicking on the format name or typing the first letter of the format name. The controller selected during the Connect process determines if a format is available for that controller and what data is displayed. Tool tips are available to display succinct description of each screen.

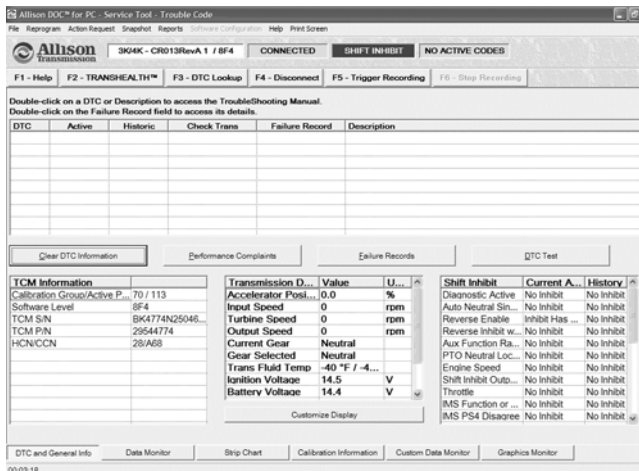


5-3. DTC AND GENERAL INFORMATION

This is the default screen and it serves as the “Home” screen where Diagnostic Trouble Codes (DTCs) and general/basic transmission information is displayed. This screen contains DTC information (with links to troubleshooting manuals), TCM Information, basic Transmission Data (customizable), and Shift Inhibits. From this screen the user can also clear codes, access Performance Complaints, Failure Records, and DTC Test.

The Allison 4th Generation Control system Diagnostic Trouble Codes (DTCs) consist of the letter “P”, “U”, or “C” followed by four numbers. A “P” indicates a transmission internal problem, a “U” indicates a problem in a vehicle system or the transmission-to-vehicle interface, and the “C” codes are reserved for retarder request sensor problems.

DTC and General Information View



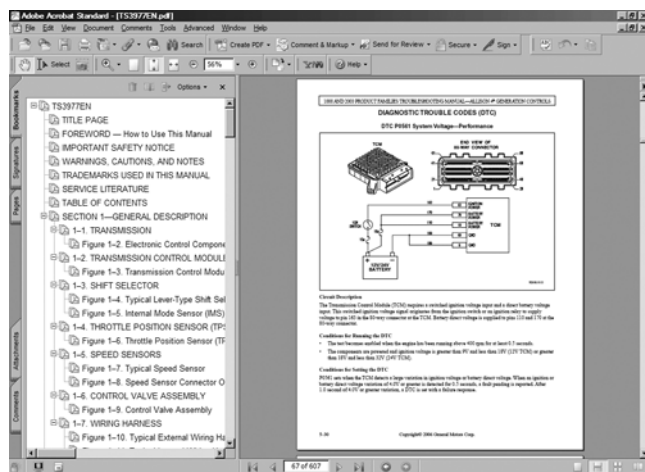
DTC Grid

Displays Diagnostic Trouble Code information:

Parameter	Description
DTC	The Allison 4 th Generation Control system uses a five character, a letter and four numbers, diagnostic trouble code.
Active	Y/N (Yes/No) indicates if the Trouble Code is currently active. When a code is logged by the TCM and the condition causing the code still exists, that code is said to be active; otherwise the trouble code is inactive.
Historic	A “Y” indicates a diagnostic code has been stored to TCM memory as a valid fault. Different types of DTC exist. Each DTC type has different requirements to be stored as Historic DTC.
Check Trans	A “Y” indicates that the DTC is significant enough to turn on the CHECK TRANS light. Not every DTC activates the CHECK TRANS light.
Failure Record	A “Y” indicates that a failure record has been generated and stored for the DTC.
Description	Describes the DTC. “Please call 1-800-252-5283 for assistance” is displayed in the Description field for any code that is unknown to the service tool.

Viewing Troubleshooting Manual Information for a Trouble Code

In the DTC and general Information window of Allison DOCT[™] For PC–Service Tool, double-click the DTC number or DTC Description to display DTC troubleshooting steps. Adobe Acrobat® Reader displays the Troubleshooting Manual page appropriate for the DTC.



Clearing DTC Information

1. In the DTC and General Information window, click the **Clear DTC Information** button.
2. A window appears displaying the message, “Clear DTC Information Request Completed Successfully!”
3. Click the **OK** button.

All Trouble Codes and associated information are cleared from the DTC and General Information window. Shift Inhibits are also clear with this command button. If the cause of the Trouble Code is not corrected, the Trouble Code may immediately reappear.



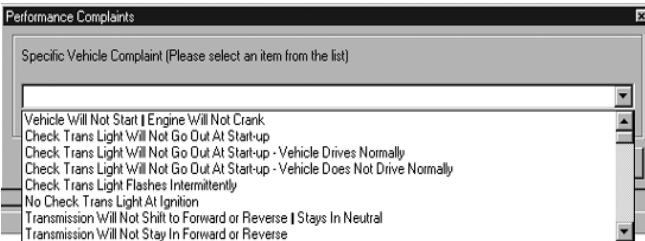
NOTE: To clear all Trouble Codes, the vehicle must be stopped and in Neutral. If these conditions are not met, a message “Request Denied. Output Speed not less than maximum allowable value.” or “Neutral not attained.” displays.

Performance Complaint

Use the Performance Complaint function when no DTCs are present to troubleshoot a transmission performance symptom.

To use Performance Complaint:

1. Click on the Performance Complaints button on the DTC and General Information—The Performance Complaint window displays.



2. Select the appropriate Vehicle Complaint from the drop-down list.
3. Click **OK**—the Troubleshooting Manual page relevant to the selected Vehicle Complain displays.

Failure Records

A Failure Record stores operating condition information at the time a problem was detected and the DTC logged. Each DTC generates a Failure Record.

A Failure Record is a very valuable source of information for the technician as it can be used to determine the operating conditions that were present when a failure

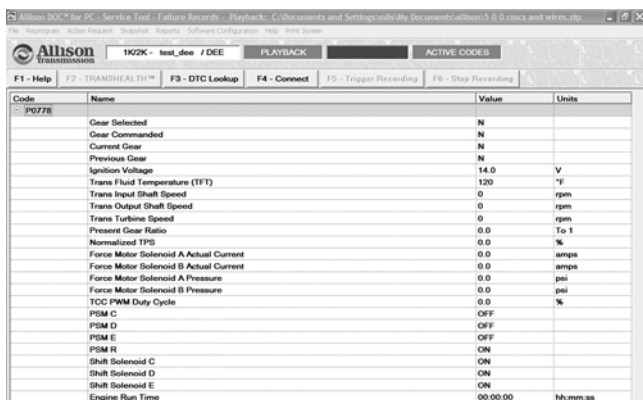
occurred. Failure Records are only updated (refreshed) the first time the Diagnostic Test (a test that the TCM runs to determine if a failure condition exists) fails during each ignition cycle.

You can view the last five DTC failure records by double clicking on a DTC row in the Failure Record Available column of the DTC grid or by selecting the Failure Record item from the Diagnostic main menu. If more than five DTCs are stored, the Failure Records are replaced on a “First-in-First out” basis.

Allison DOC™ For PC–Service Tool automatically saves the last 20 Failure Records “seen” by the tool. These files are stored in the following location as text files: ...\\Allison Transmission\\Allison DOC For PC–Service Tool\\Failure Records.

Displaying Failure Records

1. In the DTC and General Information window, double click on the “Y” in the Failure Record field—the Failure Record window displays.
2. In the DTC and General Information window, click on the Failure Record button—the Failure Record window displays.



Code	Name	Value	Units
P077E	Gear Selected	N	
	Gear Commanded	N	
	Current Gear	N	
	Previous Gear	N	
	Ignition Voltage	14.0	V
	Trans Fluid Temperature (TFT)	120	°F
	Trans Input Shaft Speed	0	rpm
	Trans Output Shaft Speed	0	rpm
	Trans Turbine Speed	0	rpm
	Present Gear Ratio	0.0	To 1
	Normalized TPS	0.0	%
	Force Motor Solenoid A Actual Current	0.0	amps
	Force Motor Solenoid B Actual Current	0.0	amps
	Force Motor Solenoid A Pressure	0.0	psi
	Force Motor Solenoid B Pressure	0.0	psi
	TCC PWM Duty Cycle	0.0	%
	PSM C	OFF	
	PSM D	OFF	
	PSM E	OFF	
	PSM R	ON	
	Shift Solenoid C	ON	
	Shift Solenoid D	ON	
	Shift Solenoid E	ON	
	Engine Run Time	00:00:00	hh:mm:ss

DTC Test

The TCM performs a series of “diagnostic tests” to determine if a failure has occurred. Diagnostic Tests are performed when specific transmission operating conditions occur. The DTC Test Screen displays all application-supported DTCs and indicates the failure status of the Diagnostic Test since clear code, and since power-up. The following table describes each state:

DTC Test Columns	Possible Values	Description
Since Clear Code	Test Failed/Not Performed	Indicates that the Diagnostic Test related to the DTC has failed at least once since the DTCs were cleared, or the Diagnostic Test hasn't been performed by the TCM *.
	Test Passed	Sometime after the last clear code event the TCM ran the Diagnostic Test with no fault found.
Since Power Up	Test Failed/Not Performed	Indicates that the Diagnostic Test related to the DTC has failed within this ignition cycle, or the Diagnostic Test hasn't been performed by the TCM *.
	Test Passed	The TCM ran the Diagnostic Test with no fault found.
* For example, the transmission hasn't reached the necessary operating conditions to run the Diagnostic Test yet.		

The DTC Test screen allows the technician to determine the status of a DTC test. For example, after fixing the problem causing a DTC, the technician must know the status of a DTC test in order to make sure that the failure condition was effectively corrected.

Displaying the DTC Test Screen:

1. Click on the **DTC Test** button on the DTC and General Information screen—the DTC Test Screen displays.

Code	Name	Value	Units
P077E			
	Gear Selected	N	
	Gear Commanded	N	
	Current Gear	N	
	Previous Gear	N	
	Ignition Voltage	14.0	V
	Trans Fluid Temperature (TFT)	120	°F
	Trans Input Shaft Speed	0	rpm
	Trans Output Shaft Speed	0	rpm
	Trans Turbine Speed	0	rpm
	Present Gear Ratio	0.0	To 1
	Normalized TPS	0.0	%
	Force Motor Solenoid A Actual Current	0.0	amps
	Force Motor Solenoid B Actual Current	0.0	amps
	Force Motor Solenoid A Pressure	0.0	psi
	Force Motor Solenoid B Pressure	0.0	psi
	TCC PWM Duty Cycle	0.0	%
	PSM C	OFF	
	PSM D	OFF	
	PSM E	OFF	
	PSM R	ON	
	Shift Solenoid C	ON	
	Shift Solenoid D	ON	
	Shift Solenoid E	ON	
	Engine Run Time	00:00:00	hh:mm:ss

TCM Information Grid

Displays general information that describes the Transmission Control Module.

Transmission Information Grid

Displays basic transmission data parameters. The user can configure (i.e. select different transmission data parameters) this grid by clicking on the **Select Data to Display** button.

Shift Inhibits Grid

Displays all the shift inhibits that are currently active or have been active since last clear code.

5-4. DATA MONITOR

The Data Monitor allows you to view controller information in a table format. The data display is dynamic and displays real-time data as it occurs. This screen is divided into three major grids: Diagnostic Data (left side), Input/Output Functions (upper right side), and Shift Inhibits (lower right side).

Diagnostic Data	Value	Units	Wire / Databus	Wire State	Function Name	Function State
Number Of Current Malfunctions	0		Mode	OFF	Input - Secondary Mode	OFF
Engine Run Time	00:00:00		101	Disable	Input - Auxiliary Function R...	Disable
Accelerator Position	0.0	%	143	Disable	Input - PTO Enable	Disable
TPS Voltage	0.0	V	102	OFF	Input - Engine Brake Enabl...	OFF
Input Speed	0	rpm	117	Disable	Input - Auto Neutral Single	Disable
Turbine Speed	0	rpm	162	OFF	Input - Service Brake Statu...	OFF
Output Speed	0	rpm	121	Disable	Input - ABS Active	Disable
Output Speed Acceleration	0	rpm/Sec	161	Disable	Input - Retarder Enable	Disable
Engine Torque	0.0	ft-lb	123	Disable	Input - RELS	Disable
Driver Demand Eng Torque	0.0	ft-lb	157	Disable	Input - Engine Brake and P...	Disable
Requested Torque Reduction	0.0	ft-lb	142	OFF	Input - Auxiliary Hold	OFF
Gear Ratio	8.0		122	OFF	Input - Direction Change E...	ON
Current Gear	Neutral		105	OFF	Output - PTO Enable	OFF
Gear Selected	Neutral					
Gear Commanded	Neutral					
Previous Gear	Neutral					
Active Shift Selector	Primary S...					
Shift Selector Range Selected	All Segm...					
Shift Selector Range Commanded	All Segm...					
Strip Selector Output Pattern SS-1	Low					
Strip Selector Output Pattern SS-2	Low					
Strip Selector Output Pattern SS-4	Low					
Strip Selector Output Pattern SS-Parity	Low					
TCC State	Off					
TCC Slip Speed	0	rpm				
Oil Level Deviation	0.0	Quarts				
Oil Level Display Code	Setting 1...					
Oil Level Reverse Withdrawn	2.0	V				

Diagnostic Data

- **Diagnostic Data**—A brief description of the diagnostic data being measured.
- **Value**—The value of the associated diagnostic data.
- **Units**—units of measure for the value.

Input/Output Functions

- **Wire**—the wire circuit number assigned to the programmed function. If “Databus” is displayed, the function is not assigned to a wire but is being controlled (turned On/Off) via the communication databus.
- **State (Wire)**—displays the state of the wire (On/Off) or if the wire is Disabled.
- **Function Name**—indicates if the function is and input or output and lists the function name.
- **State (Function)**—displays the state of the function (On/Off) or if the function is Disabled.



NOTE: Grayed rows indicate I/O functions and wires that cannot be reprogrammed.

Shift Inhibits

- Inhibit—displays the condition(s) that is or was causing the shift inhibit.
- Current Active—indicates whether a particular condition is currently inhibiting shifts.
- History—indicates that, since the last DTC clear, a particular condition has inhibited shifts.

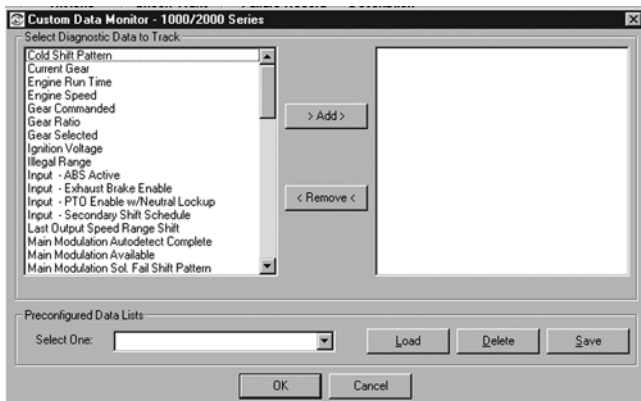
5-5. CUSTOM DATA MONITOR

You may select the information to be displayed in the Custom Data Monitor window by adding or removing transmission parameters to the display. Each control system has a unique list of transmission parameters. For 4th Generation controllers, if default data configuration is not used, only the parameters configured under the Data Configuration feature are displayed.

Transmission parameters are added or removed in the Custom Data Monitor data selection window. The Custom Data Monitor window is the same as the Data Monitor window, except that only the selected data is displayed.

To Select Custom Data Monitor Transmission Parameters:

1. Select the Custom Data Monitor tab —the Custom Data Monitor data selection window displays.



2. Select the desired transmission parameter(s) from the left-hand column.
3. Click the **> Add >** button or double click the selection—the selected transmission parameters appear in the right-hand column
4. Click the **OK** button—the selected transmission parameters appear in the Custom Data Monitor window.

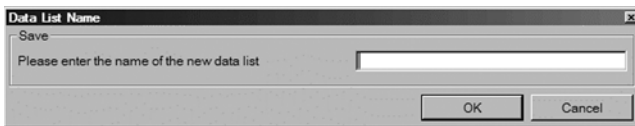
To Remove Custom Data Monitor Transmission Parameters:

1. Select the Custom Data Monitor tab—the Custom Data Monitor data selection window displays.
2. Select the desired transmission parameters from the right-hand column.
3. Click the **< Remove <** button—the selected transmission parameters are restored to the left-hand column.
4. Click the **OK** button—the deleted transmission parameters no longer appear in the Custom Data Monitor window and the Custom Data Monitor data selection window closes.

Preconfigured Data List

You can save a list of transmission parameters for display in the Custom Data Monitor by using the Preconfigured Data List feature.

1. Display the Custom Data Monitor data selection window.
2. Select the transmission parameters (from the left to the right panel).
3. Click on the **Save** button. The Data List Name dialog box displays



4. Type a unique name for the saved data list and click **OK**.

To use the saved data list:

1. Display the Custom Data Monitor data selection window.
2. Click on the Select One drop-down arrow in the Preconfigured Data Lists section:



3. Select a list name from the menu.
4. Click either **Load**, to load the list, or **Delete**, to delete the list.

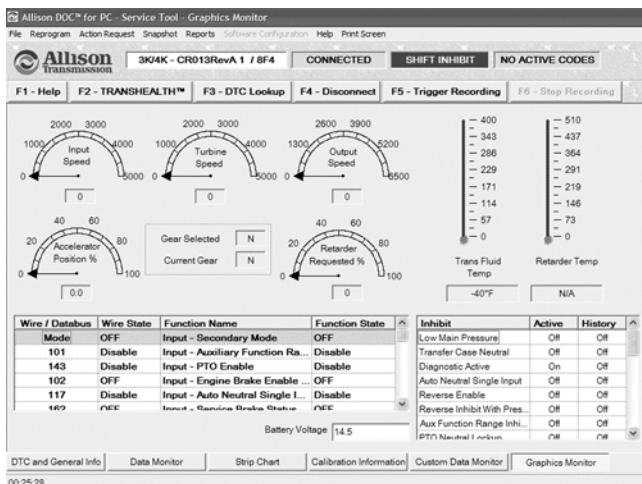
5–6. GRAPHICS MONITOR

The Graphics Monitor displays diagnostic data using gauges, thermometers, indicator lights, text boxes, and a scrollable I/O function data display.

Displaying the Graphics Monitor

To display the Graphics Monitor:

1. Select the Graphics Monitor tab —the Graphics Monitor window displays.



NOTE: A gauge can be expanded to a full-screen display by double-clicking on the gauge. Return the display to normal by pressing the ESC key or double clicking in the expanded display.

5-7. STRIP CHART

The Strip Chart is a graph that tracks, over time, changes in selected data as the changes occur. Up to fifteen transmission parameters may be selected. Each control system has a unique list of selectable parameters. The data traces start at zero on the X-axis and, depending on the selected data, the Y-axis.

The data-against-time data stream is continuous regardless of the Strip Chart mode selected. If default data configuration is not used, only the data configured under the Data Configuration feature is available for display in the Strip Chart.

Displaying the Strip Chart

1. Select the Strip Chart tab—the Select the Data to Graph on the Strip Chart window displays.



2. Select up to fifteen transmission parameters from the left-hand column.
3. Choose a color for the trace of the data selected or allow the default color.



