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IMPORTANT

Before operating or maintaining this unit, please read this manual carefully, paying extra attention to the safety warnings and precautions.

For Services and Support:

pro.autel.com
www.autel.com
1-855-288-3587/1-855-AUTELUS (North America)
0086-755-86147779 (China)
support@autel.com

For details, please refer to the *Service Procedures* in this manual.

Safety Information

For your own safety and the safety of others, and to prevent damage to the device and vehicles upon which it is used, it is important that the safety instructions presented throughout this manual be read and understood by all persons operating or coming into contact with the device.

There are various procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the person doing the work. Because of the vast number of test applications and variations in the products that can be tested with this equipment, we cannot possibly anticipate or provide advice or safety messages to cover every circumstance. It is the automotive technician's responsibility to be knowledgeable of the system being tested. It is crucial to use proper service methods and test procedures. It is essential to perform tests in an appropriate and acceptable manner that does not endanger your safety, the safety of others in the work area, the device being used, or the vehicle being tested.

Before using the device, always refer to and follow the safety messages and applicable test procedures provided by the manufacturer of the vehicle or equipment being tested. Use the device only as described in this manual. Read, understand, and follow all safety messages and instructions in this manual.

Safety Messages

Safety messages are provided to help prevent personal injury and equipment damage. All safety messages are introduced by a signal word indicating the hazard level.

DANGER

Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury to the operator or to bystanders.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury to the operator or to bystanders.

Safety Instructions

The safety messages herein cover situations Autel is aware of. Autel cannot know, evaluate or advise you as to all of the possible hazards. You must be certain that any condition or service procedure encountered does not jeopardize your personal safety.

DANGER

When an engine is operating, keep the service area WELL VENTILATED or attach a building exhaust removal system to the engine exhaust system. Engines produce

carbon monoxide, an odorless, poisonous gas that causes slower reaction time and can lead to serious personal injury or loss of life.

It is not advised to use headphones at a high volume

Listening at high volumes for long periods of time may result in loss of hearing.

⚠ Safety Warnings

- Always perform automotive testing in a safe environment.
- Wear safety eye protection that meets ANSI standards.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Operate the vehicle in a well-ventilated work area, for exhaust gases are poisonous.
- Put the transmission in PARK (for automatic transmission) or NEUTRAL (for manual transmission) and make sure the parking brake is engaged.
- Put blocks in front of the drive wheels and never leave the vehicle unattended while testing.
- Be extra cautious when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running.
- Keep a fire extinguisher suitable for gasoline, chemical, and electrical fires nearby.
- Do not connect or disconnect any test equipment while the ignition is on or the engine is running.
- Keep the test equipment dry, clean, free from oil, water or grease. Use a mild detergent on a clean cloth to clean the outside of the equipment as necessary.
- Do not drive the vehicle and operate the test equipment at the same time. Any distraction may cause an accident.
- Refer to the service manual for the vehicle being serviced and adhere to all diagnostic procedures and precautions. Failure to do so may result in personal injury or damage to the test equipment.
- To avoid damaging the test equipment or generating false data, make sure the vehicle battery is fully charged and the connection to the vehicle DLC is clean and secure.
- Do not place the test equipment on the distributor of the vehicle. Strong electro-magnetic interference can damage the equipment.

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1 Using This Manual

This manual contains device usage instructions.

Some illustrations shown in this manual may contain modules and optional equipment that are not included in your system.

1.1 Conventions

The following conventions are used.

1.1.1 Bold Text

Bold text is used to highlight selectable items such as buttons and menu options.

Example:

- Tap **OK**.

1.1.2 Notes and Important Messages

Notes

A **NOTE** provides helpful information such as additional explanations, tips, and comments.

Example:

NOTE
New batteries reach full capacity after approximately 3 to 5 charging and discharging cycles.

Important

IMPORTANT indicates a situation which that if not avoided may result in damage to the tablet or vehicle.

Example:

IMPORTANT
Keep the cable away from heat, oil, sharp edges and moving parts. Replace damaged cables immediately.

1.1.3 Hyperlink

Hyperlinks or links that take you to other related articles, procedures, and illustrations are available in electronic documents. Blue italic text indicates a selectable hyperlink and blue underlined text indicates a website link or an email address link.

1.1.4 Illustrations

Illustrations used in this manual are samples, and the actual testing screen may vary for each vehicle being tested. Observe the menu titles and on-screen instructions to make correct option selection.

1.1.5 Procedures

An arrow icon indicates a procedure.

Example:

➢ **To use the camera:**

1. Tap the **Camera** button. The camera screen opens.
2. Focus the image to be captured in the view finder.
3. Tap the inner blue circle. The view finder now shows the captured picture and auto-saves the taken photo.
4. Tap the thumbnail image on the top right corner of the screen to view the stored image.
5. Tap the **Back** or **Home** button to exit the camera application.

2 General Introduction

The MaxiSys Ultra is a multi-platform diagnostic solution comprised of a powerful 12.9-inch TFT-LCD touchscreen Android-based tablet, a VCMI communication and diagnostic measurement unit and an on-tool and cloud-based repair instructions and expert advice. As an intelligent diagnostic and information system, MaxiSys Ultra not only displays the relevant repairs gathered from experienced industry experts, but provides step-by-step guidance to ensure the repair is done correctly and efficiently.

There are three main components to the MaxiSys system:

- MaxiSys Tablet – the central processor and monitor for the system.
- MaxiFlash VCMI - Vehicle Communication and Measurement Interface

This manual describes the construction and operation of these devices and how they work together to deliver diagnostic solutions.

2.2 MaxiFlash VCMI – Vehicle Communication and Measurement Interface

2.2.1 Functional Description

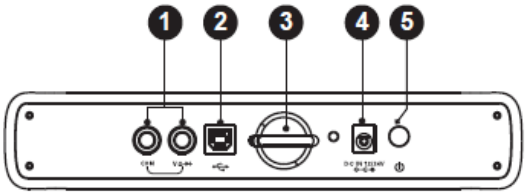


Figure 2-5 ***VCMI Top View***

1. Multimeter Jacks
2. USB Port
3. Hook
4. DC Power Supply Input Port
5. Power Button

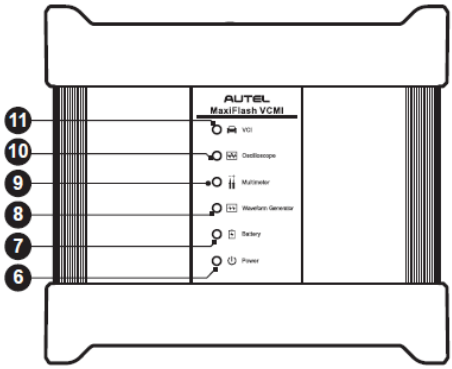


Figure 2-6 *VCMI Front View*

6. Power LED – refer to Table 2-4 Power LED Description for details
7. Battery LED - refer to Table 2-5 Battery LED Description for details
8. Signal Generator LED - lights green when operating in the signal generator mode
9. Multimeter LED - lights green when operating in the multimeter mode
10. Oscilloscope LED - lights green when operating in the oscilloscope mode and flashes green when communicating
11. Vehicle LED - refer to Table 2-6 Vehicle LED Description for details

IMPORTANT

Do not disconnect the programming device while the vehicle LED status light is on! If the flash programming procedure is interrupted while the vehicle's ECU is blank or only partially programmed, the module may be unrecoverable.

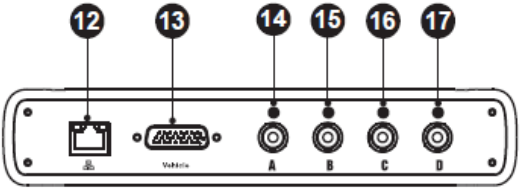


Figure 2-7 VCMI Bottom View

12. Ethernet Port
13. Vehicle Data Connector (DB26-Pin)
14. Input Channel A
15. Input Channel B
16. Input Channel C
17. Input Channel D

Table 2-4 *Power LED Description*

LED	Color	Description
Power	Yellow	Lights yellow automatically at power up when VCMI is self-testing.
	Green	Lights solid green when powered on.
	Red	● Lights solid red when system failure occurs. ● Flashes red when VCMI is upgrading.

Table 2-5 *Battery LED Description*

LED	Color	Description
Battery	Green	● Flashes green when VCMI is charging. ● Lights solid green when fully charged or the battery level is above 75%.
	Yellow	Lights yellow when the battery level is above 25% but below 75%.
	Red	● Lights red when the battery level is above 10% but below 25%. ● Flashes red when the battery level is below 10%.

