TP-99102
Revised 08-09

User's Manual

TOOLBOX™ SOFTWARE

Diagnostic and On-Screen Service Instructions For:

- Pneumatic ABS (D and E Versions)
- Trailer ABS (Easy-Stop™ and Enhanced Easy-Stop™ with PLC)
- Trailer RSS*plus*™
- Hydraulic ABS (HABS)
- Hydraulic Power Brake (HPB)
- Electronic Leveling Module (ELM) for Tractors
- Electronic Leveling Module (ELM) for Trailers
- Electronically Controlled Air Suspension (ECAS) for Buses

MERITOR WABCO

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Introduction

Meritor WABCO TOOLBOX™ Software provides PC diagnostic capabilities for Meritor WABCO tractor and trailer pneumatic ABS, trailer RSS*plus*™ , hydraulic ABS, Hydraulic Power Brake (HPB), electronic leveling valves for tractors, electronic leveling valves for trailers and Electronically Controlled Air Suspensions (ECAS) for buses. The program provides the following basic functions:

- Displays both static (e.g., ECU number) and dynamic (e.g., RPMs) information from the system under test.
- Displays both active and stored system faults, as well as the appropriate repair instructions.
- Activates system components to verify system integrity, correct component operation and installation wiring.

NOTE: For complete Meritor WABCO maintenance information, refer to the appropriate maintenance manual which is listed in this manual at the beginning of each product section. Visit Literature on Demand at arvinmeritor.com to access and order product, service, aftermarket, and warranty literature for ArvinMeritor's truck, trailer and specialty vehicle components. Meritor WABCO publications are also available on our website:

meritorwabco.com

Recommended System Requirements

- 32/64 Bit CPU-based PC
- Microsoft Windows® XP, Vista or Windows 7 operating system
- 512 MB RAM
- 60 MB HD space for full installation
- RP1210A compliant communications adapter for SAE J1708/J1587 or PLC
- Serial Port, Parallel Port or USB Port for RP1210A adapter

Windows® is a registered trademark of the Microsoft Corporation.

Installation

Follow the instructions included with TOOLBOX™ Software to install the program on your computer.

The installation screen offers three types of installations: Typical, Compact and Custom. Select ***Typical*** or ***Compact*** to install tractor, trailer and hydraulic ABS diagnostic programs. Select ***Custom*** to install only one or two of these programs.

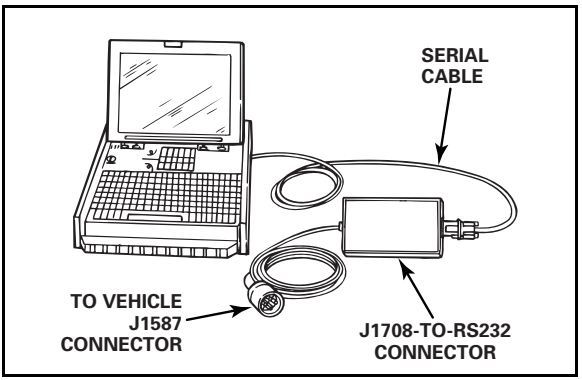
After installation, Meritor WABCO TOOLBOX™ Software will be available on your desktop as an icon and under the Windows® start menu.

Refer to "System Setup" on page 5 for first-time use instructions.

NOTE: An RS232 to J1708 or RS232 to PLC converter box attached to the communications port on your computer (COM1 or COM2) is required. Converter boxes that have been tested and proven satisfactory are Noregon, MPSI, B&B Devices, Kent-Moore and Dearborn Group.

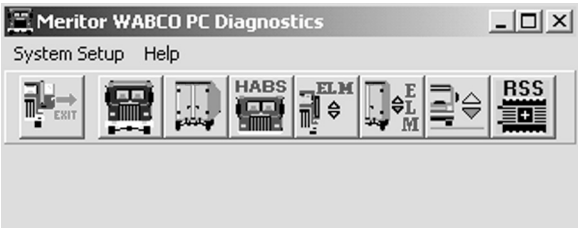
Starting TOOLBOX™ Software

1. Attach the RS232 to J1708 converter cable from your computer's serial port to the converter box.
2. Attach the diagnostic cable (Deutsch) to the vehicle.



At start-up, select the ***TOOLBOX™ Software*** icon from Desktop or from the Windows® Start Menu to display the MAIN MENU.

Main Menu



ABS Menus and Toolbars are illustrated and explained in this manual, as follows:

Tractor ABS	pages 11-21
Trailer ABS	pages 23-36
Trailer RSS*plus*™	pages 37-70
Hydraulic ABS	pages 71-81
Hydraulic Power Brake (HPB)	pages 83-93
ELM for Tractors	pages 95-99
ELM for Trailers	pages 101-106
ECAS for Buses	pages 107-122

Most TOOLBOX™ features are accessible through pull down menus. Many of these features may also be accessed by a shortcut icon. When a shortcut is available, the appropriate icon is illustrated to the left of the copy.

At the ***Main Menu*** you may select a shortcut icon to:

Exit TOOLBOX™

Go to Tractor ABS diagnostics

Go to Trailer ABS diagnostics

Go to Hydraulic ABS (HABS) diagnostics OR Go to Hydraulic Power Brake (HPB) diagnostics

Go to Electronic Leveling Module (ELM) for Tractors

Go to Electronic Leveling Module (ELM) for Trailers

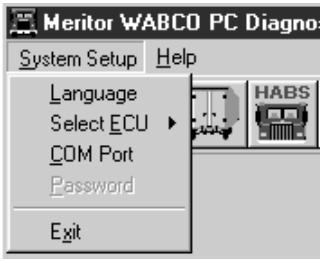
Go to Electronically Controlled Air Suspension (ECAS) for Buses

Go to Trailer RSS*plus*™

Main Menu

System Setup

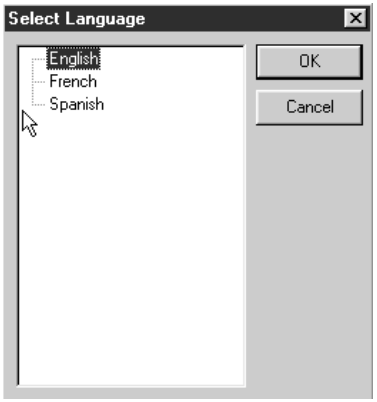
Select ***System Setup*** from the ***Main Menu***.



Language

Select ***Language*** from the ***System Setup*** menu. The default is English. To change the default to French or Spanish (ABS only):

1. Select the appropriate language.
2. Click OK to accept the selection.



Select ECU


Tractor ABS


ELM Tractor


Trailer ABS


ELM Trailer


Hydraulic ABS/HPB

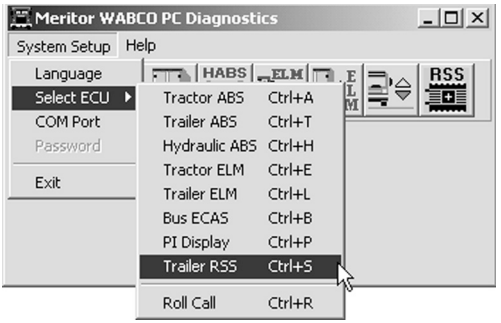

ECAS


RSS

Click on ***Select ECU*** from the ***System Setup*** menu, then select the type of ABS to be tested. Click on the appropriate Meritor WABCO product icon to display the ***Main Menu*** for that program.

Roll Call displays all actively broadcasting ECUs.

NOTE: TOOLBOX™ diagnostics cover only Meritor WABCO ECUs.



COM Port

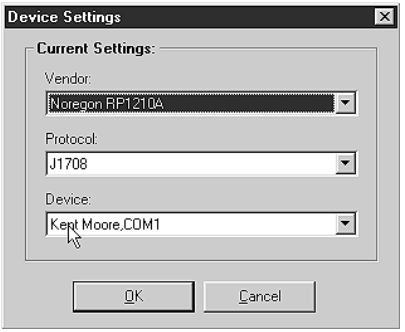
Palm Pilot Conflict:

- Go to Palm Pilot Setup Menu.
- Change COM port to COM port 3.
- Reboot PC.

The correct ***Vendor***, ***Protocol*** and ***Device*** selections are essential. TOOLBOX™ will not operate correctly if these selections are not accurate. For assistance, contact the ArvinMeritor Customer Service Center at 800-535-5560.

NOTE: TOOLBOX™ cannot be installed on a Palm Pilot. Palm Pilot users refer to instructions in Palm Pilot Conflict box.

From the ***System Setup*** pull down menu, select ***COM Port*** to display the ***Device Settings*** menu. Current settings will be shown.

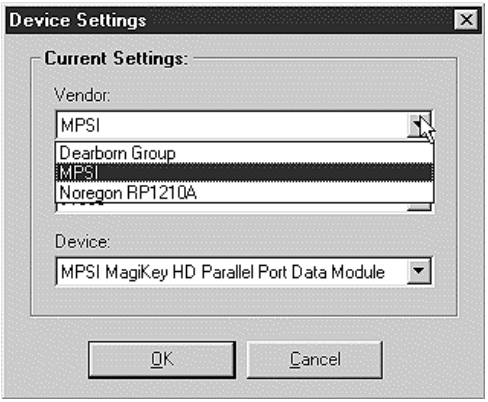


To change these selections:

Vendor

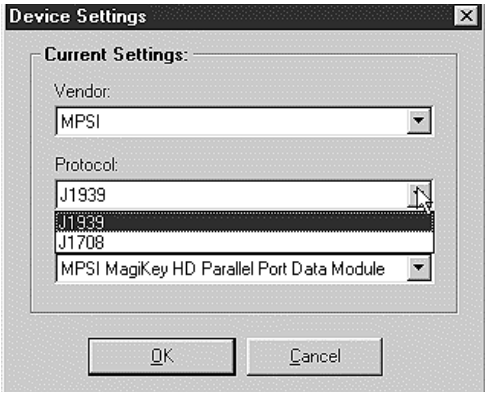
(Vendor name should appear on the parts label on the connector box)

Click on the down arrow for a list of ***vendor*** choices. Select the appropriate vendor.



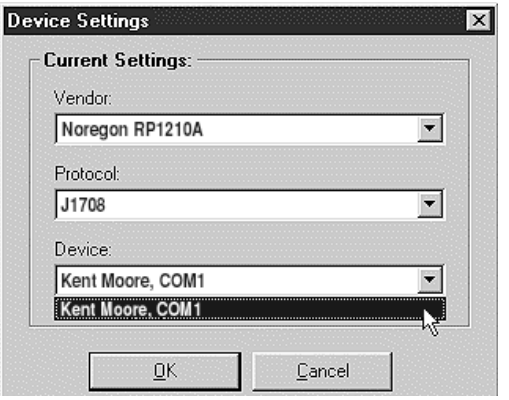
Protocol

Click on the down arrow for the ***protocol*** choices.



Device

Click on the down arrow for the ***device*** choices. Select the device and port to which the data cable is connected.



Click OK to accept the selections and close the ***Device Settings*** window.

Help

Select the ***Help*** icon for help in using Meritor WABCO TOOLBOX™ Software. Help is accessible from all TOOLBOX™ pages. Search by title ***(contents)*** or type in a specific topic ***(search for help on)***.

System Information

Select ***System Information*** and follow the screen prompts to print a report of system hardware: operating system version, drivers, etc. Run this report whenever you contact the ArvinMeritor Customer Service Center.

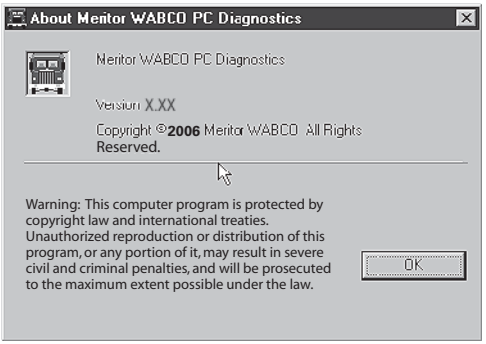
Update Application

(Versions 5.0 and Higher)

Select ***Update Application*** to download future revisions to TOOLBOX™. This option is available for TOOLBOX™ version 5.0 and higher. Follow the screen prompts to complete the download.

About

Select ***About*** from the pull down menu for information about Meritor WABCO TOOLBOX™ Software, including the version number. You may need this information if you call the ArvinMeritor Customer Service Center.

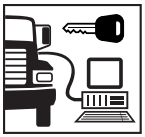


Tractor ABS

Reference Material

For maintenance and repair information, refer to the appropriate Meritor WABCO Truck, Tractor and Bus ABS Maintenance Manual:

MM-30 D Version ABS
MM-0112 E Version ABS

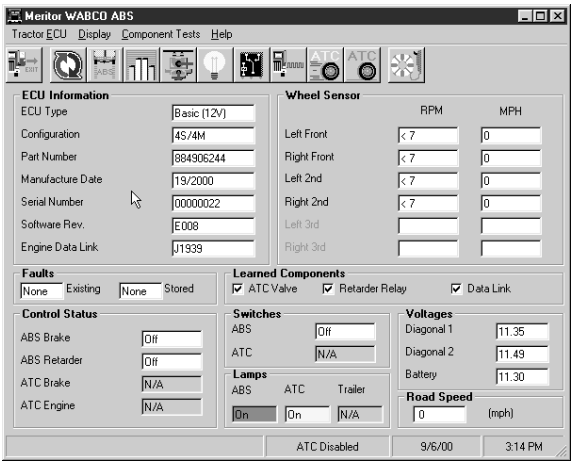


NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

TRACTOR ABS MENUS AND TOOLBARS

Select ***Tractor ABS*** from the ***TOOLBOX™ Main Menu***. The ***Tractor ABS Main Menu*** will appear.

Main Menu



ENGINE DATA LINK — If ECU has Roll Stability Control (RSC), engine data link will indicate J1989-RSC.

This screen provides icons and pull down menu task selections. It also provides information about the current state of Meritor WABCO ABS. ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, control status, voltages, faults and road speed) is read and updated continuously.

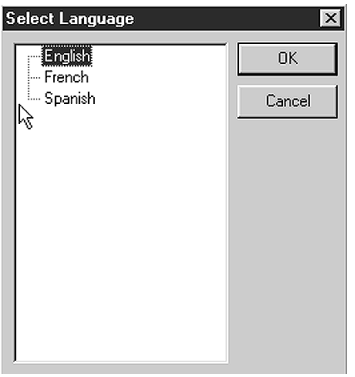
The status of ABS switches and lamps as well as other data may be observed from this screen.

Restart
Exit
Help

From the ***Main Menu*** you can select ***Restart, Exit*** or ***Help***.

Tractor ECU

Select ***Tractor ECU*** from the ***Tractor ABS Main Menu***. A pull down menu will appear.

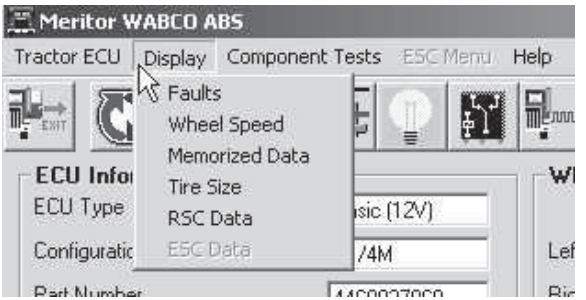


Refer to page 5 of this manual for information about using the ***Language*** selection.

Select ***Restart*** to refresh (update) ECU information.

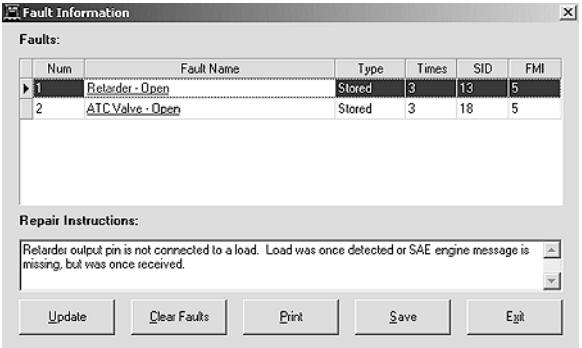
Display

Select ***Display*** from the ***Tractor ABS Main Menu***. A pull down menu will appear.



Faults

Select ***Faults*** from the pull down menu. The ***Fault Information*** screen will appear.



A description of the fault, the number of times the fault occurred, the system identifier (SID) and the failure mode (FMI) are all displayed in the fault information window. Basic repair instructions for each fault are also provided.

- Bookmarks — Complete listing of ABS fault codes by SID/FMI. Click to display.
- Thumbnails — Click individual pages to display.

For detailed repair instructions, click on the fault to display a troubleshooting information sheet. ***Bookmark*** and ***Thumbnail*** tabs at the side of the troubleshooting information sheet provide additional information. A sample troubleshooting information sheet appears in the Appendix. This screen also provides a link to the appropriate system schematic.

Faults that may occur after the screen is displayed will not appear until a screen update is requested. Use the ***update*** button to refresh the fault information table.

After making the necessary repairs, use the ***clear faults*** button to clear the fault. Use the update button to refresh the fault information table and display the new list of faults.

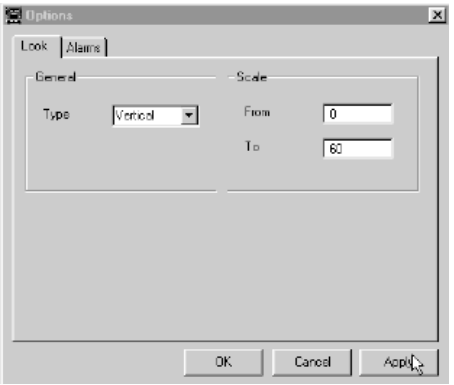
Use the ***Save*** or ***Print*** button to save or print the fault information data.

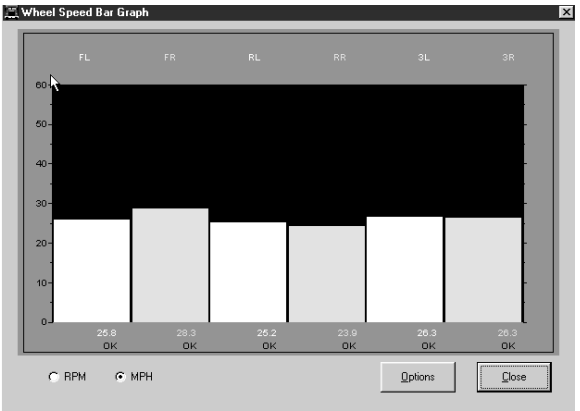
Wheel Speed

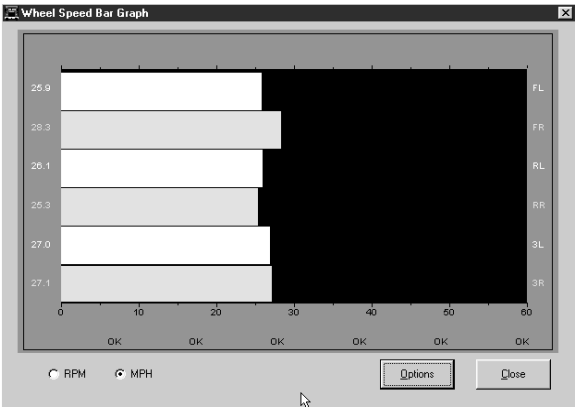
Select ***wheel speed*** from the pull down menu to display wheel speed data in both numeric and graph form.

Wheel speed information may be viewed in RPM (revolutions per minute) or MPH (miles per hour). Select the appearance and style from the ***options*** menu.

Display wheel speed data vertically or horizontally.





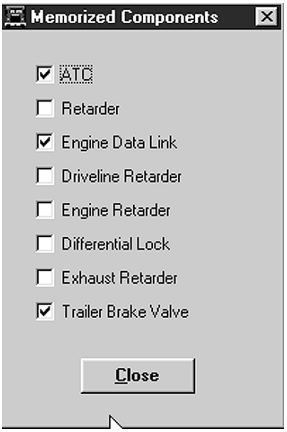


Memorized Data

(E Version ABS Only)

Select ***Memorized Components*** from the pull down menu.

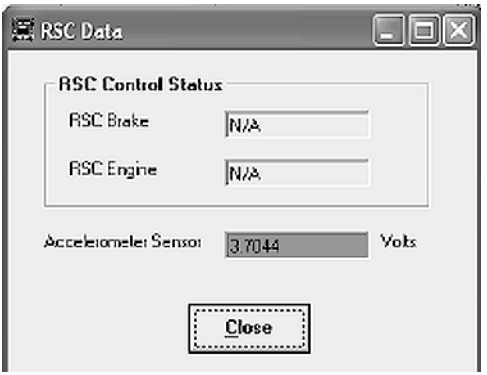
NOTE: Use Display/Memorized Components to view data. To clear a memorized component, use the Memorized Components function that appears on the Component Tests Menu.



RSC Data

(E Version ABS Only)

Select ***RSC Data*** from the pull down menu for RSC status information:



For RSC Control Status:

NA — RSC is not an option

OFF — RSC is installed but is not currently active

For Accelerometer sensor:

Acceptable range is 2.21-2.78 volts

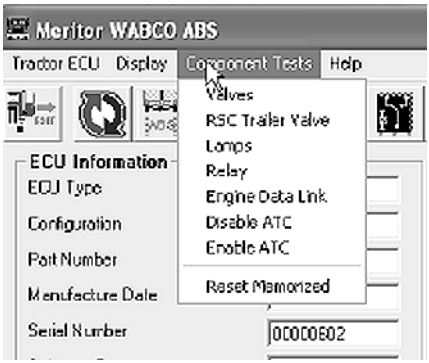
A **red** background in this field indicates voltage is outside of the acceptable range.

A **green** background in this field indicates voltage is within the acceptable range.

Component Tests

Select ***Component Tests*** from the ***Tractor ABS Main Menu***. A pull down menu will appear.

NOTE: Components for test may also be selected from the icons on the ***Tractor ABS Main Menu***.