NOTE: Contrasting colors are easier to see on the strip chart.

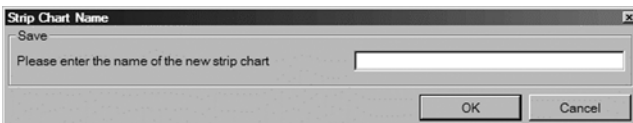
4. Click **OK**.

The selected transmission parameters appear in the Strip Chart window.

Saving A Strip Chart Configuration

You can save a list of transmission parameters for display in the Strip Chart by using Saved Strip Charts.

1. Display the Select the Data to Graph on the Strip Chart window.
2. Select the transmission parameters to chart and their color.
3. Click the **Save** button – the Strip Chart Name dialog box displays



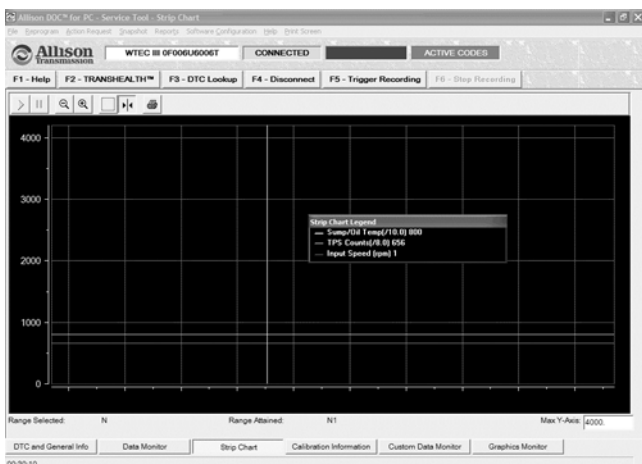
4. Type a unique name for the Strip Chart data selection, and click **OK**

To Load or Delete a Saved Strip Chart Configuration:

1. Display the Select the Data to Graph on the Strip Chart window.
2. Click on the Select One drop-down arrow in Saved Strip Charts section:



3. Highlight a list name.
4. Click either **Load**, to load the Saved Strip Chart, or **Delete**, to delete the Saved Strip Chart.



NOTE: (Allison 4th Generation Controls ONLY) To obtain higher plotting resolution and better refreshing rates, the user can configure the application to only request specific transmission parameters from the TCM. Refer to Setting Up A New Data Configuration in section 4-1 for more information.

Data Trace Identification

The selected data is assigned a color on the graph. The name of the data and its corresponding color is displayed in a box on the Strip Chart display.

X-axis Scaling

The passage of time in seconds is indicated on the X-axis, horizontal bottom of the graph. As time passes, data lines on the graph move to the right. The Strip Chart displays about 10 seconds of data at a time. If playing back recorded data, the VCR Control window displays the Total File Time and the Current File Time, in minutes.

Total File Time is the total length of the recording. Current File Time is the time elapsed since you started the playback.

Y-axis Scaling

The Y-axis, vertical left side of the Strip Chart, displays a range of values based upon the data selected for display. In most cases, the Y-axis begins at zero. If you select data having different types of measurements such as input rpm and engine cooling temperature, a divisor, preceded by a slash (/), displays next to the data that requires calculation to determine the correct value. For example: input speed and engine cooling temperature. RPM is displayed on the Y-axis, from 0 to 4000. To determine the engine cooling temperature, divide the value of the engine cooling temperature trace by 15.7. An easier method is to use the Strip Chart Cursor mode, which calculates the adjustment and displays the correct value. Entering a value in the Max Y-Axis field changes the maximum value displayed on the Y-axis.

Strip Chart Modes

Several data display modes are selectable from the tool bar in the upper left portion of the Strip Chart window. These modes, or commands, allow you to control the data display on the Strip Chart. To change to a particular mode, simply click the desired mode icon. When a mode other than Plot is selected, the data display at that time is frozen; but the data-against-time stream continues in the background. When Plot is re-selected, the data-against-time stream is re-entered at the time Plot was re-selected.

Control Modes

The control modes are:

Plot

Plot is the default Strip Chart mode, where data lines move from left to right across the Strip Chart graph.

Pause

Pauses the plot. Data continues to be collected, but not displayed in the graph. Click the **PLOT** button to resume normal plotting. While in Pause mode, the mouse cursor can be used to scroll the X-axis left or right.

Zoom Out All Axes

Each click on the Zoom Out All Axes button increases the values displayed to the left of the graph, which increases the area displayed and provides a less detailed display than the standard plot mode. Click the **PLOT** button to resume normal plotting.

Zoom In All Axes

Each click on the Zoom In All Axes button decreases the values displayed to the left of the graph, which decreases the area displayed and provides a more detailed display than the standard plot mode. Click the **PLOT** button to resume normal plotting.

Zoom Box

Zoom box allows you to zoom in on an area within the zoom box. Once the area to zoom is selected, the plot is paused. Click the **PLOT** button to resume normal plotting.

Cursor

Cursor mode allows you to place a vertical line at any point in the graph. The “Y” vertical values of the selected trace are displayed in a floating window.

Print

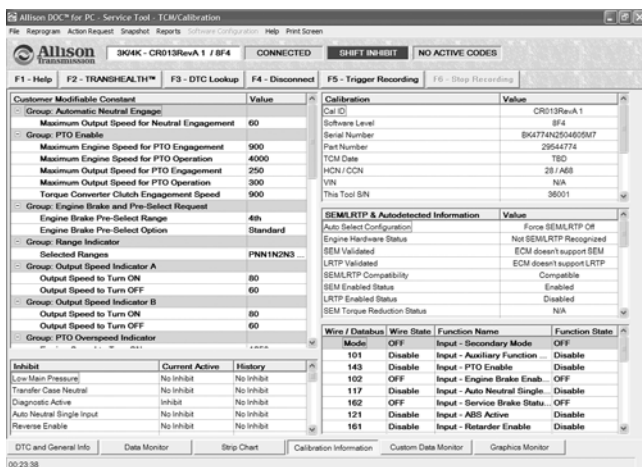
Sends the Strip Chart data display to your printer.

5-8. CALIBRATION INFORMATION

Current TCM calibration information (i.e. calibration settings) can be displayed using the Calibration Information tab.

To Display Current Calibration Information:

1. Select Calibration Information tab—the Calibration Information window for the transmission type displays.



The screenshot displays the Allison DOC™ for PC - Service Tool - TCM/Calibration window. The window is divided into several sections:

- Top Bar:** Shows the software version (304K-CR013RevA 1 / BF4) and connection status (CONNECTED).
- Navigation Tabs:** F1 - Help, F2 - TRANSEALTH™, F3 - DTC Lookup, F4 - Disconnect, F5 - Trigger Recording, F6 - Strip Recording.
- Customer Modifiable Constant:** A table listing various engine and transmission parameters and their values.

Group	Parameter	Value
Group: Automatic Neutral Engage	Maximum Output Speed for Neutral Engagement	60
	Group: PTO Enable	
	Maximum Engine Speed for PTO Engagement	900
	Maximum Output Speed for PTO Operation	4000
Group: Engine Brake and Pre-Selected Request	Maximum Output Speed for PTO Engagement	250
	Maximum Output Speed for PTO Operation	300
	Torque Converter Clutch Engagement Speed	900
	Engine Brake Pre-Selected Range	4th
Group: Range Indicator	Engine Brake Pre-Selected Option	Standard
	Selected Ranges	PNN1N2N3
Group: Output Speed Indicator A	Output Speed to Turn ON	80
	Output Speed to Turn OFF	60
	Group: Output Speed Indicator B	
	Output Speed to Turn ON	80
Group: PTO Overspeed Indicator	Output Speed to Turn OFF	60
	PTO Overspeed Indicator	
- Calibration:** A table listing calibration parameters and their values.

Parameter	Value
Cal ID	CR013RevA 1
Software Level	BF4
Serial Number	BK4774N250405067
Part Number	29544774
TCM Date	180
HCN/CCN	28 / 145
VIN	N/A
This Tool S/N	36001
- SEMLRTP & Autodetected Information:** A table listing SEMLRTP and autodetected information.

Parameter	Value
Auto Select Configuration	Force SEMLRTP ON
Engine Hardware Status	Not SEMLRTP Recognized
SEM Validated	ECM doesn't support SEM
LRTP Validated	ECM doesn't support LRTP
SEMLRTP Compatibility	Compatible
SEM Enabled Status	Enabled
LRTP Enabled Status	Disabled
SEM Torque Reduction Status	N/A
- Wires / Database:** A table listing wire status and function names.

Mode	Wire State	Function Name	Function State
101	Disable	Input - Secondary Mode	OFF
143	Disable	Input - Auxiliary Function	Disable
102	OFF	Input - PTO Enable	Disable
117	Disable	Input - Engine Brake Enab.	OFF
162	OFF	Input - Auto Neutral Single	Disable
121	Disable	Input - Service Brake Statu.	OFF
161	Disable	Input - ABS Active	Disable
161	Disable	Input - Retarder Enable	Disable
- Inhibit:** A table listing inhibit status and history.

Inhibit	Current Active	History
Line Main Pressure	No Inhibit	No Inhibit
Transfer Case Neutral	No Inhibit	No Inhibit
Diagnostic Active	Inhibit	No Inhibit
Auto Neutral Single Input	No Inhibit	No Inhibit
Reverse Enable	No Inhibit	No Inhibit
- Bottom Bar:** DTC and General Info, Data Monitor, Strip Chart, Calibration Information (selected), Custom Data Monitor, Graphics Monitor.

The TCM Calibration Information displays data in five sections:

- Customer Modifiable Constant (CMC)—displays current values/states/thresholds of those parameters to which the transmission would react, and that the user—with the proper authorization—could change or modify.
- Shift Inhibits—indicates the state of current and history shift inhibits (refer to Data Monitor section)
- Calibration—displays static data describing both software and hardware installation
- SEM/LRTP and Autodetect Information—displays information related to Shift Energy Management (SEM), Low Range Torque Protection (LRTP), and Autodetect information.
- Input/Output Functions and wire information—displays I/O functions and wire states (refer to Data Monitor section).

5-9. DATA BUS TRAFFIC VIEW

The real-time data flowing on the vehicle's databus (J1939, J1708, J1850, GMLAN, or proprietary CEC1 protocol) is viewable in the Data Bus Traffic Viewer. The Data Bus Traffic Viewer presents the data link stream data in raw format and, when available, J1939 TCM Received/Broadcasted messages in engineering units.



NOTE: Data Bus Traffic View files are not captured or contained in regular Allison DOC™ snapshots.

In the Engineering Units display, which is only available when connected via J1939, all J1939 TCM-relevant data (messages sent and received by the TCM) are displayed. The user can monitor the data exchange between the transmission controller and other control modules by selecting specific SAE J1939 Messages/Parameters.

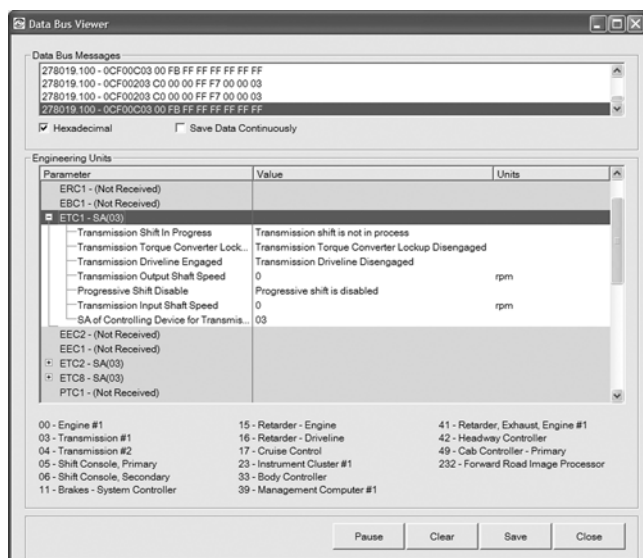
The data bus viewer can be used with or without Allison DOC™ For PC-Service Tool being in a connected state. When the service tool is connected (the tool is receiving/requesting Messages from/to the TCM), the tool is said to be in **ACTIVE** mode. Conversely, if the Data Bus Viewer is used without having the service tool communicating with the TCM, the tool is said to be in **PASSIVE** mode (the tool is physically connected to the vehicle/TCM, but it is only “listening” to all the messages going through the selected data link without requesting data from the TCM).

The following table contains all the data communication protocols that, depending upon its availability at the diagnostic connector, could be used to connect Allison

DOC™ For PC–Service Tool and to monitor data with the Data Bus Viewer in either active or passive mode.

		Allison 4 th Gen- eration	WTEC II, WTEC III and CEC2	1K/2K (Pre-4 th Gen)	CEC
Allison DOC™		J1939 or GMLAN	J1708	J1939 or J1850	Proprietary
Data Bus Viewer	Data Bus Messages	J1939, GMLAN, J1708	J1939 or J1708	J1939, J1850, J1708	Proprietary
	Engineering Units	J1939, N/A	J1939, N/A	J1939, N/A	N/A

The Data Bus Viewer has the following sections:



Data Bus Messages

This section displays the numeric representation of every message that is going through the selected communication link. The data is displayed in decimal (base 10) or hexadecimal (base 16) number systems. The decimal numeric system is the default option, while the hexadecimal system can be activated with the Hexadecimal check box.

Engineering Units

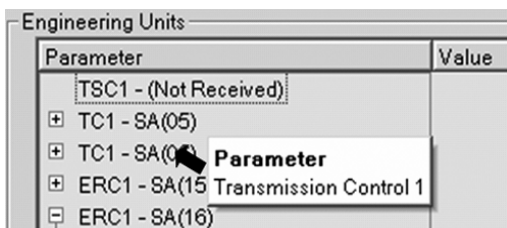
Engineering Units (only available when connected via J1939) includes every SAE J1939 Message and Parameter supported by the Allison Transmission controller. This information consists of all Messages and Parameters the transmission control

module broadcasts and receives via J1939. Refer to the Allison Transmission DATALINK COMMUNICATIONS technical document, available on the Allison Transmission Extranet, for specific information for each of the displayed J1939 Messages/Parameters.

- **Parameter**—displays SAE J1939 Messages the TCM can receive/send. Each SAE J1939 Message can be expanded to display the corresponding SAE J1939 parameter.



TOOL TIP: Each SAE J1939 Message is displayed in its acronym form. In order to see the complete/long description of a Message, place the cursor (do not click) over its acronym, and a tool tip is displayed.



Since each Message can be broadcasted from different Source Addresses (SA), the tool displays every detected SA that can initiate a given Message. Consequently, if the user is interested in finding a particular J1939 parameter (for example, Percent Load at Current Speed), the first step would be to find out which J1939 Message contains that parameter (EEC2: Electronic Engine Controller # 2), and second to see if Databus Viewer has detected that message in the databus. If detected, the Databus Viewer will display the SA of the controller sending that particular message. At this point, the user can expand that message to display the parameter of interest.

- **Value**—the value/state of the parameter.
- **Units**—the units of measure used for the value.

Source Addresses

Describes all Source Addresses (SA) that can be included/displayed in the Data Bus Viewer.

MID/SA

(J1708 or J1850 only) Message Identifier/Source Addresses code—the message type/source/destination.

Component ID

(J1708 or J1850 only) Manufacturer of a controller.

Model

(J1708 or J1850 only) A controller's model number.

Software ID

(J1708 or J1850 only) Identifies the software used by the controller.

Command Buttons:

- **Pause**—pauses and continues the Data Bus Message display.
- **Clear**—clears all Data Bus Message data.
- **Save**—displays the File Save dialog box and automatically saves the last 2 minutes of data displayed on the Data Bus Viewer, under the entered file name or under a default file named, defined by date and time. If the **Save Data Continuously** check box is selected, the tool will continuously save data (as opposed to the last 2 minutes of data) until the user clicks on the **Save** button.



WARNING: Having **Save Data Continuously** checked causes the application to continuously save all the data bus traffic into the PC, which could be detrimental for your computer. When this function is enabled / checked, be aware that your hard drive could be rapidly filled with Data Bus Viewer log files. It is recommended to only use this function when strictly necessary.

- To find the recorded file, use Windows Explorer and navigate to the directory on which Allison DOC™ For PC–Service Tool is located (usually defaulted to ...\\Program Files\\Allison Transmission\\Allison DOC For PC Service Tool), then open the Saved DataBusViewer Files folder. The raw data can be viewed with NotePad® or WordPad™. Also, the user can playback these file using the Data Bus Viewer feature in the service tool.
- When receiving Data Bus Viewer files from the field, the user needs to save these files in the same directory mentioned above (...\\Program Files\\Allison Transmission\\Allison DOC For PC Service Tool\\Saved DataBusViewer Files), in order to have them listed on the Data Bus Viewer Session list.
- **Close**—closes the Data Bus Viewer window.



NOTE: The Data Bus Viewer logs are not captured in the regular Snapshot function.

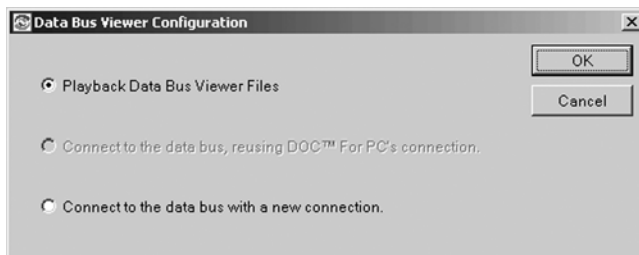
Displaying the Data Bus Viewer

There are two different ways to display the Data Bus Viewer:

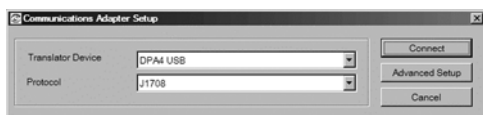
Passive Mode

When Allison DOC™ For PC–Service Tool is in Passive mode, the Data Bus Viewer can be accessed as follows:

1. Select Data Bus Viewer from the Transmission Connect/Disconnect dialog box—the Data Bus Viewer Configuration window displays



2. Select “**Connect to the data bus with a new connection.**” option and click OK—the Communication Adapter Setup window displays.

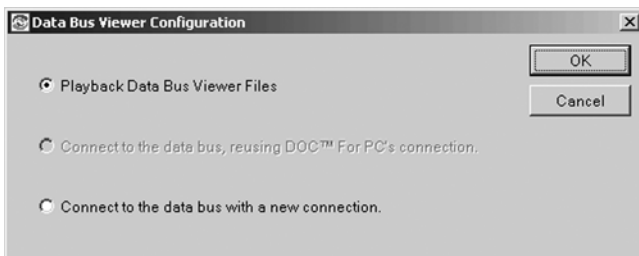


3. Refer to Section 5–1 for selecting a Vendor, Protocol, and Device for a particular translator device
4. Click **OK**—the Data Bus Viewer is displayed. This function captures all the data being sent through the communication link.