Table 2-6 *Vehicle LED Description*

LED	Color	Description
Vehicle	Green	Lights solid green when connected via USB cable. Flashes green when communicating.
	Blue	Lights solid blue when connected via BT. Flashes blue when communicating.
	Cyan (Blue/Green)	Lights solid cyan when connected via Wi-Fi. Flashes cyan (blue/green) when communicating.
	Magenta (Blue/Red)	Lights solid magenta when connected via Internet cable. Flashes magenta (blue/red) when communicating.

Communication Capability

The Vehicle Communication and Measurement Interface supports Bluetooth (BT), Wi-Fi and USB communications. It can transmit vehicle data to the tablet with or without

a cable connection. In open areas, the working range of the transmitter through BT communication is up to 328 feet (100 m). The working range of 2.4G Wi-Fi communication is up to 328 feet (100 m) while 5G Wi-Fi is up to 164 feet (50 m). If the signal is lost due to being taken out of range, communication will be restored once the tablet is within range.

Measurement Capability

The VCMI device is designed with the functions of multimeter, oscilloscope, signal generator and OBDII communication line inspection. The parameters such as voltage, resistance, current, signal frequency, and voltage-time characteristic of the signal can be measured and the results are displayed on the tablet.

Programming Capability

The VCMI device is a D-PDU, SAE J2534-1 & RP1210 compliant PassThru programming interface device. Using the updated OEM software, it is capable of replacing the existing software/firmware in the Electronic Control Units (ECU), programming new ECUs and fixing software-controlled drivability issues and emission issues.

2.2.2 Power Sources

The VCMI device can receive power from the following sources:

- Vehicle Power
- AC/DC Power Supply
- Built-in rechargeable Battery Pack

Vehicle Power

The VCMI device operates on 12/24 Volt vehicle power, which it receives through the vehicle data connection port. The device powers on whenever it is connected to an OBD II/EOBD compliant data link connector (DLC). For non OBD II/EOBD compliant vehicles, the device can be powered from a cigarette lighter or other suitable power port on the test vehicle using the auxiliary power cable.

AC/DC Power Supply

The VCMI device can be powered from a wall socket using the AC/DC power adapter.

Built-in Battery Pack

The VCMI device can also be powered with its built-in 3750mAh battery pack.

2.2.3 Technical Specifications

Table 2-7 *VCMI Specifications*

Item	Description
Communications	● BT V2.1 + EDR ● USB 2.0 ● Wi-Fi 2.4G/5G ● Ethernet
Wireless Frequency	2.4GHz/5GHz
Power and Battery	● 3750 mAh lithium-polymer battery ● Charging via 12 V DC power supply
Operating Temp.	0°C to 50°C
Storage Temp.	-20°C to 60°C
Dimensions (L x W x H)	214 mm (8.43”) x 192 mm (7.56”) x 39 mm (1.54”)
Weight	1.2kg (2.64 lb.)

Note

For additional information, please refer to the accompanied user manual for the VCMI device.

2.3 Accessories Kit

2.3.1 Main Cable

The VCMI device can be powered through the Main Cable when connected to an OBD II/EOBD compliant vehicle. The Main Cable connects the VCMI device to the vehicle’s data link connector (DLC), through which the VCMI device can transmit vehicle data to the tablet.

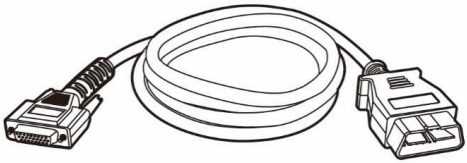


Figure 2-9 ***Main Cable – 1.5 m in length***

2.3.2 OBD I-Type Adapters

The OBD I-type adapters are for Non-OBDII vehicles. The adapter used depends on the type of vehicle being tested. The most common adapters are shown below (Adapters may be sold separately, please contact your distributor for details).

Benz-14

Chrysler-16

BMW-20

Nissan-14

Mitsubishi/Hyundai-12+16

Fiat-3

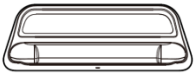
PSA-2

Mazda-17

VW/Audi-2+2

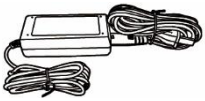
Benz-38

2.3.3 Other Accessories



Docking Station
Provides power to the tablet.

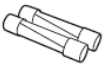
Standard 2.0 USB Cable
Connects the tablet to the VCMI unit.



AC/DC External Power Adapter
Connects the tablet to the external DC power port for power supply.

Cigarette Lighter
Provides power to the tablet or the VCMI device through connection to the vehicle's cigarette lighter receptacle, as some non-OBD II vehicles cannot provide power via the DLC connection.

Clipper Cable
Provides power to the tablet or the VCMI device through connection to the vehicle's battery.



Lighter Fuse x2

A safety device for the cigarette lighter.

3 Getting Started

Make sure the tablet has sufficient power or is connected to the external power supply (see *Power Sources* on page 5).

3.1 Power Up

Press and hold (long press) the Lock/Power button on the top right side of the tablet to switch the unit on. The system boots up and displays the MaxiSys Job Menu.

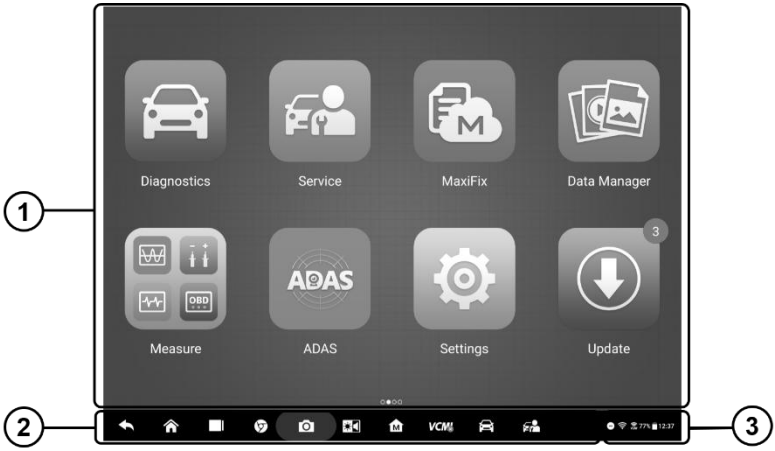


Figure 3-1 ***Sample MaxiSys Job Menu***

1. Application Buttons
2. Locator and Navigation Buttons
3. Status Icons

NOTE

It is recommended to lock the screen when not in use to protect information in the system and conserve the power.

Almost all operations on the tablet are controlled through the touchscreen. The touchscreen navigation is menu driven allowing for quick access you to test procedure, or data that you need, through a series of questions and options. Detailed descriptions of the menu structures are found in the chapters for each application.

3.1.1 Application Buttons

The table below briefly describes each of the applications in the MaxiSys system.

Table 3-1 *Applications*

Name	Button	Description
Diagnostics		Accesses the unit's diagnostics functions. See *Diagnostics* on page 20.
Service		Accesses special functions menu. See *Service* on page 74.
MaxiFix		Provides an extensive resource of repair techniques and diagnostic information. See *MaxiFix* on page 88.
Measurement		Software tools that measure vehicle system parameters such as voltage, resistance, current, and monitor signal activities. See *Measurement* on page 103.
Data Manager		Accesses the saved repair shop, customer and vehicle data including detail vehicle diagnostics and test record history. See Data Manager on page 246.
Settings		Accesses the system settings menu and general tablet menu. See *Settings* on page 255.
Update		Accesses system software update menu. See *Update* on page 260.
VCMI Manager		Accesses VCMI connection menu. See *VCMI Manager* on page 262.
ADAS		Accesses ADAS systems menu. See *ADAS* on page 267.
Support		Synchronizes Autel's online service database with the MaxiSys tablet. See *Support* on page 268.
Remote Desktop		Configures your unit to receive remote support using the TeamViewer application. See Remote Desktop on page 273.
Quick Link		Provides associated website bookmarks to allow quick access to product update, service, support

Name	Button	Description
		and other information. See *Quick Link* on page 275.
MaxiViewer		Provides a quick search for supported functions and/or vehicles. See MaxiViewer on page 276.
MaxiVideo		Configures the unit to operate as a video scope device by connecting to an Imager head cable for close vehicle inspections. See *MaxiVideo* on page 278.
MaxiMall		Purchase the software update subscriptions directly from tablet. See *MaxiMall* on page 285.