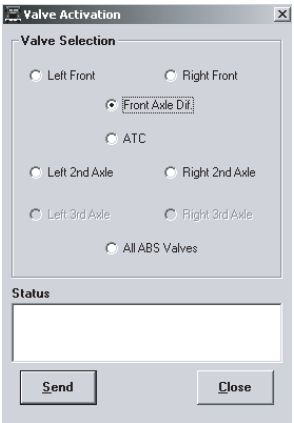


Valves

Select ***Valves*** from the pull down menu to select and cycle individual ABS modulator valves. Then, listen to ensure the correct valve is cycling. This is also helpful in verifying correct operation, installation and wiring.

Select ***all valves*** from the menu to cycle all available ABS valves in the order shown below.

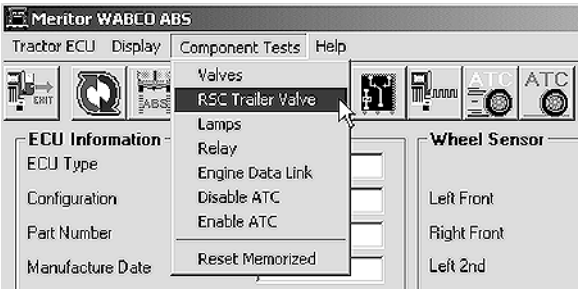
NOTE: Verification of the ATC valve is also available from this menu.



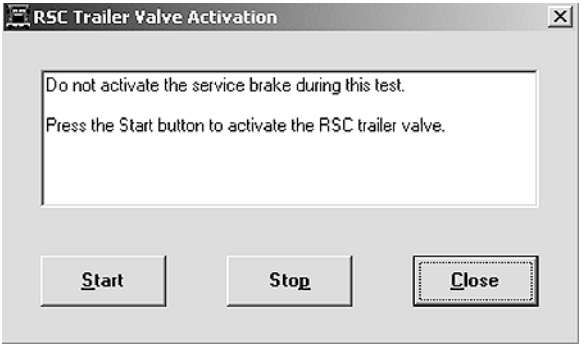
RSC Trailer Valve

(E Version ABS Only)

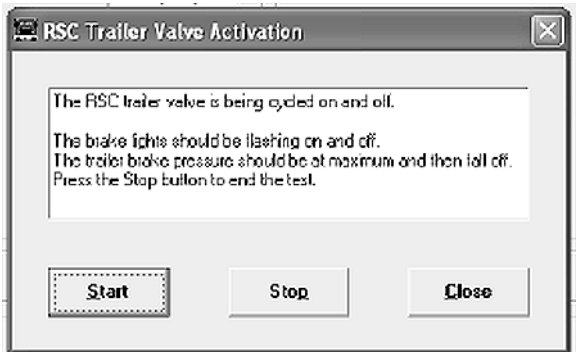
Select ***RSC Trailer Valve*** from the pull down menu to cycle the RSC trailer valve.



NOTE: Do not activate the service brake while testing the RSC trailer valve.

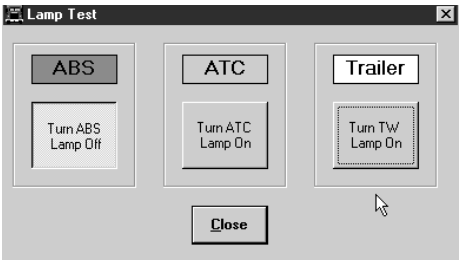


Press ***Start*** to begin the test.



Lamps

Select ***Lamps*** from the pull down menu to turn the tractor ABS, trailer ABS or ATC (wheel spin) indicator lamps on or off.



This is helpful in verifying correct operation, installation and wiring of the lamps to the ECU.

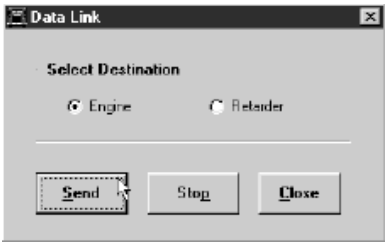
Relay

Select ***Relay*** from the pull down menu to turn the Retarder Relay on or off.

This is helpful in verifying correct operation, installation and wiring of the unit under test.

Engine Data Link

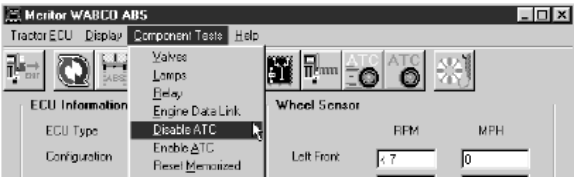
Select ***Engine Data Link*** from the pull down menu to send a "limit engine torque" command to the engine or a "disable retarder" command to the retarder.



Disable ATC

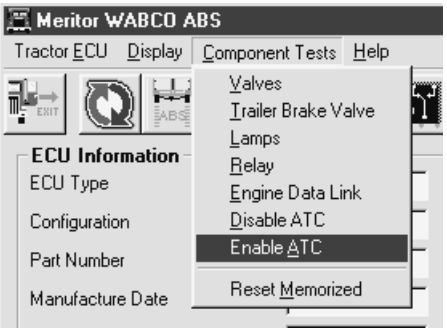
Select ***Disable ATC*** from the pull down menu to send a command to the ECU to disable automatic traction control. ATC will remain disabled until the enable command is sent or the vehicle ignition is cycled. The status bar on the Main Menu reflects the current state of the ATC function, either Enabled, Disabled or N/A (not available).

Using the **Disable ATC** command is useful and essential for dynamometer testing.



Enable ATC

Select ***Enable ATC*** from the pull down menu to send a command to the ECU to enable automatic traction control. This is the normal state of the ECU. The status bar on the Main Screen reflects the current state of the ATC function, either Enabled, Disabled or N/A (not available).



Reset Memorized

Select ***Reset Memorized*** from the pull down menu to tell the ECU to reset the memorized or “learned” components.

The ECU has the ability to learn the following components: ATC valve, engine data link and retarder relay. Once any of these have been detected, the ECU expects to see them each time the ECU is powered on. If they are not seen, the ECU records a fault.

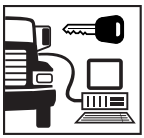
Because there are times when an ECU is moved to another vehicle — or during diagnostic testing — you may want the ECU to disregard these learned components. Use the ***Reset Memorized*** command for this purpose.

Trailer ABS

Reference Material

For maintenance and repair information, refer to the appropriate Meritor WABCO Trailer ABS Maintenance Manual:

MM-33 Easy-Stop™ Trailer ABS
MM-0180 Enhanced Easy-Stop™ with PLC Trailer ABS

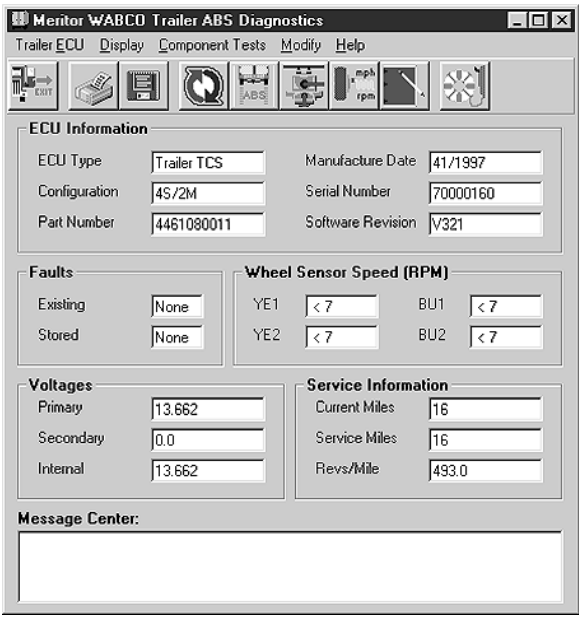


NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

TRAILER ABS MENUS AND TOOLBARS

Select ***Trailer ABS*** from the ***TOOLBOX™ Main Menu***. The ***Trailer ABS Main Menu*** will appear.

Main Menu



This menu provides icons and pull down menu task selections. It also provides information about the current status of Meritor WABCO ABS.

ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, voltages and fault information) is read and updated continuously.

NOTE: Double click on Yes in the Existing or Stored Faults fields to bring up the Fault Information screen. This screen is illustrated on page 110.

Service Information may also be observed from the ***Trailer ABS Main Menu***.

Restart
Exit
Help

From the ***Main Menu***, you can select ***Restart, Exit*** or ***Help***.

Trailer ECU

Select ***Trailer ECU*** from the ***Trailer ABS Main Menu***. A pull down menu will appear.

Language
Restart

Refer to page 5 of this manual for information about using the ***Language*** selection.

Select ***Restart*** to refresh (update) ECU information.

Manual Setup

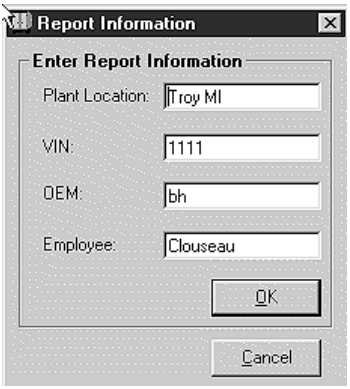
The ***Manual Setup*** menu selection is not available.

Print

To print vehicle data in a report format.

1. From the Trailer ECU pull down menu, select ***Print***. The ***Report Information Screen*** will appear.
2. Enter the VIN and Employee number for the report you want to print.
3. Click OK to print and close the window.

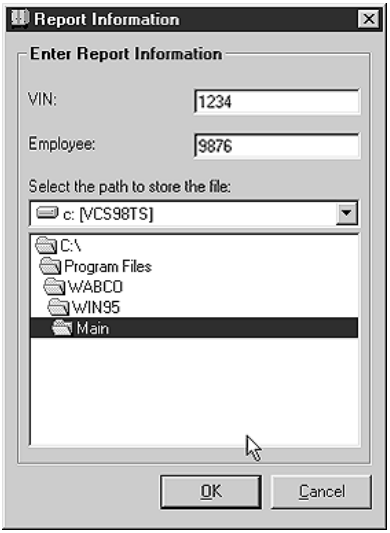
NOTE: Selecting the ***Print*** function does not save report data. You must save all data according to the instructions given in Save, above.



Save

To save vehicle data in a report format:

1. From the Trailer ECU pull down menu, select ***Save***. The ***Report Information Screen with path selections*** will appear.
2. Enter the VIN and Employee number.
3. Select the file where vehicle reports are stored; e.g., Main.
4. Click OK to close the window.



NOTE: Trailer ABS reports are not displayed in TOOLBOX™. To view a report, use Windows Explorer to find and open the report file. The following is a sample report.

Meritor WABCO ABS Fault Report

Date:	September 13, 2000
Time:	5:25 PM
Page:	1
VIN:	12345678
Employee Information:	KILEY
ABS System Configuration:	4S/2M
ECU Revision:	V 3 2 2xxxx
Part Number:	446-108-000-1
Serial Number:	5 9 3 0 3 9 4 8xxxxxxxxx
Date of Manufacture:	13/1999
Current Miles:	0.0
Service Miles:	0.0
Tire Calibration:	495.0

Fault#	Description	Status	SID	FMI	Count
1	Ext. modulator BLUE open circuit detected	Active	9	5	1
2	Ext. modulator BLUE open circuit detected	Stored	9	5	1

Sensor Test Results:

Sensor	Max RPM	Order
YE1	40.0	1
YE2	59.0	2
BU1	50.0	3
BU2	38.0	4

Valve Tests Performed:

Valve	Status (Tested / Not Tested / NA)
Yellow	Tested
Blue	Tested
Red	N/A

Display

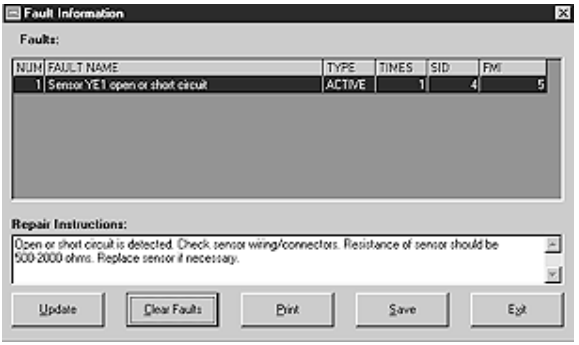
Select ***Display*** from the ***Trailer ABS Main Menu***. A pull down menu will appear.

Faults

Select ***Faults*** to display the Fault Information Screen.

NOTE: The Fault Information Screen is also accessible from the ***Trailer ABS Main Menu***. Refer to page 23.

Fault Information



The ***Fault Information Screen*** contains a description of each fault, including the type of fault (Active or Stored), SID and FMI number. Repair instructions for the fault appear at the bottom of the screen.

- Bookmarks — Complete listing of ABS fault codes by SID/FMI. Click to display.
- Thumbnails — Click individual pages to display.

For detailed repair instructions, click on the fault to display a troubleshooting information sheet. ***Bookmark*** and ***Thumbnail*** tabs at the side of the troubleshooting information sheet provide additional information. A sample troubleshooting information sheet appears in the Appendix. This screen also provides a link to the appropriate system schematic.

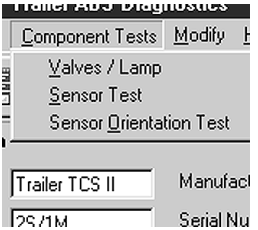
Faults that occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button at the bottom of the screen to refresh the fault information table and display a new list of faults.

After making any required repairs, use the ***Clear Faults*** button to clear the fault. Clear each fault as it is repaired.

Use the ***Save*** or ***Print*** button to save or print the fault information data. Please refer to page 25 for complete information about Save and Print functions.

Component Tests

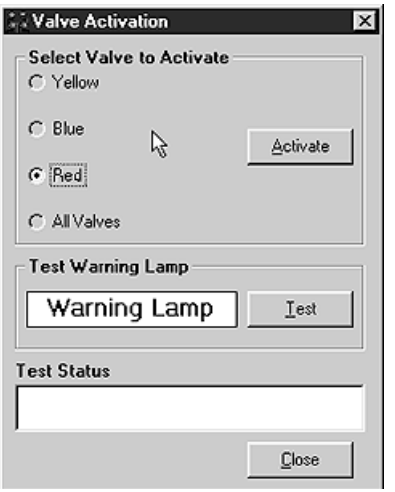
Select ***Component Tests*** from the ***Trailer ABS Main Menu***. A pull down menu will appear.



NOTE: Sensor Orientation Test option is only available with TCSII (Enhanced Easy-Stop™) ECUs. It will not appear as a menu choice for Easy-Stop™ ECUs.

Valve and Lamp Activation

Select ***Valves/Lamp*** to display the ***Valve Activation*** screen. From this screen you can check the status of the trailer ABS valves and the ABS indicator lamp mounted on the trailer.



Valves

2S/1M Systems

S = Sensors
M = Modulator Valves

The ***Red*** valve indicator will be selected. Click on the ***Activate*** button and listen for the valve to click, indicating a good installation.

2S/2M, 4S/2M and 4S/3M Systems

The ***Yellow*** valve indicator will be selected. Click on the ***Activate*** button and listen for the valve to click, indicating a good installation. Repeat for the ***Blue*** valve.

NOTE: Selecting ***All Valves*** will sequence all of the valves, beginning with the Yellow valve.

As each valve is cycled, the ***Test Status*** box at the bottom of the screen will display the status of the test.

Lamp

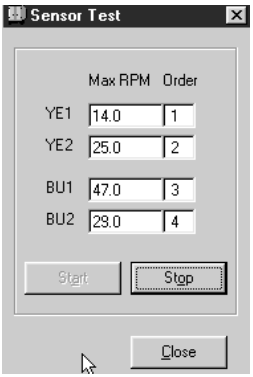
Click on the ***Warning Lamp Test*** button on the bottom of the valve and lamp activation screen to activate the lamp that is mounted on the side of the trailer. The lamp will flash eight times, indicating the lamp is OK. The test status box at the bottom of the menu will display the status.

Message	Status
Complete	OK
Critical Error	Communication error (If this message occurs, check the cable connections, recycle power.)

Sensors

This test requires rotating the vehicle wheels. Refer to the maintenance manual to make sure the vehicle is correctly prepared for this test. Follow all of the warnings and cautions printed in the manual.

Select ***Sensor Test*** to display the ***Sensor Test*** screen.



WARNING

To prevent serious eye injury, always wear safe eye protection when you perform vehicle maintenance or service.

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

The ABS is an electrical system. When you work on the ABS, take the same precautions that you must take with any electrical system to avoid serious personal injury. As with any electrical system, the danger of electrical shock or sparks exists that can ignite flammable substances. You must always disconnect the battery ground cable before working on the electrical system.

1. Make sure sensed wheel ends are off of the ground.
2. Apply air to the emergency line to fill the air tanks and release the spring brakes so that the wheels can be rotated.
3. Apply 12 volts DC to the ABS.
4. Click on the ***Start*** button on the ***Sensor Test*** screen to start the test.
5. Rotate the sensed wheel ends at a rate of 1/2 revolution per second. This rate equals a wheel speed of approximately 4 mph (7 kph).
6. Check the screen for sensor output: If Sensor Output is displayed, the sensor test is complete. If there is no Sensor Output, verify tone ring installation and sensor placement (sensor must be pushed all the way in against the tone ring). Refer to the maintenance manual for complete information.

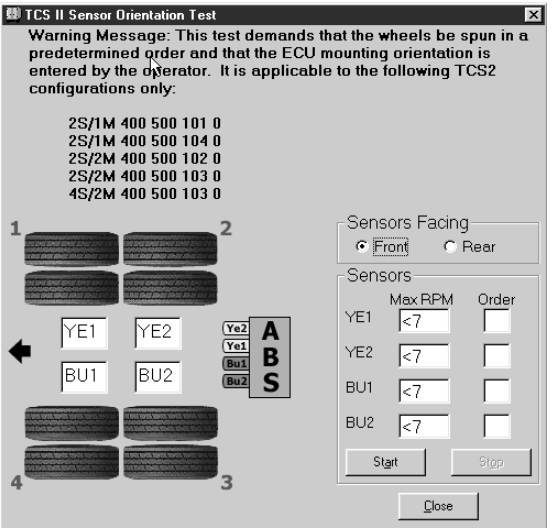
7. Check the ***Order*** fields to verify sensors were installed in the right location, based on the orientation of the valves.

Sensor Orientation Test

(For Enhanced Easy-Stop™ Only)

If you are using TOOLBOX™ to test an Enhanced Easy-Stop™ system, you can check sensor installation by performing a sensor orientation test.

Select ***Sensor Orientation Test*** from the pull down menu. The ***Sensor Orientation Test*** screen will appear.



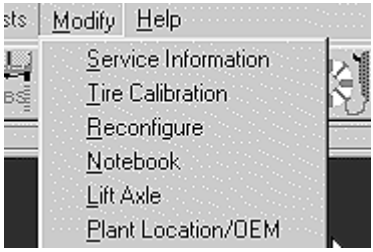
This test requires that the sensed wheels be spun in a predetermined order and that you enter the ECU mounting orientation. The sensed wheels are rotated in turn, starting at the front curbside, moving to the rear, and ending at the front roadside.

- A correct sensor installation will be displayed in green (Pass).
- An incorrect installation will be displayed in red (Fail).

The results of the sensor orientation test will also appear on the test page printout.

Modify

Select Modify from the ***Trailer ABS Main Menu***. A pull down menu will appear.



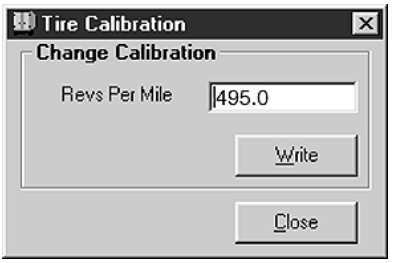
Service Information

Select ***Service Information*** to set, change or display the odometer reading for scheduled maintenance.

When the mileage setting selected for scheduled maintenance is reached, the ABS indicator lamp on the side of the trailer will flash eight times. The lamp will continue to flash eight times whenever the ignition switch is turned on, or until service is performed and this parameter is changed. To change the mileage for the next scheduled maintenance, type in the new odometer reading, then press the ***Write*** button. Maintenance settings may be entered in miles or kilometers.

Tire Calibration

Select ***Tire Calibration*** to set, change or display the revolutions per mile.



Tip: TOOLBOX™ will automatically change some numeric values; e.g., you may type in a number and see a number that is slightly higher or lower displayed. This does not affect calibration accuracy.

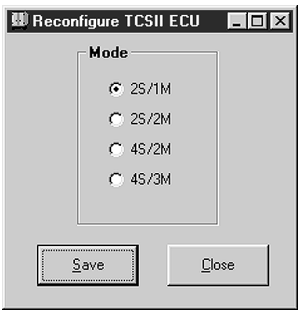
The RPM entry range is 150.0 to 634.0 RPM. The default value is 502.0. RPM figures are calculated based on a 100-tooth tone ring. To change a value, type in the RPM figure, then press the ***Write*** button.

- Trailers with 12-1/4-inch brakes use an 80-tooth tone ring. Use a value of 80 percent of the tire manufacturer's recommended RPM (revolutions x 0.80).

Reconfigure

This option is used to reconfigure an ECU that has been installed on a system with ***fewer*** sensors or modulator valves than the original system. It is not necessary to reconfigure an ECU installed on a system with ***more*** sensors or modulator valves than the original system. In these cases, reconfiguration is automatic.

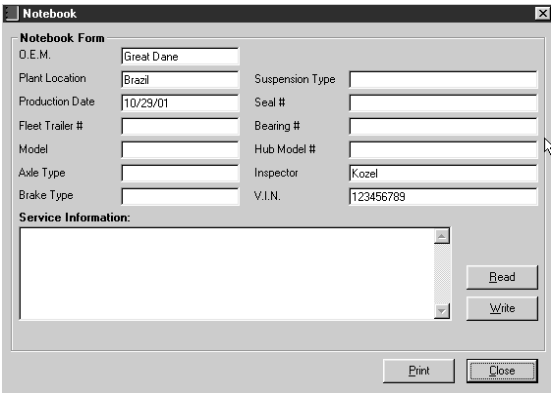
Select ***Reconfigure*** to display the following screen, then mark the appropriate configuration.



Notebook

Select ***Notebook*** to enter or view information about a specific vehicle.

NOTE: The O.E.M. location and production date are automatically saved in Notebook and will appear on this screen once they have been saved to the registry. V.I.N. and inspector must be saved after entering.