Active Mode

When Allison DOC™ For PC–Service Tool is in Active mode, the Data Bus Viewer can be accessed as follows:

1. Select Data Bus Viewer from the File menu—the Data Bus Viewer Configuration window displays.



2. Select “**Connect to data bus, reusing DOC™ For PC's connection.**” and click OK—the Data Bus Viewer screen displays.

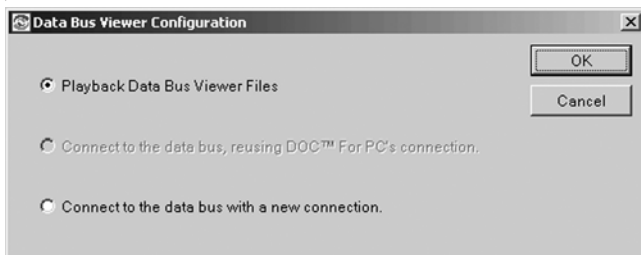


NOTE: The “Connect to the data bus with a new connection.” option should only be selected if the user wants to use the Data Bus Viewer (monitor the data bus) with a different physical translator device.

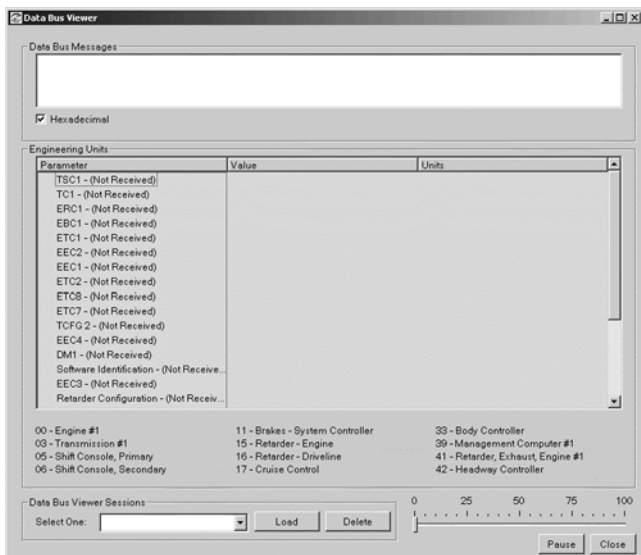
Playing Back Data Bus Viewer Files

The following steps describe how to playback the files saved with the Data Bus Viewer:

1. Select Data Bus Viewer from the File menu, or the Transmission Connect/Disconnect dialog box—the Data Bus Viewer Configuration window displays.



2. Select “**Playback Data Bus Viewer Files**” and click OK. The Data Bus Viewer window displays.



3. Click on the “Select One” pull-down menu, and select the file you want to playback.



NOTE: If you cannot see the file you want to playback, make sure the file is saved in the following directory: \Program Files\Allison Transmission\Allison DOC For PC Service Tool\Saved DataBusViewer Files.

- Once the file is highlighted/selected, click on Load, and the playback starts.

5-10. ACTION REQUESTS

Clutch Test Enabled

The Clutch Test Enabled allows the user to command any forward range by selecting it from a floating window.



NOTE: For 7-speed calibrations only, use the following table as a reference to compensate for the display differences between the shift selector and the service tool.

Allison DOCTM For PC	Gear Selected	L	1	2	3	4	5	6
	Gear Commanded							
	Current Gear							
	Previous Gear							
	Clutch Test							
Diagnostic Trouble Codes		1	2	3	4	5	6	7
Shift Selector								

To Enable the Clutch Test Function:

- Select the Action Request drop-down menu.
- Click on the Clutch Test Enabled menu item—the Clutch Test window displays.



- Select Drive (for the 1000/2000 Product Families) or the highest range (for the 3000/4000 Product Families) from the shift selector. At this point 1st range is attained and highlighted on the Clutch Test floating window.
- Click on the range you want the transmission to attain.

The current range attained is highlighted in the Clutch Test window. A message displays if Allison DOC™ For PC–Service Tool cannot conduct a clutch test.



NOTE: The transmission will maintain the selected range until the TCM determines that the operational conditions constitute a risk to the transmission hardware. At this point the TCM will command an up or downshift to eliminate that condition of risk. The service tool command (i.e. clutch test) cannot force the transmission to stay in a specific range under these circumstances.

Solenoid Test

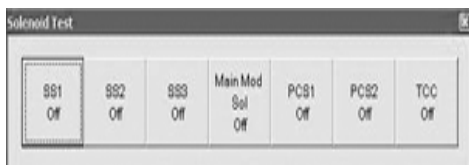
The Solenoid Test provides a means of troubleshooting complaints involving the transmission solenoids. The Solenoid Test does not test the electrical condition of a solenoid (solenoid internal resistance, circuit continuity, etc.). Instead, the Solenoid Test determines the TCM's ability to command signals to a particular solenoid. Consequently, depending on the particular test, the user may need to use a voltmeter to complement the purpose of this feature.

In order to use the solenoid test, the engine speed must be zero. The TCM will not honor the solenoid test command from the service tool if the engine speed is greater than zero.

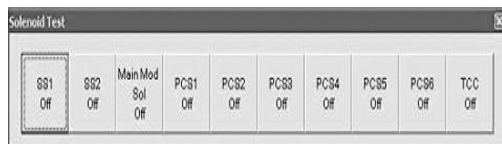
To Enable the Solenoid Test Function:

1. Select the Action Request drop-down menu.
2. Click on the Solenoid Test menu item—the Solenoid Test dialog box displays.

1000 and 2000 Product Families Solenoid Test



3000 and 4000 Product Families Solenoid Test



3. Select a solenoid to test.

The solenoid state changes from Off to On or On to Off. A successful test is indicated by the changed solenoid state.

A message displays if Allison DOC™ For PC–Service Tool is unable to turn on/off a particular solenoid, no response back (acknowledgement) is received from the TCM, or if the TCM replied with a negative response.

Reset Auto-detect

Autodetect is TCM logic that allows the TCM to automatically detect the presence of certain transmission components or input signals. The Reset Autodetect function forces the TCM to re-start the autodetect logic. Resetting autodetect with the service tool causes the TCM to reinitialize the detection of Throttle data source, Engine Coolant Temperature data source, Oil Level Sensor feature, Retarder feature, and TransID configuration.

To activate the Reset Autodetect function:

1. Select the Action Request drop-down menu.
2. Click the Reset Auto-Detect menu item—the Reset Autodetect Successful window displays
3. Click **OK**.

Autodetect will run again after the next normal TCM power-down (i.e. an ignition cycle is required to complete autodetect reset).

Reset Auto-detect Retarder

Autodetect Retarder is available only for the 3000/4000 Product Family. Autodetect Retarder automatically detects the presence of a transmission retarder. Reset Autodetect Retarder commands the TCM to re-initialize the Retarder auto-detection.

To reset Autodetect Retarder:

1. Display the Action Request Menu.
2. Click on the Reset Autodetect Retarder menu item—A message displays indicating that the Autodetect Retarder feature has been reset.
3. Click **OK**.

Autodetect will run again after the next normal TCM power-down (i.e. an ignition cycle is required to complete autodetect reset).

Reset Fast Adaptive

The TCM continuously compares each up/down shift against a corresponding “ideal” up/down shift pattern. Two algorithms are used to reach this ideal pattern for each shift: Fast Adaptive and Slow Adaptive. If the TCM detects that the difference between a real shift and the ideal pattern is significant, the Fast Adaptive logic is

used. This allows the TCM to use drastic changes to the shift parameters in order to quickly converge the patterns. Once the two patterns meet a convergence criterion, the TCM switches to slow adaptive, which allows the TCM to fine-tune the up/down shifts.

The Reset To Fast Adaptive forces the TCM to use the Fast Adaptive algorithm.

To Reset To Fast Adaptive:

1. Select the Action Request drop-down menu.
2. Click on the Reset Fast Adaptive menu item—the message “The adaptive shift parameters have been successfully reset to Fast Adapt.” displays indicating that the TCM has been reset to use fast adaptive parameters.
3. Click **OK**.

Reset Adaptive Shift Parameters

Reset Adaptive Shift Parameters replaces all adaptive clutch control parameters with the original factory calibration values and invokes fast adaptive algorithms to adapt clutch control parameters. Reset Adaptive Shift Parameters applies to all shifts or to specific up/downshifts.



NOTE:

- The adaptive values displayed in this section are refreshed only at connection time and after resetting adaptive information. In order to read current adaptive information, disconnect the service tool, reconnect it, and then read the values.
- The Garage Shift Adaptive Parameters (**Garage** tab) resets only the N-2, R-2, and 2-R adaptive parameters. Consequently, if a given situation requires resetting **all** garage shifts, reset the following adaptive parameters: **Garage, R-1, D-R, N-R, and N-1** (tabs).

To Reset Adaptive Shift Parameters:

1. Select the Action Request drop-down menu.
2. Click on the Reset Adaptive Shift Parameters menu item—a Caution window displays.



- Read the text in the Caution window and acknowledge it by clicking on the **YES** button – the Reset Adaptive Shift Parameters dialog box displays

Item Name	Value	Units
N-R Oncoming Clutch Volume	5	cc
N-R Minimum Oncoming Clutch Volume	0	cc
N-R On Coming Pressure	200.0	kpa
R-N Off Going Pressure	400.0	kpa
N-1 On Coming Clutch Volume	36	cc
N-1 Minimum On Coming Clutch Volume	0	cc
N-1 On Coming Pressure	216.0	kpa
R-1 Oncoming Clutch Volume	32	cc
R-1 Minimum Oncoming Clutch Volume	0	cc
R-1 On Coming Fill Delay	0	Seconds
R-1 On Coming Pressure	192.0	kpa
D-R Oncoming Clutch Volume	5	cc
D-R Minimum Oncoming Clutch Volume	0	cc
D-R On Coming Fill Delay	0	Seconds
D-R On Coming Pressure	168.0	kpa
R-1 Adaptive Pattern 0	Fast Adapt	
R-2 Adaptive Pattern 0	Fast Adapt	
D-R Adaptive Pattern 0	Fast Adapt	

- Select the appropriate tab and click on the **Reset “x” Shift Adaptive Parameters** button, where “x” is the selected shift.

The Reset Fast Adapt window contains up to eighteen tabs; one for each up/down shift (in addition to Garage and All shifts) that can be reset to factory values.

The following information displays in the Reset Adaptive Shift Parameters window:

Item Name

The name of the adaptive shift or clutch control parameter.

Value

The numerical value of the parameter.

Units

Unit Of Measure for the parameter value.

The adaptive shift parameters are reset when you click on the **RESET SHIFT ADAPTIVE PARAMETERS** button—the message “The adaptive clutch control parameters have been successfully reset to its factory calibration values and to Fast Adapt.” displays in the Rest Shift Adaptive Parameters Successful window.



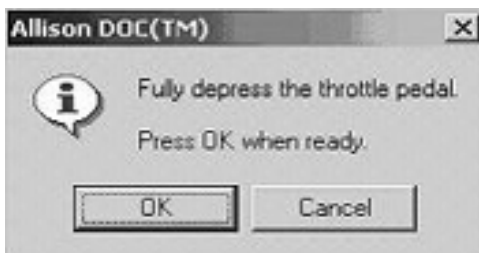
NOTE: Reset Adaptive Shift Parameters does not reset the autodetect information. If required, use Reset Autodetect Information.

Reset Full/Closed Throttle Calibration (TPS only)

These functions re-establish the limits of a mechanical throttle position sensor (TPS) in the TCM calibration. These features allow the user to reset—in the calibration—the minimum (closed throttle) and maximum (full throttle) values for the mechanical TPS. This action request is only applicable to TPS and does not have any effect when the throttle information is communicated via J 1939 or by any other means different from a throttle position sensor.

To reset open throttle calibration:

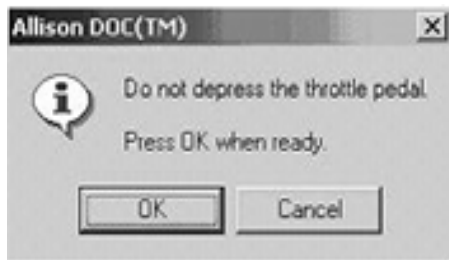
1. Select the Action Request drop-down menu.
2. Select Reset Full Throttle Calibration (TPS only)—the Throttle Action window displays.



3. Fully depress the throttle.
4. Click **OK**—The Reset Full Throttle Calibration Successful window displays.

To reset closed throttle calibration:

1. Select the Action Request drop-down menu.
2. Select Reset Closed Throttle Calibration (TPS only)—the Throttle Action window displays.



3. Click **OK**—The Reset Closed Throttle Calibration Successful window displays.

Reset SEM Auto-Select

Shift Energy Management (SEM) is a special feature that allows the transmission to perform smoother shifts. Depending upon the transmission calibration configuration, the service tool will (or will not) allow the user to reset SEM Auto Select. For more information on SEM/LRTP, refer to SEM/LRTP definitions in Section 13–2.

To reset the TCM to automatically select the presence of the SEM calibration information:

1. Display the Action Request menu.
2. Click the Reset SEM Autodetect menu item.
3. The message “Reset SEM Autodetect information was successful.” displays.
4. Click the **OK** button.

Engineering Calculations

After the user enters specific vehicle information, the Engineering Calculations function allows the service tool to calculate and display Converter Speed Ratio, Vehicle Speed, and Vehicle Acceleration in g’s. The engineering calculation values are displayed in the Diagnostic Data grid of the Data Monitor and Custom Data Monitor screens, and are a selectable data parameter for the Strip Chart. The Engineering Calculation values are lost when Allison DOC™ For PC–Service Tool is disconnected from the transmission.

Engineering Calculations

Please Enter

☐ Tire Revolutions: 495
Ade Ratio: 8

-OR-

☐ N/V: 0

CAUTION

If the user elects to install these values, the following three additional parameters will be displayed in the transmission data list.

Converter Speed Ratio
Vehicle Speed
Acceleration [g's]

The accuracy of those additional parameters will be the user's responsibility.

OK Cancel

Engineering Calculation values are derived from the following formulas:



NOTE: Enter Tire Revolutions in:

- Revolutions/Kilometer when using **Metric** units of measure
 - Revolutions/Mile when using **English** units of measure.
-
- $N/V = (\text{Tire Revolutions} \times \text{Axel Ratio})/60$
 - Converter Speed Ratio = Turbine Speed/Input Speed
 - Vehicle Speed = $(\text{Output Shaft Speed})/(N/V)$
 - Acceleration (g's) = $\text{Output Speed Acceleration}/(N/V \times \text{Divisor})$.



NOTE: Output Speed Acceleration is a value obtained from the TCM and the divisor is:

- Metric Divisor = 35.28
- English Divisor = 21.96

Enter the required data and press the **OK** button. The calculated data is added to the transmission information available for display in the Data Monitor, Custom Data Monitor, and Strip Chart windows.

Transmission Fault Lamp Test

The Transmission Fault Lamp Test tests whether or not the TCM is sending the signal (both analog and digital) to illuminate the Transmission Fault Lamp indicator on the dashboard.

To initiate a Fault Lamp test:

1. Display the Action Request menu.
2. Click on the Transmission Fault Lamp Test menu item—the Transmission Fault Lamp Test window displays.



If the lamp is illuminated and the word “ON” is displayed, the Transmission Fault Lamp is on. If the lamp is not illuminated and the word “OFF” is displayed, the Transmission Fault Lamp is off.

Change the status of the fault lamp by clicking the **ON** or **OFF** button.

Reverse Warning Lamp Test

The Reverse Warning Lamp Test tests whether or not the TCM is sending the signal to illuminate the Reverse Warning signal.

To Initiate a Reverse Warning Test:

1. Display the Action Request menu.
2. Click on the Reverse Warning Lamp Test menu item—the Reverse Warning Test window displays.



If the lamp is illuminated and the word “ON” is displayed the Reverse Warning is activated. If the lamp is not illuminated and the word “OFF” is displayed the Reverse Warning is not activated.

Change the status of the fault lamp by clicking on the **ON** or **OFF** button.

5–11. RECORDING SNAPSHOTS

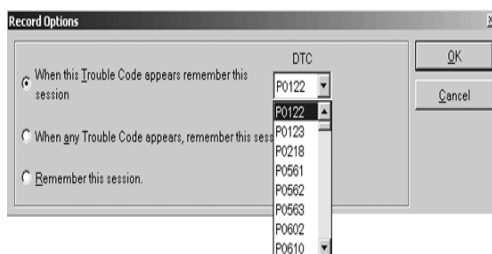
Snapshots are log files containing all transmission data recorded by Allison DOC™ For PC–Service Tool. Snapshot recording is started either by a DTC event (DTC driven), or triggered by the user (Trigger button driven). With the default settings, the tool will automatically trigger the recording of a snapshot when any DTC becomes active. Snapshot log files have the following characteristics:

- Contain all data the Allison DOC™ For PC–Service Tool requests. Regardless of the screens selected/used during the recording session, the snapshot captures all data the TCM reports to the Allison DOC™ For PC–Service Tool.

- Snapshots can be played back only with the Allison DOC™ For PC–Service Tool.
- Allison DOC™ For PC–Service Tool automatically saves the snapshot files as .ad files.
- Users can playback snapshots by double-clicking on the .ad files as long as Allison DOC™ is installed on the PC.
- Snapshot files are saved at Program Files\Allison Transmission\Allison DOC™ For PC–Service Tool\Logs.
- The length of snapshot files is limited by the amount of available RAM in the PC and the available storage space on the disk drive.

To Record an Event Driven Snapshot:

1. Select the Snapshot drop-down menu.
2. Select Record.
3. Select Recording Options—the Record Options window displays.



4. Select one of the following trigger conditions to start recording data:
 - When this Trouble Code appears, remember this session. You must enter a Trouble Code or select one from the drop-down list. If the Trouble Code entered occurs, the session is recorded.
 - When any Trouble Code appears, remember this session. (Default option) The session is recorded if any Trouble Code occurs.
 - Remember this session. A Trigger Point gets inserted immediately after you click **OK**.
 - Do not remember this session. Allows starting a recording session when commanded by the user (i.e. via F5-TRIGGER RECORDING).
5. Click **OK**.

Triggering a Snapshot Recording (and/or Setting a Bookmark)

The **F5-TRIGGER RECORDING** button allows you to quickly start to record a snapshot without having to specify any condition. After **F5-TRIGGER**

RECORDING is clicked, the Bookmark function is enabled. From this point you can bookmark a position for future reference in the TCM data recording. Bookmarks are assigned a sequential number in the order in which they were inserted into the playback file. In addition to their bookmark number, bookmarks are associated with a time relative to the length of the recording.

To Insert a Bookmark While Recording Data:

- Press the **F5** keyboard key
- or
- Click on the **F5-TRIGGER RECORDING** button.



NOTE: The **F5-TRIGGER RECORDING** button text changes to display the **F5-BOOKMARK #**.



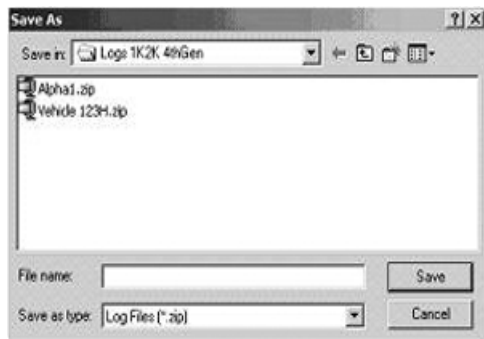
NOTE: A snapshot captures data from up to thirty minutes before the trigger point until the recording session is stopped. If the trigger point is set in less than thirty minutes after the time the Allison DOC™ For PC-Service Tool was connected, the snapshot data will include data from the connection time until the recording session is stopped.