3.1.2 Locator and Navigation Buttons

Operations of the Navigation buttons at the bottom of the screen are described in the table below:

Table 3-2 *Locator and Navigation Buttons*

Name	Button	Description
Locator		Indicates the location of the screen. Swipe the screen left or right to view the previous or next screen.
Back		Returns to the previous screen.
Android Home		Returns to Android System's Home screen.
Recent Apps		Displays a list of applications that are currently running. Tap an app icon to launch. Remove an app by swiping it to the right. Long press (press and hold) the icon to display side-by-side windows that enable you to perform operations simultaneously when applications are opened. Long press again to exit the multi-window display. Note: Not all the applications support the multi-window display function.
Browser		Launches the Chrome Internet browser.

Name	Button	Description
Camera		Tap icon to open camera viewfinder. Press and hold icon to capture screenshot of display screen. The saved files are auto-stored in the Data Manager application for later review. See Data Manager on page 246.
Display & Sound		Adjusts the brightness of the screen and the volume of the audio output.
MaxiSys Home		Returns to MaxiSys Job Menu.
VCMI		Opens the VCMI Manager application. A green icon at the bottom right corner indicates the VCMI device is connected, a red X icon will display if connection fails. The battery status icon displays the remaining VCMI power.
MaxiSys Shortcut		Returns to the Diagnostics screen.
Service		Returns to the Service screen.

➢ **To use the camera:**

1. Tap the **Camera** button. The camera screen opens.
2. Focus the image to be captured in the view finder.
3. Tap the inner blue circle. The view finder now shows the captured picture and auto-saves the taken photo.
4. Tap the thumbnail image on the top right corner of the screen to view the stored image.
5. Tap the **Back** or **Home** button to exit the camera application.

Refer to Android documentation for additional information.

3.1.3 System Status Icons

Your MaxiSys tablet is a fully functional Android tablet with the standard Android operation system status icons. Refer to Android documentation for additional information.

3.2 Power Down

All vehicle communications should be terminated before shutting down the tablet. A warning message displays if a shutdown is attempted while the tablet is communicating with the vehicle. Forcing a shut down while the tablet is communicating with the vehicle

may lead to ECM problems on some vehicles. Please exit the Diagnostics application before shutting off the tablet.

➢ **To power down the MaxiSys tablet:**

1. Long press (press and hold) the Lock/Power Button.
2. Tap **Power off** option.
3. Tap **OK**.

3.2.1 Reboot System

In case of system crash, long press the Lock/Power button and tap **Restart** to reboot the system.

3.3 Configure Printing

To print from the MaxiSys tablet, printer software needs to be installed on a Windows-based computer that is connected to a printer.

➢ **To install the MaxiSys Printer driver program:**

1. Download the **Maxi PC Suite** from www.autel.com > *Support & Updates* > *Firmware & Downloads* > *Update Client*, and install to your windows-based computer.
2. Follow the pop-up instructions to install the Maxi PC Suit to your PC.
3. After the Maxi PC Suite installation, the printer driver program, **PC Link,** will be automatically installed on your PC.
4. Click on **Finish** to complete the installation procedure.

3.3.1 Printing Operation

This section describes how to receive files from the tablet through the windows PC to the connected printer.

➢ **To perform printing through the computer**

1. Before printing, ensure the tablet is connected either via Wi-Fi or LAN, See Printing Setting on page 256 for more information.
2. Launch the PC Link application on the computer to open up the printer dialog windows.
3. Click **Test Print** to make sure the printer is working successfully.

4. Tap the **Print** button on the toolbar displayed in various applications of the MaxiSys system. A temporary file will be created and sent to the computer for printing.

5. Ensure the Auto Print function to automatically print the files received from the tablet.

To print the document later, click the **Open PDF file** and select the document, and double click the **Print** on the MaxiSys Printer interface to start printing.

NOTE

Ensure the computer with the PC Link software installed is connected to a printer.

4 Diagnostics

The Diagnostics application can access the electronic control module of multiple vehicle control systems, including but not limited to the engine, transmission, antilock brake system (ABS) and airbag system (SRS).

4.1 Establish Vehicle Communication and Selection

4.1.1 Establish Vehicle Communication

The Diagnostics operations require connecting the MaxiSys Ultra Diagnostic tablet to the test vehicle through the VCMI device using the Main Cable. (Use the applicable OBD I-type adapter if needed). To establish proper vehicle communication to the tablet, you need to perform the following steps:

1. Connect the VCMI device to the vehicle's DLC for both communication and power source.
2. Connect the VCMI device to the tablet via BT pairing, Wi-Fi or USB connection.
3. When the above steps are completed, check the VCMI navigation button at the bottom bar on the screen, if a green BT, Wi-Fi or USB icon displays at the lower right corner, the MaxiSys Ultra Diagnostic Platform is ready to start vehicle diagnosis.

4.1.1.1 Vehicle Connection

The method used to connect the VCMI device to a vehicle's DLC depends on the vehicle's configuration as follows:

- A vehicle equipped with an On-board Diagnostics Two (OBD II) management system supplies both communication and 12-volt power through a standardized J-1962 DLC.
- A vehicle not equipped with an OBD II management system supplies communication through a DLC connection, and in some cases supplies 12-volt power through the cigarette lighter receptacle or a connection to the vehicle battery.

OBD II Vehicle Connection

This type of connection only requires the main cable without any additional adapter.

➢ **To connect to an OBD II vehicle**

1. Connect the main cable's female adapter to the Vehicle Data Connector on the

VCMI device, and tighten the captive screws.

2. Connect the cable's 16-pin male adapter to the vehicle's DLC, which is generally located under the vehicle dash.

NOTE

The vehicle's DLC is not always located under the dash; refer to the user manual of the test vehicle for additional connection information.

Non-OBD II Vehicle Connection

This type of connection requires both the main cable and a required OBD I adapter for the specific vehicle being serviced.

There are three possible conditions for Non-OBD II vehicle connection:

- DLC connection supplies both communication and power.
- DLC connection supplies communication and power is to be supplied via the cigarette lighter connection.
- DLC connection supplies communication and power is to be supplied via connection to the vehicle battery.

➢ **To connect to a Non-OBD II Vehicle**

1. Connect the main cable's female adapter to the Vehicle Data Connector on the VCMI device, and tighten the captive screws.
2. Locate the required OBD I adapter and connect its 9-pin jack to the main cable's male adapter.
3. Connect the attached OBD I adapter to the vehicle's DLC.

NOTE

Some vehicles may have more than one adapter or may have test leads instead of an adapter. Make the proper connection to the vehicle's DLC as required.

➢ **To connect the cigarette lighter**

1. Plug the DC power connector of the cigarette lighter into the DC power supply input port on the device.
2. Connect the male connector of the cigarette lighter into the vehicle's cigarette lighter receptacle.

➢ **To connect the clipper cable**

1. Connect the tubular plug of the clipper cable to the male connector of the cigarette lighter.

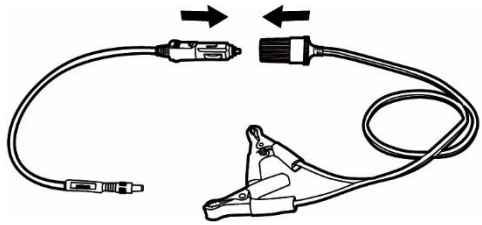


Figure 4-1 ***Connection between Cigarette Lighter and Clipper Cable***

2. Plug the DC power connector of the cigarette lighter into the DC power supply input port of the VCMI device.
3. Connect the clipper cable to the vehicle's battery.

NOTE

After the VCMI device is successfully connected to the vehicle, the Power LED on the device lights, and a beep sound will be heard.

4.1.1.2 VCMI Connection

After the VCMI device is properly connected to the vehicle, the Power LED on the VCMI device lights solid green, and is ready to establish communication with the tablet.

Coming with the MaxiSys Ultra tool kit, the VCMI device supports three communication methods with the tablet: BT, Wi-Fi and USB.

Pairing Up via BT

In open areas, the working range for BT communication is about 328 feet (100 m), giving technicians greater mobility to perform vehicle diagnosis from anywhere in the repair shop.

To expedite multi-vehicle diagnostics, more than one VCMI can be used in busy repair shops enabling technicians to quickly pair via BT their Ultra to each VCIM separately and therefore eliminating the need to unplug the VCMI from one vehicle and then connect it to another each time.