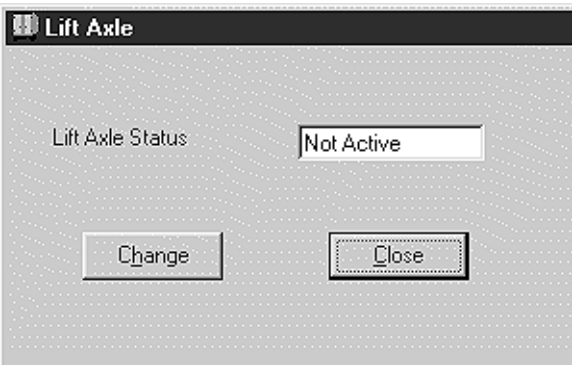


Tip: The registry function of Notebook is especially useful to an OEM.

To enter information, type the data, then click on the ***Write*** button to send the information to the ECU. Use the ***Print*** button to print the displayed data.

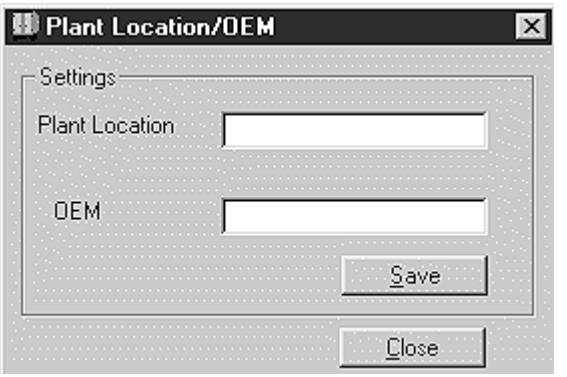
Lift Axle

Select ***Lift Axle*** to observe or change lift axle status.



Plant Location/ OEM

Select Plant Location/OEM to observe or enter plant and OEM information.



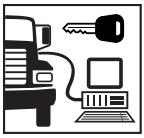
Trailer RSS*plus*™

Reference Material

For maintenance and repair information, refer to Technical Bulletin:

TP-0887 RSS*plus*™ Installation Guide and Maintenance Manual

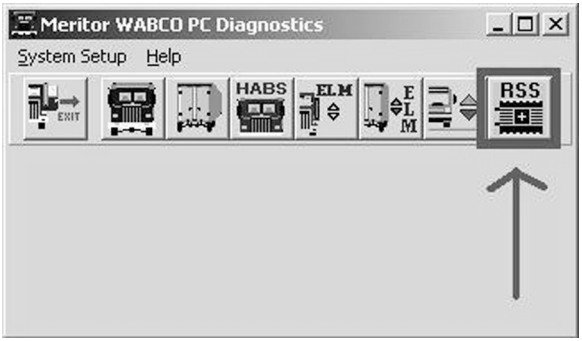
MM-0888 RSS*plus*™ Trailer ABS with Roll Stability Support.



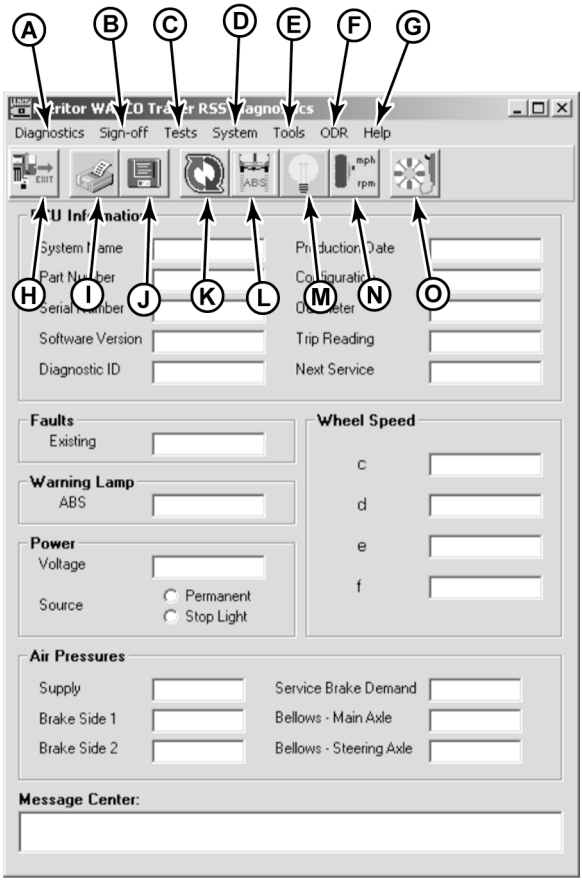
NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

Introduction

The Roll Stability Support (RSS) option of Meritor WABCO is accessed from version 9.0 or greater TOOLBOX™ Software. This software is used with RSS*plus*™ ECU part number 480-107-000-0. Once the TOOLBOX™ Software has been brought up, the RSS*plus*™ portion of the software can be accessed by clicking the "RSS+" button on the menu bar.



Once RSS*plus*™ has been selected, the user will see the following screen providing numerous menu options. These menu options are described below.



A — Using this pull down menu selection allows the user to view and clear diagnostic faults. It also allows the user to restart communications between the RSS*plus*™ software and the ECU.

B — Using this pull down menu selection allows the user to perform the End of Line test required for all new installations or ECU replacement. Step-by-step instructions can be found in the RSS*plus*™ Installation Guide (TP-0887) or the RSS*plus*™ Maintenance Manual (MM-0888).

C — Using this pull down menu selection allows the user to individually test the specific components of the RSS*plus*™ system.

D — Using this pull down menu selection allows the user to edit the RSS*plus*™ system parameters that are in the ECU or that have been created for loading into the ECU.

E — Using this pull down menu selection allows the user to save to file advanced diagnostic EEPROM data or electronically recycle the ECU.

F — Using this pull down menu selection allows the user to display the On-board Data Recorder (ODR) information to the screen or save the data to a file that can be exported for in-depth analysis using the ODR Tracker software package.

G — Using this pull down menu selection allows the user to access the internal help screens for the RSS*plus*™ software.

H — Using this menu button allows the user to exit the RSS*plus*™ portion of the software and return to the main ABS menu.

I — Using this menu button allows the user to print fault and test information. A printer must be hooked up and on-line when this feature is used.

J — Using this menu button allows the user to save to file the fault and test information.

K — Using this menu button allows the user to restart the diagnostic communication with the ECU.

L — Using this menu button allows the user to view, clear, save and print diagnostic faults.

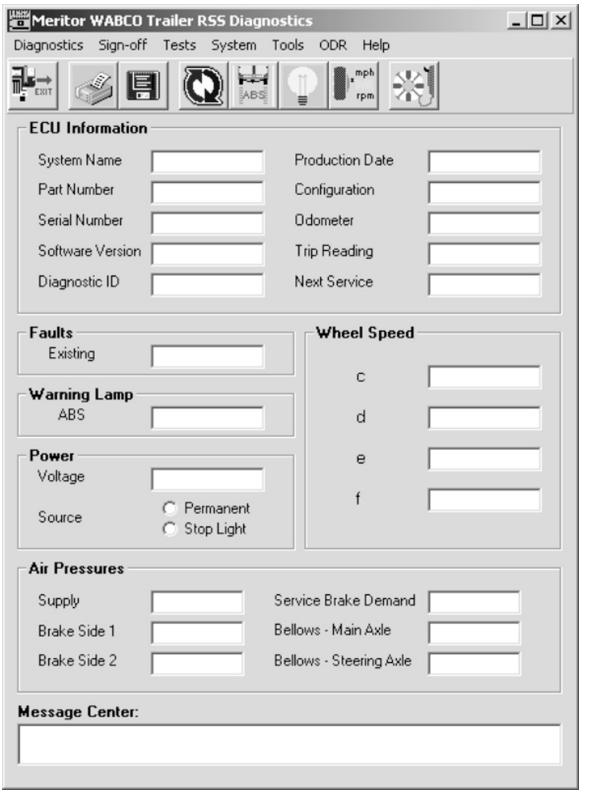
M — Using this menu button allows the user to test the operation of the trailer ABS warning light.

N — Using this menu button allows the user to individually test the wheel speed sensor operation.

O — Using this menu button allows the user to access the internal help screens for the RSS*plus*™ software.

TRAILER RSS*plus*™ MENUS

Select **Trailer *RSSplus™*** from the ***TOOLBOX™ Main Menu***. The ***Trailer RSSplus™ Diagnostics Main Menu*** will appear.



The ***Trailer RSSplus™ Main Menu*** (described in the beginning of this section) displays the system information and provides access to all RSS*plus*™ software functions. The top menu bar consists of pull down menus and push button icons. The lower portion of the main screen displays relevant information from the RSS*plus*™ ECU.

ECU Information

This area provides the following information about the ECU that the TOOLBOX™ Software is connected to.

System Name — Product nomenclature.

Part Number — Meritor WABCO part number for the ECU/valve assembly.

Serial Number — Serial number for the ECU/valve assembly.

Software Version — Version number of the software resident in the ECU.

Diagnostic ID — Version number of the diagnostic software resident in the ECU.

Production Date — Manufacturing date of the ECU in week/year format.

Configuration — Indicates the configuration of the ECU/valve assembly.

Odometer — Distance traveled as recorded by the ECU.

Trip Reading — Distance of last trip.

Next Service — Odometer threshold for service indicator.

Faults

System faults, either active or stored, can be accessed by placing the mouse pointer over the **Faults** field and double clicking the mouse.

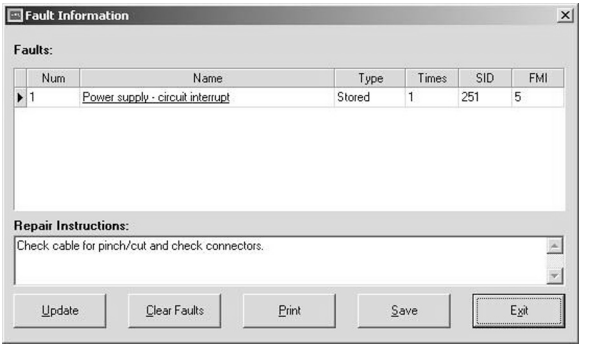
This indicator box displays one of three possibilities.

YES (red background): Indicates there are active faults recorded by the ECU.

YES (yellow background): Indicates there are stored faults recorded by the ECU.

NO (white background): Indicates the system is not displaying any active or stored faults.

Double click on the ***Faults*** field to display the ***Fault Information*** screen.



Update — Press the ***Update*** button to display the most current fault data.

Clear Faults — Click on ***Clear Faults*** to refresh the screen and delete stored faults from the display.

Print — Select ***Print*** to print a list of the faults if a printer is attached to the diagnostic computer.

Save — Choose ***Save*** to save the fault list to a file.

Exit — Click ***Exit*** to return to the previous screen.

Repair Instructions — This field provides general information concerning the highlighted fault.

Warning Lamp

ABS — Indicates the current status of the ABS lamp — on or off.

Power

Voltage — Displays the voltage seen at the ECU in volts DC.

Source — Displays where the ECU is powered from — ignition (blue pin) or the stoplight (red pin) circuit.

Wheel Speed

This area displays the wheel speed output for each sensed wheel end.

Air Pressures

This area displays various air pressures present at the ECU.

Supply — Displays in pounds per square inch the amount of air at the air reservoir.

Brake Side 1 — Displays in pounds per square inch the amount of air at the brake chamber(s) connected to the 2.1 delivery ports.

Brake Side 2 — Displays in pounds per square inch the amount of air at the brake chamber(s) connected to the 2.2 delivery ports.

Service Brake Demand — Displays in pounds per square inch the amount of air on the control (blue) air line connected to port 4 on the ECU.

Bellows — Main Axle — Displays in pounds per square inch the amount of air from the suspension air bags connected to port 5 on the ECU.

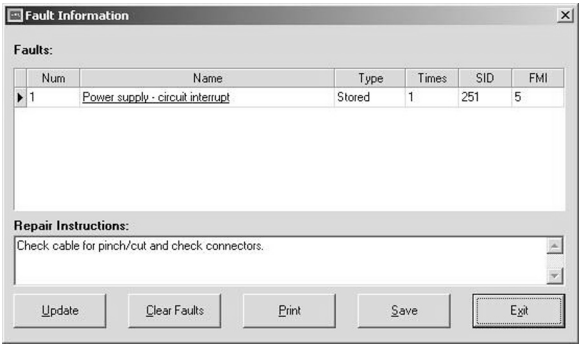
Diagnostics Menu

Choose ***Diagnostics*** from the Trailer RSS*plus*™ Main Menu.

The Diagnostic pull down menu allows the user to determine any faults that may be in the RSS*plus*™ system.

Display Faults

Selecting ***Display Faults*** brings up the ***Fault Information*** screen.



Update — Press the ***Update*** button to display the most current fault data.

Clear Faults — Click on ***Clear Faults*** to refresh the screen and delete stored faults from the display.

Print — Select ***Print*** to print a list of the faults if a printer is attached to the diagnostic computer.

Save — Choose ***Save*** to save the fault list to a file.

Exit — Click ***Exit*** to return to the previous screen.

Repair Instructions — This field provides general information concerning the highlighted fault.

Clear Faults

Selecting the ***Clear Faults*** option clears all stored faults and leaves only active faults for display.

Restart ECU Communications

Choosing the ***Restart ECU Communications*** option reconnects the TOOLBOX™ Software to the interface adapter. It does not restart the ECU.

Sign-off Menu

The ***Sign-off*** pull down menu has only one possible selection, ***Begin Sign-off Procedure***. This begins the process required of all new trailers and those with an ECU replacement. A step-by-step description of this process can also be found in Technical Bulletin TP-0887, RSS*plus*™ Installation Guide, and Maintenance Manual MM-0888, RSS*plus*™ Trailer ABS with Roll Stability Support.

Before beginning the sign-off procedure, parameters need to be loaded into the ECU. Go to the ***System*** pull down menu section for step-by-step instructions.

Sign-off Procedure (End of Line Testing)

Once installed, the Meritor WABCO RSS*plus*™ system must go through a sign-off procedure. This ensures that the system has been correctly installed and the pneumatic functions of the trailer are supporting the Roll Stability ABS.

In order to run the sign-off procedure, the trailer must be connected to 12 volt DC power (10 amp minimum), be connected to supply air (120 psi), have the capability to have control line air applied, and the ability to have the sensed axles raised off the ground.

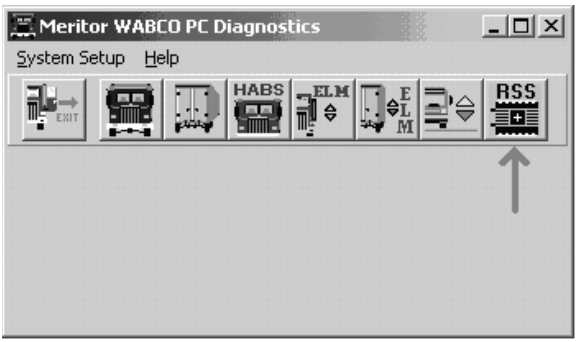
The following procedure can be performed immediately if the replacement ECU has been installed in the default configuration (4S/2M, air suspension, ECU facing forward). If the ECU is installed in a non-default configuration, the ECU must be programmed before the sign-off procedure can be conducted. (Refer to TP-0887 and MM-0888 for further information

on programming the ECU in a non-default configuration.)

For mechanical suspensions, the vehicle parameters must be changed from the default settings. Refer to the parameter entry information in the system pull down menu section.

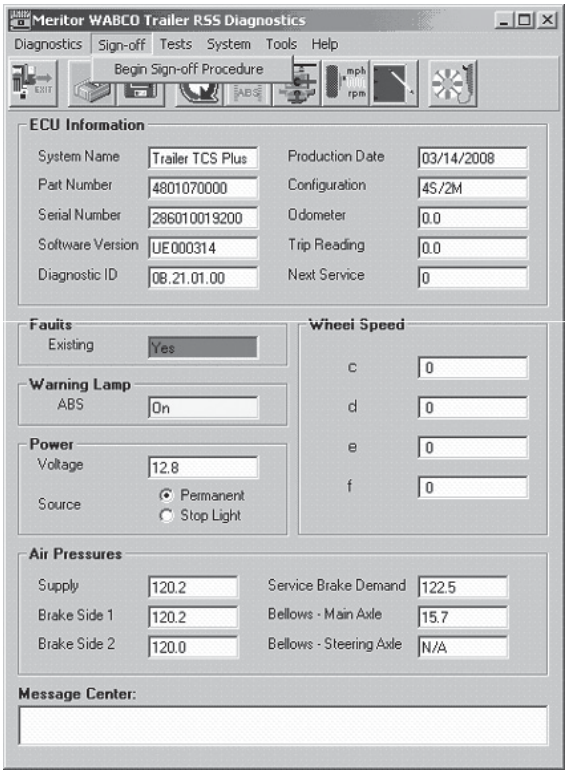
All RSS*plus*™ ECUs have 1:1 air delivery default settings. If trailer specific load proportioning is desired, please contact Meritor WABCO at 800-535-5560 for assistance. If no proportioning is desired, air pressures are left at the default settings. Refer to the parameter entry information in the system pull down menu section.

From the initial screen of the TOOLBOX™ Software, click on the RSS*plus*™ icon.



4003663b

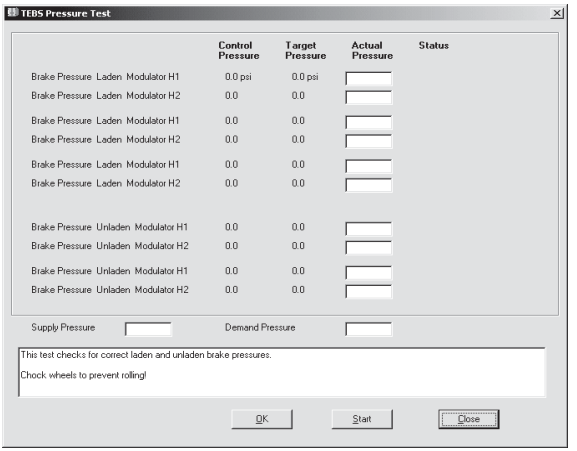
From the Main Screen, select ***Sign-off*** from the pull down menu bar. Then select ***Begin Sign-off Procedure*** to begin the automated test procedure.



4007039a

The Pressure Test

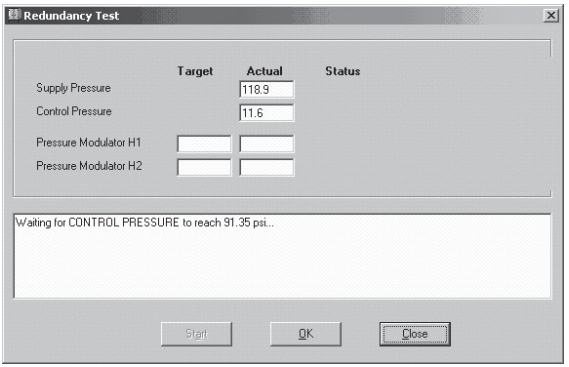
This portion of the sign-off will check the ECU's internal modulator valves for correct operation. The test will begin automatically. Once the test successfully concludes, the sign-off procedure will automatically advance to the Redundancy Test. *There is no input needed from the tester.*



4006943a

The Redundancy Test

This portion of the sign-off will check the pneumatic functionality of the trailer's air system to the RSS equipment. The Redundancy Test ensures the air capacity and control to the ECU is correct and measures the pressure at the internal modulator valves. The test will begin automatically. Apply control (blue) line air when prompted in the lower box. Once the test successfully concludes, the sign-off procedure will automatically advance to the Sensor Test.

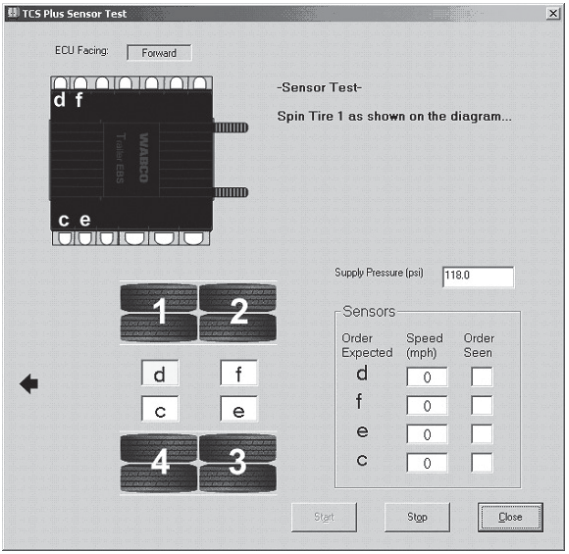


4007040a

The Sensor Test

This portion of the sign-off will check the placement of the ABS wheel sensors. Ensure there is no pressure on the control (blue) line and that the trailer has all ABS sensed axles up off the ground. The following message will appear. Press ***OK*** after all safety precautions have been taken and release the **blue** air line to begin the test.

Rotate each wheel individually (in the order shown on the screen) and check the on-screen diagram to ensure correct sensor placement. Once the placement of all sensors has been correctly verified, the software will automatically advance to the Warning Lamp Test.



4007041a

The Warning Lamp Test

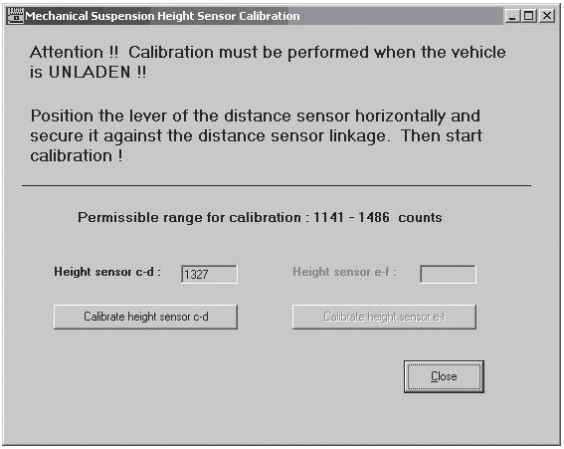
This portion of the sign-off will ensure correct operation of the ABS warning lamp. The warning light will flash on and off. Once correct operation is confirmed, press ***Yes***.