5-12. STOPPING/SAVING SNAPSHOT SESSIONS

Once started recording a snapshot, there are different ways to stop recording data, and saving it to the PC.

Saving a Recording by Selecting STOP RECORDING

1. Click the **F6-Stop Recording** button or press the **F6** key. The Save As dialog box appears:



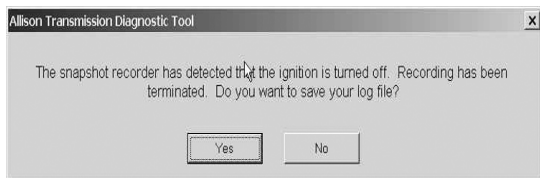
2. Enter a name for the snapshot without the extension file. For example, *vehicle123* (do not type *vehicle123.zip*, or *vehicle123.ad*, or any other extension file). The application will automatically assign the file extension. In this case, the .ad extension file.
3. Click **SAVE**.



NOTE: To save a recording in a folder other than the Logs folder, navigate to the desired folder before clicking the **SAVE** button.

Saving a Recording if the Ignition is Turned Off

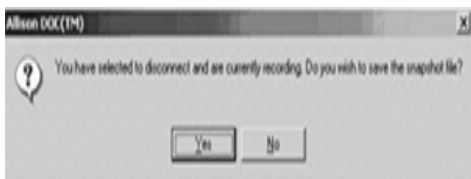
If no data bus traffic is detected for 6 seconds, Allison DOC™ For PC–Service Tool assumes the vehicle ignition has been turned off, recording is halted, and the Ignition Off window displays.



- Click **NO** to not save the recording.
- Click **YES** to save the recording—the Save As window displays.

Saving a Recording if Allison DOC™ For PC–Service Tool Gets Closed

If you close the Allison DOC™ For PC–Service Tool during a recording session the following window displays:



- Click **YES** to save the recording—the Save As window displays.
- Click **CANCEL** to not save the snapshot file.

5-13. PLAYING BACK SNAPSHOTS

Snapshot playback provides data to any of the diagnostic views. Snapshot files are played back in real-time, data being displayed as it occurred during the recording session.

To Playback a Snapshot:

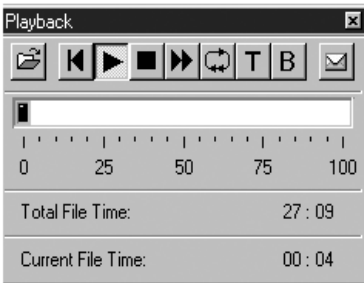
1. Select the Snapshot drop-down menu.
2. Select Playback.
3. Select Open Playback File.



NOTE: If Allison DOC™ For PC–Service Tool is connected, and the user tries to playback a snapshot, the live connection is broken and the Open File window displays.

4. Navigate to the appropriate directory.
5. Select the playback file to be played.
6. Click **OK**—the Trouble Code window and the Playback VCR control box display.

VCR Control box



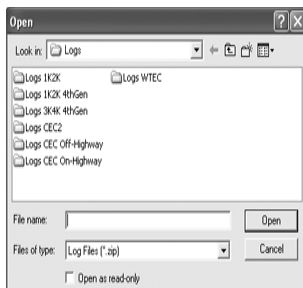
NOTE: The VCR control box moves to the lower-right corner of the screen when the playback file has completed loading and the VCR controls can be used.

Playback Indicators and VCR Controls are:

- Meter bar—the percentage of the playback file played.
- Total File Time—the length of the playback file in minutes and seconds.
- Current File Time—the elapsed time in minutes and seconds since the beginning of the file, based on the current location of the meter bar. Using your mouse pointer, you may click and drag the meter bar to any point within the file and play the file from that point. Other controls include:



Open file—displays the Open File window.



Rewind to beginning of file.



Play.



Stop.



Play at four times normal speed.



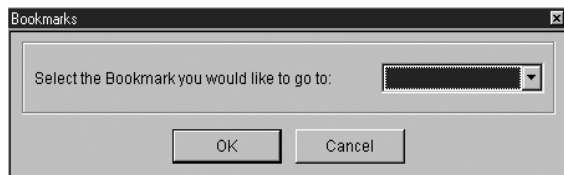
Loop—continuous play.



Jump to trigger—displays data starting at the trigger condition selected when the data was recorded.



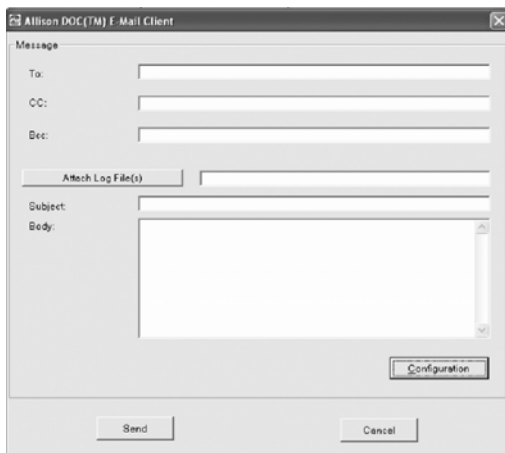
Jump to Bookmark—displays the bookmark window.



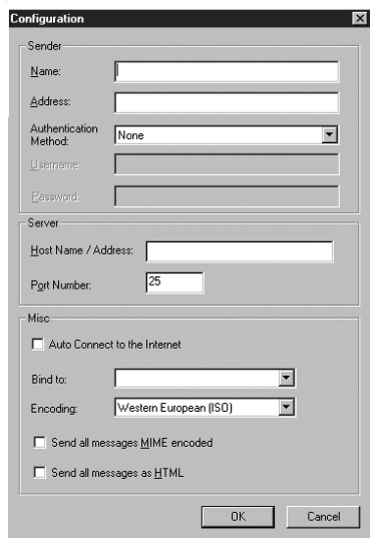
Email Playback as Attachment—displays the Compose E-mail window.



NOTE: A playback file that is not loaded can also be e-mailed. Click on the e-mail menu item in the snapshot menu.



If you have not configured your PC for sending Email, click the **CONFIGURATION** button—The Email Configuration window displays.



Contact your E-mail Administrator for the correct values to enter for your configuration.

5-14. EXPORTING PLAYBACK DATA

Data contained within a playback file can be exported in a comma-delimited format to allow for inclusion of that data into an Excel or other spreadsheet. The playback data can be incorporated into a spreadsheet on the host PC or emailed. Only the Allison 4th Generation Controls snapshots can be exported.

To Export Playback File Data:

1. Display the Snapshot menu.



2. Click on Export – the Open Playback file dialog box displays.
3. Select a playback file to export—a custom data monitor dialog box displays.
4. Select the data to be exported.
5. Click the **OK** button—data is exported as follows:
 - The export file name is the same as the playback file.
 - The export file type (extension) is .csv.
 - The first record of the file contains the names of the exported data with the units of measure (Metric or English) for each data item contained in parentheses immediately after the data item name, separated by commas.
 - Subsequent records contain the timestamp followed by the current or last recorded value of the parameters chosen for export.
 - If a maximum 65,530 records are exported, the export file is closed and a new export file is started with a sequential number, starting with 1, added to the file name.



NOTE: The export file (.csv) will be saved in the same directory as the snapshot file.

6.0 REPROGRAMMING TCM

6-1. REPROGRAMMING TCM



NOTE: You must have obtained and entered the proper authorization code to access this feature and reprogram the TCM/ECU.

TCM Reprogramming allows for modifying Customer Modifiable Constants (CMCs) and Input/Output (I/O) information. Reprogramming is defined as modifying CMCs and I/Os in an existing calibration. Reflashing or Recalibration is defined as loading a new application program (firmware) and/or calibration into a TCM. Before the Reprogramming TCM feature can be used, a password must be obtained from the tool provider (usually SPX Kent Moore) and entered into the Allison DOC™ For PC–Service Tool. For specific requirements to enable the Reprogramming section in Allison DOC™, refer to section 4-1.

Enabling/Authorizing the Reprogramming Section in Allison DOC™ For PC–Service Tool

1. Select Options from the main menu bar.
2. Select Application Configuration—the Application Configuration window displays.
3. Click on the Reprogramming Tab.

The screenshot shows the 'Application Configuration' window with the 'Reprogramming' tab selected. The window has four tabs: 'General', 'Reprogramming', 'Update Application', and 'TAC Data'. The 'Reprogramming' tab is active, displaying a message box that reads: 'You must call 1-800-329-6657 to activate the reprogramming features. You will need to provide the Authorization key (see below), your Product Serial Number and the appropriate proof of reprogramming certification in order to obtain a password.' Below this message, there are three input fields: 'Key' with the value '1007116761', 'Password' (empty), and 'Product Serial Number' (empty). At the bottom, there are 'Apply' and 'Cancel' buttons. A mouse cursor is pointing at the 'Apply' button.

4. Enter the reprogramming Password.

5. Enter the Product Serial Number.
6. Click **Apply**—the Reprogram tab grays-out to indicate that the Reprogramming function has been enabled or authorized.

Accessing the Reprogramming Function

1. Select Reprogram from the main menu bar.



NOTE:

- You must be connected to a transmission in order to display the Reprogramming screen. If you are playing back snapshots or using a DEMO file, the reprogramming menu is disabled.
 - If you are connected to a transmission and the Reprogramming menu option is disabled (grayed-out), it means that you have not enabled or authorized this section in the tool. Refer to section 4-1 for more information on how to enable this section in the tool.
- a. If the TCM/ECU password was changed from its defaulted values (i.e. eight zeros “00000000” or “Allison_”) the TCM/ECU Password dialog box displays.



- b. Enter the TCM password
- c. Click the **OK** button—

2. The Reprogram TCM window displays.

The screenshot shows the 'Reprogram TCM' window with the following sections:

Wire / Databus	State	Function Name	State
102	Enabled	Input - Engine Brake Enable and Pre-select Request 1	Enabled
162	Enabled	Input - Service Brake Status Non-Inverted	Enabled
Databus		Input - ABS Active	Enabled
161	Enabled	Input - Retarder Enable	Enabled
123	Enabled	Input - RELS	Enabled
157	Enabled	Input - Engine Brake and Pre-select Request 2	Enabled
143	Enabled	Input - Shift Selector Transition (SST)	Enabled
130	Enabled	Output - PTO Enable	Enabled
104	Enabled	Output - Engine Brake Enable - Non-Inverted	Enabled

Customer Modifiable Constant	Value
PTO Enable	
Maximum Engine Speed for PTO Engagement	900
Maximum Engine Speed for PTO Operation	4000
Maximum Output Speed for PTO Engagement	250
Maximum Output Speed for PTO Operation	300
Torque Converter Clutch Engagement Speed	900
Automatic Neutral for PTO	
Maximum Output Speed for Neutral Engagement	60
PTO Overspeed Indicator	

Active Package: 115 Password: 00000000

Buttons: Reprogram TCM, Close, Print

Saved Configurations:

Select One: [Dropdown] Load Delete Save

The Reprogram TCM window is divided in different sections:

- Input/Output Information—displays modifiable I/O information
- Customer Modifiable Constants—displays modifiable CMCs
- Active Package—displays current I/O active package
- Password—displays current TCM/ECU password

Reprogram TCM—command button used to reprogram the TCM after all the modifications are entered are:

- **Close**—command button used to close the Reprogram TCM window.
- **Print**—command button used to print a report that contains current Calibration, I/O, and CMC information.
- **Save**—saves current configuration. This includes current I/O, CMC, Active Package and TCM Password selection. Enter a unique name for the saved configuration. This function is particularly useful when reprogramming multiple vehicles with the exact same calibration.
- **Select One**—allows the user to select a previously saved configuration from the drop-down menu.
- **Delete**—deletes a configuration selected from the Select One drop-down menu.
- **Load**—loads a configuration from the Select One drop-down menu.

Reprogramming Input/Output Configuration

Allison 4th Generation Controls allows disabling or enabling wires independently of their assigned functions.

Wire/Databus—displays the wire number assigned to a specific function. Possible values are:

Wire #—a 3-digit number describing the TCM wire #.

Databus—the function is available on the databus.

State—indicates if a **wire** is enabled or disabled in the calibration. State is user modifiable.

Name—describes the I/O function name.

State—indicates if a function is enabled or disabled in the calibration. State is user modifiable.

To Reprogram Wire Status and Function Status:

1. Check (enable) or uncheck (disable) the State checkbox for the Wire # and/or Function as needed.



NOTE:

- If the user disables a wire that is assigned to an enabled function, the function will only remain enabled if its signal can be received via communication link. Otherwise, both the wire and function will be disabled.
- If the user disables a function, the calibration will cease using that function regardless of the signals (wire or Databus) being received for that particular function.

Reprogramming Customer Modifiable Constants

CMCs are ordered in groups. Each group contains the calibration constants that can be modified. Please refer to CMC definitions (Section 13–1) for more information on each CMC.

CMC information includes:

- Customer Modifiable Constants—a description of the CMC.
- Value—the current assigned value of the CMC. The CMC value can be modified.



NOTE: Each CMC has a maximum and a minimum limit to which the value can be changed. This range is displayed in a tool tip. In order to see that range, place the cursor (do not click) on the Value to modify.

To reprogram CMC values:

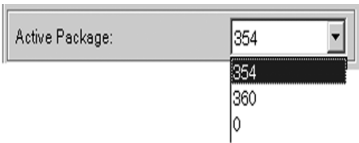
1. Click the value to be changed.
2. Enter or select a new value as necessary.

Reprogramming Package Assignments

Each calibration group contains several I/O packages. The current Active Package number is displayed near the center of the Reprogramming window. Available alternate package numbers are displayed immediately below the current package.

To reprogram the Current Vocation Package number:

1. Click on the pull-down menu.



2. Select the new I/O package.

Reprogramming TCM Password

Each TCM has a password that is defaulted to eight zeros “00000000” or “Allison_”, depending on the TCM software. If the user changes the TCM password, the TCM will require the user to enter that new password next time the reprogramming section is invoked.

To reprogram the TCM Password:

- Enter 8 numeric characters in the Password input box.

Initiating TCM Reprogramming

TCM reprogramming can be initiated after all applicable entries (I/Os, CMCs, etc.) are made in the TCM Reprogramming window.

To initiate TCM Reprogramming:

1. Click the **Reprogram TCM** button.
2. A warning window displays



3. If you want to continue, click **YES**.
4. The tool starts reprogramming the wires. A red status bar is displayed at the bottom of the TCM Reprogramming window.
5. A window is displayed indicating the wires were successfully reprogrammed.



6. Click **OK**.
7. The tool continues the process of reprogramming the CMCs. A red status bar is displayed at the bottom of the TCM Reprogramming window.



NOTE: If the service tool receives an error message from the TCM (for example a CMC value is out-of-range), a window (describing the problem) will be displayed, and the service tool re-displays the reprogramming screen.

8. A window displays indicating the CMCs were successfully reprogrammed.



9. Click **OK**.

Reprogramming Status for WTEC II, WTEC III, and CEC2

During the reprogramming function, a status line displays at the bottom of the reprogramming window.



NOTE: The reprogramming of WTEC II, WTEC III, and CEC2 might take several minutes. Please be patient and make sure ignition and power is always provided during this process.

The following status messages are displayed for a WTEC II ECU:

- Calculating calibration length and starting address.
- Entering programming mode.
- Reading calibration data.
- Writing CMCs.
- Calculating calibration checksums.
- Writing calibration checksums.
- Exiting programming mode.
- Reinitializing ECU.

The following status messages are displayed for a WTEC III or CEC2 ECU:

- Calculating calibration length.
- Entering programming mode.
- Reading calibration data.
- Saving old calibration data.
- Calculating CMC checksum.
- Erasing calibration data.
- Writing calibration data.
- Exiting programming mode.
- Sending re-initialize auto-detect action request.

7.0 REPORTS

The Allison DOC™ For PC–Service Tool Report function allows you to generate TCM/Transmission information reports. There are two types of reports: The Diagnostic Reports and the TRANSHEALTH™ Reports. The Diagnostic Reports data can come from saved Diagnostic Reports, snapshots, or from a real-time connection. Conversely, the TRANSHEALTH™ Report data comes from saved TRANSHEALTH™ Reports or from real-time connections. The following table lists the report sections available for the various transmission control systems.

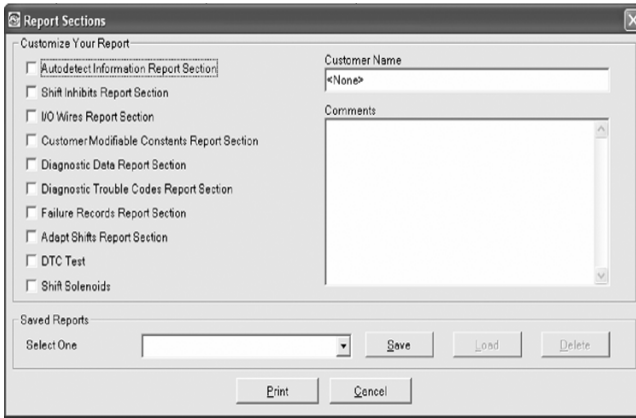
Allison 4 th Generation Controls Reports	1000 and 2000 Product Families Controls Reports (Pre-Allison 4 th Generation Controls)	WTEC II/III and CEC2 Controls Reports
Auto Detect Information	—	Auto Detect Information
Shift Inhibits	Shift Inhibits	Shift Inhibits
I/O Wires and Functions	I/O Wires	I/O Wires
Customer Modifiable Constants	—	—
Diagnostic Data	Diagnostic Data	Diagnostic Data
Failure Records	CMC Information (includes SEM)	CMC Information
Adapt Shifts	DTC Information	DTC Information
DTC Information	Failure Records	—
DTC Test	DTC Test	—
Adaptive Information	Adaptive Shifts	—
Shift Solenoids	—	—
—	TRANSHEALTH™ Report	TRANSHEALTH™ Report (excluding CEC2)

7–1. DIAGNOSTIC REPORTS

The Diagnostic Reports contain the transmission information displayed in Allison DOC™ For PC–Service Tool. The user can select the data to save or print in these reports.

Saving Diagnostic Reports

1. Connect the service tool to a transmission control module or playback a snapshot.
2. Select Diagnostic Reports from the Reports menu. The Report Sections window displays.



3. Type a Customer Name and any relevant comments you might want to add as references.
4. Select any or all of the available Report Sections to save.
5. Click the **SAVE** button—the Report Name Dialog Box displays.



6. Type a unique name for the report.
7. Click the **OK** button—the report is saved under the name typed in the Report Name dialog box.



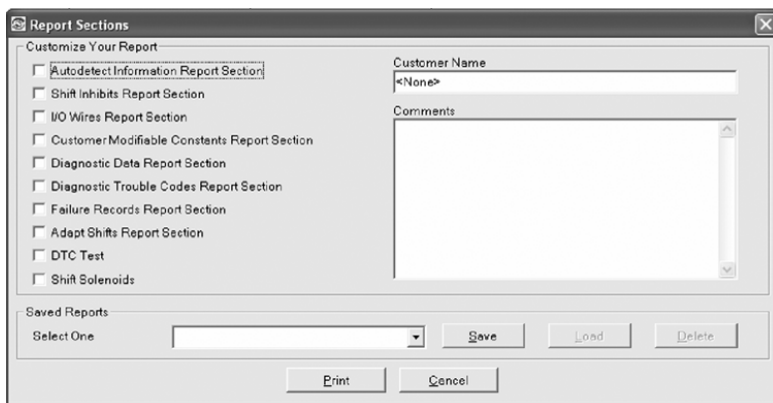
NOTE: Reports are saved at C:\Program Files\Allison Transmission\Allison DOC™ For PC–Service Tool \Reports.