➢ **To pair the tablet with the VCMI device via BT**

1. Power up the tablet.
2. Select the **VCMI Manager** application from the MaxiSys Job Menu.
3. When the **VCMI Manager** application is opened, the device automatically scans for available VCMI devices for BT pairing. The found devices are listed in the Setting section on the right side of the screen.

NOTE
If no VCMI device is found, this may indicate that the signal strength is too weak to be detected. Reposition the VCMI device, and remove all possible objects that may cause signal interference. Tap the **Scan** button at the top right corner to rescan for VCMI.

4. Typically, the VCMI device name displays as Maxi suffixed with a serial number. Select the VCMI device for pairing. (If more than one VCMI is used in the shop, ensure the correct VCMI is selected to pair.)
5. When pairing is successful, the connection status displays as Connected.
6. The VCMI icon on the tablet Navigation bar at the bottom of the screen displays a green circle BT icon when the tablet and the VCIM are connected.

Refer to *BT Pairing* on page 264 for additional information.

Wi-Fi Connection

The VCMI device supports both 2.4GHz and 5GHz Wi-Fi connection. Please choose 2.4GHz or 5GHz Wi-Fi connection according to specific situations. In open areas, the working range of 2.4G Wi-Fi communication is up to 328 feet (100 m) while 5G Wi-Fi is up to 164 feet (50 m).

➢ **To pair the tablet with the VCMI device via Wi-Fi**

1. Power up the tablet.
2. Select the **VCMI Manager** application from the MaxiSys Job Menu.
3. When the **VCMI Manager** application is opened, the tablet automatically scans for available VCMI devices for Wi-Fi connection. Found VCMI devices are listed in the Setting section on the right side of the screen.
4. Typically, the VCMI device name displays as Maxi suffixed with a serial number. Select the required device for connection.
5. When pairing is successful, the connection status is shown as Connected.
6. The VCMI icon on the tablet Navigation bar at the bottom of the screen displays a green circle Wi-Fi icon when the tablet and the VCIM are connected.

Refer to *Wi-Fi Connection* on page 263 for additional information.

USB Cable Connection

The USB cable connection is a simple and quick way to establish communication between the tablet and the VCMI device. After properly connecting the USB cable from the tablet to the VCMI device, the VCMI navigation button at the bottom bar of the screen displays a green check mark, and the USB LED on the VCMI device lights solid green, indicating the connection between the devices is successful.

The MaxiSys diagnostic platform is now ready to perform vehicle diagnosis.

NOTE

Since the USB connection provides the most stable and fastest communication and is the recommended communication method between the tablet and VCMI when operating ECU programming or coding. The USB communication method will take priority over other connected communication methods.

4.1.1.3 No Communication Message

A. If the tablet is unable to connect to the VCMI, an “Error” message displays. An “Error” message indicates the tablet is not communicating with the VCMI device. Troubleshoot the error by performing the following steps:
   - Ensure the VCMI device is powered on.
   - When using the wireless connection, ensure the network is configured correctly and the proper device has been connected.
   - If the tablet loses communication abruptly during the diagnosis, ensure no objects are causing signal interruption.
   - Ensure the VCMI device is properly positioned with the VCMI front side up.
   - Move the tablet closer to the VCMI device. If using the wired connection, ensure the cable is securely attached to the VCMI.
   - Ensure the VCMI communication mode is lit for the selected communication type: BT, Wi-Fi or USB.

B. If the VCMI device is unable to establish a communication link, a message will display troubleshooting instructions. Possible causes for the communication error include:
   - The VCMI device is unable to establish a communication link with the vehicle.
   - A vehicle system has been selected for diagnoses that is not supported by the vehicle.
   - There is a loose connection.
   - There is a blown vehicle fuse.
   - The vehicle or the data cable has a wiring fault.
   - There is a circuit fault in the data cable or adapter.
   - The vehicle identification is incorrectly entered.

4.1.2 Getting Started

Prior to first use of the Diagnostics application, ensure the VCMI device is properly connected to and is communicating with the tablet. See *VCMI Manager* on page 262.

4.1.2.1 Vehicle Menu Layout

When the VCMI device is properly connected to the vehicle, and paired to the tablet, the platform is ready to start vehicle diagnosis. Tap on the Diagnostics application button on the MaxiSys Job Menu, the Vehicle Menu displays on the screen.

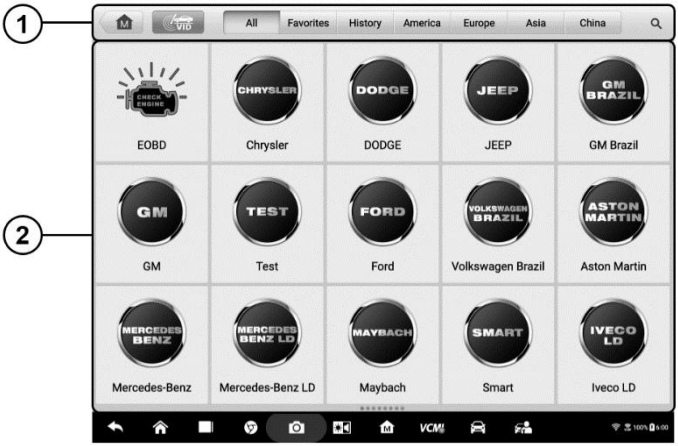


Figure 4-2 ***Sample Vehicle Menu Screen***

1. Top Toolbar Buttons
2. Manufacturer Buttons

Top toolbar Buttons

The operations of the Toolbar buttons at the top of the screen are listed and described in the table below:

Table 4-1 ***Top Toolbar Buttons***

Name	Button	Description
Home		Returns to the MaxiSys Job Menu.
VID Scan		Tap this button to open a dropdown list; tap **Auto Detect** for auto VIN detection; tap **Manual Input** to enter VIN code or license number manually. Tap **Scan VID** to scan the license number / VIN code by camera.
All	All	Displays all the vehicle makes in the vehicle menu.
Favorites	Favorites	Displays user-selected favorite vehicle makes.
History	History	Displays the stored test vehicle history records. This option provides direct access to the previously tested vehicle recorded during previous tests. See *Vehicle History* on page 247.
America	America	Displays the American vehicle menu.

Name	Button	Description
Europe	Europe	Displays the European vehicle menu.
Asia	Asia	Displays the Asian vehicle menu.
China	China	Displays the Chinese vehicle menu.
Search	Search	Tap inside the search field to display the virtual keyboard and input the vehicle manufacturer to test.
Cancel	Cancel	Tap this button to exit the search screen or cancel an operation.

Manufacturer Buttons

The Manufacturer buttons display the various vehicle brand names. Select the manufacturer button after the VCMI device is properly connected to the test vehicle to start a diagnostic session.

4.1.3 Vehicle Identification

The MaxiSys diagnostic system supports five methods of Vehicle Identification.

1. Auto VIN Scan
2. Manual Input
3. Scan License / VIN
4. Manual Vehicle Selection
5. OBDII Direct Entry

4.1.3.1 Auto VIN Scan

The MaxiSys diagnostic system features the latest VIN-based Auto VIN Scan function to identify CAN vehicles in just one tap, enabling the technician to quickly identify the exact vehicle and scan its available systems for fault codes.

➢ **To perform Auto VIN Scan**

1. Tap the **Diagnostics** application button from the MaxiSys Job Menu. The Vehicle Menu displays.
2. Tap the **VID Scan** button on the top toolbar.
3. Select **Auto detect**. The tablet starts VIN scanning on the vehicle's ECU. Once the test vehicle is successfully identified, the system will guide you to the Vehicle Diagnostics screen.

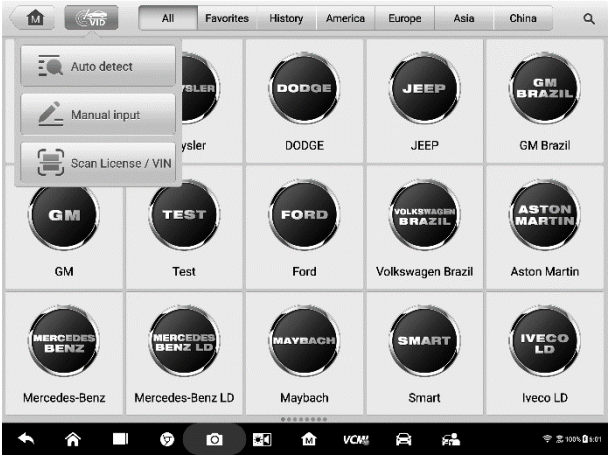


Figure 4-3 ***Sample Auto Detect Screen***

Depending on the vehicle, the Auto VIN function is still available after a vehicle brand is selected.