4007042a

Distance Sensor Calibration

If the trailer has a mechanical (spring) suspension, the distance sensor is calibrated next. Ensure that the trailer is lowered so that all sensed wheels are fully on the ground before proceeding.

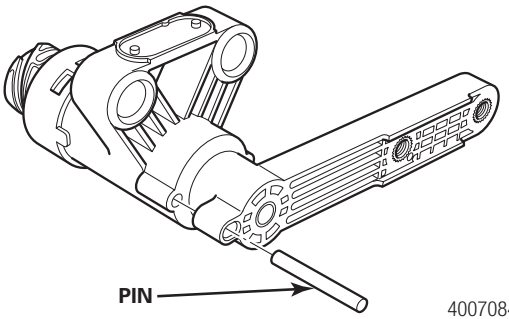
The Mechanical Suspension Calibration screen appears.



4007079a

Ensure the Distance Sensor arm is parallel to the ground. The trailer must be in the unladen (empty) state. Once the value in the "Height Sensor" field no longer changes and is within the displayed acceptable range, press the button labeled **Calibrate Height Sensor**.

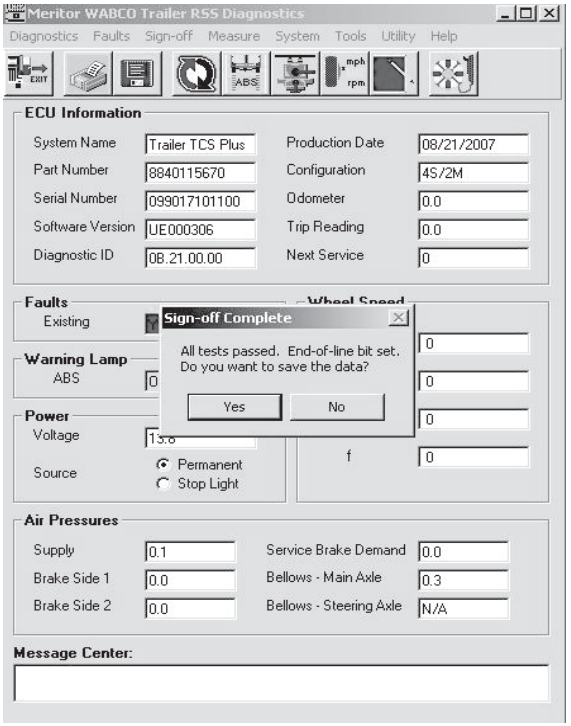
A message appears that the calibration is successful. Press OK.



4007084a

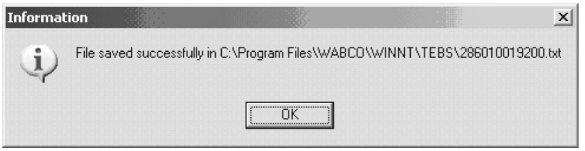
4007082a

Successfully signing off the trailer will produce the confirmation screen and allow the tester the opportunity to save the results. Click on the ***Yes*** button and save the file in the appropriate data directory.



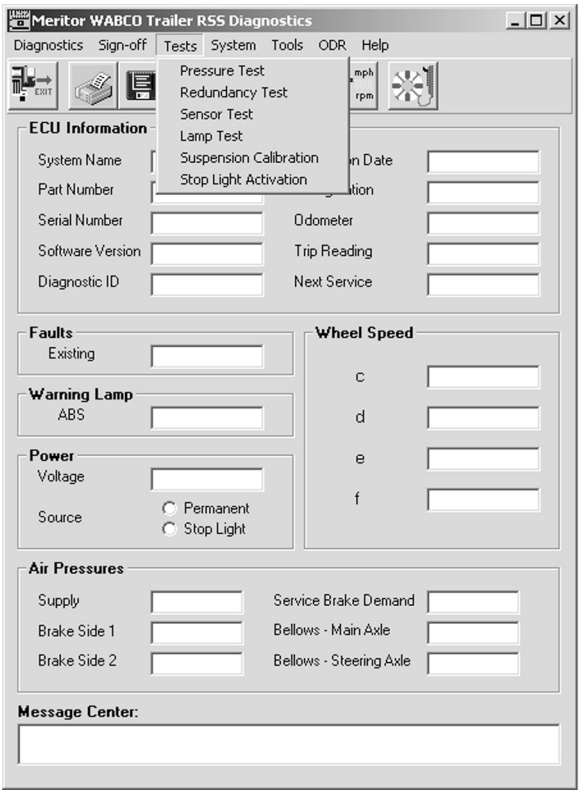
4006948a

A message appears confirming the file has been saved and shows the location of the data.



Tests Menu

The ***Tests*** pull down menu allows the user to test the various components of the RSS*plus*™ system.

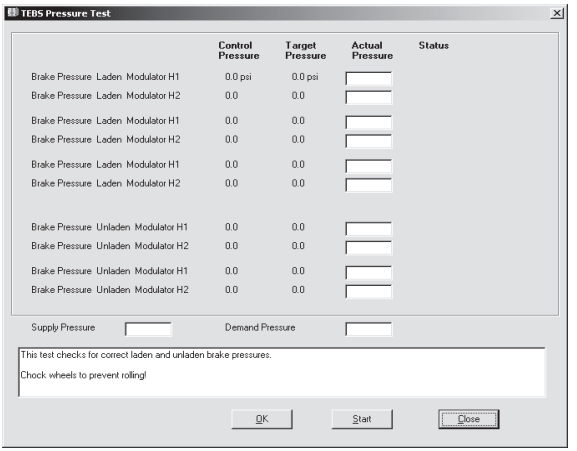


Pressure Test

Choose ***Pressure Test*** to check the ECU valve assembly's internal modulator valves for correct operation.

The Pressure Test

This portion of the sign-off will check the ECU's internal modulator valves for correct operation. The test will begin automatically. *There is no input needed from the tester.*



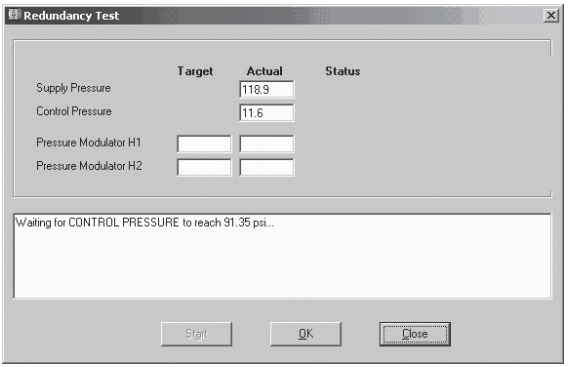
4006943a

Redundancy Test

Select ***Redundancy Test*** to check the trailer air system's pneumatic functionality as connected to the RSS*plus*™ equipment.

The Redundancy Test

This portion of the sign-off will check the pneumatic functionality of the trailer's air system to the RSS equipment. The Redundancy Test ensures the air capacity and control to the ECU is correct and measures the pressure at the internal modulator valves. The test will begin automatically. Apply control (blue) line air when prompted in the lower box. Once the test successfully concludes, the sign-off procedure will automatically advance to the Sensor Test.



4007040a

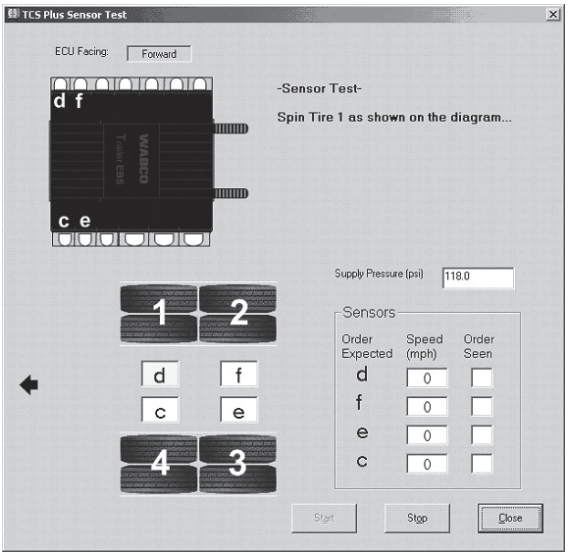
Sensor Test

Choose ***Sensor Test*** to check the placement of the ABS sensors and for the correct plumbing of the air system from the ECU to the brake chambers.

The Sensor Test

This portion of the sign-off will check the placement of the ABS wheel sensors. Ensure there is no pressure on the control (blue) line and that the trailer has all ABS sensed axles up off the ground. The following message will appear. Press OK after all safety precautions have been taken and release the blue air line to begin the test.

Rotate each wheel individually (in the order shown on the screen) and check the on-screen diagram to ensure correct sensor placement.



4007041a

Lamp Test

Select ***Lamp Test*** to check for the correct operation of the ABS warning lamp.

The Warning Lamp Test

This portion of the sign-off will ensure correct operation of the ABS warning lamp. The warning light will flash on and off. Press the ***Yes*** button.

4007042a

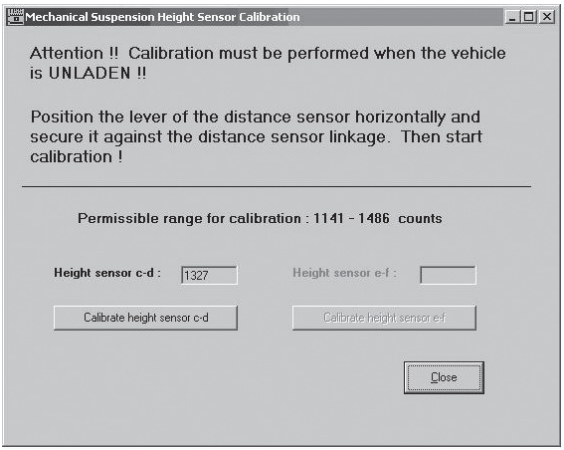
Suspension Calibration

Choose ***Suspension Calibration*** to allow for the calibration of the distance sensor that is required for mechanical (spring) suspensions.

Distance Sensor Calibration

If the trailer has a mechanical (spring) suspension, the distance sensor is calibrated next. Ensure that the trailer is lowered so that all wheels are fully on the ground before proceeding.

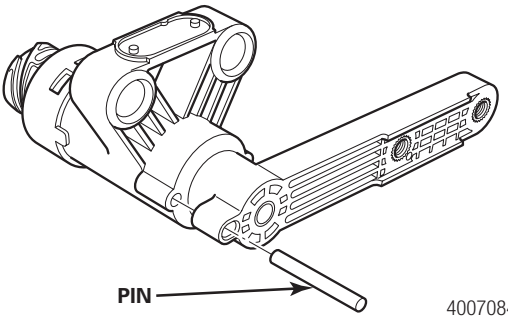
The Mechanical Suspension Calibration screen appears.



4007079a

Ensure the Distance Sensor arm is parallel to the ground. The trailer must be in the unladen (empty) state. Once the value in the “Height Sensor” field no longer changes and is within the displayed acceptable range, press the button labeled **Calibrate Height Sensor**.

A message appears that the calibration is successful. Press OK.



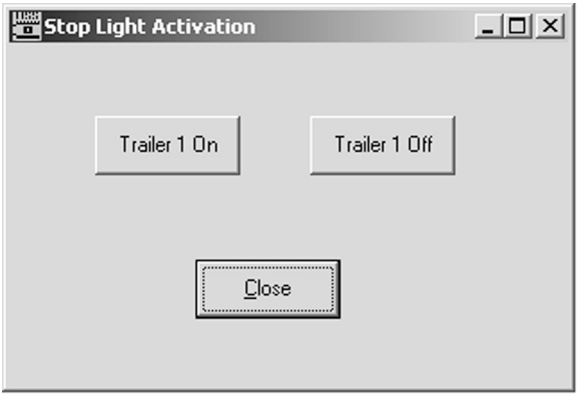
4007084a

4007082a

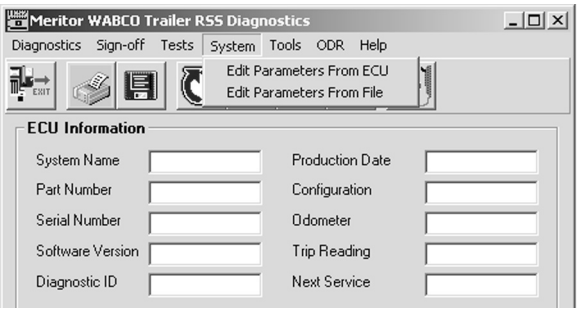
Successfully signing off the trailer will produce the confirmation screen and allow the tester the opportunity to save the results. Click on the ***Yes*** button and save the file in the appropriate data directory.

Stoplight Activation Test

This test is used only when the optional stoplight activation cable has been installed in place of the RSS*plus*™ power cable. Press the "Trailer 1 On" button to turn on the trailer stoplights. Press the "Trailer 1 Off" button to turn off the trailer stoplights. This option may be used only with single (non-double or triple) trailers.



System Menu



Edit Parameters from ECU

Choose ***Edit Parameters from ECU*** when you are programming the ECU prior to performing the End of Line test. A step-by-step description of this process can also be found in TP-0887, RSS*plus*™ Installation Guide, and Maintenance Manual MM-0888, RSS*plus*™ Trailer ABS with Roll Stability Support.

Air Suspension Trailers

Air Suspension Parameters

Vehicle Type — Select the appropriate trailer type.

Number of Axles — Select the total number of axles on the trailer.

Axle Definition — Select the sensed axles by indicating the location of each sensor pair. Lift axles are not sensed and are controlled by generic I/O function. The on-screen illustration will change to reflect the sensor configuration.

Modulator Mounting — A modulator facing FORWARD will have the mount bolts pointing TOWARD the rear of the trailer. A forward facing ECU will have this box checked.

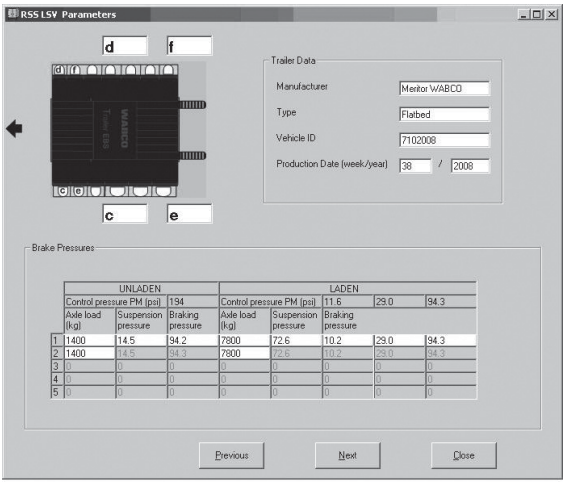
ABS System — Select the appropriate ABS type being installed.

Suspension — Select air suspension.

Optional Stoplight Activation Cable Installed — This field is checked ONLY if the optional stoplight activation cable has been installed in place of the standard RSS*plus*™ power cable.

NOTE: Mechanical suspensions are covered in the Mechanical Suspension Parameters section.

Once all the parameters are correctly input, press the ***Next*** button to advance to the next parameter screen.



4007133a

Trailer Data — This area contains important data about the trailer.

Manufacturer — Enter the manufacturer of the trailer.

Type — Enter the trailer type such as tanker, flatbed, van, etc.

Vehicle I.D. — Enter the last seven digits of the trailer VIN number or the fleet's trailer number. Do not leave this field blank as the software creates files using what is entered in this field as file names.

Production Date — Enter the trailer's production date by week number and year.

Brake Pressures — This area contains parameters affecting how the trailer brakes perform. These fields are unavailable with mechanical suspensions.

Additional Characteristic Point — This box is normally left blank. Checking this box allows brake pressure characteristics to be altered across four bands instead of the standard three.

Unladen Axle Load (kg) — Enter the amount of weight each axle will bear when the trailer is empty. The weight in kilograms can be converted from pounds with the formula 2.2 pounds equals 1 kilogram.

Unladen Suspension Pressure — The amount of air pressure found in the suspension air bags when the trailer is empty. The suspenison pressure is measured in psi (pounds per square inch).

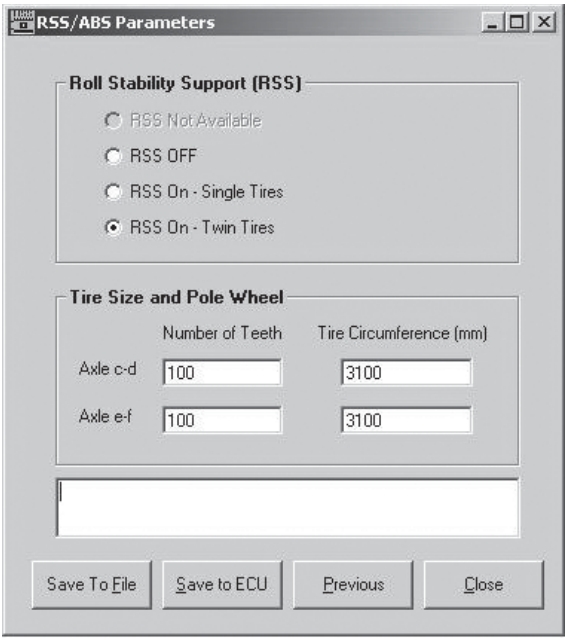
Unladen Braking Pressure — The default setting is 90 psi. If brake proportioning is desired, the setting may be less than 90 psi. Do not set this value below 38 psi.

Laden Axle Load — Enter the amount of weight each axle will bear when the trailer is fully loaded. The weight in kilograms can be converted from pounds with the formula 2.2 pounds equals 1 kilogram.

Laden Suspension Pressure — The amount of air pressure found in the suspension air bags when the trailer is fully loaded. The suspension pressure is measured in psi (pounds per square inch).

Laden Braking Pressure — Values in these output fields affect the trailer's brake performance in the laden condition. There are three columns (left to right) that affect light, medium, and heavy braking. Please contact Meritor WABCO at 800-535-5560 for assistance if changing these values from the default values.

Once all the values have been correctly determined and entered, press the ***Next*** button to advance to the last Parameter screen.



4007134a

Roll Stability Support — If the trailer will have a single wheel on each side of the axle ("Super Singles"), select **RSS ON — Single Tires**. If the trailer will have dual wheels on each side of the axle, select **RSS On — Twin Tires**. Only select **RSS Off** if no roll stability is desired.

Tire Size and Pole Wheel — The Number of Teeth field is for the quantity of teeth on the tone ring. Nearly all tone rings have 100 teeth. The **Tire Circumference** is the dynamic tire radius of the tire in millimeters. The default setting of 3100 will be applicable to most tires, although an exact figure can be obtained from the tire's manufacturer.

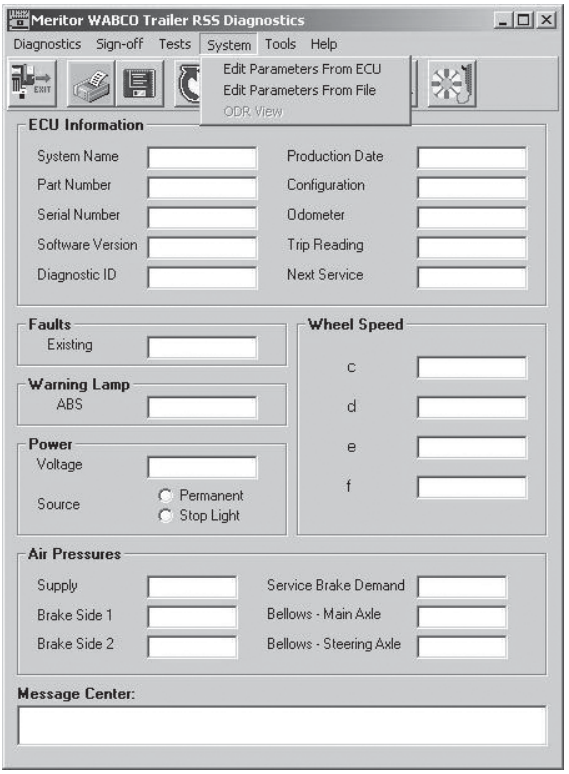
Once the parameters have been entered, press the ***Save to ECU*** button. The parameters are then saved to the ECU. You are now ready to proceed to the sign-off procedure.

Spring Suspension Trailers

Mechanical Suspension Parameters

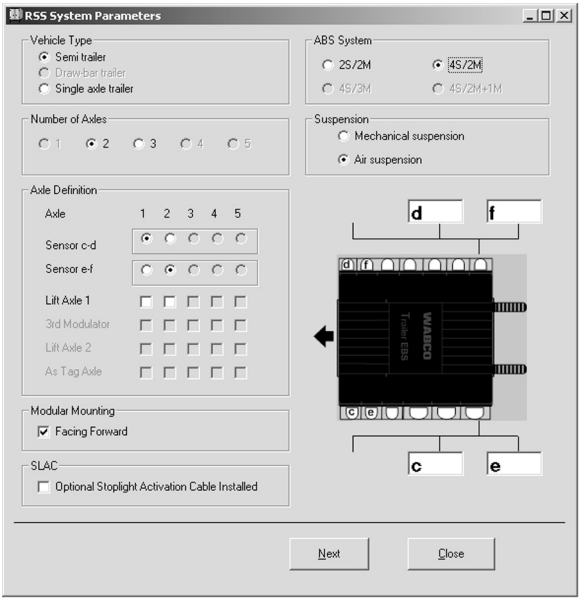
NOTE: The distance the springs on a mechanical suspension compress between unladen and laden states is known as "deflection". This value, in millimeters, MUST be obtained from the suspension manufacturer prior to programming the ECU. Meritor WABCO does not have and cannot provide this essential information.

From the main screen, select ***System*** and then ***Edit Parameters From ECU***.


Meritor WABCO Trailer RSS Diagnostics
Diagnostics
Sign-off
Tests
System
Tools
Help
Edit Parameters From ECU
Edit Parameters From File
ODR View
ECU Information
System Name
Part Number
Serial Number
Software Version
Diagnostic ID
Production Date
Configuration
Odometer
Trip Reading
Next Service
Faults
Existing
Warning Lamp
ABS
Power
Voltage
Source
Permanent
Stop Light
Wheel Speed
c
d
e
f
Air Pressures
Supply
Brake Side 1
Brake Side 2
Service Brake Demand
Bellows - Main Axle
Bellows - Steering Axle
Message Center:

4007135a

Input the correct valves for each data area.