You do not have to exit the Report Sections window to display a report on the screen.

Displaying Saved Diagnostic Reports

1. Connect the service tool to a transmission control module or playback a snapshot.

2. Select Diagnostic Reports from the Reports menu. The Report Sections window displays.

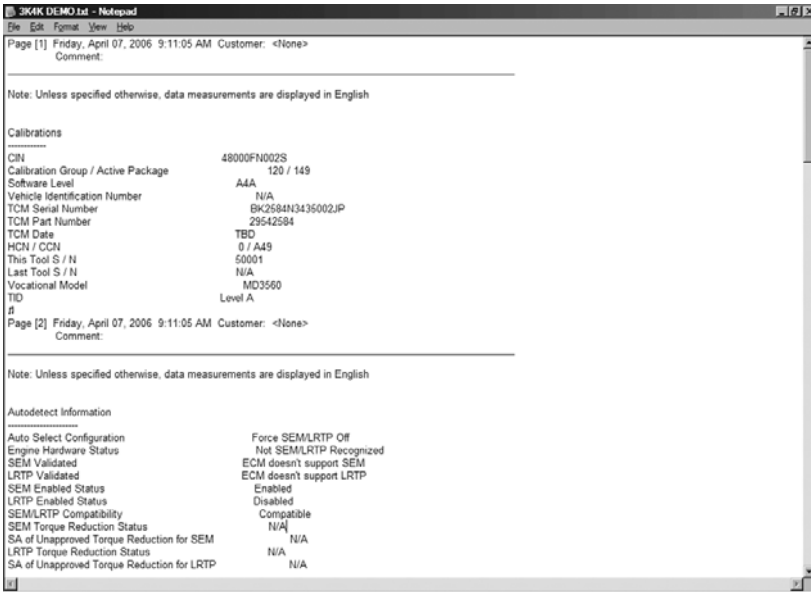


3. 3. Select a report from the drop-down list of Saved Reports.
4. 4. Click the **LOAD** button—the selected report displays in WordPad® or Notepad®.

Diagnostic Report Examples

The reports may be printed or saved as a text file. Saved reports can be displayed on the screen. **All reports are formatted with calibration information at the beginning of the report.**

The following is an example of a screen-displayed Autodetect Information report.



7-2. TRANSHEALTH™ REPORT

TRANSHEALTH™ is a special feature that describes the transmission condition at the time of service. Please refer to the Allison Transmission Extranet for Service Policy Letter #21 and SIL 1-TR-06 information associated with this feature.

The TRANSHEALTH™ feature is available for the following control systems only:

- WTEC II
- WTEC III
- 1000/2000 Product Families (Pre-Allison 4th Generation Controls)

The TRANSHEALTH™ feature contains two functions depending on the users Reprogramming capabilities:

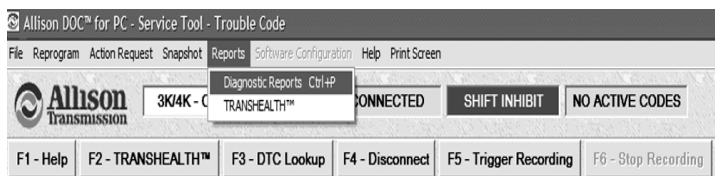
- TRANSHEALTH™ Monitor—available for all users; allows users to determine if the current condition of the transmission is OK (green), Not OK (Red), or simply undetermined (Gray).
- TRANSHEALTH™ Report—available for users who have Reprogramming enabled in their tools; allows users to obtain the same information provided by the TRANSHEALTH™ Monitor, but in a more detailed manner (i.e. clutch by clutch condition, as opposed to a general/over-all condition). It also allows users to add service performed, service recommendations/comments, and local promotions information to TRANSHEALTH™ reports they can save, print or load from the tool.



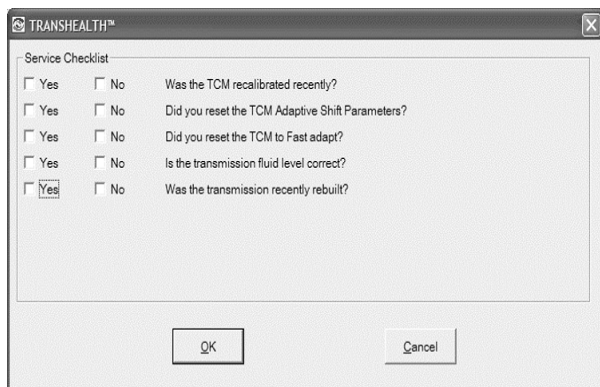
NOTE: A saved TRANSHEALTH™ Report cannot be loaded while the service tool is connected to a transmission control system, or while playing back a snapshot.

Accessing the TRANSHEALTH™ Feature

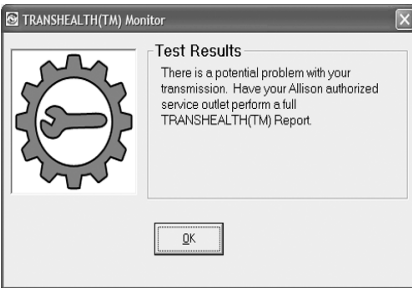
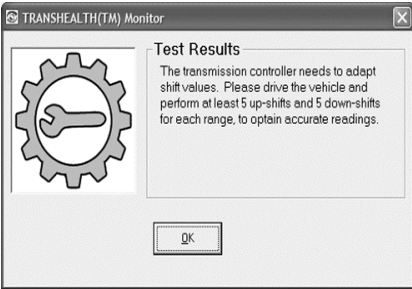
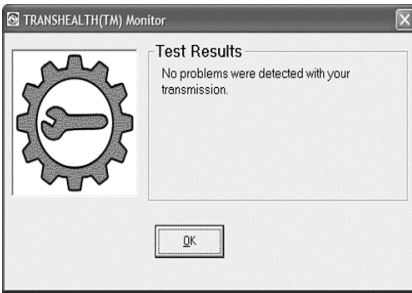
1. Select the TRANSHEALTH™ Report option from the Reports drop-down menu, or click the **F2-TRANSHEALTH™** button, or press the **F2** key.



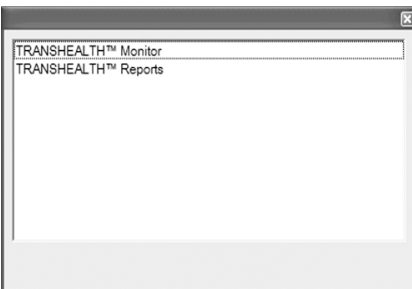
2. If the user does not have the Reprogramming section enabled, the TRANSHEALTH™ Monitor is initiated and the following window is displayed:



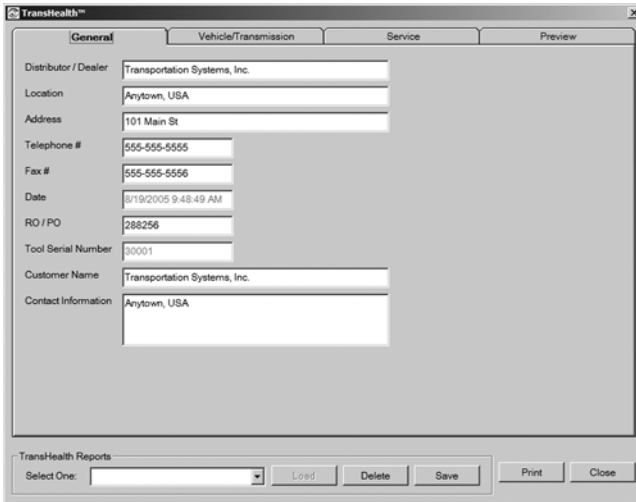
3. Answer all questions (required) displayed in the Service Checklist, and click **OK**. The TRANSHEALTH™ Monitor is displayed with the current transmission condition



4. If the user has Reprogramming enabled, the tool prompts the user to select the TRANSHEALTH™ Monitor or TRANSHEALTH™ Report.



5. Select TRANSHEALTH™ Reports. The following window appears, and the TRANSHEALTH™ **General** tab is displayed.



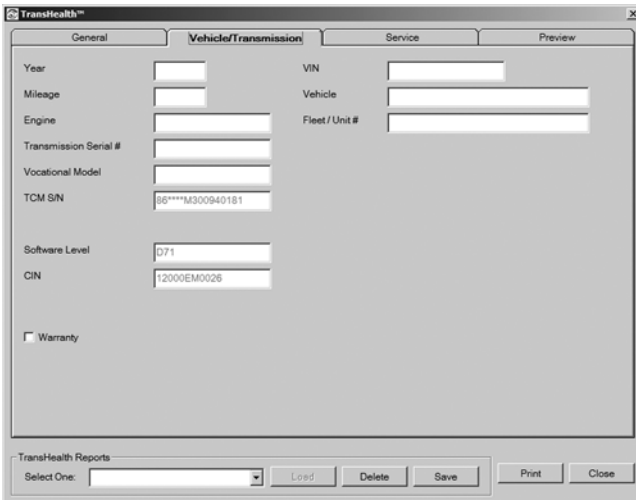
The screenshot shows the TransHealth™ application window with the 'General' tab selected. The window contains several input fields for company and contact information. The 'Date' field is populated with '8/19/2005 9:48:49 AM' and the 'Tool Serial Number' field is populated with '30001'. At the bottom, there is a 'TransHealth Reports' section with a 'Select One:' dropdown menu and buttons for 'Load', 'Delete', 'Save', 'Print', and 'Close'.

Distributor / Dealer	Transportation Systems, Inc.
Location	Anytown, USA
Address	101 Main St
Telephone #	555-555-5555
Fax #	555-555-5556
Date	8/19/2005 9:48:49 AM
RO / PO	288256
Tool Serial Number	30001
Customer Name	Transportation Systems, Inc.
Contact Information	Anytown, USA



NOTE: The first time this feature is accessed, you will have to type in most of the information displayed in the General tab. This initial information is saved for subsequent uses of this feature. The tool automatically populates the Date and Tool S/N.

6. Select the Vehicle/Transmission tab.



The screenshot shows the TransHealth™ application window with the 'Vehicle/Transmission' tab selected. The window contains input fields for vehicle and transmission details. The 'TCM S/N' field is populated with '98****M300940181' and the 'CIN' field is populated with '12000EM0026'. A 'Warranty' checkbox is present and unchecked. At the bottom, there is a 'TransHealth Reports' section with a 'Select One:' dropdown menu and buttons for 'Load', 'Delete', 'Save', 'Print', and 'Close'.

Year		VIN	
Mileage		Vehicle	
Engine		Fleet / Unit #	
Transmission Serial #			
Vocational Model			
TCM S/N	98****M300940181		
Software Level	071		
CIN	12000EM0026		
☐ Warranty			

7. Enter vehicle and transmission specific information. The tool will read and auto-populate some of the required information.

8. Select the Service tab.

TransHealth™

General Vehicle/Transmission **Service** Preview

Service Checklist

☐ Yes ☒ No Was the TCM recalibrated recently?

☐ Yes ☒ No Did you reset the TCM Adaptive Shift Parameters?

☒ Yes ☐ No Did you reset the TCM to Fast adapt?

☐ Yes ☒ No Is the transmission fluid level correct?

☐ Yes ☒ No Was the transmission recently rebuilt?

Service Performed

Service Recommendations / Comments

Local Promotions

TransHealth Reports

Select One: Load Delete Save Print Close

9. Click the checkboxes (required) to answer the service questions. Enter (optional) any service performed, service recommendations/comments, and local promotions information.

10. Click the Preview tab to display the TRANSHEALTH™ report.

TRANSHEALTH™

General Vehicle/Transmission Service **Preview**

Allison Transmission

TRANSHEALTH™ Report

Distributor / Dealer	Transportation Systems, Inc.	Customer Name	asdf
Location	Anytown, USA	Contact Information	sdf
Address	101 Main St	Repair Order	sdf
Telephone #	555-555-5555	Date	4/5/2007 10:47:01 AM
Fax #	555-555-5556	Tool Serial Number	36001

VEHICLE/TRANSMISSION INFORMATION

Year		Transmission Serial #	
Mileage		Vocational Model	
Engine		Software Level	U2A
VIN		TCM S/N	8600003J302353457
Vehicle		CIN	180004A004T
Fleet/Unit #			
Warranty	No		

TRANSMISSION SERVICE HISTORY

TRANSHEALTH™ Reports

Select One: Load Delete Save Print Close

TRANSHEALTH™ Report Screen Buttons

- Load—loads and displays a saved reports.
- Delete—deletes a displayed report from the save listing.
- Save—saves a new report.
- Print—prints a displayed report.
- Close—exits the TRANSHEALTH™ feature, DOES NOT save a displayed report.

Loading Saved TRANSHEALTH™ Reports

To load a saved report, Allison DOC™ For PC–Service Tool must not be connected to a transmission or playing back a snapshot. This feature is only available for users with Reprogramming enabled.

1. Select the TRANSHEALTH™ Report option from the Reports drop-down menu or click the **F2-TRANSHEALTH™** button, or press the **F2** key. The TRANSHEALTH™ dialog box is displayed

The screenshot shows the TRANSHEALTH™ dialog box with the 'General' tab selected. The form contains the following data:

Field	Value
Distributor / Dealer	Transportation Systems, Inc.
Location	Anytown, USA
Address	101 Main St
Telephone #	555-555-5555
Fax #	555-555-5556
Date	
RO / PO	
Tool Serial Number	
Customer Name	
Contact Information	

At the bottom, the 'TRANSHEALTH™ Reports' section includes a 'Select One:' dropdown menu and buttons for 'Load', 'Delete', 'Save', 'Print', and 'Close'.

2. Select the saved TRANSHEALTH™ report from the Select One drop-down menu.
3. Click on the **Load** button.
4. The saved TRANSHEALTH™ report is displayed.

Saving TRANSHEALTH™ Reports

To save a TRANSHEALTH™ Report:

1. Load the saved report to the TRANSHEALTH™ Report screen.
2. Click the **Save** button—the application automatically assigns the filename as TransHealth_[timestamp]_[S/N]. dat, where [S/N] is the ECU/TCM serial number, and [timestamp] is the current time, in YYYYMMDD_hhmmss format. The filename can be changed. The application saves the report to [installation directory]\Reports\TransHealth\[filename].
3. When a report is saved, the application automatically creates a Summary Report. The Summary Report is saved in the following directory [installation directory]\Reports\TransHealth\Summary Report.csv.

The Summary report contains all the data from saved TRANSHEALTH™ reports and can be opened with a spreadsheet application such as a Microsoft Excel®. When a TRANSHEALTH™ report is saved, the application appends an entry (a row) to the spreadsheet. The data in each row of the spreadsheet is formatted as follows:

Timestamp, File Name, TCM/ECU Serial Number, C1, C2, C3, C4, C5, and C6. The timestamp is in the “YYYY/MM/DD hh:mm:ss” format. Colors are one of the following strings, as appropriate: “Red”, “Green”, “Gray”, or “Not Displayed”.

Printing TRANSHEALTH™ Reports

To print a TRANSHEALTH™ saved report:

1. Load the saved report to the TRANSHEALTH™ Report screen.
2. Click the **Print** button—the report is sent to the system printer.

To print a TRANSHEALTH™ new report: Click the **Print** button—the report is sent to the system printer.

Closing the TRANSHEALTH™ Feature

Click the Close button—clicking the Close button exits the TRANSHEALTH™ Report feature. Closing TRANSHEALTH™ with a report displayed DOES NOT save the report.

7–3. PRINTING SCREENS

The Print Screen function of Allison DOC™ For PC–Service Tool allows you to print the screen being displayed.

To print a screen:

1. Select **Print** Screen from the Main Menu. The Allison DOC™ For PC–Service Tool screen being displayed prints at the default printer.

7-4. EXITING ALLISON DOC™ FOR PC-SERVICE TOOL

There are two ways to exit Allison DOC™ For PC-Service Tool:

- Click the EXIT button in the top right corner of the Allison DOC™ For PC-Service Tool window.
- Select the File drop-down menu and select Exit—the Allison DOC™ For PC-Service Tool program closes.

8.0 WTEC II/III, CEC2, AND CEC1 CONTROL SYSTEMS

The WTEC II/III, CEC2, and CEC1 Control Systems section describes Allison DOC™ For PC–Service Tool features and functions that apply to only the WTEC II/III, CEC2, and CEC1 Control System previous to Allison 4th Generation Controls.

WTEC II/III and CEC2 Diagnostic Trouble Codes

A Trouble Code is a pair of two-digit codes, primary and secondary, that indicates a problem in the transmission. The primary code indicates the type of problem and the secondary code more closely defines the fault. A Diagnostic Trouble code is often referred to as a “Trouble Code”, “a DTC”, or “a Code”.

WTEC II/III and CEC2 DTC and General Info View

Double-click on a Trouble Code Number or Description to access the TroubleShooting Manual.

Trouble Code	Active	Ignition Cycles	Events	Description
23-12	Yes	0	35	Primary Shift Selector or RSLink Fault
45-26	No	6	7	Open Circuit, N Solenoid Circuit
33-23	No	10	1	Sump Oil Temperature Sensor Failed High

Buttons: Clear Active Codes, Clear Inactive Codes, Performance Complaints

TCM Information		Transmission Data		Shift Inhibit		Status
CIN	OF006U6006T	Solenoid Apply Volts	14.0	Input Speed N-R I...	No	
ECU Serial Number	3 - 00200007	Sump/Oil Temp	80.0	Special Function ...	No	
Trans Config (WT3)	1	Oil (+/-)	No Sensor	Medium Cold Oil	No	
Active Package	113	Actual Range Selected	N	Wheel Lock	No	
TPS %	0.0	Actual Range Attained	N1	SPLoic Throttle	Low	
		TPS Percent	0.0	SPLoic Output S...	Low	
		Input Speed (rpm)	1	SPLoic Action C...	Inhibit Warning	
		Turbine Speed (rpm)	1			

Buttons: DTC and General Info, Data Monitor, Strip Chart, Calibration Information, Custom Data Monitor, Graphics Monitor

00:01:24

Trouble Code

The DTC related to the information being displayed, “Please call 1-800-252-5283 for assistance.” is displayed in the Description field for any code that is unknown to the controller.

Active

Yes or No indicates if the Trouble Code is active or not. When a code is logged by the ECU and the condition causing the code still exists, that code is said to be active; otherwise the trouble code is inactive.

Ignition Cycles

The number of times the engine ignition has been turned on since the problem first occurred.

Events

The number of times the transmission experienced the same problem indicated by the Trouble Code since the last time codes were cleared from the ECU.

Description

Describes the Diagnostic Trouble Code and Fault Code.

Clearing Active Codes

1. In the Trouble Code window, click the **CLEAR ACTIVE CODES** button—a window appears displaying the message “Clear Active Codes Request Completed Successfully”.
2. Click the **OK** button.