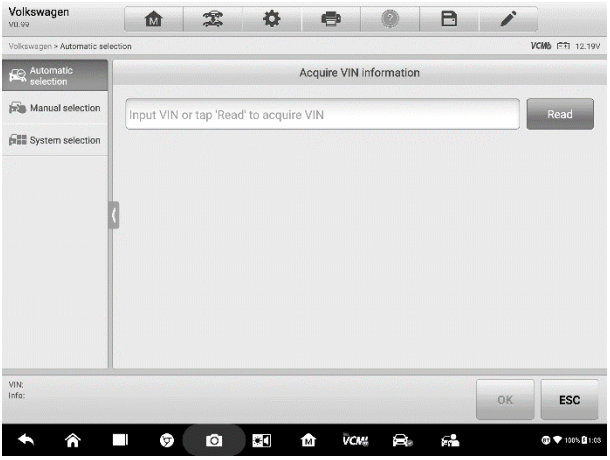


Figure 4-4 Sample Vehicle Selection Screen

Select **Automatic Selection** and the system will acquire VIN information automatically or allow users to input the VIN manually.

4.1.3.2 Manual Input

For vehicles that do not support the Auto VIN Scan function, the MaxiSys diagnostic system allows you to enter the vehicle VIN manually, or simply take a photo of the VIN sticker for quick vehicle identification.

➢ **To perform Manual Input**

1. Tap the **Diagnostics** application button from the MaxiSys Job Menu. The Vehicle Menu displays.
2. Tap the **VID Scan** button on the top toolbar.
3. Select **Manual input**.
4. Tap the input box and enter the correct VIN code or license numbers.

Figure 4-5 ***Sample Manual VIN Input***

5. Tap **OK**. The vehicle will be identified and matched to the vehicle database and the Vehicle Diagnostics screen will display.
6. Tap **Cancel** to exit Manual Input.

4.1.3.3 Scan License / VIN

Tap **Scan License / VIN** in the dropdown list (Figure 4-3), the camera will be opened. Position the tablet to align the license number or VIN Code within the scanning window, and the license number or VIN code will be scanned and identified automatically, tap "**OK**".

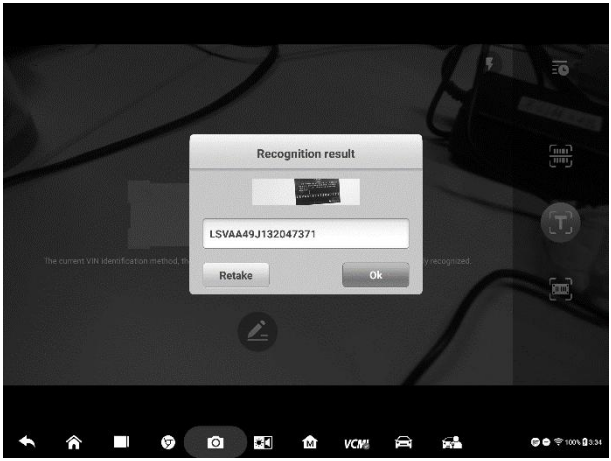


Figure 4-6 *Sample Scan License / VIN Code 1*

The vehicle information will be displayed on the tablet. If previous diagnostic records are present for the vehicle, these records and the vehicle information will display. The vehicle number and/or vehicle make, model and year must be entered manually if no record for a vehicle with the scanned license number exists on the tablet.

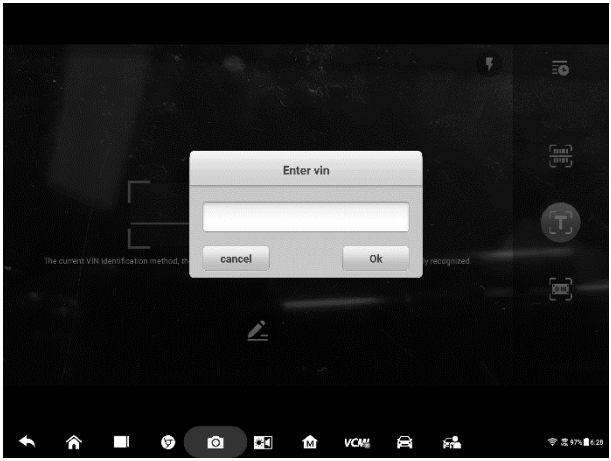


Figure 4-7 *Sample Scan License / VIN Code 2*

4.1.3.4 Manual Vehicle Selection

When the vehicle’s VIN is not automatically retrievable through the vehicle's ECU, or the specific VIN is unknown, you can select the vehicle manually.

Step-by-step Vehicle Selection

This mode of vehicle selection is menu driven. Follow the screen prompts and make a series of choices. Each selection you make advances you to the next screen. A **Back** button at the lower right corner of the screen returns you to the previous screen. Procedures may vary by the vehicle being tested.

4.1.3.5 Alternative Vehicle Identification

Occasionally, the tablet may not be able to identify a vehicle. For these vehicles, the user may perform a generic OBDII or EOBD diagnostics. See *Generic OBD II Operations* on page 56 for additional information.

4.2 Diagnostics Screen Layout

This section describes how to navigate the Diagnostics interface and select test options.

4.2.1 Diagnostics Screen Layout

The Diagnostics screens typically includes six sections.

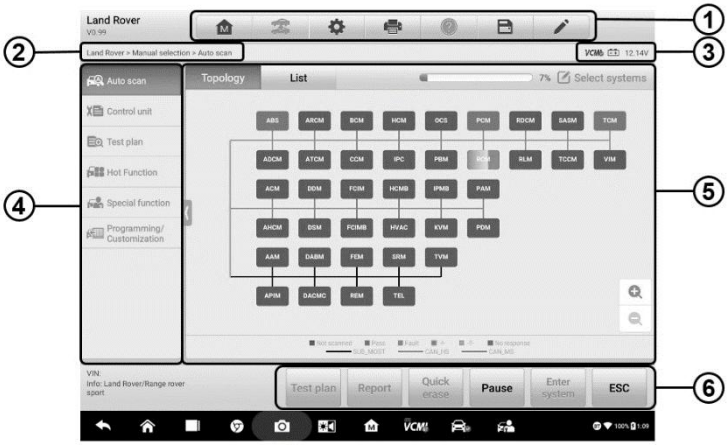


Figure 4-8 ***Sample Diagnostics Screen***

1. Diagnostics Toolbar
2. Current Directory Path
3. Status Information Bar
4. Navigation Bar
5. Main Section

6. Functional Buttons

Diagnostics Toolbar

The Diagnostics Toolbar contains buttons that allow you to print or save the displayed data and perform other operations. The table below provides a brief description for the operations of the Diagnostics toolbar buttons:

Table 4-2 *Diagnostics Toolbar Buttons*

Name	Button	Description
Home		Returns to the MaxiSys Job Menu.
Vehicle Swap		Exits the diagnostic session and returns to the vehicle menu screen to select another vehicle for testing.
Settings		Opens the setting screen. See *Settings* on page 255.
Print		Saves and prints a copy of the displayed data. See *Print* on page 256.
Help		Provides instructions or tips for operations of various diagnostic functions.
Save		Opens a submenu for the 3 options to save data. • Tap **Save This Page** to take a screenshot image • Tap **Save All Data** to save a PDF file (used this save option when data displays on multiple screens) • Tap **Start Saving** to record a video clip (available for recording Live Data or graph data only) These files are stored in Data Manager application for later reviews. See Data Manager on page 246.
Data Logging		Use this function when encountering an error when testing or diagnosing a vehicle. This function will record the communication data and ECU information of the test vehicle and send it to Autel's technical staff to review and provide solution. Go to the Support application to follow up the processing progress, see *Data Logging* on page 271.

➢ **To print data in Diagnostics**

1. Tap the **Diagnostics** application button on the MaxiSys Job Menu. The **Print** button on the diagnostic toolbar is available throughout the Diagnostics operations.
2. Tap **Print** and a drop-down menu displays.
   a) **Print This Page** – prints a screenshot copy of the current screen.
   b) **Print All Data** – prints a PDF copy of all displayed data.
3. A temporary file will be created and sent via the computer to the printer.
4. When the file is sent, a confirmation message displays.

NOTE

Make sure the tablet and the printer are connected either by Wi-Fi or LAN before printing. For more instructions on printing, see *Print* on page 256 for details.