Vehicle Type — Select the appropriate trailer type.

Number of Axles — Select the total number of axles on the trailer.

Axle Definition — Select the sensed axles by indicating the location of each sensor pair. Lift axles are not sensed and are controlled by generic I/O function. The on-screen illustration will change to reflect the sensor configuration.

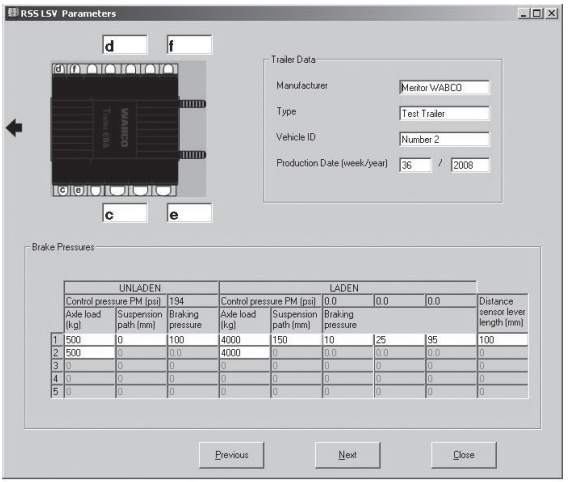
Modulator Mounting — A modulator facing FORWARD will have the mount bolts pointing TOWARD the rear of the trailer. A forward facing ECU will have this box checked.

ABS System — Select the appropriate ABS type being installed.

Suspension — Select Mechanical Suspension.

Optional Stoplight Activation Cable Installed — This field is checked ONLY if the optional stoplight activation cable has been installed in place of the standard RSS*plus*™ power cable.

When all fields are correctly configured, press ***Next*** to advance to the second parameter screen.



4007136a

Trailer Data — This area contains important data about the trailer.

Manufacturer — Enter the manufacturer of the trailer.

Type — Enter the trailer type such as tanker, flatbed, van, etc.

Vehicle I.D. — Enter the last seven digits of the trailer VIN number or the fleet's trailer number. Do not leave this field blank as the software creates files using what is entered in this field as file names.

Production Date — Enter the trailer's production date by week number and year.

Unladen Axle Load (kg) — Enter the amount of weight each axle will bear when the trailer is empty. The weight in kilograms can be converted from pounds with the formula 2.2 pounds equals 1 kilogram.

Unladen Suspension Path — This value is typically zero for an empty (unladen) trailer.

Unladen Braking Pressure — The default setting is 90 psi. If brake proportioning is desired, the setting may be less than 90 psi. Do not set this value below 38 psi.

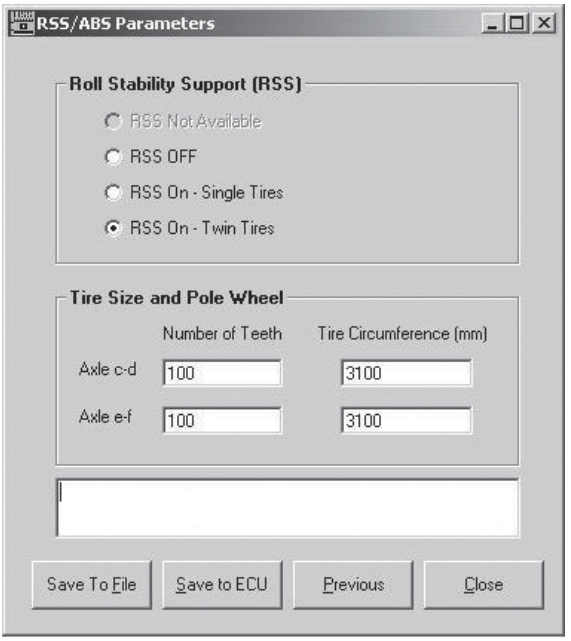
Laden Axle Load — Enter the amount of weight each axle will bear when the trailer is fully loaded. The weight in kilograms can be converted from pounds with the formula 2.2 pounds equals 1 kilogram.

Laden Suspension Path — This value is the amount of spring compression (in millimeters) when the trailer is fully laden. This value is obtained by the trailer builder from the mechanical suspension manufacturer.

Laden Braking Pressure — Values in these output fields affect the trailer's brake performance in the laden condition. There are three columns (left to right) that affect light, medium, and heavy braking. Please contact Meritor WABCO at 800-535-5560 for assistance if changing these values from the default values.

Distance Sensor Lever Length — The software defaults to 100 mm. This is the setting when the distance sensor lever is mounted to the farthest integrated nut on the distance sensor. If the lever is mounted to the center integrated nut on the distance sensor arm, the value is 50 mm.

Once all the values have been correctly determined and entered, press the ***Next*** button to advance to the last Parameter screen.



4007137a

Roll Stability Support — If the trailer will have a single wheel on each side of the axle ("Super Singles"), select **RSS ON — Single Tires**. If the trailer will have dual wheels on each side of the axle, select **RSS On — Twin Tires**. Only select **RSS Off** if no roll stability is desired.

Tire Size and Pole Wheel — The Number of Teeth field is for the quantity of teeth on the tone ring. Nearly all tone rings have 100 teeth. The **Tire Circumference** is the dynamic tire radius of the tire in millimeters. The default setting of 3100 will be applicable to most tires, although an exact figure can be obtained from the tire's manufacturer.

Once the parameters have been entered, press the ***Save to ECU*** button. The parameters are then saved to the ECU. You are now ready to proceed to the sign-off procedure.

Edit Parameters from File

Select ***Edit Parameters from File*** if you are programming the ECU with a preconfigured file prior to performing the End of Line test. It allows the user to select a file on the diagnostic computer and load it into the RSS*plus*™ portion of TOOLBOX™ Software for download into the ECU.

Tools Menu

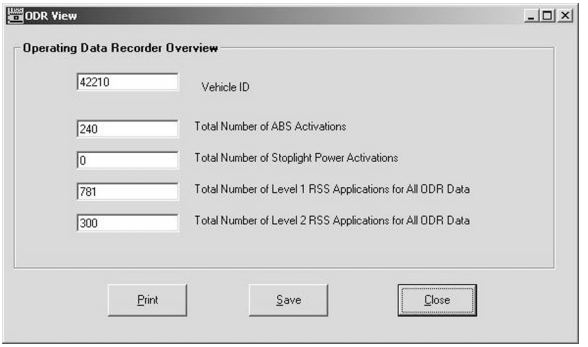
Choosing the ***Tools*** pull down menu from the Trailer RSS*plus*™ Main Menu provides the ***Save EEPROM Data*** and ***Reset ECU*** options.

Save EEPROM Data — The ***Save EEPROM Data*** option is used for saving high level diagnostic information that may be requested by Meritor WABCO. It is unlikely the user will ever have to use this menu selection.

Reset ECU — Choose ***Reset ECU*** to repower the ECU. It does not initialize the EEPROM data.

ODR Menu

Select ODR Overview Data to display ODR data on the user's computer. This will display the number of Level 1 and Level 2 RSS activations, the number of ABS activations, and the number of stoplight power only activations.

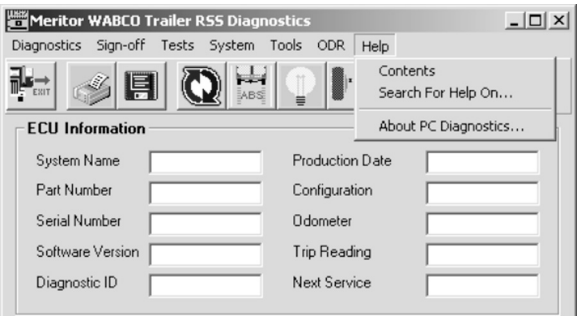


Save ODR Data — Select ***Save ODR Data*** to save the ODR data to a text file on the diagnostic computer.

Print ODR Data — Choose ***Print ODR Data*** to print the ODR data to a printer connected to the diagnostic computer.

NOTE: The "Export ODR Data" function is used with the separate software package *ODR Tracker*.

Help Menu



The ***Help*** pull down menu from the Main Menu offers three options.

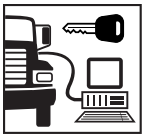
Contents — Choose ***Contents*** to list the topics in a Table of Contents format.

Search for Help On — Select ***Search for Help On*** to access Help topics by searching for key words or subject.

About PC Diagnostics — Click ***About PC Diagnostics*** to display software version information.

Hydraulic ABS

Reference Material



For maintenance and repair information, refer to the Meritor WABCO Trailer ABS Maintenance Manual:

MM-0677 Hydraulic Anti-Lock Braking Systems (HABS) for Medium-Duty Trucks, Buses and Motor Home Chassis (For E Version Hydraulic ABS)

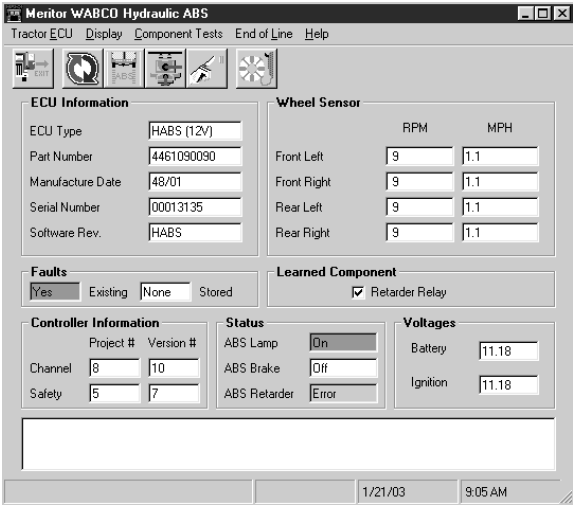
MM-39 Hydraulic ABS for Medium-Duty Trucks, Buses and Motor Home Chassis (For D Version Hydraulic ABS)

NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

HYDRAULIC ABS MENUS AND TOOLBARS

Select ***Hydraulic ABS*** from the ***TOOLBOX™ Main Menu***. TOOLBOX™ will recognize the HABS or Hydraulic Power Brake (HPB) ECU and display the appropriate screen. If you are working with HPB, refer to the HPB section of this manual.

Main Menu



The ***Main Menu*** provides icons and pull down menu task selections. It also provides information about the current status of Meritor WABCO HABS.

ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, voltages and fault information) is read and updated continuously.

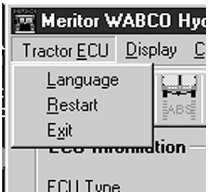
NOTE: Double click on Yes in the Existing or Stored Faults fields of the ***HABS Main Menu*** to bring up the Fault Information screen. Service Information may also be observed from this screen.

From the ***Main Menu***, you can select ***Restart, Exit*** or ***Help***.

Restart
Exit
Help

Tractor ECU

Select ***Tractor ECU*** from the ***HABS Main Menu***. A pull down menu will appear.



Language Restart

Refer to page 5 of this manual for information about using the ***Language*** selection.

Select ***Restart*** to refresh (update) ECU information.

Exit

Select ***Exit*** to exit HABS and return to the TOOLBOX™ ***Main Menu***.

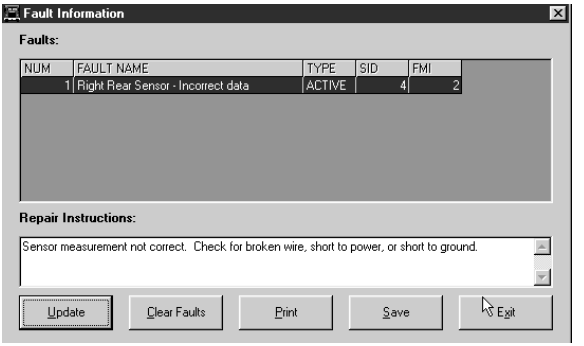
Display

Select ***Display*** from the ***HABS Main Menu***. A pull down menu will appear.

Faults

Select ***Faults*** to display the ***Fault Information*** screen.

NOTE: The ***Fault Information*** Screen is also accessible from the ***HABS Main Menu***.



The ***Fault Information*** screen contains a description of each fault, including the type of fault (Active or Stored), SID and FMI number. Repair instructions for the fault appear at the bottom of the screen.

- Bookmarks — Complete listing of ABS fault codes by SID/FMI. Click to display.
- Thumbnails — Click individual pages to display.

For detailed repair instructions, click on the fault to display a troubleshooting information sheet. ***Bookmark*** and ***Thumbnail*** tabs at the side of the troubleshooting information sheet provide additional information. A sample troubleshooting information sheet appears in the Appendix. This screen also provides a link to the appropriate system schematic.

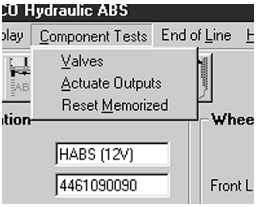
Faults that occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button at the bottom of the screen to refresh the fault information table and display a new list of faults.

After making any required repairs, use the ***Clear Faults*** button to clear the fault. Clear each fault as it is repaired.

Use the ***Save*** or ***Print*** button to save or print the fault information data. Please refer to page 25 for more information about Save and Print functions. Select ***Exit*** to close this screen.

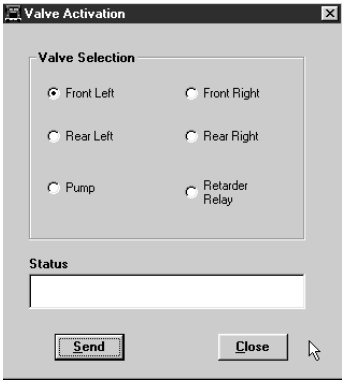
Component Tests

Select ***Component Tests*** from the ***HABS Main Menu***. A pull down menu will appear.



Valves

Select ***Valves*** to display the ***Valve Activation*** screen.

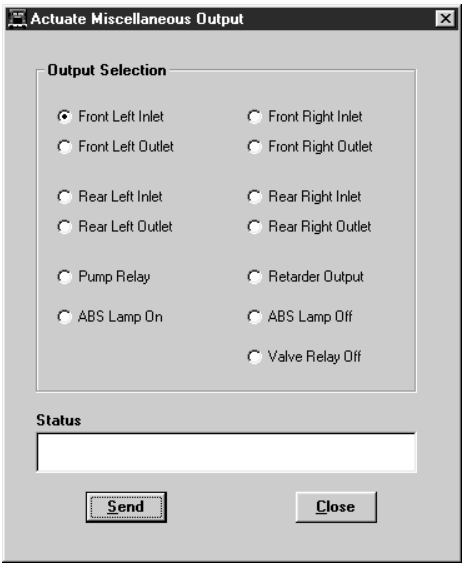


The ***Valve Activation*** screen lets you activate the four valves, the pump and the retarder relay. In addition to checking for correct activation, this screen provides an easy way to make sure the valves are wired correctly — and that wiring is not reversed.

Click on the valve, pump or retarder relay you wish to test, then click on the ***Send*** button to actuate the component. Component activation status appears in the ***status box*** field. Use the ***Close*** button to close this screen.

Actuate Outputs

Select ***Actuate Outputs*** to display the ***Actuate Miscellaneous Output*** screen.



This screen provides a check of the ABS indicator lamp. In addition, it provides a way to check either inlet or outlet activity of the valves, pump or retarder relay.

Click on the component you wish to test, then click on the ***Send*** button to actuate the component. Component activation status appears in the ***status box*** field. Use the ***Close*** button to close this screen.

Reset Memorized

Select ***Reset Memorized*** to display the ***Learned Component*** screen.

Relay is an automatic default and cannot be de-selected. It indicates the ECU has memorized the installed retarder relay. Once the ECU has seen a retarder, it expects to see it every time the vehicle is powered up.

Because there are times when an ECU is moved to another vehicle — or during diagnostic testing — you may want the ECU to disregard this learned component. Use the ***Reset Memorized*** command for this purpose.

End of Line

Tip: Have a copy of MM 39 or Installation Guide TP-99124 available BEFORE you perform a brake bleed. For your convenience, these publications are posted on meritorwabco.com.

The End of Line Brake Bleed Procedure is accessed from the ***HABS Main Menu***. Use the Brake Bleed feature to bleed the expansion chambers. (Refer to page 79.)

NOTE: Before connecting the vehicle to the computer, bleed the circuit and master cylinder. Follow the standard bleed procedures used by your facility, or use the procedures listed in Meritor WABCO HABS Installation Guide TP-99124 or HABS Maintenance Manual 39.

WARNING

Failure to bleed the system whenever any hydraulic system fitting is loosened or disconnected will allow air to remain in the system. This will prevent the hydraulic pressure in the brake system from rising enough to apply the brakes correctly. This will cause the stopping distance to increase and can result in serious personal injury.

Correctly discard hydraulic brake fluid that is removed from the brake system. Hydraulic brake fluid that is removed can be contaminated and can cause damage, loss of braking and serious personal injury.

Use only the type of hydraulic brake fluid specified by the equipment manufacturer. Do not use or mix different types of hydraulic brake fluid. The wrong hydraulic brake fluid will damage the rubber parts of the brake caliper and can cause damage, loss of braking and serious personal injury.

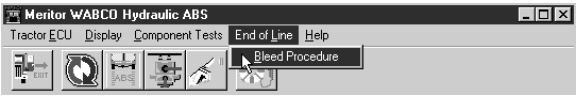
Do not let the brake master cylinder fluid get below the minimum level during the bleeding operation. Keep the master cylinder reservoir filled with new DOT-approved brake fluid, as specified by the original equipment manufacturer. Failure to keep the brake reservoir level above minimum could result in more air entering system, making it impossible to effectively bleed the system.

NOTE: Use DOT 3 or DOT 4 hydraulic brake fluid. Refer to the vehicle specifications to determine which fluid to use.

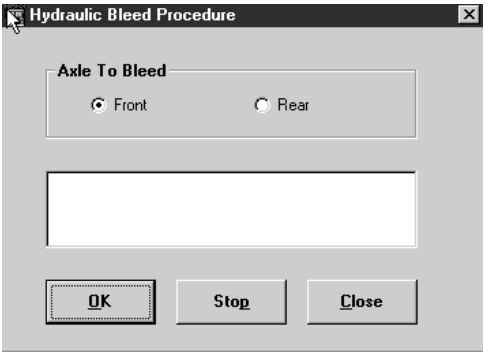
CAUTION

Hydraulic brake fluid is a caustic substance. Contact with hydraulic brake fluid can cause skin irritation. Do not let hydraulic brake fluid touch any painted surfaces, as it will remove the paint. Hydraulic brake fluid may also damage certain non-metal surfaces. Do not let fluid get on brake pads, shoes, rotors or disks.

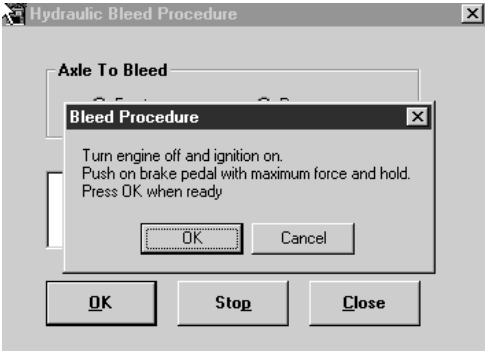
1. Apply the parking brake and block the tires. Turn the ignition off.
2. Perform brake bleed procedure for wet module, bleeding the circuit and master cylinder if required, prior to connecting laptop to truck.
3. Connect laptop to the vehicle using the J1587 diagnostic port in the cab of the truck.
4. Launch Meritor WABCO TOOLBOX™ Diagnostic Software.
5. From the ***Main Menu*** select the HABS icon.
6. Select ***End of Line*** from the ***HABS Main Menu***.
7. Select ***Bleed Procedure*** from the ***End of Line Menu***.



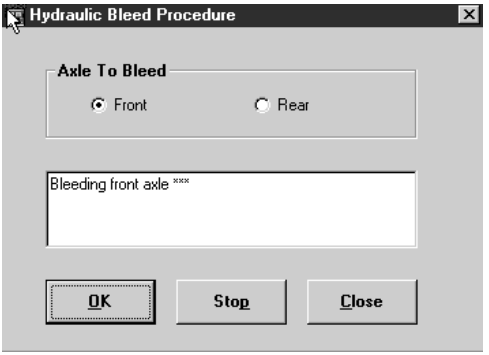
8. Choose axle to bleed from the select axle screen.



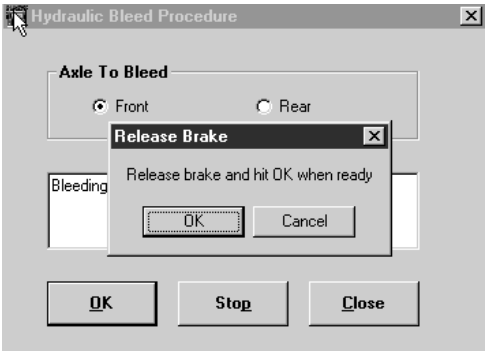
9. Follow on-screen prompts.



Click OK to continue.



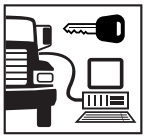
Click OK to continue.



10. Repeat procedure two additional times on this axle. This should eliminate all of the air in the chamber.
11. Perform manual bleed on this axle.
12. Repeat Steps 8-11 for the other axle.
13. Test drive the vehicle after bleeding the brakes.
    - If a firm brake pedal resistance is felt and the brake pedal pushes back when you perform an ABS stop, the system bleed procedure is complete.
    - If there is no firm pedal resistance, check the brake system for defects (leaks, etc.) and make the necessary repairs, then repeat the bleed procedure.

Hydraulic Power Brake (HPB)

Reference Material



For maintenance and repair information, refer to the Meritor WABCO HPB Maintenance Manual:

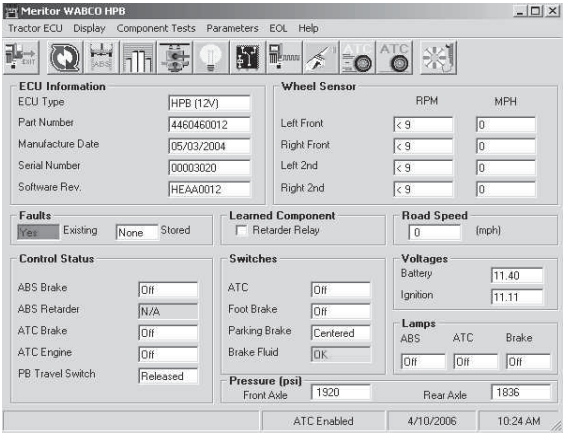
MM-0401 Meritor WABCO Hydraulic Power Brake (HPB) System

NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

HYDRAULIC POWER BRAKE MENUS AND TOOLBARS

Select ***Hydraulic ABS*** from the ***TOOLBOX™ Main Menu***. TOOLBOX™ will sense the type of ECU being used and will display the ***HPB Main Menu***.