Clearing Inactive Codes

1. In the of Allison DOC™ For PC–Service Tool Trouble Code window, click the **Clear Inactive Codes** button.
2. A window appears displaying the message, “Clear Inactive Codes Request Completed Successfully!”
3. Click the **OK** button.

Most inactive Trouble Codes and associated information are cleared from the Allison DOC™ For PC–Service Tool window, leaving only active Trouble Codes.

WTEC II/III and CEC2 Diagnostic Data Monitor

The screenshot shows the Allison DOC™ for PC - Service Tool - Data Monitor interface. The window title is 'Allison DOC™ for PC - Service Tool - Data Monitor'. The menu bar includes 'File', 'Program', 'Action Request', 'Snapshot', 'Reports', 'Software Configuration', 'Help', and 'Print Screen'. The toolbar has buttons for 'Allison Transmission', 'WTEC III 0F006U6006T', 'RECORDING', and 'ACTIVE CODES'. The main area is divided into three sections: Diagnostic Data, Wire Number, and Shift Inhibit Factor. The Diagnostic Data section lists various vehicle parameters and their values. The Wire Number section lists input wires and their states. The Shift Inhibit Factor section lists various inhibit factors and their states.

Diagnostic Data	Value
Number of Active Codes	1
Ignition Status	On
Solenoid Apply Volts	13.8
Pump/Oil Temp	80.0
Oil Level Available	No Sensor
Oil (-/-)	No Sensor
Oil Level Counts	82
Actual Range Selected	N
Actual Range Attained	N1
Shift Selector Display	CAI EYE
Pri Sel Out (WTEC 3)	FAULT
Sec Sel Out (WTEC 3)	NEUTRAL
Mode Icon LED (WTEC 3)	OR
Throttle Src (WTEC 3)	Unknown
TPS Percent	0.0
TPS Counts	82
Input Speed (rpm)	1
Turbine Speed (rpm)	1
Output Speed (rpm)	1
Lockup (rpm)	0
Last Range Shift (rpm)	0
Next Up Shift (rpm)	0
Next Down Shift (rpm)	0
C3 Pressure Switch	Off
Check Trans (WTEC 3)	On
Reverse Warning	Off
Neutral Start	Off
Oncoming Pressure #1	0

Wire Number	Invert...	Enabl...	State
Input Wire# 117	NO	NO	OFF
[Auto Neutral Single Input]			
Input Wire# 118	NO	YES	OFF
[PTO Enable]			
Input Wire# 119	NO	YES	OFF
[Eng Brake & Preselct Request]			
Input Wire# 126	NO	NO	OFF
[Input Not Used]			
Input Wire# 137	NO	YES	OFF
[Service Brake Status]			
Input Wire# 153	NO	YES	OFF
[Auxiliary Hold Indicator]			
Input Wire# 154	NO	YES	OFF
[Anti-Lock Brake Response]			
Input Wire# 155	YES	NO	ON
[Auxiliary Function Range Inhibit (Standard)]			
Input Wire# 163	NO	YES	OFF
[Retarder Enable]			

Shift Inhibit Factor	Value
Input Speed N-R Inhibit	No
Special Function Range	No
Medium Cold Oil	No
Wheel Lock	No
SPLogic Throttle	Low
SPLogic Output Speed	Low
SPLogic Action Code	Inhibit Warning

The bottom of the window shows a status bar with '00:16:18' and a row of buttons: 'DTC and General Info', 'Data Monitor', 'Strip Chart', 'Calibration Information', 'Custom Data Monitor', and 'Graphics Monitor'.

The WTEC II/III and CEC2 Data Monitor display data in three sections:

- Diagnostic Data
- Input and Output Wires/Functions
- Shift Inhibits.

Diagnostic Data

- Diagnostic Data—A brief description of the diagnostic data being measured.
- Value—The value of the associated diagnostic data.

Input and Output Wires/Functions

- Wire #—The wire circuit number of the programmed function.
- Inverted—Yes/No.
- Enabled—Yes/No.
- State—On/Off.



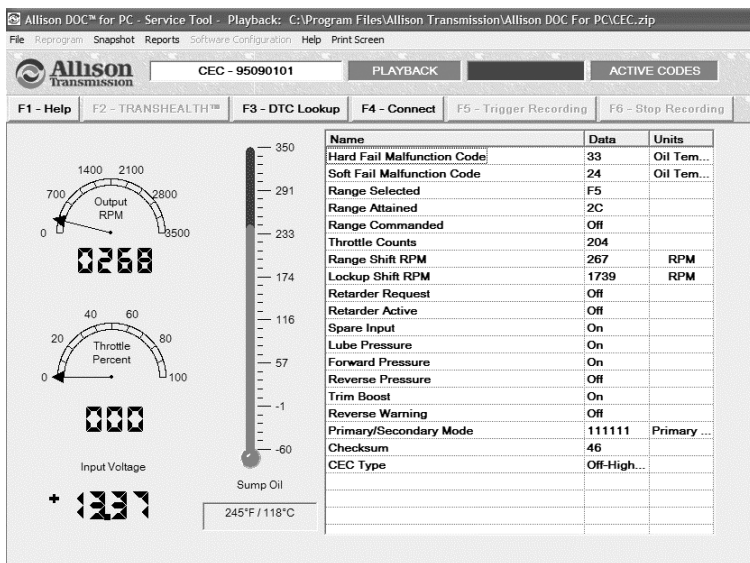
NOTE: Double click in the wire data area to display the Input/Output Functions section of the appropriate Troubleshooting Manual.

Shift Inhibits

- **Shift Inhibit Factor**—A brief description of the Shift Inhibit Factor being measured.
- **Value**—The value of the associated Shift Inhibit Factor.

CEC1 Diagnostic Data Monitor

For CEC1, the Diagnostic Data Monitor and the Graphic Data Monitor are combined.



WTEC II/III and CEC2 Custom Data Monitor

You may select the information to be displayed in the Custom Data Monitor window by adding or removing data types to the display.

Data types are added or removed in the Custom Data Monitor data selection window. The Custom Data Monitor window is the same as the Data Monitor window, except that only the selected data is displayed.

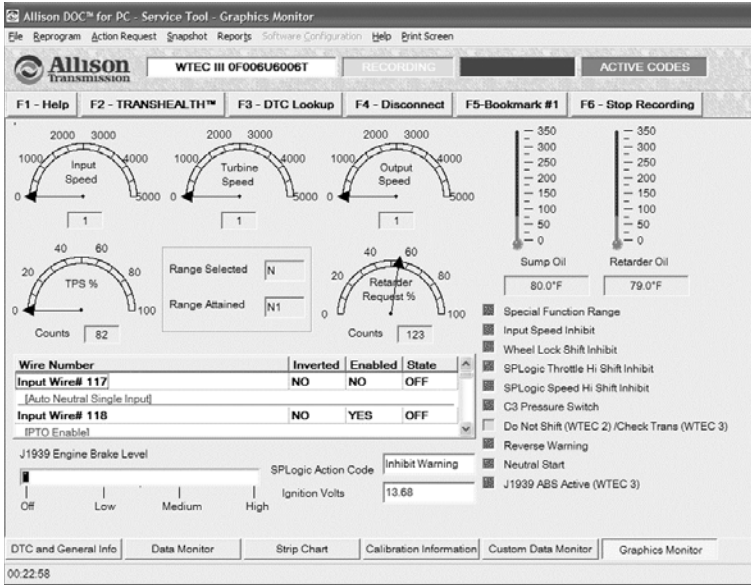
WTEC II/III and CEC2 Graphics Monitor

The Graphics Monitor displays diagnostic data using gauges, thermometers, indicator lights, text boxes, and a scrollable I/O Wire/Function data display.

Displaying the Graphics Monitor

To display the Graphics Monitor, Click the **Graphics Monitor** button.

WTEC II/III Graphics Monitor



NOTE: A gauge or thermometer can be expanded to a full-screen display by double-clicking on the gauge or thermometer. Return the display to normal by pressing the **ESC** key.

ECU Calibration Information

To display current ECU and Calibration information, select the **Calibration Information** button.

WTEC II/III and CEC2 ECU Calibration Information

The screenshot shows the Allison DOC software interface for ECU/Calibration. The main window displays calibration data for WTEC III 0F006U6006T. The interface includes a menu bar (File, Program, Action Request, Snapshot, Reports, Software Configuration, Help, Print Screen) and a toolbar with buttons for F1-Help, F2-TRANSEALTH™, F3-DTC Lookup, F4-Disconnect, F5-Bookmark #1, and F6-Stop Recording. The main area is divided into several sections:

- Customer Modifiable Constants (CMC):** A table with columns for the parameter name and its value.

Parameter	Value
Max Engine Speed for PTO Engagement (rpm)	900
Max Engine Speed for PTO Operation (rpm)	4000
Max Output Speed for PTO Engagement (rpm)	4000
Max Output Speed for PTO Operation (rpm)	5000
Engine Brake Preselct Shift Range	FOURTH
Override Throttle Source Autodetect	Autodetect
Override Engine Coolant Source Autodetect	Autodetect
Override Oil Level Sensor Autodetect	Autodetect
Override Retarder Autodetect	Autodetect
Eng Cool Temp to Start Retarder Capacity Reduct...	207
Eng Cool Temp Above Which to Use Preselct Shift...	215
Engine Brake Preselct Shift Schedule Selection	Preselct
- Calibration:** A table with columns for the parameter name and its value.

Parameter	Value
CIN	0F006U6006T
SW Level	9C2
ECU S/N	3 - 00200007
ECU P/N	2953/291
ECU Date	12/20/1999
HCN/CCN	15/9C0
Trans Config(WTEC 3)	1
Config Avail(WTEC 3)	3
Config Used(WTEC 3)	1
This Tool S/N	36001
Last Tool S/N	30444
IO Package #	113
- Wire Number:** A table with columns for the wire number, inverted status, enabled status, and state.

Wire Number	Inverted	Enabl.	State
Input Wire# 117	NO	NO	OFF
[Auto Neutral Single Input]			
Input Wire# 118	NO	YES	OFF
[PTO Enable]			
Input Wire# 119	NO	YES	OFF
[Eng Brake & Preselct Request]			
Input Wire# 126	NO	NO	OFF
[Input Not Used]			
Input Wire# 137	NO	YES	OFF
[Service Brake Status]			
Input Wire# 153	NO	YES	OFF
[Auxiliary Hold Indicator]			
Input Wire# 154	NO	YES	OFF
- Autodetect Info:** A table with columns for the parameter name and its value.

Parameter	Value
Oil Level Auto-detected	No
Autodetect Engine Starts #	0
Throttle Source	Unknown
Analog Throttle Auto-detected	No
J1939 Throttle Auto-detected	No
J1587 Throttle Auto-detected	No
Retarder Available	Yes
Engine Coolant Source	Unknown
Analog Coolant Auto-detected	No
J1939 Coolant Auto-detected	No
J1587 Coolant Auto-detected	No
SEM Status	0 (Unknown)

The bottom of the window has tabs for DTC and General Info, Data Monitor, Strip Chart, Calibration Information (selected), Custom Data Monitor, and Graphics Monitor. The status bar at the bottom left shows 00:21:14.

WTEC II/III and CEC2 Clutch Test

Enabling Clutch Tests allows clutch pressure testing, stall testing, and other diagnostic procedures. With Clutch Test enabled, you can use the shift selector to command reverse, neutral, and any available forward range. Once a range is commanded, the transmission can be operated in that range, but no shifts will be commanded unless output speed is less than about 57 rpm. Automatic shifts into and out of lockup are commanded according to normal calibration parameters.

To enable or disable Clutch Tests:

1. Select the Action Request drop-down menu.
2. Select Clutch Test Enabled—the Request Completed window displays.



3. Click **OK**.
4. Select the desired range with the shift selector.

When enabled, a check mark appears next to this item in the Action Request menu.

WTEC II/III Reset Fast Adaptive

The Fast Adaptive Mode allows quicker convergence to a smooth shift condition. WTEC Adaptive Controls look at current shifts, compares them to a model, and then adjusts accordingly to reach the model's optimum shift characteristics. Fast Adaptive forces the ECU to adjust more quickly than the slow, gradual adjustment procedures that makes minor changes after a shift has converged.

To reset Fast Adaptive:

1. Select the Action Request drop-down menu.
2. Click the Reset Fast Adaptive menu item—the Reset Fast Adaptive Successful window displays.
3. Click **OK**.

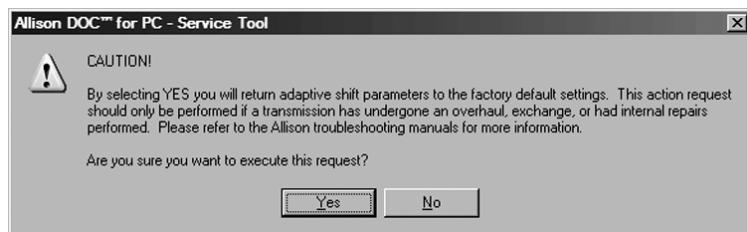
WTEC II/III Reset Unadapted Shifts

This action request commands the ECU to replace all adaptive clutch control parameters in memory with the factory calibration values. At the same time, the command of this function causes the ECU to:

- Use fast adaptive algorithms to adapt clutch control parameters.
- Reset all Autodetect parameters

To reset Unadapted Shifts:

1. Select the Action Request drop-down menu.
2. Select Reset Unadapted Shifts—the Caution window displays.



3. Click **YES**, disconnect Allison DOC™ For PC–Service Tool and recycle ignition power.

WTEC II/III and CEC2 Reset Throttle Calibration

Resetting throttle calibration commands the ECU to reset the throttle position sensor calibration. Reset throttle calibration if the throttle sensor experienced over-travel or under-travel outside of normal operational limits and within failure limits. This action request has no effect on the throttle position sensor, if the ECU receives throttle information over the J1939 or J1708/J1587 communication link.

To reset Throttle Calibration for WTEC II/III:

1. Select the Action Request drop-down menu.
2. Select Reset Throttle Calibration—the Reset Throttle Calibration Successful window displays.
3. Click **OK**.

WTEC II/III TAC Data Collection

TAC Data collection creates a file with TCM/Transmission information for the Service Engineering group to interpret. Do not to enable or activate TAC Data Collection unless requested by an Allison Transmission representative. When enabled, this function can be used for a limited number of times.



NOTE: SPX Kent-Moore does not have the capability to enable this the TAC Data Collection function in the Allison DOC™ For PC–Service Tool. This feature can only be enabled/authorized by the person/party asking the technician to use this function.

To initiate TAC Data collection:

1. Display the Action Request menu.
2. Click the TAC Data Collection menu item—the TAC Data Collection dialog box displays.



NOTE: The VIN will display if the VIN has been received from the database. A message displays if an invalid data format is entered.

3. Click the **OK** button. The message “TAC data successfully collected.” displays when TAC data is collected.

TAC Data File Use

TAC data is extracted in a comma-delineated format into the C:\Program Files\Allison Transmission\Allison DOC For PC - Service Tool\TAC Data Logs folder. The extracted data filename is named as *transmission serial number_mmdyyy_hhmmss.vr*, where *mmdyyy* corresponds to the current month, day, year and *hhmmss* corresponds to the current hour, minutes, and seconds. This file can be attached to an e-mail to Allison Transmission representatives for their review.

Valid Data Field Formats

- Vehicle Number—17 alphanumeric characters
- Transmission Serial Number—10 digits [0 to 9]
- Fleet Number—one to 55 printable characters
- Distributor / Dealer—one to 55 printable characters
- Location—one to 55 printable characters
- Customer Name—one to 55 printable characters
- Miles—one to six digits
- Transmission Model—one to 55 printable characters

9.0 1000/2000 (PRE-ALLISON 4TH GENERATION CONTROLS) CONTROL SYSTEM

This section describes the Allison DOC™ For PC–Service Tool features and functions that only apply to the 1000/2000/2400 Series™ Pre-Allison 4th Generation Controls system.

Diagnostic Trouble Codes

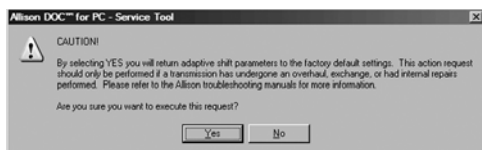
A Diagnostic Trouble Code consists of a letter “P” or “U” followed by four or five numbers. A “P” indicates a transmission internal problem, while a “U” indicates a network communication problem.

Reset Adaptive Shift Parameters

Reset Adaptive Shift Parameters replaces all adaptive clutch control parameters with the factory calibration values and invokes fast adaptive algorithms to adapt clutch control parameters.

To reset Adaptive Shift Parameters:

1. Select the Action Request drop-down menu.
2. Click on the Reset Adaptive menu item—the Caution window displays.



3. Click **YES** and the Reset Adaptive Shift Parameters dialog box displays.

Item Name	Value	Units
N-R Oncoming Clutch Volume	5	cc
N-R Minimum Oncoming Clutch Volume	0	cc
N-R On Coming Pressure	200.0	kpa
R-N Off Going Pressure	400.0	kpa
N-1 On Coming Clutch Volume	36	cc
N-1 Minimum On Coming Clutch Volume	0	cc
N-1 On Coming Pressure	216.0	kpa
R-1 Oncoming Clutch Volume	32	cc
R-1 Minimum Oncoming Clutch Volume	0	cc
R-1 On Coming Fill Delay	0	Seconds
R-1 On Coming Pressure	192.0	kpa
D-R Oncoming Clutch Volume	5	cc
D-R Minimum Oncoming Clutch Volume	0	cc
D-R On Coming Fill Delay	0	Seconds
D-R On Coming Pressure	168.0	kpa
R-1 Adaptive Pattern 0	Fast Adapt	
R-2 Adaptive Pattern 0	Fast Adapt	
D-R Adaptive Pattern 0	Fast Adapt	

The Reset Fast Adapt window contains 10 tabs; one for each shift that can reset adaptive shift parameters.

The following information displays in the Reset Adaptive Shift Parameters window:

Item Name

The name of a parameter.

Value

The numerical value of the parameter.

Units

Unit Of Measure for the parameter value—cc (cubic centimeter), kPa (kilopascal), sec (second).

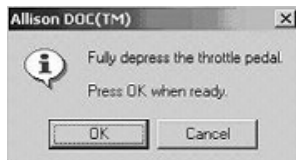
The adaptive shift parameters are reset when you click on the **RESET SHIFT ADAPTIVE PARAMETERS** button—the Reset Shift Adaptive Parameters Successful window displays. Click the **OK** button.

1000/2000 Throttle Calibration

Throttle Calibration re-initializes the values of throttle sensor input that indicates closed throttle and full (wide open) throttle. Reset throttle calibration if the throttle sensor experienced over-travel or under-travel outside of normal operational limits and within failure limits. The resetting action does not have any effect on throttle information when such signal is received via J1939 or any other digital communication link.