➢ **To submit Data Logging reports in Diagnostics**

1. Tap the **Diagnostics** application button from the MaxiSys Job Menu. The pen-shaped **Data Logging** button on the diagnostic toolbar is available throughout the whole Diagnostics operations.
2. Tap the **Data Logging** button (a pen icon) to open a selection box. Select from a list of errors to generally describe the problem encountered. A blue check mark will display adjacent to the error selected. Tap **OK** to continue.
3. A submission form will display to let you fill in the report information.
4. Tap the **Send** button in the upper right corner of the screen to submit the report form via the Internet, a confirmation message displays when sent successfully.

Status Information Bar

The Status Information Bar at the top of the Main Section displays the following items:

1. VCMI Icon – indicates the communication status between the tablet and the VCMI device.
2. Battery Icon – indicates the battery status of the vehicle.

Main Section

The Main Section varies depending on the stage of operations which shows vehicle identification selections, the main menu, test data, messages, instructions and other diagnostic information.

The Main Section can display as two format types, a topology map and a listing of vehicle modules.

A. Topology Tab Page

The Topology Tab Page displays a system distribution diagram of the vehicle control modules.

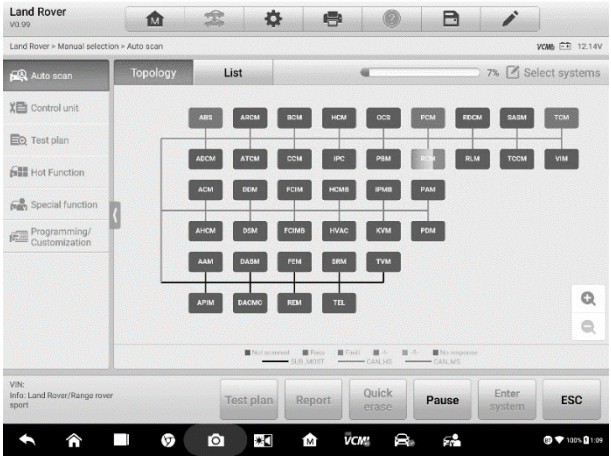


Figure 4-9 *Sample* Topology Tab Page

Tap a module to perform further diagnosis and test. A Function Menu screen (Figure 4-11) will display.

B. List Tab Page

Column 1 – displays the system numbers.

Column 2 – displays the scanned systems.

Column 3 – displays the scan results.

- ✧ **-!-**: Indicates that the scanned system may not support the code reading function, or there is a communication error between the tester and the control system.
- ✧ **-?-**: Indicates that the vehicle control system has been detected, but the tester cannot access it.
- ✧ **Fault | #**: Indicates there is/are detected fault code(s) present; "#" indicates the quantity of detected faults.
- ✧ **Pass | No Fault**: Indicates the system was scanned and no fault has been detected.
- ✧ **Not Scanned**: Indicates the system has not been scanned.
- ✧ **No Response:** Indicates the system has not received a response.

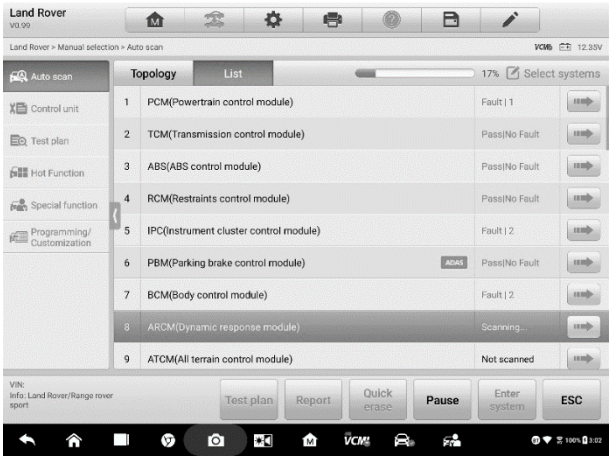


Figure 4-10 *Sample* List Tab Page

Functional Buttons

The type of Functional Buttons displayed on the bottom of the screen vary by operation. Function include navigation, reporting and code clearing. The functions of these buttons will be described in the following sections when relevant.

The table below provides a brief description of the Functional Buttons' operations in Auto Scan:

Table 4-3 *Functional Buttons in Diagnostics Screen*

Name	Description
Report	Displays the diagnostic data in the report form.
Quick Erase	Erases DTC records and other data from the ECM.
Fault Scan	Scans vehicle system modules.
Pause	Pauses the scanning process.
Enter System	Enters the ECU system.
ESC	Returns to the previous screen or exit Auto Scan.

Select one of the system modules from the Topology or List, and tap **Enter System** to enter the specific system functions

NOTE

The Diagnostic Buttons Toolbar (located on the top pf the screen) will be active throughout the diagnostic session for such tasks as printing and saving the displayed data, obtaining help information, or performing data logging

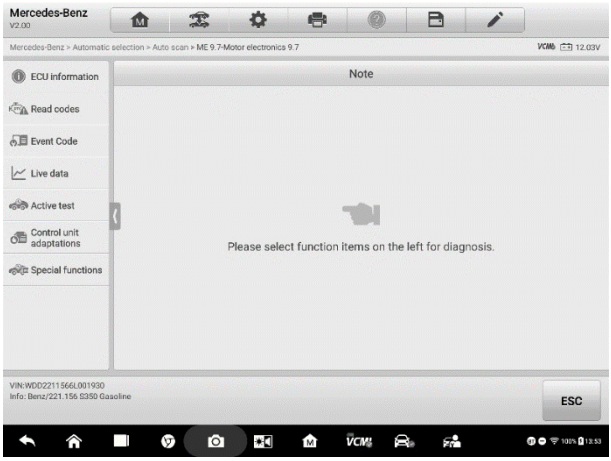


Figure 4-11 *Sample* Function Menu Screen

Available functions may vary by vehicle. The function menu may include:

- **ECU Information** – displays detailed ECU information. Select to display information screen.
- **Read Codes** – displays detailed DTC information retrieved from the vehicle control module.
- **Event Codes** – a small category of fault codes.
- **Live Data** – retrieves and displays live data and parameters from the vehicle's ECU.
- **Active Test** – provides specific subsystem and component tests. This selection may display as *Actuators*, *Actuator Test*, or *Function Tests*. Available test vary by vehicle.
- **Control Unit** - Select to directly locate a needed control system for testing. Follow the menu driven procedure, and make proper selections to be guided to appropriate module and function menu.

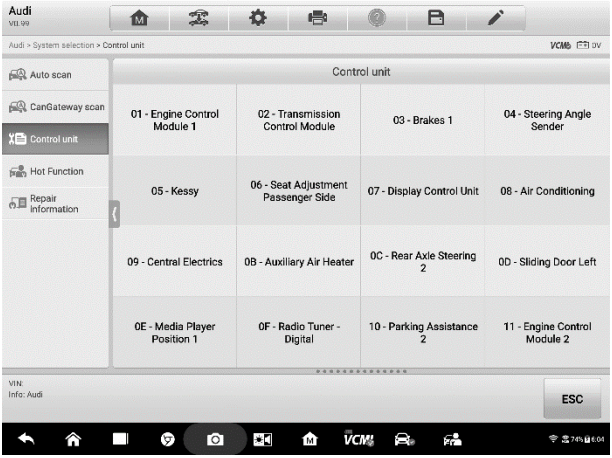


Figure 4-12 *Sample Control Unit Screen*

- **Special Functions** – provides component adaptation or variant coding functions for custom configurations, and allows entry of adaptive values for certain components after repairs.

Screen Messages

Messages display when additional input is needed before proceeding. There are mainly three main types of on-screen messages: Confirmation, Warning, and Error.

- **Confirmation Messages**

This type of messages usually displays as an “Information” screen, when you are about to perform an action that cannot be reversed or when an action has been initiated and your confirmation is needed to continue.

When a user-response is not required, the message displays briefly.

- **Warning Messages**

This type of messages displays when completing the selected action may result in an irreversible change or loss of data. An example of this message is the “Erase Codes” message.

- **Error Messages**

Error messages display when a systemic or procedural error has occurred. Possible errors include cable disconnection and communication interruption.

4.2.2 Making Selections

The Diagnostics application is a menu-driven program that presents a series of options one at a time. As you select from a menu, the next menu in the series displays. Each selection narrows the focus and leads to the desired test. Use your fingertip or the stylus pen to make menu selections.