Main Menu



This screen provides icons and pull down menu task selections. It also provides information about the current status of Meritor WABCO HPB.

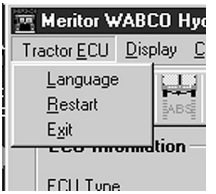
ECU information is read once from the ECU and does not change. All other information (e.g., wheel sensors, voltages and fault information) is read and updated continuously.

From the Main Menu you can select ***Restart***, ***Exit*** or ***Help***.

Restart
Exit
Help

Tractor ECU

Select ***Tractor ECU*** from the ***HPB Main Menu***. A pull down menu will appear.



Language

Refer to page 5 of this manual for information about using the Language selection.

Restart

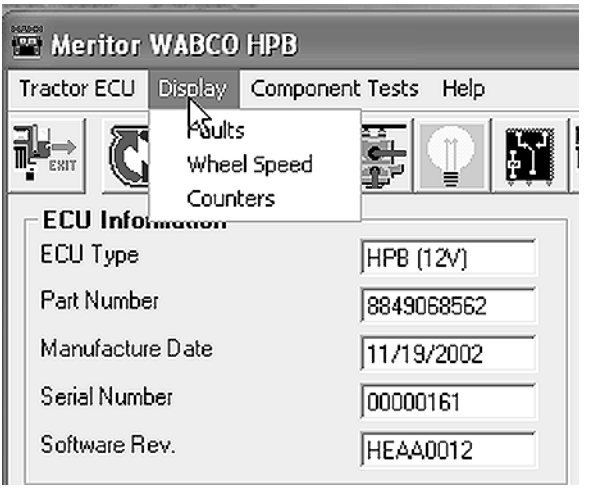
Select ***Restart*** to refresh (update) ECU information.

Exit

Select ***Exit*** to exit HPB and return to the TOOLBOX™ ***Main Menu***.

Display

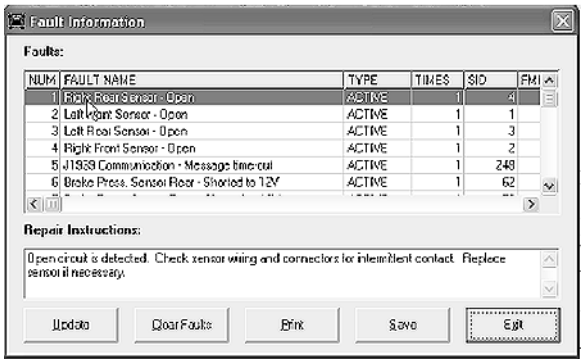
Select ***Display*** from the ***HPB Main Menu***. A pull down menu will appear.



Faults

Select ***Faults*** to display the ***Fault Information*** screen.

NOTE: The ***Fault Information*** screen is also accessible from the ***HPB Main Menu***.



The ***Fault Information*** screen contains a description of each fault, including the type of fault (Active or Stored), SID and FMI number. Repair instructions for the fault appear at the bottom of the screen.

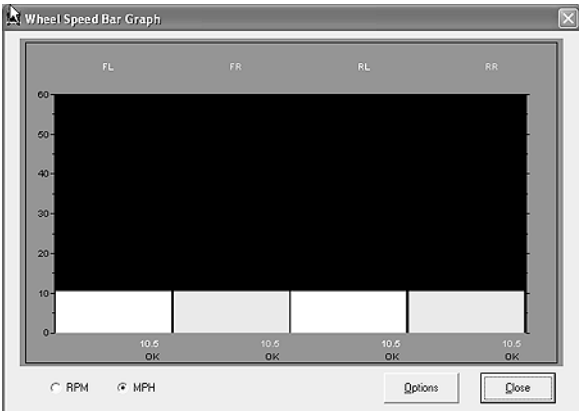
Faults that occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button at the bottom of the screen to refresh the fault information table and display a new list of faults.

After making any required repairs, use the ***Clear Faults*** button to clear the fault. Clear each fault as it is repaired.

Use the ***Save*** or ***Print*** button to save or print the fault information data. Please refer to page 25 for more information about Save and Print functions. Select ***Exit*** to close this section.

Wheel Speed

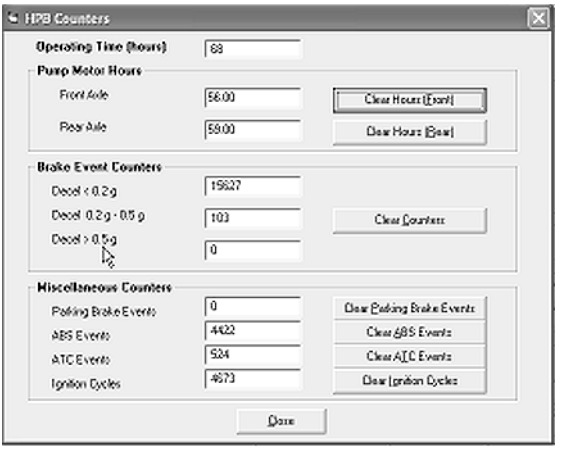
Select ***Wheel Speed*** to display the ***Wheel Speed*** screen.



Use the ***Wheel Speed*** screen to verify that sensors are connected at each wheel. Speed at a sensed wheel (FL, FR, RL, RR) indicates sensors are installed, but does not verify correct sensor installation.

Counters

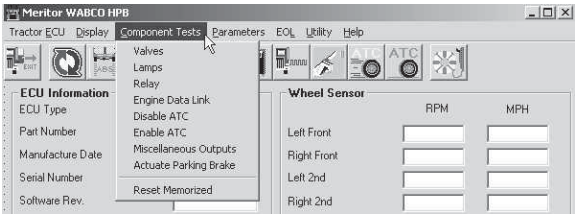
Select Counters to display the ***Counters*** screen.



The ***Counters*** screen provides an overview of HPB component performance (pump hours, brake events, etc.) as well as general vehicle activity such as ignition cycles. Occurrences displayed on this screen accumulate until the Clear button is selected.

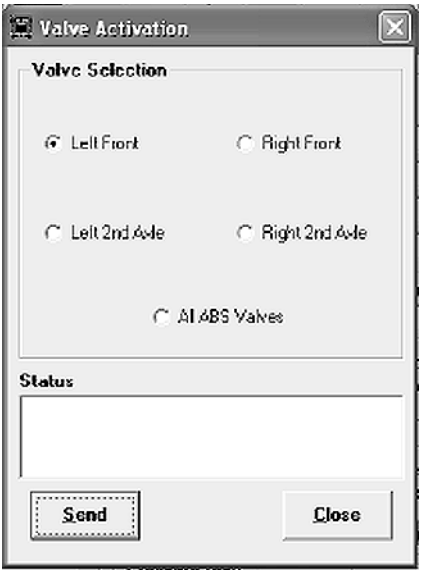
Component Tests

Select ***Component Tests*** from the ***HPB Main Menu***. A pull down menu will appear.



Valves

Select ***Valves*** to display the ***Valve Activation*** test screen.

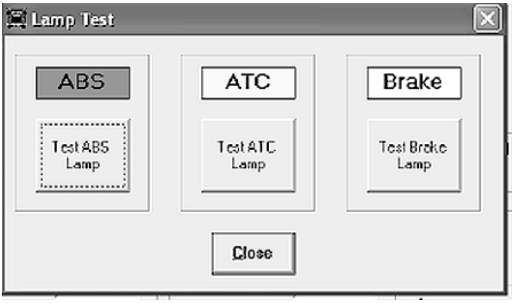


The Valve Activation test screen lets you activate the HPB valves and verify correct brake line installation.

Click on the valve you wish to test, then click the ***send*** button to actuate the component. Component activation status appears in the ***Status*** box field. Select ***Close*** to exit this screen.

Lamps

Select ***Lamps*** to display the ***Lamp Test*** screen.



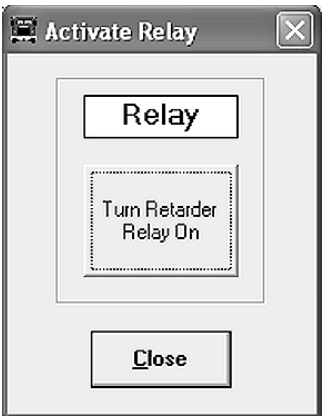
As each lamp is tested, check the actual lamp to verify correct operation. Select ***Close*** to exit this screen.

WARNING

Park the vehicle on a level surface. Block the wheels to prevent the vehicle from moving. Support the vehicle with safety stands. Do not work under a vehicle supported only by jacks. Jacks can slip and fall over. Serious personal injury and damage to components can result.

Relay

Select ***Relay*** to display the ***Activate Relay*** test screen.



This screen allows you to turn the Retarder Relay on or off. This is helpful in verifying correct operation, installation and wiring of the unit under test. Select ***Close*** to exit this screen.

Engine Data Link

Select Engine Data Link to display the ***Data Link*** test screen.

This screen allows you to send a "limit engine torque" command to the engine or a "disable retarder" command to the retarder.

Select the data link destination (engine or retarder), then select ***Send*** to test. Use the ***Stop*** button to end testing. Select ***Close*** to exit this screen.

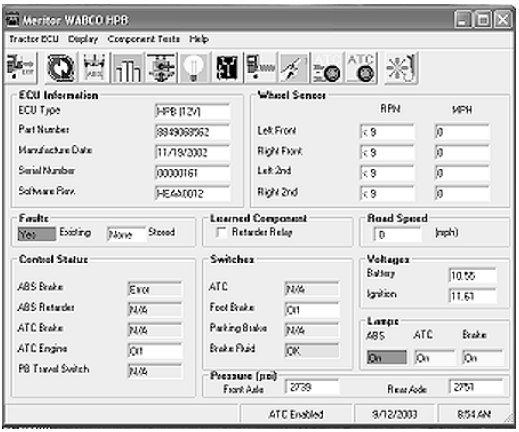
Disable ATC

Select Disable ATC to send a command to the ECU to disable automatic traction control. ATC will remain disabled until the enable command is sent, or until the vehicle ignition is cycled. ATC must be disabled for ATC testing.

Enable ATC

Select Enable ATC to send a command to the ECU to enable automatic traction control. This is the normal state of the ECU.

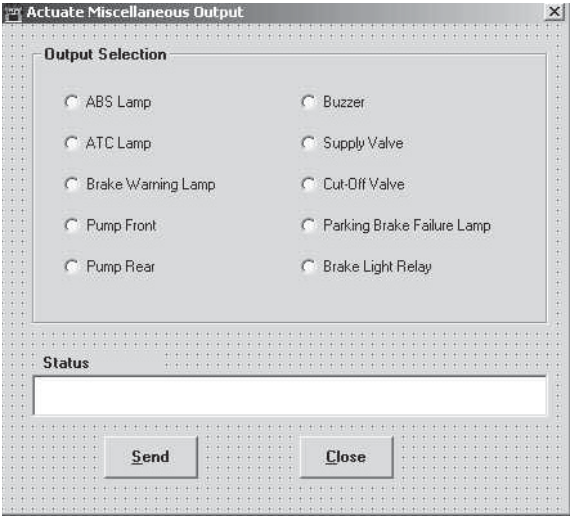
NOTE: The status bar on the ***HPB Main Menu*** reflects the current ATC status (enabled, disabled or not available).



Miscellaneous Outputs

Select Miscellaneous Outputs to display the Activate Miscellaneous Outputs test screen.

NOTE: Use TOOLBOX™ to test the following components: **Retarder Relay, Brake Light Relay, Supply Valve, Cut-Off Valve, ABS Lamp, Traction Lamp, Brake Warning, Pump Front, Pump Rear, Buzzer.**



This screen provides a check of several HPB components, as well as a way to check either inlet or outlet activity of the valves, pump or retarder relay.

Highlight the component you wish to test, then select the ***Send*** button to actuate the component. Component activation status appears in the ***Status Box*** field. Select ***Close*** to exit this screen.

Actuate Parking Brake

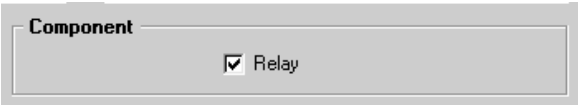
Select ***Actuate Parking Brake*** to display the ***Parking Brake*** test screen.

Select ***Release*** or ***Apply,*** then select ***Send*** to test the parking brake. Select ***Close*** to exit this screen.

Reset Memorized

(For Systems Equipped with a Retarder Relay)

Select ***Reset Memorized*** to display the ***Learned Component*** screen.

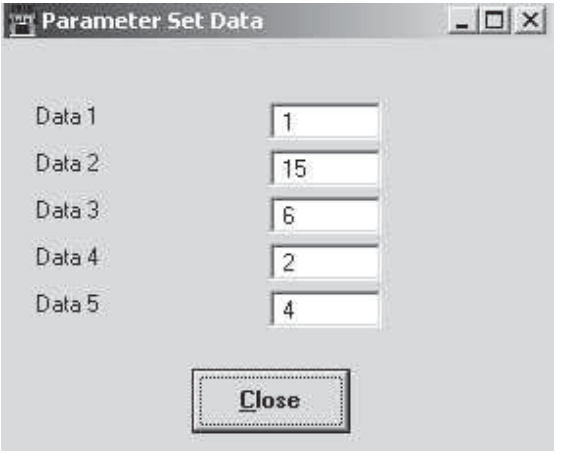


Relay is an automatic default and cannot be de-selected. It indicates the ECU has memorized the installed retarder relay. Once the ECU has seen a retarder, it expects to see it every time the vehicle is powered up.

Parameters

Select ***Parameters*** from the ***HPB Main Menu***. A pull down menu will appear.

Select ***Read Parameters*** or ***Write Parameters***. The ***Parameters*** screen will appear.



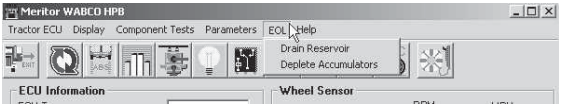
Read Parameters

Write Parameters

Please contact the ArvinMeritor Customer Service Center at 800-535-5560 for information about using these screens.

End of Line

Select ***End of Line*** from the ***HPB Main Menu***. A pull down menu will appear.

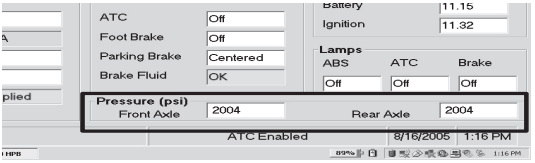


Drain Reservoir

This option sends a command to drain the HCU reservoir. For information about using this option, please contact the ArvinMeritor Customer Service Center at 800-535-5560.

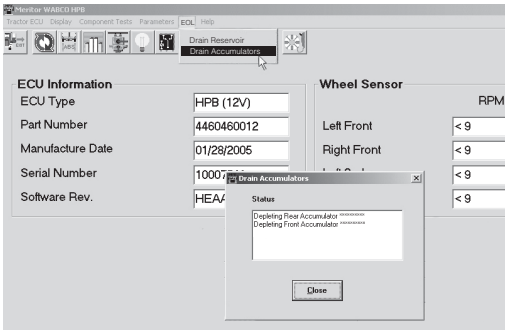
Deplete Accumulators

Before selecting ***Deplete Accumulators*** from the ***HPB Main Menu***, make sure the accumulators are fully charged, approximately 2100 psi (144.79 bar). Review the ***Pressure*** field of the ***HPB Main Menu*** to verify pressure.

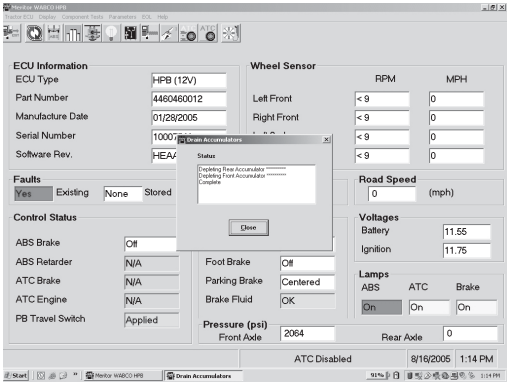


Select ***Deplete Accumulators*** from the pull down menu. A status message screen will appear. When the system pressure has been depleted from both the front and rear accumulators, the message screen will indicate the procedure has been completed.

(Depleting Accumulators)



(Complete)

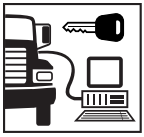


Electronic Leveling Module (ELM) for Tractors

Reference Material

For Maintenance and Repair information, contact ArvinMeritor Customer Service Center at 800-535-5560.

Computer to Vehicle

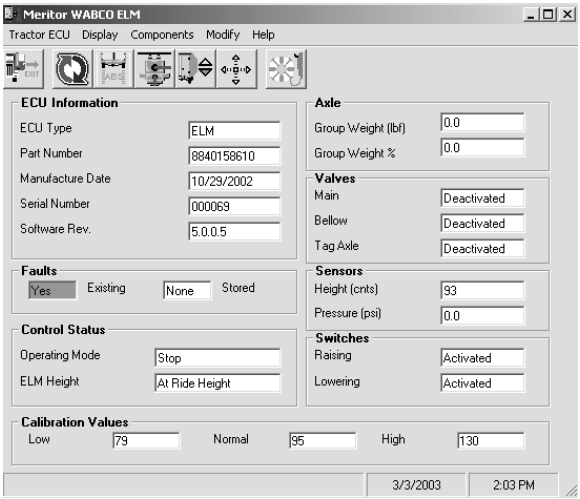


NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be on in order to display information.

ELM ABS MENUS AND TOOLBARS

Select ***Tractor ELM*** from the ***TOOLBOX™ Main Menu***. The ***ELM Main Menu*** will appear.

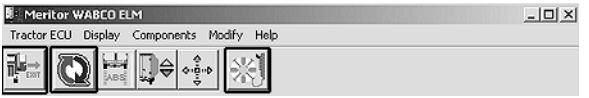
Main Menu



This screen provides icons and pull down menu task selections. It also provides information about the current state of the Meritor WABCO ELM. ECU information (e.g., part number, serial number, etc.) is read once and does not change. All other information, such as wheel sensor speed and voltages, is read and updated continuously.

Restart
Exit
Help

From the ***Main Menu*** you can select ***Restart***, ***Exit*** or ***Help***.



ELM

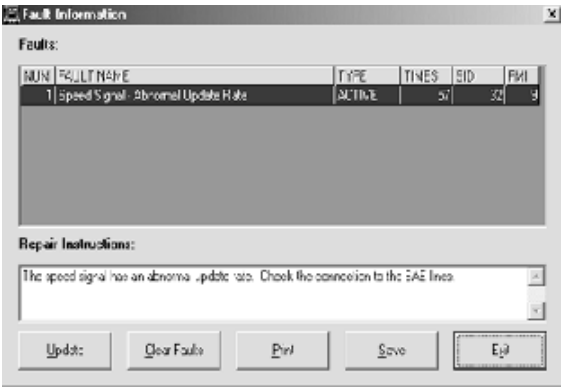
Select ***ELM*** from the ***ELM Main Menu***. A pull down menu will appear with English listed. This program is available in English only.

Display

Select Display from the ***ELM Main Menu***. A pull down menu will appear.

Faults

Select faults from the pull down menu. The ***Fault Information*** screen will appear.



A description of the fault, the number of times the fault occurred, the system identifier (SID) and the failure mode (FMI) are all displayed in the fault information window. Repair instructions for each fault are also provided.

Faults that may occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button to refresh the fault information table.

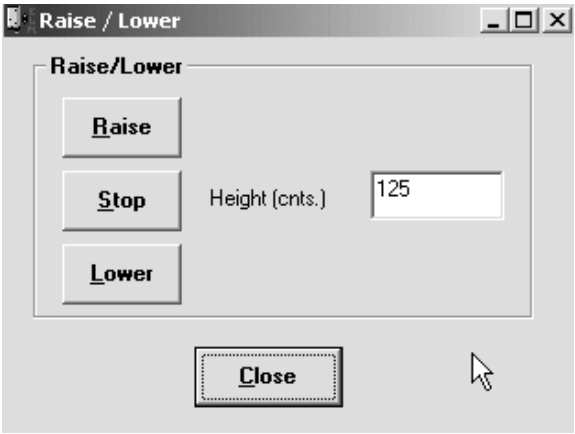
After making the necessary repairs, use the ***Clear Faults*** button to clear the fault. Use the update button to refresh the fault information table and display the new list of faults.

Use the ***Save*** or ***Print*** button to save or print the fault information data.

Components

Select ***Component Tests*** from the ***ELM Main Menu***. A pull down menu will appear.

Select ***Raise/Lower*** to raise or lower the chassis. The ***Raise/Lower*** screen will appear.



Select ***Raise*** to raise the vehicle chassis to the ride height or ***Lower*** to lower the vehicle chassis to the ride height low level.

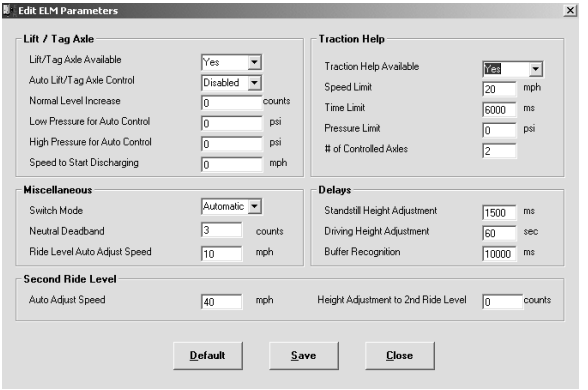
Select ***Stop*** to halt the raising or lowering. The height of the vehicle chassis during raising or lowering is displayed on the screen in the ***Height*** field. Note that the measurement is in centimeters.

Select ***Close*** to return to the ***ELM Main Menu***.