To reset full throttle calibration:

1. Select the Action Request drop-down menu.
2. Select Reset Open Throttle Calibration—the Throttle Action window display



3. Fully depress the throttle.
4. Click **OK**—the Reset Open Throttle Calibration Successful window displays.

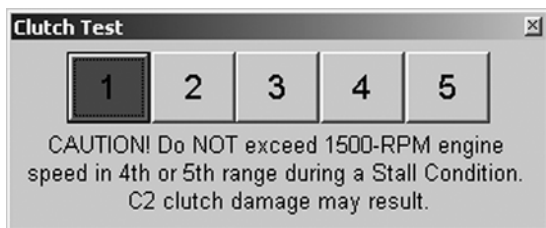
To reset closed throttle calibration:

1. Select the Action Request drop-down menu.
2. Select Reset Closed Throttle Calibration—the Throttle Action window displays.
3. Do not depress the throttle.
4. Click **OK**—the Reset Closed Throttle Calibration Successful window displays.

Clutch Test

The Clutch Test uses a software tool bar to command a particular range. Fourth and Fifth range are inhibited if the engine speed is above 1400 rpm and Output Speed is 0 rpm. Enable a Clutch Test by:

1. Selecting Drive (D) on the transmission shift selector.
2. Selecting the Action Request drop-down menu.
3. Selecting Clutch Test—the Clutch Test Tool Bar displays with the current range highlighted.



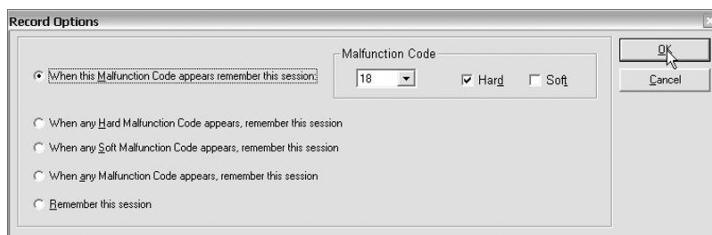
4. To select a range from the Clutch Test Tool Bar, click on the desired range. When the shift or range change is accomplished, the selected number is highlighted.
5. Disable the Clutch Test by closing the Clutch Test window.

10.0 CEC CONTROL SYSTEM

CEC Snapshot Record

The CEC controller uses Hard and Soft Malfunction Codes. A Snapshot recording can be started when a hard or soft codes is generated.

Record Options Dialog—CEC Version



The following options are used to start a recording session:

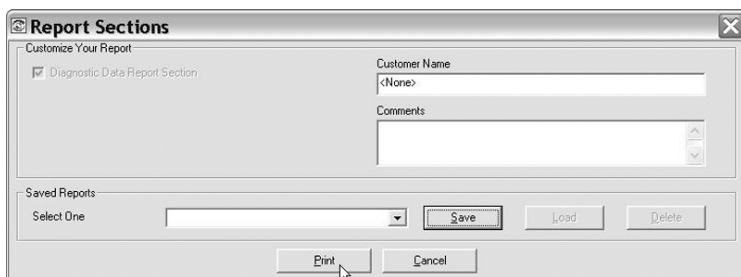
- When This Malfunction Code appears remember this session starts a recording if the entered malfunction code is detected.
- When any Hard Malfunction Code selection starts a recording if any Hard Malfunction code is detected. (Defaulted option)
- When any Soft Malfunction Code selection starts a recording if any Soft Malfunction code is detected.
- When any Malfunction Code selection starts a recording if any Malfunction code is detected.
- Remember This Session selection starts a recording immediately.
- Recording starts when the selection criteria are met.

To initiate a recording session:

1. Select Record Option from the Snapshot menu or press the **F5** key.
2. To select a malfunction code to start a recording:
 - Select the When This Malfunction Code appears remember this session radio button.
 - Select a Malfunction Code from the drop-down box.
3. Check the Hard and/or Soft check boxes.
4. Click the **OK** button.

Reports

Select reports for a CEC controller



Report Sections

Customize Your Report

☒ Diagnostic Data Report Section

Customer Name: <None>

Comments:

Saved Reports

Select One: [Dropdown]

Save Load Delete

Print Cancel

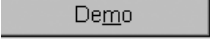


NOTE: “Data Monitor” and “Data Bus Viewer” are the only menu items or screens available for the CEC1 control system.

11.0 USING ALLISON DOC™ FOR PC–SERVICE TOOL DEMOS

Allison DOC™ For PC–Service Tool Demos allows you to observe and explore Allison DOC™ For PC–Service Tool functions without the service tool being connected to an ECU/TCM. The initial Demo display is the Trouble Code window and the Playback Control window. Entering Demo mode breaks any active connection to an ECU/TCM.

To use the Allison DOC™ For PC–Service Tool Demos:

1. From the Warnings window, click the  button. Demo is also available in the Help menu—the Choose Demo window displays.



2. Select the demo you would like to view. The selections are:

1000/2000

Data from a prerecorded 1000/2000 Allison 4th Generation Controls snapshot displays, with playback controls.

3000/4000

Data from a prerecorded 3000/4000 Allison 4th Generation Controls snapshot displays, with playback controls.

WTEC II

Data from a prerecorded WTEC II snapshot displays, with playback controls.

WTEC III

Data from a prerecorded WTEC III snapshot displays with, playback controls.

CEC2

Data from a prerecorded CEC2 Off-Highway snapshot displays, as do the playback controls.

CEC1

Data from a prerecorded CEC1 snapshot displays, as do the playback controls.

Reprogramming

Displays a Help file featuring an animated sequence that demonstrates the steps necessary to reprogram an /TCM.

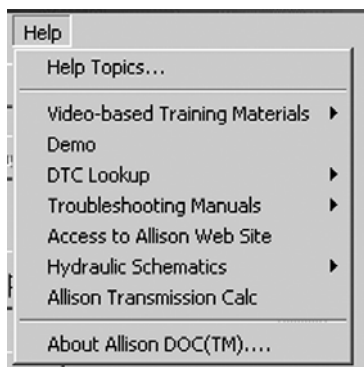
Run Snapshot/Replay Demo

Displays a Help file featuring an animated sequence that demonstrates the steps necessary to record snapshot.

End Demo execution by clicking on the Close File “X” in the playback control window.

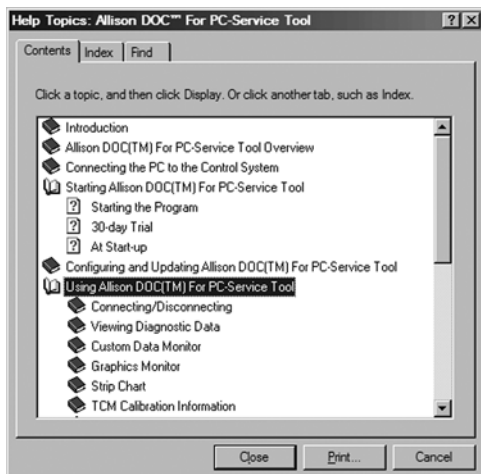
12.0 HELP SYSTEM

Allison DOC™ For PC–Service Tool contains an extensive multi-media help system. Access the help system by clicking on **Help** in the main tool bar or by pressing **ALT** then **H** keyboard keys—the Help Topics menu displays.



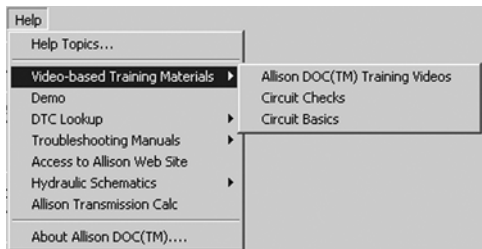
Help Topics

Displays a listing of Allison DOC™ For PC–Service Tool HELP topics. This section contains an extensive and detailed information about every section and feature in the Allison DOC™ service tool.



Video-Based Training Materials

The Video Based Training Materials are multi-media videos that run in a window on your PC.



- **Allison DOC™ Training Videos**—Explains how to navigate and use Allison DOC™ For PC—Service Tool through enhanced PC training videos. These videos provides an excellent reference of how to use the Allison DOC™ service tool.
- **Circuit Checks**—Explains how to use a Multi-meter to test for electrical circuit continuity, resistance values, and shorts.
- **Circuit Basics**—Describes and explains operation of basic electrical circuits, sensors, and switches in a transmission control system.

Demo

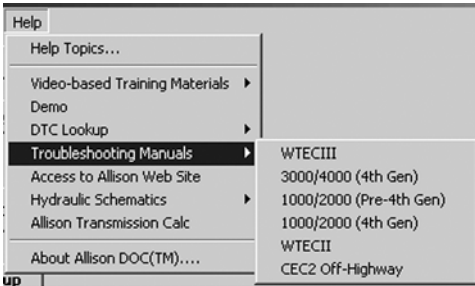
Allison DOC™ For PC—Service Tool provides data display demonstrations for Allison 4th Generation Controls 1000/2000 and 3000/4000 systems, WTEC II, WTEC III, CEC2, and CEC1 control systems. The Demos allow you to practice the various methods of data display without requiring connection to an active ECU/TCM. Refer to Section 11 for more information.

DTC Lookup

Displays the Trouble Code Lookup window for various transmission control systems.

Troubleshooting Manuals

Allows the user to open the Troubleshooting Manual (using Adobe Acrobat Reader) of every control system supported by the Allison DOC™ For PC Service Tool.



Access To Allison Transmission Web Site (requires an internet connection)

Connects, via the Internet, to the Allison Transmission web site at www.allisontransmission.com.

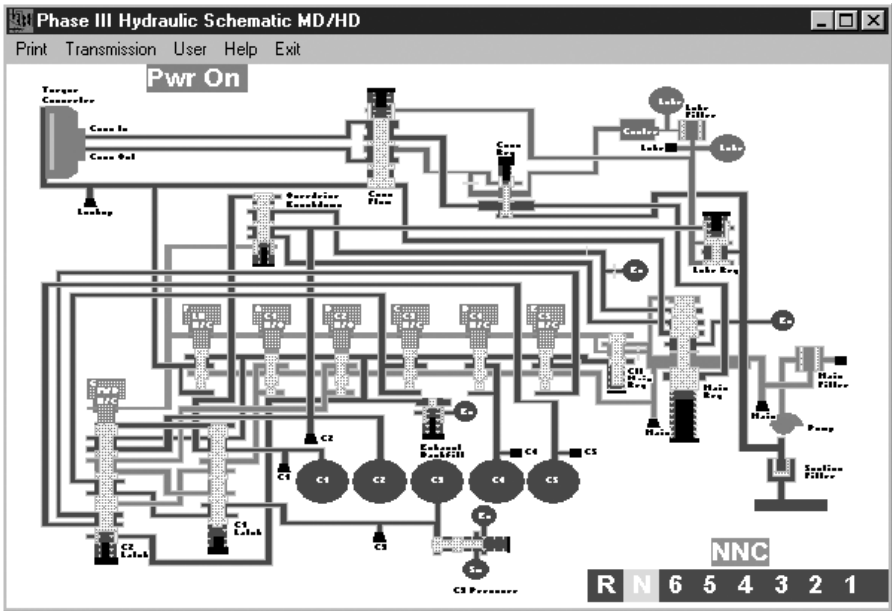
Hydro Schematics

Displays hydraulic schematics for the following control systems:

- Allison 4th Generation Controls 1000/2000 Product Families—1000/2000 Hydro Schematics (4th Generation)
- Allison 4th Generation Controls 3000/4000 Product Families—3000/4000 Hydro Schematics (4th Generation)
- WTEC Control system—WTEC Hydro Schematics
- 1000/2000/2400 Series™ Product Families—1K2K Hydro Schematics.

A hydraulic schematic for each range can be displayed, selecting the desired range on the range bar. Hydraulic and electrical failures can also be simulated, by clicking on a solenoid or hydraulic valve. Menus are also available to change transmission models, highlight hydraulic paths, print schemes, and more.

3000/4000 4th Generation Hydraulic Schematic



Allison Transmission Calc

Displays the Allison Transmission Calculation application.



About Allison DOC

Displays the “About” window which contains the Allison DOC™ For PC–Service Tool version number and copyright information.

13.0 DIAGNOSTIC DATA DEFINITIONS

This section contains definitions for some parameters displayed in Allison DOC™ For PC–Service Tool. The list of definitions is grouped in sections as displayed on the tool.



NOTE: Detailed diagnostic and troubleshooting procedures can be found in the Allison Troubleshooting Manuals.

13–1. CUSTOMER MODIFIABLE CONSTANTS (CMC)

The following tables contain general definitions for the Allison 4th Generation Controls Customer Modifiable Constants (CMC). Not all the CMC defined in this section will be available in every calibration. Depending upon the calibration (I/O package and vocation) some of these CMC will not be available.

Max Engine Speed for PTO Engage		
Group	Product Family	Units
PTO Enable	1000/2000 and 3000/4000	rpm
Indicates the maximum engine speed that the TCM will allow the PTO to engage. If the engine speed is greater than this value, the TCM will not allow PTO engagement. PTO must be interfaced with TCM.		

Max Engine Speed for PTO Operation		
Group	Product Family	Units
PTO Enable	1000/2000 and 3000/4000	rpm
Indicates the maximum engine speed that the TCM will allow the PTO to operate. If the engine speed is greater than this value, the TCM will deactivate the PTO operation. PTO must be interfaced with TCM.		

Max Output Speed for PTO Engage		
Group	Product Family	Units
PTO Enable	1000/2000 and 3000/4000	rpm
Indicates the maximum transmission output speed that the TCM will allow the PTO to engage. If the transmission output speed is greater than this value, the TCM will not allow PTO engagement. PTO must be interfaced with TCM.		

Max Output Speed for PTO Operation		
Group	Product Family	Units
PTO Enable	1000/2000 and 3000/4000	rpm
Indicates the maximum transmission output speed that the TCM will allow the PTO to operate. If the transmission output speed is greater than this value, the TCM will deactivate the PTO operation. PTO must be interfaced with TCM.		

TCC Engagement (Turbine) Speed		
Group	Product Family	Units
PTO Enable	1000/2000	rpm
Indicates the transmission turbine speed at which the TCM will engage the torque converter clutch during PTO operation. If the transmission turbine speed is lower than this value, the transmission will operate the PTO in torque converter mode. PTO must be interfaced with TCM and PTO Enable function must be enabled.		

Max Output Speed For Neutral Engage		
Group	Product Family	Units
Automatic Neutral Engage	1000/2000 and 3000/4000	rpm
The transmission output speed above which the TCM will not allow automatic neutral (TCM single Input function) engagement. PTO must be interfaced with TCM.		
NOTE: This CMC only affects (consequently, it is only applicable to) the Automatic Neutral Single Input function, as opposed to Automatic Neutral Dual Input function (Automatic Neutral Refuse Packer). For the CMC that manages the Auto Neutral Dual Input, refer to Auto Neutral for Refuse Packer—Output Speed For Auto Neutral for Refuse Packer CMC.		

Engine Speed to Turn Output ON		
Group	Product Family	Units
PTO Overspeed Indicator	3000/4000	rpm
Indicates the engine speed above which the PTO Overspeed Indicator (TCM Output function) will be activated (turned ON). The TCM will maintain the PTO Overspeed Indicator ON until the engine speed is reduced to a value that turns it Off (PTO Overspeed Indicator—Engine Speed to Turn it OFF). PTO must be interfaced with TCM.		

Engine Speed to Turn Output OFF		
Group	Product Family	Units
PTO Overspeed Indicator	3000/4000	rpm
Indicates the engine speed below which the PTO Overspeed Indicator (TCM Output Function) will be turned OFF. The TCM will maintain the PTO Overspeed Indicator OFF until the engine speed is increased to the value that turns it ON (PTO Overspeed Indicator—Engine Speed to Turn it On). PTO must be interfaced with TCM.		

Engine Brk Pre-Select Range		
Group	Product Family	Units
Engine Brk and Pre-Select Request	1000/2000 and 3000/4000	Ranges
Indicates the range that the TCM will try to attain using elevated downshifts points during an Engine Brake operation.		

Engine Brk Pre-Select Option		
Group	Product Family	Units
Engine Brk and Pre-Select Request	1000/2000 and 3000/4000	Standard or Alt E-Brk / Retarder
Indicates the preselect shift schedule that the TCM uses when the Engine Brake and Preselect Request (TCM Input function) is activated. There are two possible options: Standard and Alternate Engine Brake/Retarder.		
Standard: Downshifts will occur at the speed values specified in the “Preselect” (or “Low Preselect”) section of the calibration shift schedule reports (TCM Reflashing—PCCS).		
Alt E-Brk/Retarder: (Low or Alternate) downshifts will occur at approximately half-way between normal closed throttle downshifts and the preselect shift points described above. For exact values, refer to the calibration shift schedule reports (TCM Reflashing—PCCS).		

Selected Ranges		
Group	Product Family	Units
Range Indicator	1000/2000 and 3000/4000	Ranges
Contains the range (or group of ranges) that once commanded by the TCM and attained by the transmission—the Range Indicator (TCM output function) becomes active (turned ON). This function remains active (ON) until a shift to a range not specified in this CMC is commanded.		

Speed to Turn Output ON		
Group	Product Family	Units
Output Speed Indicator A	1000/2000 and 3000/4000	rpm
Indicates the transmission output speed above which Output Speed Indicator A (TCM Output Function) will be activated (turned ON). Output Speed Indicator A will remain active until the transmission output speed is reduced to a value that turns it Off (Output Speed Indicator A—Speed to Turn it OFF).		

Speed to Turn Output OFF		
Group	Product Family	Units
Output Speed Indicator A	1000/2000 and 3000/4000	rpm
Indicates the transmission output speed below which Output Speed Indicator A (TCM Output Function) will be deactivated (turned OFF). Output Speed Indicator A will remain deactivated until the transmission output speed is increased to a value that turns it ON (Output Speed Indicator A—Speed to Turn it ON).		

Speed to Turn Output ON		
Group	Product Family	Units
Output Speed Indicator B	1000/2000 and 3000/4000	rpm
Indicates the transmission output speed above which Output Speed Indicator B (TCM Output Function) will be activated (turned ON). Output Speed Indicator B will remain active until the transmission output speed is reduced to a value that turns it Off (Output Speed Indicator B—Speed to Turn it OFF).		

Speed to Turn Output OFF		
Group	Product Family	Units
Output Speed Indicator B	1000/2000 and 3000/4000	rpm
Indicates the transmission output speed below which Output Speed Indicator B (TCM Output Function) will be deactivated (turned OFF). Output Speed Indicator B will remain inactive until the transmission output speed is increased to a value that turns it ON (Output Speed Indicator B—Speed to Turn it ON).		

Engine Speed to Turn it ON		
Group	Product Family	Units
Engine Overspeed Indicator	3000/4000	rpm
Indicates the engine speed above which the Engine Overspeed Indicator (TCM Output Function) will be activated (turned ON). The Engine Overspeed Indicator will remain active until the engine speed is reduced to a value that turns it Off (Engine Overspeed Indicator—Speed to Turn it OFF).		

Engine Speed to Turn it OFF		
Group	Product Family	Units
Engine Overspeed Indicator	3000/4000	rpm
Indicates the engine speed below which the Engine Overspeed Indicator (TCM Output Function) will be deactivated (turned OFF). The Engine Overspeed Indicator will remain inactive until the engine speed is increased to a value that turns it ON (Engine Overspeed Indicator—Speed to Turn it ON).		

Flash When Hot Oil Capacity Reduction Active		
Group	Product Family	Units
Sump/Retarder Temp Indicator	3000/4000	Disable/Enable
Enables or Disables the option to flash the Sump Temperature Indicator (TCM Output function) On/Off, when retarder oil temperature is reaching a value that forces the TCM to activate the Retarder Capacity Reduction (a special condition in which the TCM modifies the retarder duty cycle to compensate for either high oil temperature or high engine temperature).		