4.3 Auto Scan

The Auto Scan function performs a comprehensive scanning of all the systems in the vehicle ECU to locate faults and retrieve DTCs. Tap Fault Scan to start. Systems with no faults detected will display in green; systems containing faults will display orange.

➢ **To perform Auto Scan function**

1. Tap the **Diagnostics** application button on the MaxiSys Job Menu. Choose the corresponding vehicle information and enter the vehicle diagnostic page.

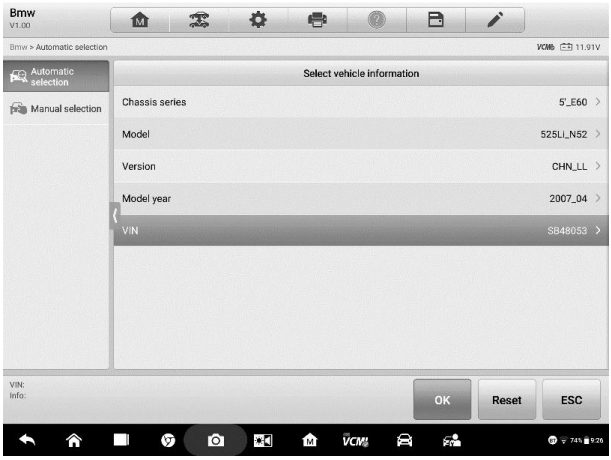


Figure 4-13 ***Sample Vehicle Selection Screen***

2. The Topology tab page displays in the main section. Tap the **Fault Scan** button on the bottom of the screen to scan the vehicle system modules.

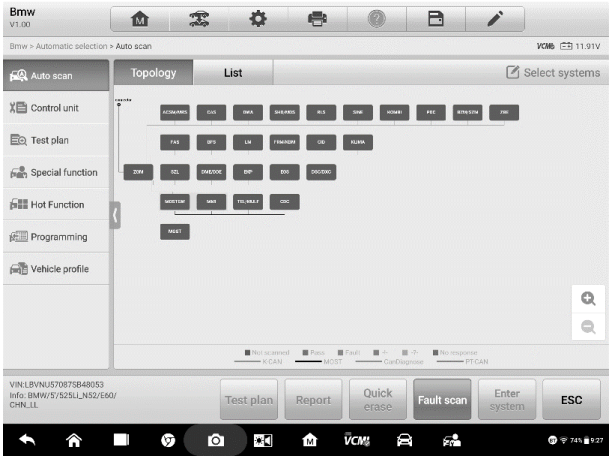


Figure 4-14 ***Sample Auto Scan Screen 1***

3. A system scanned with no fault detected displays in green; a system scanned with faults detected will display in orange.

Figure 4-15 ***Sample Auto Scan Screen 2***

4.3.1 Test Plan

The Test Plan function intelligently prioritizes DTCs and leads the user to the proper repair. This function is initially available for a subset of vehicles with extensive coverage to follow in subsequent software updates.

➢ **To perform Test Plan function**

1. Tap **Test Plan** from the bottom functional buttons, or tap **Test Plan** in the

navigation bar to the left of the screen, then select **Test Plan** in the main section.

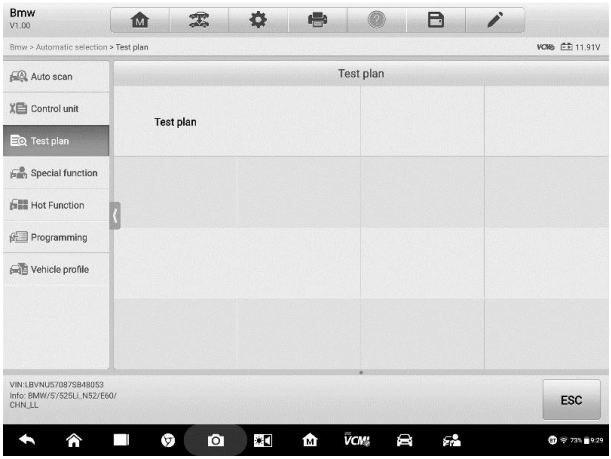


Figure 4-16 ***Sample Test Plan Screen 1***

2. A test plan displays with recommended test or procedures to perform. Items with higher priority should be tested first.

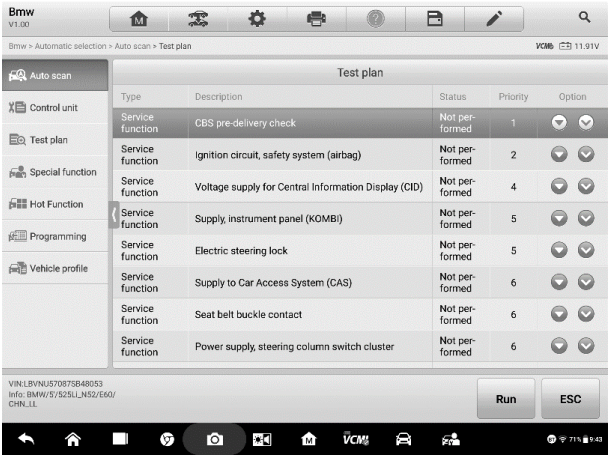


Figure 4-17 ***Sample Test Plan Screen 2***

4. Tap the button to test relative functions. Tap the button to display the system information in detail and tap button again to no longer display detail.

Figure 4 18 Sample Test Plan Screen 3

5. Press **OK** to continue.

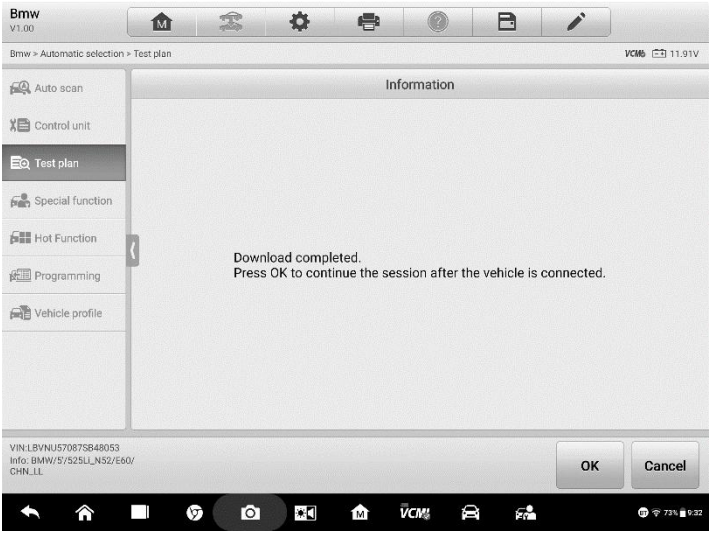


Figure 4 19 Sample Test Plan Screen 4

6. Follow the instructions on the tablet to complete action.

4.4 Read and Erase Codes

4.4.1 Read Codes

This function retrieves and displays the DTCs from the vehicle control system. The Read Codes screen varies for each vehicle being tested. For some vehicles, freeze frame data can also be retrieved for viewing. A sample Read Codes screen displays as below:

Figure 4-20 ***Sample Read Codes Screen***

1. Diagnostics Toolbar – see *Table 4-2 Diagnostics Toolbar Buttons* on page 31 for details.

2. Current Directory Path

3. Status Information Bar

4. Navigation Bar

5. Main Section

   - Column 1 – displays the retrieved codes from the vehicle.
   - Column 2 – indicates the status of the retrieved codes.
   - Column 3 – detailed descriptions for the retrieved codes.

6. Functional Buttons

   - **DTC guide** – tap to check related repair cases and help information.
   - **Freeze Frame** – icon displays when freeze frame data is available for viewing; Tap icon to display data screen. The Freeze Frame interface is similar to that of the Read Codes interface and share similar operations.

- **Search** – tap to search the selected DTC for additional information on the Internet.
- **Erase codes** – tap to erase codes from the vehicle. It is recommended that DTCs are read and needed repairs are performed before erasing codes.
- **Read codes** - retrieves and displays the DTCs from the vehicle control system. The Read Codes screen varies for each vehicle being tested.
- **ESC** – tap it to return to the previous screen or exit the function.

4.1.2 Erase Codes

After reading the retrieved codes from the vehicle and certain repairs have been made, you can erase the codes from the vehicle using this function. Before performing this function, make sure the vehicle's ignition key is in the ON (RUN) position with the engine off.