Modify

CAUTION:
Do not modify ELM parameters unless instructed to do so by the fleet or terminal manager.

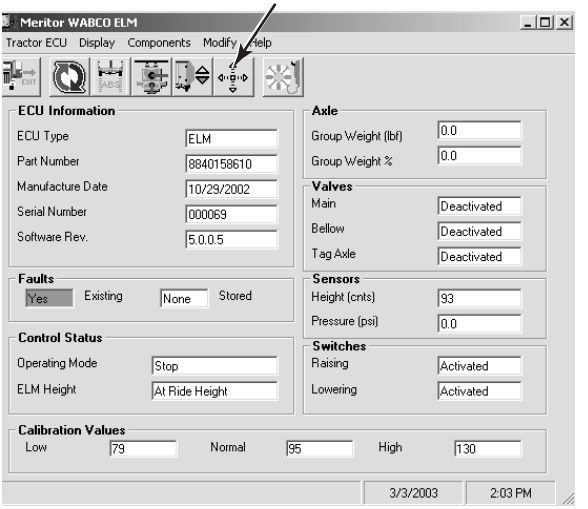
Select Modify from the ***ELM Main Menu***. The ***Edit ELM Parameters*** screen will appear.



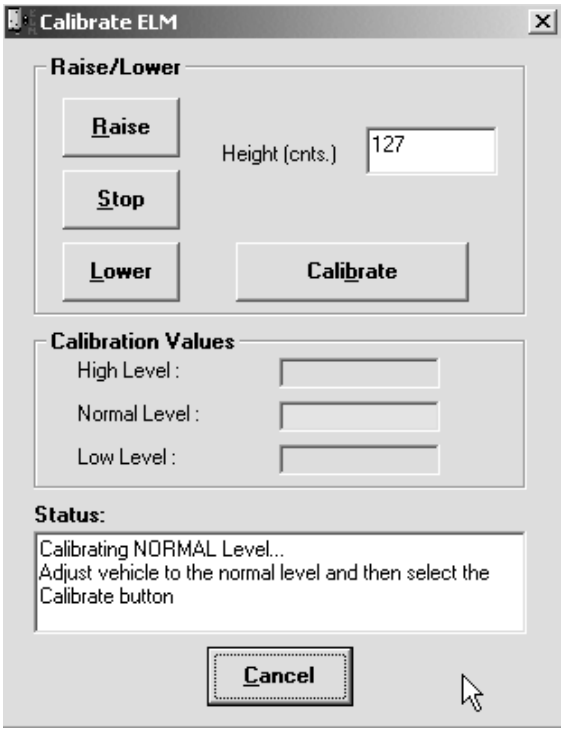
Calibrate

At the ***ELM Main Menu*** click on the ***Calibration*** icon.

CALIBRATION ICON



Select ***Start Calibration***. The ***Calibrate ELM*** screen will appear.



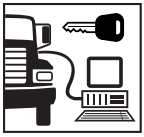
- Follow the on-screen prompts to raise and lower the vehicle to the normal ride height selected by the vehicle manufacturer. Press ***Calibrate*** to set.
- After ride height is set, raise the vehicle to the upper level. Press ***Calibrate*** to set.
- After upper level is set, lower the vehicle to the low level. Press ***Calibrate*** to set.
- Check the screen to verify that the calibration was successful.

Electronic Leveling Module (ELM) for Trailers

Reference Material

For Maintenance and Repair information, contact ArvinMeritor Customer Service Center at 800-535-5560.

Computer to Vehicle

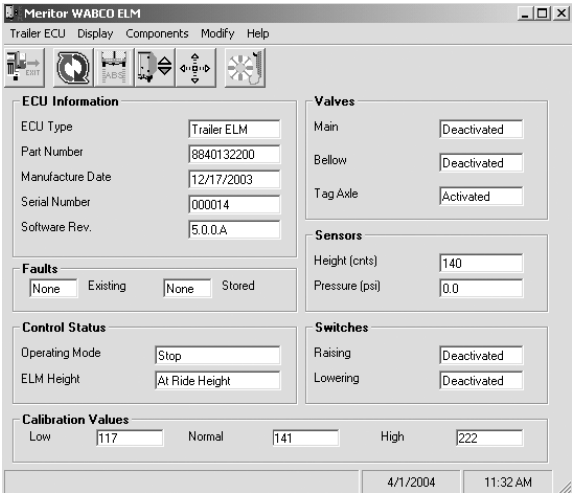


NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

ELM ABS MENUS AND TOOLBARS

Select ***Trailer ELM*** from the ***TOOLBOX™ Main Menu***. The ***ELM Main Menu*** will appear.

Main Menu



This screen provides icons and pull down menu task selections. It also provides information about the current state of the Meritor WABCO ELM. ECU information (e.g., part number, serial number, etc.) is read once and does not change. All other information, such as wheel sensor speed and voltages, is read and updated continuously.

Restart
Exit
Help

From the ***Main Menu*** you can select ***Restart***, ***Exit*** or ***Help***.

ELM

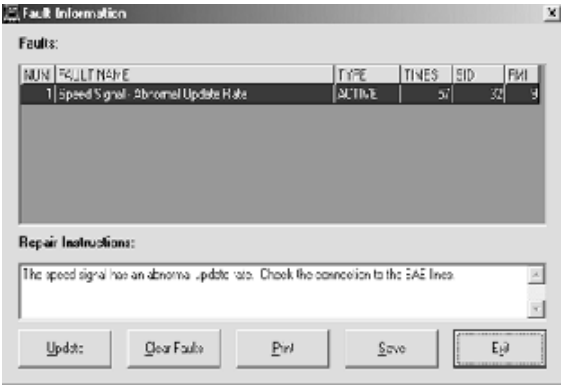
Select ***ELM*** from the ***ELM Main Menu***. A pull down menu will appear with English listed. This program is available in English only.

Display

Select Display from the ***ELM Main Menu***. A pull down menu will appear.

Faults

Select faults from the pull down menu. The ***Fault Information*** screen will appear.



A description of the fault, the number of times the fault occurred, the system identifier (SID) and the failure mode (FMI) are all displayed in the fault information window. Repair instructions for each fault are also provided.

Faults that may occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button to refresh the fault information table.

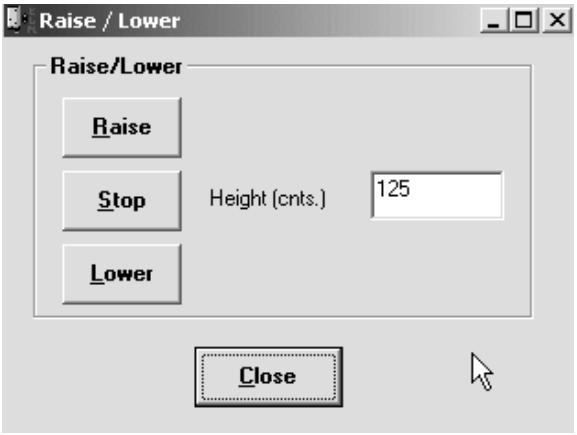
After making the necessary repairs, use the ***Clear Faults*** button to clear the fault. Use the update button to refresh the fault information table and display the new list of faults.

Use the ***Save*** or ***Print*** button to save or print the fault information data.

Components

Select Components from the ***ELM Main Menu***. A pull down menu will appear.

Select ***Raise/Lower*** to raise or lower the chassis. The ***Raise/Lower*** screen will appear.



Select ***Raise*** to raise the vehicle chassis to the ride height or ***Lower*** to lower the vehicle chassis to the ride height low level.

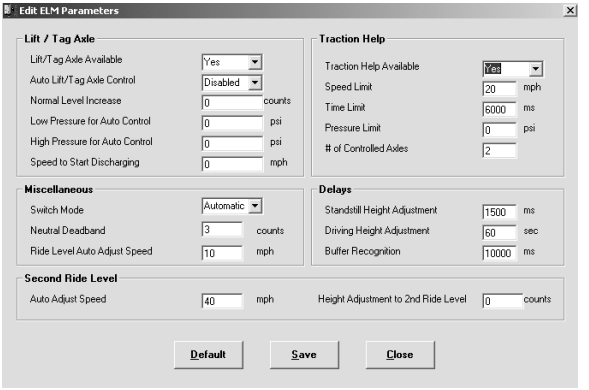
Select ***Stop*** to halt the raising or lowering. The height of the vehicle chassis during raising or lowering is displayed on the screen in the ***Height*** field. Note that the measurement is in centimeters.

Select ***Close*** to return to the ***ELM Main Menu***.

Modify

CAUTION:
Do not modify ELM parameters unless instructed to do so by the fleet or terminal manager.

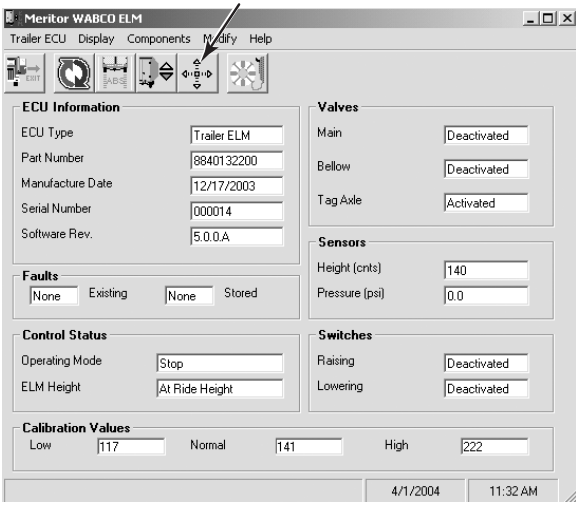
Select Modify from the ***ELM Main Menu***. The **Edit ELM Parameters** screen will appear.



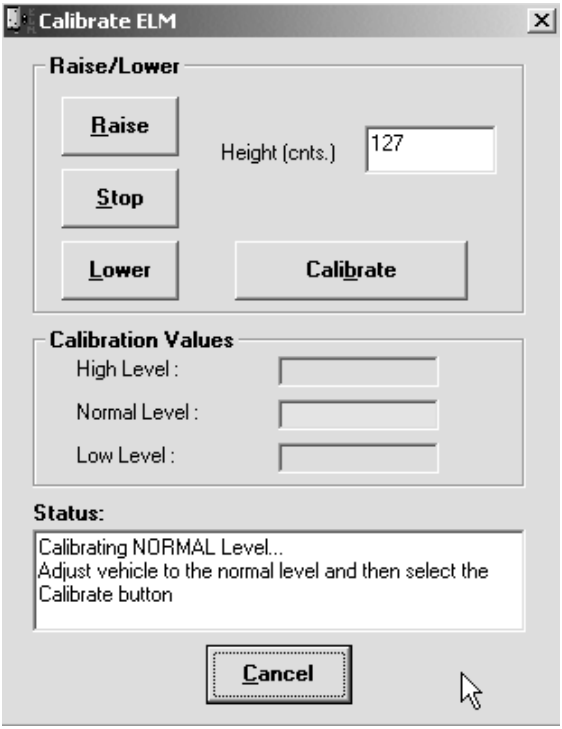
Calibrate

At the ***ELM Main Menu***, click on the ***Calibration*** icon.

CALIBRATION ICON



Select ***Start Calibration***. The ***Calibrate ELM screen*** will appear.



- Follow the on-screen prompts to raise and lower the vehicle to the normal ride height selected by the vehicle manufacturer. Press ***Calibrate*** to set.
- After ride height is set, raise the vehicle to the upper level. Press ***Calibrate*** to set.
- After upper level is set, lower the vehicle to the low level. Press ***Calibrate*** to set.
- Check the screen to verify that the calibration was successful.

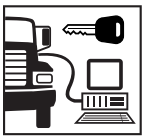
ECAS for Buses

Reference Material

For maintenance and repair information, refer to the appropriate Meritor WABCO ECAS Maintenance Manual:

MM37 Electronically Controlled Air Suspension (ECAS) for Buses

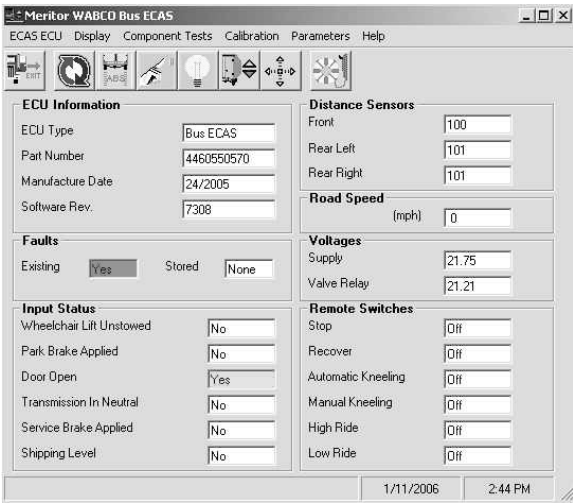
Computer to Vehicle



NOTE: TOOLBOX™ Software must be connected to the vehicle and the vehicle ignition must be ON in order to display information.

Main Menu

ECAS MENUS AND TOOLBARS



The ***ECAS Main Menu*** contains icons and pull down menu task selection. It also provides information about the ECU and the current status of the ECAS system.

- Several features have been built into the ECAS system to help ensure correct level changes. The status of the bus door, parking brake, transmission and bus height are all considered by the ECU before a level change is initiated. The following table explains how these features apply to each function and lists the switches used to initiate manual ECAS level changes. These ECAS height change requirements will appear in the ***Input Status*** and ***Remote Switches*** fields of the ***Main Menu***.

ECAS Function	Doors	Parking Brake	Transmission	Speed	Kneel	Height	Switches
Normal/ Recover	Closed	No effect	No effect	No effect	No effect	No effect	Normal/ Recover
Lifting	Closed	Released	Not neutral	Less than or equal to V_{LIMIT} (param. 17)	Not active	—	High ride
Lowering	Closed	Released	Not neutral	Less than or equal to V_{LIMIT} (param. 17)	Not active	—	High ride
Kneeling	Closed	Applied	Neutral	Less than or equal to 5 mph (no speed signal fault)	Not interrupted	Greater than or equal to normal	Kneeling
Shipping level	Closed	Applied	Neutral	Less than or equal to V_{LIMIT} (param. 17)	Not active	—	Shipping level
* Disable all suspension movement	No effect	No effect	No effect	No effect	No effect	No effect	Wheel chair stowed signal from lift controller

*Wheel chair lift inhibits feature for systems with ECAS ECU serial numbers of 4000 and higher.

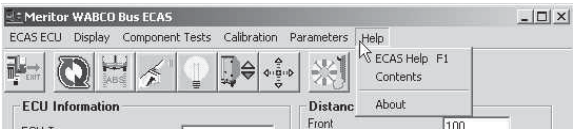
- The ***Distance Sensors*** field reflects the current normal, upper and lower calibration levels and will appear as part of the screen display when manual vehicle calibration is performed.

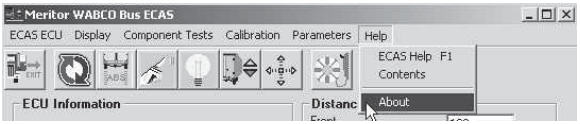
NOTE: Double click on **Yes** in the Existing or Stored ***Faults*** field on the ***Main Menu*** to bring up the Fault Information screen. This screen is illustrated on page 110.

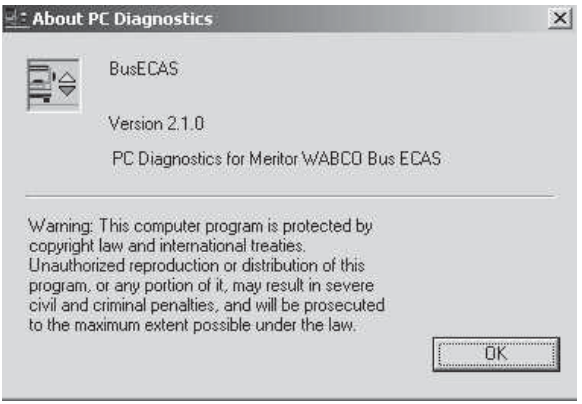
Restart
Exit
Help

From the ***Main Menu*** you can select ***Restart***, ***Exit*** or ***Help***. These features are explained in the Introduction.

From the ***Help*** menu you can also verify the version of Bus ECAS included in TOOLBOX™ 7.0. Select ***About*** from the ***Help*** pull down menu.

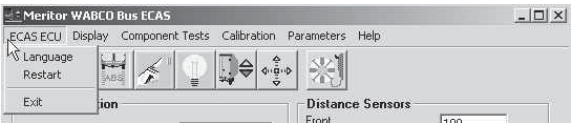






ECAS ECU

Select ***ECAS ECU*** from the ***ECAS Main Menu***. A pull down menu will appear.



Language

Refer to page 5 of this manual for information about using the ***Language*** selection.

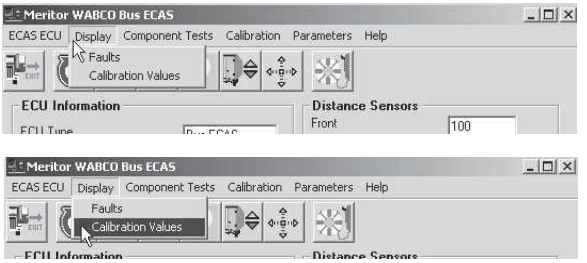
NOTE: The TOOLBOX™ ECAS program is available in English only.

Restart

Select ***Restart*** to refresh (update) ECU information.

Display

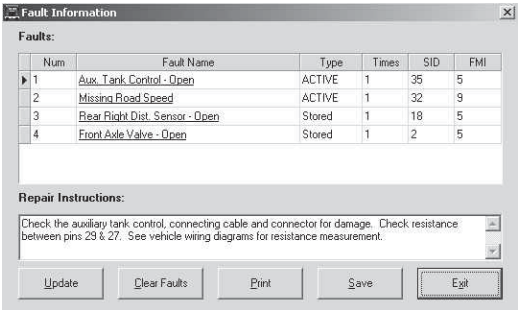
Select ***Display*** from the ***ECAS Main Menu***. A pull down menu will appear.



Faults

Select ***Faults*** to display the ***Fault Information*** screen.

NOTE: The ***Fault Information*** screen is also accessible from the ***ECAS Main Menu***. Refer to page 74.



Fault Information

The ***Fault Information*** screen contains a description of each fault, the number of times the fault occurred, the system identified (SID) and the failure mode (FMI). Basic repair instructions for each fault are also provided.

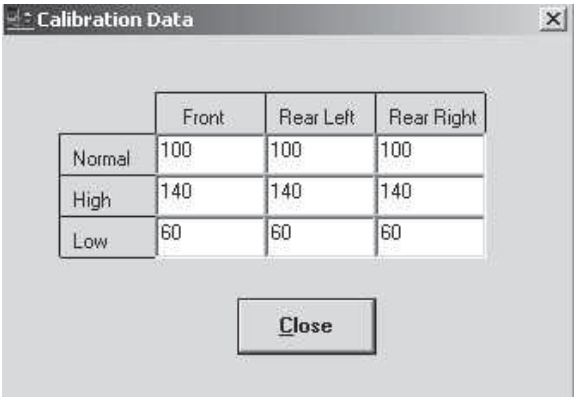
Faults that may occur after the screen is displayed will not appear until a screen update is requested. Use the ***Update*** button to refresh the fault information table.

After making the necessary repairs, use the ***Clear Faults*** button to clear the fault. Use the ***Update*** button to refresh the fault information table and display the new list of faults.

Use the ***Save*** or ***Print*** button to save or print the fault information data.

Calibration Values

Select ***Display Calibration Values*** to view the current calibration levels

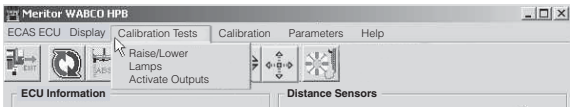


When selecting ***Calibration Values*** from the ***Display*** menu, data is for review only. Values cannot be changed from this screen. To change existing values, select the ***Calibration*** menu. Refer to page 114.

Component Tests

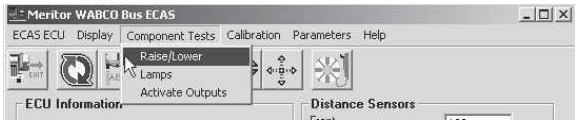
This option lets you test various ECAS functions.

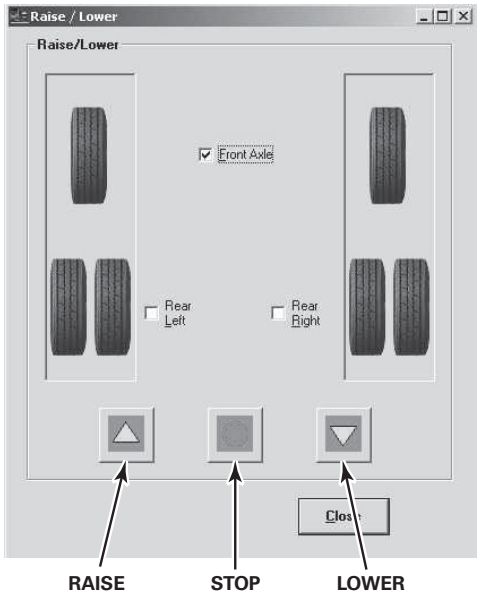
Select ***Component Tests*** from the ***ECAS Main Menu***. A pull down menu will appear.



Raise/Lower

Raise/Lower is used to verify the function of the valve body of the ECAS system. Select ***Raise/Lower*** to display the ***Raise/Lower*** screen.





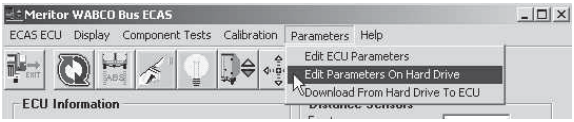
Select the axle, or axles, to be tested (front, rear left or rear right). Use the up or down arrows on the screen to raise or lower the appropriate axle. Use the round ***Stop*** key to end the raising or lowering.