Flash When Hot Oil Preselect Active		
Group	Product Family	Units
Sump/Retarder Temp Indicator	3000/4000	Disable/Enable
Enables or Disables the option to flash the Sump Temperature Indicator (TCM Output function) On/Off, when retarder oil temperature is reaching a value that forces the TCM to activate the Preselect Downshift schedule (as opposed to the normal Retarder schedule).		

Flash When Eng. Coolant Capacity Reduction Active		
Group	Product Family	Units
Sump/Retarder Temp Indicator	3000/4000	Disable/Enable
Enables or Disables the option to flash the Sump Temperature Indicator (TCM Output function) On/Off, when the engine coolant temperature is reaching a value that forces the TCM to activate the Retarder Capacity Reduction (a special condition in which the TCM modifies the retarder duty cycle to compensate for either high oil temperature or high engine temperature).		

Flash When Eng. Coolant Preselect Active		
Group	Product Family	Units
Sump/Retarder Temp Indicator	3000/4000	Disable/Enable
Enables or Disables the option to flash the Sump Temperature Indicator (TCM Output function) On/Off, when engine coolant temperature is reaching a value that forces the TCM to activate the Preselect Downshift schedule as opposed to the normal Retarder schedule.		

Engine Temp to Flash Output—Reduction Active		
Group	Product Family	Units
Sump/Retarder Temp Indicator	3000/4000	°F / °C
Indicates the engine coolant temperature above which a request is made to start flashing the Sump Temperature Indicator (TCM Output function) On/Off, when the engine coolant temperature is reaching a value that forces the TCM to activate the Retarder Capacity Reduction (a special condition in which the TCM modifies the retarder duty cycle to compensate for either high oil temperature or high engine temperature).		

Engine Temp to Flash Output—Preselect Active		
Group	Product Family	Units
Sump/Retarder Temp Indicator	3000/4000	°F / °C
Indicates the engine coolant temperature above which a request is made to start flashing the Sump Temperature Indicator (TCM Output function) On/Off, when engine coolant temperature is reaching a value that forces the TCM to activate the Preselect Downshift schedule as opposed to the normal Retarder schedule.		

Engine Temp Difference to Flash Output—Hysteresis		
Group	Product Family	Units
Sump/Retarder Temp Indicator	3000/4000	°F / °C
When the engine coolant temperature is less than the associated Engine Temp to Flash Output—Reduction active CMC or Engine Temp to Flash Output—Preselect active CMC minus this hysteresis value, a request is made to stop flashing the Sump Temperature Indicator (TCM Output function) On/Off, because the engine coolant temperature is no longer forcing the TCM to activate the Retarder Capacity Reduction or the Preselect shift schedule.		

Primary Fwd. Shift Selector Position		
Group	Product Family	Units
D1 Selection	3000/4000	Forward Ranges
When the transmission is operating in primary mode, this CMC defines the forward range that the TCM will command after the vehicle operator selects any forward range and activates D1 Selection (TCM Input function).		

Secondary Fwd. Shift Selector Position		
Group	Product Family	Units
D1 Selection	3000/4000	Forward Ranges
When the transmission is operating in secondary mode, this CMC defines the forward range that the TCM will command after the vehicle operator selects any forward range and activates D1 Selection (TCM Input function).		

Override Throttle Source		
Group	Product Family	Units
Override Autodetect	3000/4000	Autodetect, Analog, J1939, J1587, or PWM
Indicates how the TCM is setup to receive the signal source for the throttle. If set to Autodetect, the TCM activates logic that automatically selects the best source for the Throttle signal, with the exception of PWM. Conversely, any of the other options forces the TCM to only accept throttle from the selected source.		

Override Engine Coolant Source		
Group	Product Family	Units
Override Autodetect	3000/4000	Autodetect, Analog, J1939, or J1587
Indicates how the TCM is setup to receive the signal source for engine coolant temperature. If set to Autodetect, the TCM activates logic that automatically selects the best source for the engine coolant signal. Any of the other options forces the TCM to only accept engine coolant from the selected source.		

Override Oil Level Sensor		
Group	Product Family	Units
Override Autodetect	3000/4000	Autodetect, Present, Not Present
Indicates if an Oil Level Sensor is Autodetected, forced to be Present, or forced to be Not Present.		

Override Retarder Autodetect		
Group	Product Family	Units
Override Autodetect	3000/4000	Autodetect, Present, Not Present
Indicates if the retarder is Autodetected, forced to be Present, or forced to be Not Present.		

Eng. Coolant Temp to Start Retarder Capacity Reduction		
Group	Product Family	Units
Retarder Parameters	3000/4000	°F / °C
Indicates the engine coolant temperature above which the TCM activates the Retarder Capacity Reduction (a special condition in which the TCM modifies the retarder solenoid command to compensate for either high oil temperature or high engine temperature). The applicability of this CMC depends on the enable/disable status of the Retarder Parameters—Retarder Capacity Reduction Enable for Hot Coolant CMC.		

Retarder Capacity Reduction Enable for Hot Coolant		
Group	Product Family	Units
Retarder Parameters	3000/4000	Disable/Enable
Enables or Disables the option of activating the Retarder Capacity Reduction when detecting high engine coolant temperatures. Refer to Retarder Parameters—Eng. Coolant Temp to Start Retarder Capacity Reduction CMC.		

Eng. Coolant Temp to invoke Retarder Auto Preselect		
Group	Product Family	Units
Retarder Parameters	3000/4000	°F / °C
Indicates the engine coolant temperature above which the TCM activates the Preselect Downshift schedule, as opposed to the normal Retarder schedule. The applicability of this CMC depends on the enable/disable status of the Retarder Parameters—Preselect Shift Points Enable for Hot Coolant CMC.		

Preselect Shift Points Enable for Hot Coolant		
Group	Product Family	Units
Retarder Parameters	3000/4000	Disable/Enable
Enables or Disables the option of activating the Preselect Downshift schedule when detecting high engine coolant temperatures. Refer to Retarder Parameters—Eng. Coolant Temp to invoke Retarder Auto Preselect CMC.		

Retarder Accumulator		
Group	Product Family	Units
Retarder Parameters	3000/4000	Used, Not Used
Indicates whether the TCM is set to use the Retarder accumulator.		

Retarder Capacity Level		
Group	Product Family	Units
Retarder Parameters	3000/4000	Low, Medium, High
Indicates the retardation capacity level (Low, Medium, or High) that the TCM is set up to use on the installed retarder.		

Maximum Output Speed for Low Axle Select		
Group	Product Family	Units
Two Speed Axle Enabled	3000/4000	rpm
Indicates the maximum engine speed below which the low axle can be safely selected. The Two Speed Axle indicator (a TCM Output function) becomes active (turned ON), when the TCM determines that the conditions have been met to permit the second speed axle.		

Engine Speed Neutral To Range Inhibit		
Group	Product Family	Units
Special Logic Pattern	3000/4000	rpm
Indicates the maximum engine speed above which Neutral to Range shifts will be inhibited.		

Engine Speed for Neutral Indicator for PTO		
Group	Product Family	Units
Neutral Indicator for PTO	3000/4000	rpm
Indicates the maximum engine speed above which the TCM will prevent the Neutral Indicator for PTO (a TCM Output function) from coming On.		

Output Speed for Neutral Indicator for PTO

Group	Product Family	Units
Neutral Indicator for PTO	3000/4000	rpm

Indicates the maximum transmission output speed above which the TCM will prevent the Neutral Indicator for PTO (a TCM Output function) from coming On.

Output Speed for Auto Neutral for Refuse Packer

Group	Product Family	Units
Auto Neutral for Refuse Packer	3000/4000	rpm

The transmission output speed above which the TCM will not allow automatic neutral (TCM dual Input function) engagement.

NOTE: This CMC only affects the Automatic Neutral Dual Input function (Automatic Neutral Refuse Packer), as opposed to Automatic Neutral Single Input function. For the CMC that manages the Auto Neutral Single Input refer to Auto Neutral Engage—Max Output Speed For Neutral Engage CMC.

13-2. SEM/LRTP

Depending on the TCM's SEM/LRTP configuration (indicated by **Auto Select Configuration**), the transmission controller conducts a series of tests to determine the SEM/LRTP enabling status. These tests are only performed when new TCM software is loaded into a TCM and/or when the tool resets SEM Autoselect (refer to **Reset SEM Auto-Select** action request).

In order to “pass” the SEM/LRTP Autoselect tests, the TCM must detect an Allison-validated/certified engine, and the engine must support—and react correctly—to all J1939 messages and parameters required by SEM/LRTP. Otherwise, the SEM/LRTP Autoselect tests would “fail.”

Auto Select Configuration Possible Values:	Observations: With the exception of Force SEM/LRTP Off, any Auto Select Configuration activates the SEM/LRTP Autoselect tests. - Autoselect (SEM/LRTP Not Required)—indicates that the TCM calibration would only enable SEM/LRTP, if the SEM/LRTP Autoselect tests are passed. If any of the SEM/LRTP Autoselect tests fails, the TCM will not enable SEM/LRTP, and no SEM/LRTP DTCs will be logged, because SEM/LRTP is not required. - Force SEM/LRTP Off—indicates that the TCM is calibrated not to run the SEM/LRTP Autoselect tests. - SEM Required—Indicates that the TCM is calibrated to use SEM. In this configuration, if any of the SEM Autoselect tests fails, the TCM will log DTCs. The LRTP, however, would only be enabled if the engine meets the requirements to activate LRTP. - SEM and LRTP Required—indicates that the TCM is calibrated to use both SEM and LRTP. In this configuration, if any of the SEM/LRTP Autoselect tests fails, the TCM will log DTCs. - LRTP Required—Indicates that the TCM is calibrated to use LRTP. In this configuration, if any of the LRTP Autoselect tests fails, the TCM will log DTCs. The SEM, however, would only be enabled if the engine meets the requirements to activate SEM.
Possible Values:	Description: Indicates how the calibration is set up with respect to enabling or requiring SEM/LRTP.

Engine Hardware Status	
Possible Values: • Recognized • Not Recognized	Observations: Engines must undergo an Allison Transmission certification process to verify compliance with specific governor characteristics and torque response accuracy. Once a given engine is certified, Allison Transmission includes it in the TCM Calibration as a validated engine. This information is used in the SEM/LRTP Autoselect tests. This parameter will be set to “Not Recognized” when: 1. The TCM calibration is configured to never use SEM/LRTP (indicated by Auto Select Configuration = Force SEM/LRTP Off), or 2. The TCM detected an engine that hasn’t been validated and certified by Allison Transmission; in which case the SEM/LRTP Autoselect tests would fail. The tests TCMs conduct to determine the Engine Hardware Status are only re-run when a new TCM software is loaded into TCMs and/or when the tool resets SEM Autoselect.
Description: Indicates if the TCM calibration recognized (or not) the vehicle’s engine as an Allison validated and certified engine.	

SEM Enabled Status Possible Values: • Enabled • Disabled	Observations: This parameter will be set to “Enabled” when all the SEM/LRTP Autoselect tests pass, in which case SEM may be permanently enabled or activated. Conversely, this parameter is set to “Disabled” when: 1. Any of the SEM/LRTP Autoselect tests has failed. Depending on the Auto Select Configurations, some DTCs may be logged, or 2. When the TCM is calibrated to never use SEM/LRTP (indicated by Auto Select Configuration = Force SEM/LRTP Off).
Description: Indicates the SEM enable/disable status in the TCM calibration.	

LRTP Enabled Status Possible Values: • Enabled • Disabled	Observations: This parameter will be set to “Enabled” when all the SEM/LRTP Autoselect tests pass, in which case LRTP may be permanently enabled or activated. Conversely, this parameter will be set to “Disabled” when: 1. Any of the SEM/LRTP Autoselect tests fails. Depending on the Auto Select Configurations, some DTCs may be logged, or 2. When the TCM is calibrated to never use SEM/LRTP (indicated by Auto Select Configuration = Force SEM/LRTP Off).
Description: Indicates the LRTP enable/disable status in the TCM calibration.	

SEM/LRTP Compatibility	
Possible Values: • Compatible • Not Compatible	Observations: Part of the SEM/LRTP Autoselect process consists of testing the engine controller's support and reaction to a number of J1939 messages/parameters requested by the TCM. Depending on the engine controller's message/parameter support and reaction to these requests, the TCM determines if the engine is compatible with SEM/LRTP or not. This parameter will be set to "Not Compatible" when SEM and/or LRTP is required, but at least one of the SEM/LRTP Autoselect tests fails.
Description: Indicates whether the TCM calibration has determined that the engine calibration is compatible (or not) with the SEM/LRTP requests. NOTE: If the TCM Calibration is configured to never use SEM/LRTP (indicated by Auto Select Configuration = Force SEM/LRTP Off), this parameter is <u>not</u> applicable at all. Consequently, when such configuration exists, the value of this parameter (i.e. Compatible or Not Compatible) is completely irrelevant.	

SEM Validated Possible Values: • ECM doesn't support SEM • ECM supports SEM	Observations: ECM doesn't support SEM—Indicates that the TCM has determined that the engine controller: 1. Does not appear in the Allison validated/certified engines, or 2. Does not support all J1939 messages/parameters required for SEM, or 3. Does not react (as expected) to one (or more) of the J1939 messages/parameters required for SEM. ECM supports SEM—Indicates that the TCM has determined that the engine controller: 1. Appears in the Allison validated/certified engines, and 2. Support all J1939 messages/parameters required for SEM, and 3. Reacts (as expected) to every J1939 messages/parameters required for SEM.
Description: Indicates whether the TCM has determined that the engine controller supports (or not) SEM.	

L RTP Validated	
Possible Values: - ECM doesn't support L RTP - ECM supports L RTP	Observations: ECM doesn't support L RTP—Indicates that the TCM has determined that the engine controller: - Does not appear in the Allison validated/certified engines, or - Does not support all J1939 messages/parameters required for L RTP, or - Does not react -as expected- to one (or more) of the J1939 messages/parameters required for L RTP. ECM supports L RTP—Indicates that the TCM has determined that the engine controller: - Appears in the Allison validated/certified engines, and - Support all J1939 messages/parameters required for L RTP, and - Reacts (as expected) to every J1939 messages/parameters required for L RTP.
Description: Indicates whether the TCM has determined that the engine controller supports (or not) L RTP.	

SEM Torque Reduction Status	
Possible Values: - Correct Response - Incorrect Response - N/A	Observations: - Incorrect Response—Indicates that the engine hasn't honored (as required) SEM requests that have been generated by the TCM - Correct Response—Indicates that the engine has reacted (as expected) to the TCM SEM requests - N/A—Not Available
Description: Reflects current status of the SEM request/response activity between the TCM and the engine controller.	

Unapproved SEM Torque Reducing Device	
Possible Values: • 0 = Engine #1 • 1 = Engine #2 • 3 = Transmission #1 • 4 = Transmission #2 • 7 = PTO (Main or Rear) • 11 = Brakes-System Controller or Traction Controller • 12 = Brakes-Steer Axle • 13 = Brakes-Drive Axle #1 • 14 = Brakes-Drive Axle #2 • 15 = Retarder-Engine • 16 = Retarder-Driveline • 17 = Cruise Controller • 36 = PTO (Front or Secondary) • 41 = Retarder, Exhaust, Engine #1 • 42 = Headway Controller • 44 = Retarder, Exhaust, Engine #2 • 254 = Null Address (info invalid) • N/A	Observations: This parameter is only relevant (and, consequently, will only be updated/refreshed in the service tool) when the TCM determines that the SEM request was not honored as required (indicated by SEM Torque Reduction Status = Incorrect Response). This situation is usually accompanied with a P2637 DTC.
Description: Indicates the controller (with its corresponding source address) that is interfering with the TCM's SEM requests.	

LRTP Torque Reduction Status	
Possible Values: • Correct Response • Incorrect Response • N/A	Observations: • Incorrect Response—Indicates that the engine did not honored (as required) LRTP requests that have been generated by the TCM • Correct Response—Indicates that the engine has reacted (as expected) to the TCM LRTP requests • N/A—Not Available
Description: Reflects current status of the LRTP request/response activity between the TCM and the engine controller.	

Unapproved LRTP Torque Reducing Device	
Possible Values: • 0 = Engine #1 • 1 = Engine #2 • 3 = Transmission #1 • 4 = Transmission #2 • 7 = PTO (Main or Rear) • 11 = Brakes-System Controller or Traction Controller • 12 = Brakes-Steer Axle • 13 = Brakes-Drive Axle #1 • 14 = Brakes- Drive Axle #2 • 15 = Retarder-Engine • 16 = Retarder-Driveline • 17 = Cruise Controller • 36 = PTO (Front or Secondary) • 41 = Retarder, Exhaust, Engine #1 • 42 = Headway Controller • 44 = Retarder, Exhaust, Engine #2 • 254 = Null Address (info invalid) • N/A	Observations: This parameter is only relevant (and, consequently, will only be updated/refreshed in the service tool) when the TCM determines that the LRTP request was not honored as required (indicated by LRTP Torque Reduction Status = Incorrect Response). This situation is usually accompanied with a P2641 DTC.
Description: Indicates the controller (with its corresponding source address) that is interfering with the TCMs LRTP requests.	

Maximum Engine Torque Allowed during loss of J1939 ECM/TCM Communication	
Possible Values: Any number between -32,768.0 N·m (-24168.4 lb·ft) and 32,767.0 N·m (24168.4 lb·ft)	Observations: When the engine controller establishes communication with the TCM, the TCM communicates the engine controller what the maximum torque should the engine generate in case of J1939 failure. The engine confirms that the new torque limit has been accepted.
Description: Indicates the maximum torque the engine would be allowed to produce when the J1939 communication is interrupted between the TCM and the engine controller.	

WTEC III Control Systems Specific Parameters:

SEM Status	Possible Values: • Not Available/Unknown • 1 (Enabled, inactive) • 3 (Autodetect in progress) • 9 (Complete, no SEM) • 13 (Complete, SEM active) • x (Unknown)
	Observations: • Not Available—Indicates that the ECU software level either does not support SEM, or is unable to report SEM information to the diagnostic tool. • 1 (Enabled, inactive)—Indicates that SEM is enabled, but it is currently not used. • 3 (Autodetect in progress)—Indicates that the ECU is still performing the autodetect tests to determine the SEM enabling status in current configuration. • 9 (Complete, no SEM)—Indicates that the Autodetect process has been completed, and conditions are not the required to enable SEM. • 13 (Complete, SEM active)—Indicates that the Autodetect process has been completed, and SEM is enabled/active. • X (Unknown)—Indicates that currently the ECU does not know the status of SEM information. “X” could be any number different from 1, 3, 9, and 13.
	Description: Indicates current status of SEM in the ECU calibration.

1000/2000 (Pre-Allison 4th Generation Controls) Specific Parameters:

Engine Torque Rating	
Possible Values: • Acceptable • Not Acceptable	Observations: • Acceptable—Indicates that the engine torque rating is within the acceptable range. • Not Acceptable—Indicates that the engine torque rating is out of the acceptable range.
Description: Indicates how the TCM is perceiving (acceptable or not acceptable) the engine torque rating.	

NOTES