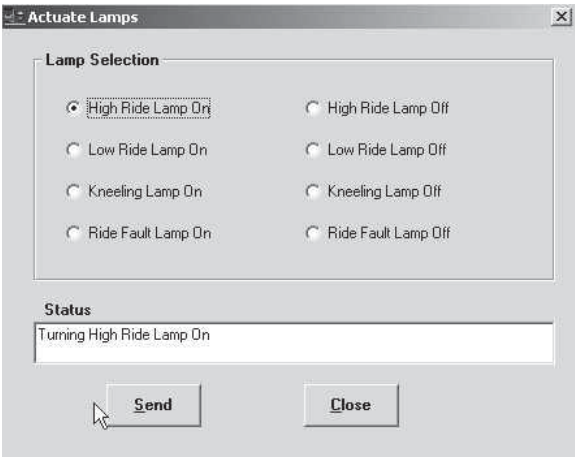
Select ***Close*** to exit ***Raise/Lower***.

Lamps

The vehicle may not have all of the lamps displayed on the screen.

Select ***Lamps*** from the pull down menu to display the ***Actuate Lamps*** screen. This feature lets you verify lamp function.





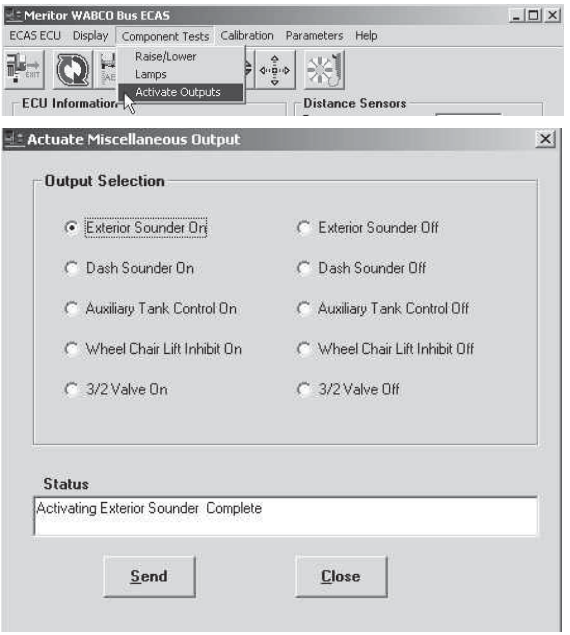
Select the lamp to actuate, then select ***Send***. The status of the lamp is displayed in the ***Status*** field.

Select ***Off*** to turn the lamp off. When all of the lamps have been tested, select ***Close*** to exit ***Actuate Lamps***.

Activate Outputs

The vehicle may not have all of the outputs displayed on the screen.

Select ***Activate Outputs*** from the ***Component Tests*** menu to display the ***Actuate Miscellaneous Output*** screen. This option tests the various optional ECAS outputs.

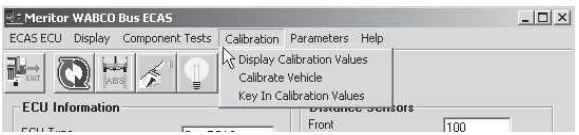


Select the function to be tested, then select ***Send***. The status of the function being tested is displayed in the ***Status*** field.

Select ***Close*** to exit ***Activate Outputs***.

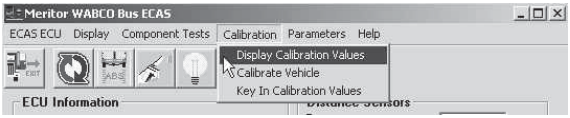
Calibration

Select ***Calibration*** from the ***ECAS Main Menu***. A pull down menu will appear. This menu option lets you view, enter or change the upper, lower and normal ECAS calibration values. For complete instructions for selecting these values refer to Meritor WABCO Maintenance Manual MM37.



Display Calibration Values

Select the ***Display Calibration Values*** option to view the Calibration Data. This screen is for display only. Use the ***Calibrate Vehicle*** screen to set levels.

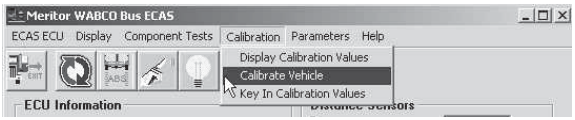


Calibrate Vehicle

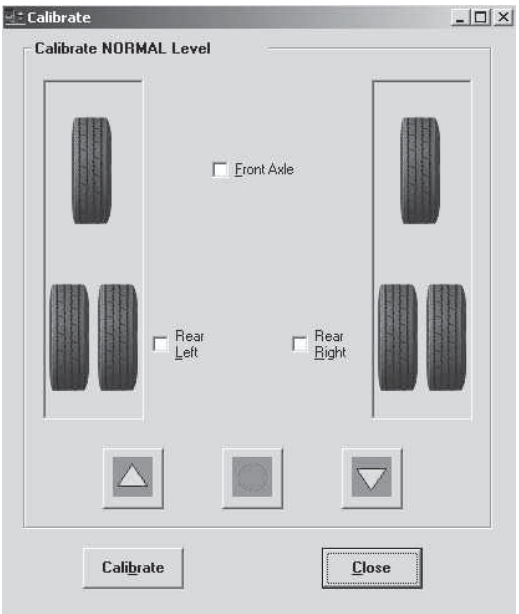
Manual calibration is not recommended. Whenever possible use the Key in Calibration Screen to calibrate the normal, upper and lower vehicle levels.

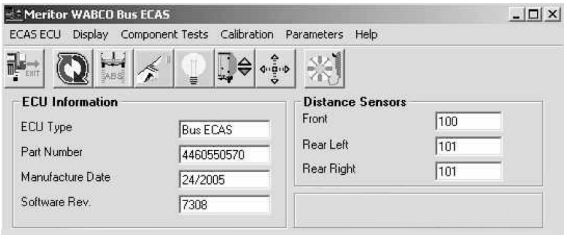
Refer to MM37 for complete calibration instructions.

Select the ***Calibrate Vehicle*** option to set upper, lower and normal vehicle levels. Calibration must be done for each of the three levels.



Select ***Calibrate Vehicle*** to display the first Calibrate screen. The ***ECAS Main Menu*** will also appear. As vehicle levels are calibrated, the values in the ***Distance from Sensors*** field will change to reflect the selected levels.



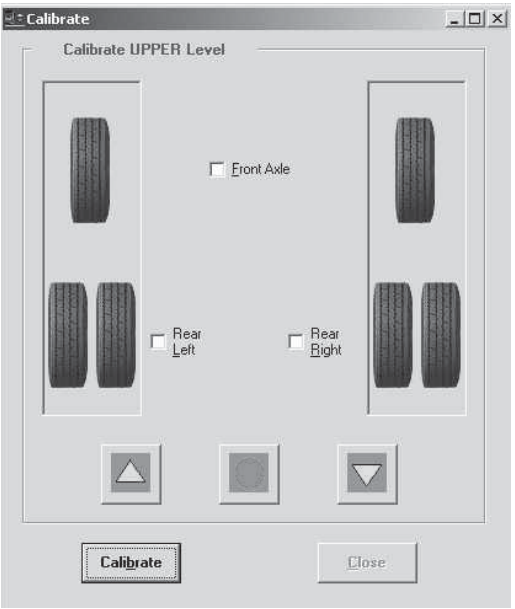


Select the appropriate axle and use the arrows on the screen to raise or lower the vehicle to the desired level. Select ***Calibrate*** to set.

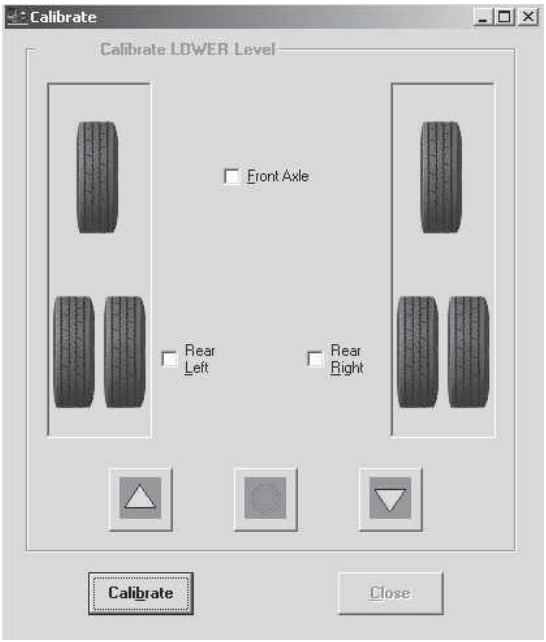
The PC keyboard may be used to raise or lower levels during manual calibration:

- Press ***ALT*** and the ***up*** arrow to ***raise*** levels.
- Press ***ALT*** and the ***down*** arrow on the keyboard to ***lower*** levels.
- Press ***ALT*** and the ***side*** arrow to stop the vehicle from raising or lowering.

When the normal level calibration is complete, select ***Calibrate*** to display the second (upper) screen.



Repeat the calibration process described above to set the upper level, then select ***Calibrate*** to display the third (lower) screen.



Select ***Calibrate*** to display the Calibration Complete screen.

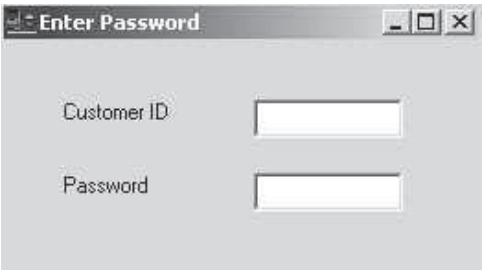
Select ***OK*** to return to the Calibration pull down menu.

Key In Calibration Values

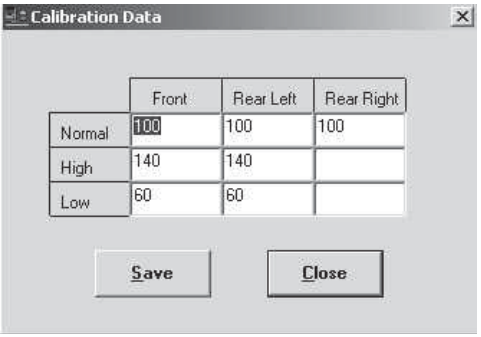
(Password Required)

Use this option to enter numeric vehicle calibration levels. Refer to the vehicle manufacturer's specifications for the appropriate values.

Select ***Key In Calibration Values***. TOOLBOX™ will ask for a password.



Enter the ***Customer ID*** and ***Password*** assigned to you. Once the password information has been entered, the ***Calibration Data*** screen will appear



Fill in the normal, high and low values for the Front, Rear Left and Rear Right axles. These values are predetermined by previous calibration or by the vehicle manufacturer.

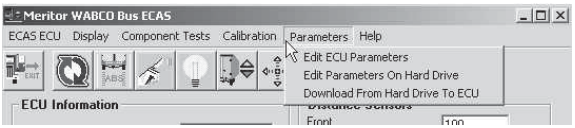
Select ***Save*** to retain the settings. The ***Calibration Complete*** screen will appear, indicating that all calibration values have been entered.

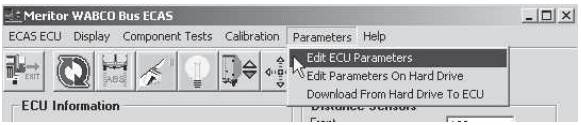
Select ***OK*** to return to the ***ECAS Main Menu***.

Parameters

Select ***Parameters*** from the ***ECAS Main Menu***. A pull down menu will appear.

Contact Meritor WABCO **before** changing any of the vehicle parameters.





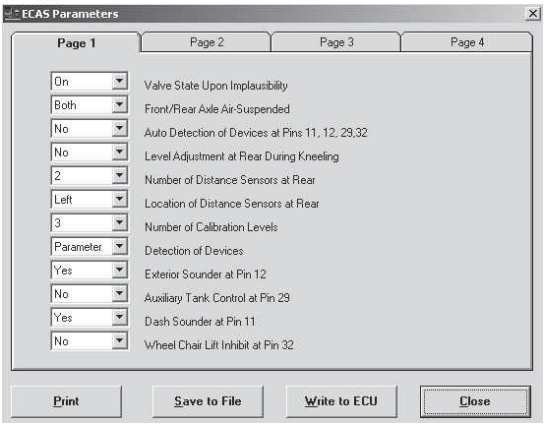
TOOLBOX™ lets you edit, or change, the existing parameters in two ways:

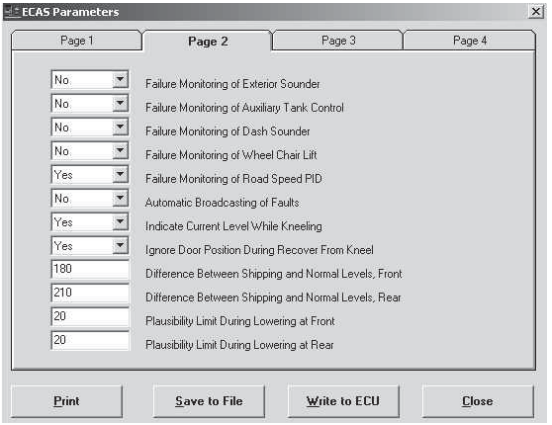
- Directly to the ECU
- Edit a file on the PC hard drive, then download that file to the ECU

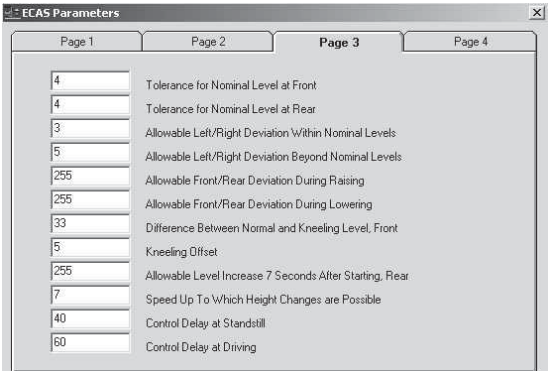
Edit ECU Parameters

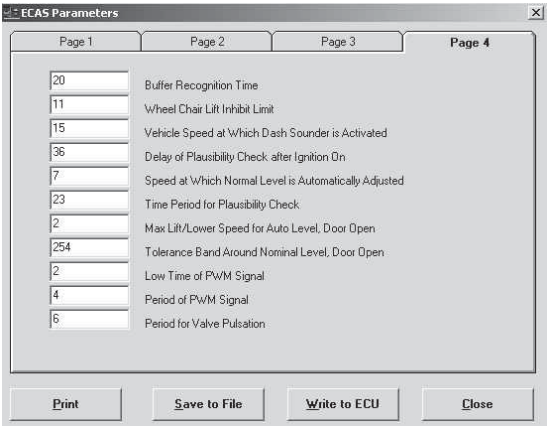
Use this option to change existing ECU ECAS parameters.

Contact Meritor WABCO **before** changing any of the vehicle parameters.









Use the ***Print***, ***Save to File*** or ***Write to ECU*** button at the bottom of the page to print, establish a file or send the new values to the ECU. You will be prompted to enter your user ID and password before performing these functions.

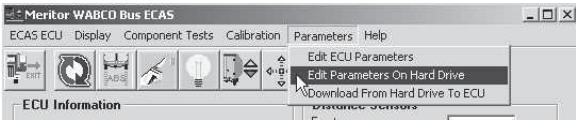
When finished, select ***Close*** to return to the ***Parameters*** pull down menu.

Edit Parameters on Hard Drive

Contact Meritor WABCO **before** changing any of the vehicle parameters.

Use this option to edit the ECU ECAS parameter file on the PC hard drive. This function changes the hard drive file only. It does not change parameters in the ECU until it is downloaded.

Select ***Edit Parameters on Hard Drive***. You will be prompted to enter your user ID and password. Provide the information requested. The four parameter screens will appear.

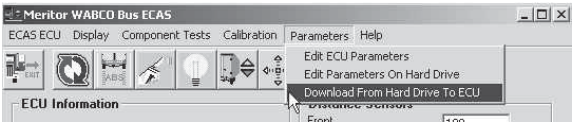


After making any changes, use the ***Print***, ***Save to File*** or ***Write to ECU*** button at the bottom of the page to print, establish a file or send the new values to the ECU.

Download From Hard Drive to ECU

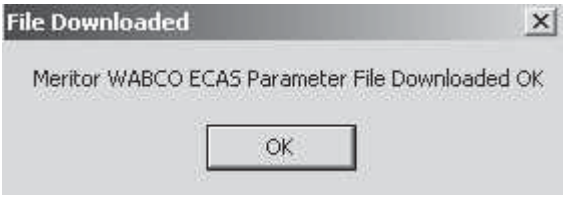
Contact Meritor WABCO **before** changing any of the vehicle parameters.

Use this option to send the changes made to the hard drive file to the ECU.



Use the ***Print***, ***Save to File*** or ***Write to ECU*** button at the bottom of the ECAS Parameters page to print, establish a file or send the new values to the ECU. You will be prompted to enter your user ID and password before performing these functions.

When the download is complete the ***File Downloaded*** screen will appear, indicating a successful download.



Select OK to return to the ***ECAS Main Menu***.

Appendix

Device Select Information

Before using TOOLBOX™ Software for the first time, you must indicate which COM port and adapter box will be used. If you have questions about Com Ports, Adapter Boxes or Drivers, the following information will answer many of your questions. Please review this material before you select the COM port and device. If you need further clarification, please contact the ArvinMeritor Customer Service Center at 1-800-535-5560.

Communication Drivers

Communication drivers are software programs that control the passing of data between the PC and the vehicle. Messages are sent and received via the PC's Com port and an adapter box.

Noregon communication drivers are included with the TOOLBOX™ installation CD. These drivers are RP1210A compliant and work with most adapter boxes (refer to adapter boxes). Some adapter boxes (i.e., MPSI MagiKey and Dearborn) require communication drivers other than Noregon. These drivers must be procured from the manufacturer and installed separately.

Adapter Box

An adapter box is an electronic device that connects the PC's COM port to the vehicle's diagnostic connector. It converts the computer's voltages to the levels used in the truck.

Selecting an Adapter Box in TOOLBOX™

To communicate correctly with the vehicle, TOOLBOX™ needs to know which adapter box is being used. To select an adapter box, run TOOLBOX™. Go to the ***System Setup*** menu and select ***COM Port*** from the pull down menu. All of the installed communication drivers with be displayed on the ***Vendor*** listing.

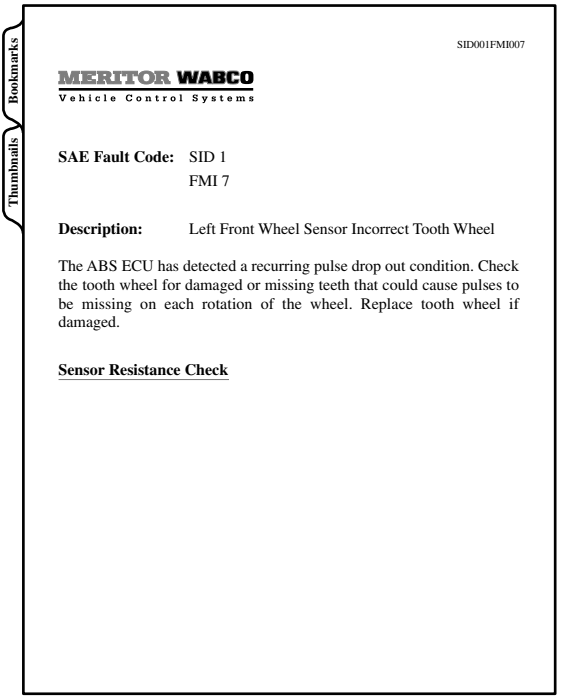
Once a vendor has been selected, the ***Protocol*** and ***Device*** lists will be updated, and the adapter can then be selected under ***Devices***.

Connecting the Adapter Box

Most adapter boxes require two cables, one that connects the PC to the adapter box and a second that connects the adapter box to the vehicle. The first cable is usually connected to the serial (COM) port on the PC, but in the case of the MPSI Parallel Data Module, the connection is made to the parallel (printer) port. The second cable goes to the diagnostic connector located in the vehicle.

Fault Information Sheet

This is an example of a Fault Information Sheet. These sheets are available in version 5.0 for Tractor ABS, Trailer ABS and Hydraulic ABS.



Bookmarks

Thumbnails

SID001FMI007

MERITOR WABCO
Vehicle Control Systems

SAE Fault Code: SID 1
FMI 7

Description: Left Front Wheel Sensor Incorrect Tooth Wheel

The ABS ECU has detected a recurring pulse drop out condition. Check the tooth wheel for damaged or missing teeth that could cause pulses to be missing on each rotation of the wheel. Replace tooth wheel if damaged.

Sensor Resistance Check

TOOLBOX™ Technical Support

For technical assistance, contact the ArvinMeritor Customer Service Center at 800-535-5560. Or, visit the Meritor WABCO website at www.meritorwabco.com and use the Contact Us form to email your request to a customer service representative.

To expedite your request, you should be prepared to provide the following information.

- TOOLBOX™ Software Version Number. To find the version number:

  Open TOOLBOX™.

  Click on Help, then on About PC Diagnostics.

  The version number will appear on the screen.
- ECU Type
- ABS Tractor: Basic, Universal or Frame
- ABS Trailer:

  Look at the ECU field on the ***ABS Tractor Main Menu***. If ECU type is not listed, refer to the vehicle specification sheet for this information.

Electronic Leveling Module (ELM)

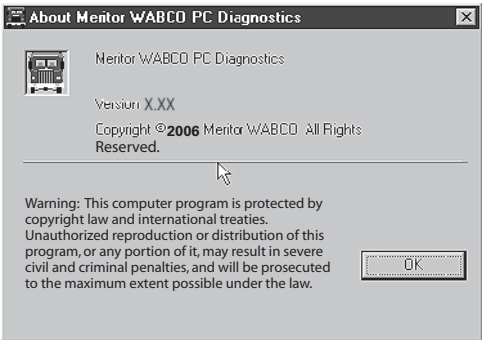
System Information

(Versions 5.0 and Higher)

Select ***System Information*** and follow the screen prompts to print a report of system hardware: operating system version, drivers, etc. Run this report whenever you contact the ArvinMeritor Customer Service Center.

About

Select ***About*** from the pull down menu for information about Meritor WABCO TOOLBOX™ Software, including the version number. You may need this information if you call the ArvinMeritor Customer Service Center.



MERITOR WABCO

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TOOLBOX™ Software
User's Manual
TP-99102

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