➢ **To erase codes**

1. Tap **Erase Codes** in the Function Menu.
2. A warning message displays to inform you of data loss when this function is applied.
   a) Tap **Yes** to continue. A confirming screen displays when the operation is successfully done.
   b) Tap **No** to exit.
3. Tap **ESC** on the confirming screen to exit Erase Codes.
4. Check the Read Codes function again to ensure the operation is successful.

4.5 Live Data

When this function is selected, the screen displays the data list for the selected module. The data available for any control module varies by vehicle. The parameters display in the order that they are transmitted by the ECM, so expect variation among vehicles.

Gesture scrolling allows you to quickly move through the data list. Touch the screen and drag your finger up or down to reposition the parameters being displayed if the data occupies more than one screen. The figure below displays a typical Live Data screen:

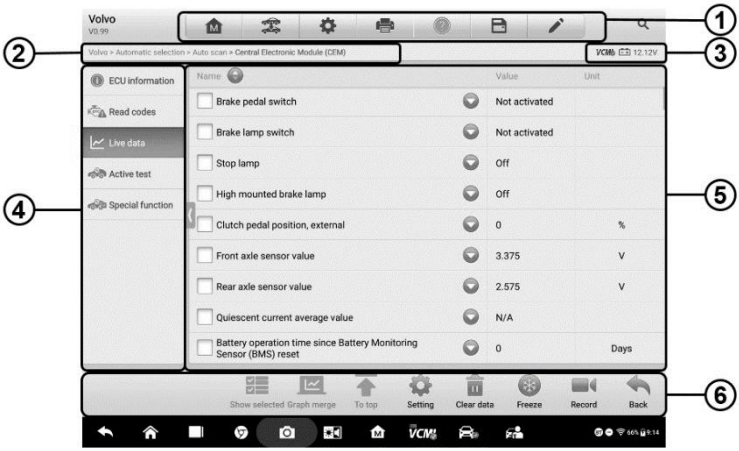


Figure 4-21 ***Sample Live Data Screen***

1. Diagnostics Toolbar Buttons – see *Table 4-2 Diagnostics Toolbar Buttons* on page 31 for detailed descriptions of the operations for each button.

2. Current Directory Path

3. Status Information Bar

4. Navigation Bar

5. Main Section

   - Name Column – this column displays the parameter names.

     a) Check Box – tap the check box to the left of a parameter name to select the item. Tap the check box again to deselect it.

     b) Drop-down Button – tap the drop-down button on the right side of the parameter name to open a submenu, which provides optional modes in which to display the data.

   - Value Column – displays the values of the parameter items.

   - Unit Column – displays the unit for the parameter values.

     ➢ To change the Unit mode, tap the **Setting** button in the top toolbar and select a required mode. See *Unit* on page 255.

Display Mode

There are four types of display modes available for data viewing, allowing you to view various types of parameters in the mode best suited to represent the data.

Tap the drop-down button on the right side of the parameter name to open a submenu. There are 4 buttons to configure the data display mode, plus one **Help** button on the right, active when additional information is available for your reference.

Each parameter item displays the selected mode independently.

- ✧ **Analog Gauge Mode** – displays the parameters in gauge charts.
- ✧ **Text Mode** – the default mode that displays the parameters as a text list.

NOTE

Status parameters, such as a switch reading like ON, OFF, ACTIVE, and ABORT can only be displayed in Text Mode. Value parameters, such as a sensor reading, can be displayed in both text and graph modes.

- ✧ **Waveform Graph Mode** – displays the parameters in waveform graphs.

  In this mode, three control buttons will display on the right side of the parameter item, allowing you to manipulate the display status.

  - Text Button – resumes Text Display Mode.
  - Scale Button – changes the scale values, which are displayed below the waveform graph. There are four scales available: x1, x2, x4 and x8.
  - Zoom-in Button – tap once to display the selected data graph in full screen.

- ✧ **Digital Gauge Mode** – displays the parameters in the form of a digital gauge graph.
- ✧ **Full Screen Display** – this option is only available in the waveform graph mode, and mostly used in Graph Merge status for data comparison. There are three control buttons available on the top right side of the screen under this mode.

  - Edit Button – tap to open an edit window, in which you can set the waveform color and the line thickness displayed for the selected parameter item.
  - Scale Button – tap to change the scale values below the waveform graph. There are four scales available: x1, x2, x4 and x8.
  - Zoom-out Button – tap to exit full screen display.

➢ **To edit the waveform color and line thickness in a data graph**

1. Select 1 to 3 parameter items to display in Waveform Graph mode.
2. Tap the **Zoom-in Button** on the right side to display the data graph in full screen.
3. Tap the **Edit Button**, and an edit window displays.

4. Select a parameter item from the left column.
5. Select a color from the second column.
6. Select a line thickness from the right column.
7. Repeat step 4 to 6 to edit the waveform for each parameter.
8. Tap **Done** to save the setting and exit, or tap **Cancel** to exit without saving.

6. Functional Buttons

The operations of the available functional buttons on the Live Data screen are described below:

✧ **Back** – returns to the previous screen or exits the function.

✧ **Record** – starts recording the retrieved live data; the recorded data is then stored as a video clip in the Data Manager application for future reviews. This function can be triggered automatically at preset threshold values or manually. The triggering mode and record duration can be configured in the Setting mode of Live Data.

✧ **Freeze** – displays the retrieved data in freeze mode.

- Previous Frame – moves to the previous frame of frozen data.
- Next Frame – moves to the next frame of frozen data.

✧ **Resume** – this button displays when the Record or Freeze function is applied. Tap this button to stop data recording, or exit freeze data mode, and resumes normal data display mode.

✧ **Flag** – this button displays when the Record function is applied. Tap this button to set flags to note points of interest when recording data. During playback in *Data Manager*, the preset flag will enable a popup window to allow for notes to be added.

✧ **Clear Data** – tap this button to clear all previously retrieved parameter values.

✧ **To Top** – moves a selected data item to the top of the list.

✧ **Graph Merge** – tap this button to merge selected data graphs (for Waveform Graph Mode only). This function is very useful when comparing different parameters.

NOTE

This mode supports Graph Merge for 2 to 3 parameter items only. Select 2 or 3 parameters when creating a graph merge.

➢ To cancel Graph Merge mode, tap the drop-down button on the right side of the

parameter name, and select a data display mode.

✧ **Show Selected/Show All** – tap this button to switch between the two options; one displays the selected parameter items, the other displays all the available items.

✧ **Setting** – tap this button to open a setting screen to set the trigger mode, recording duration, and to set threshold values for data recording.

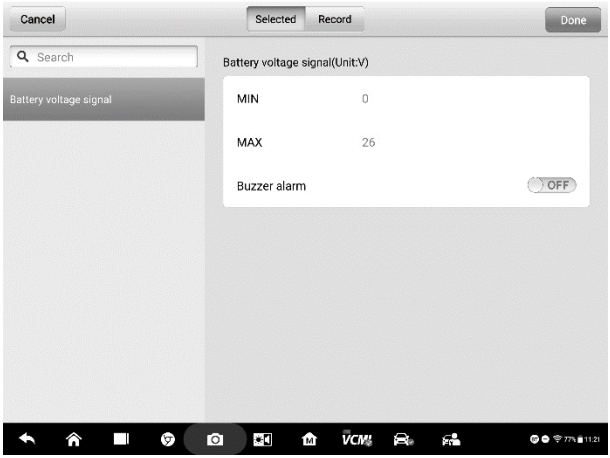


Figure 4-22 ***Sample Setting Mode in Live Data***

There are four navigation buttons at the top of the **Setting** mode screen.

- **Selected Button** – displays the configuration screen to set the threshold values, an upper limit and a lower limit, for triggering the buzzer alarm. This function is only applied to the Waveform Graph display mode.

  a) MIN – tap this button to display a virtual keyboard to enter the required lower limit value.

  b) MAX – tap this button to display a virtual keyboard to enter the required upper limit value.

  c) Buzzer Alarm – switches the alarm on and off. The alarm function makes a beep sound as an alert when the data reading reaches the preset minimum or maximum point.

➢ **To set threshold limits for the parameter values**

1. Tap the **Setting** button at the bottom of the Live Data screen.
2. Tap the **Selected** navigation button.

3. Select a parameter item from the left column, or enter the item name in the Search bar.

4. Tap the **MIN** button on the right side, and enter the required minimum value.

5. Tap the **MAX** button on the right side, and enter the required maximum value.

6. Tap the **ON/OFF** button on the right side of the Alarm button to turn it on or off.

7. Tap **Done** to save the setting and return to the Live Data screen; or tap **Cancel** to exit without saving.

   When the limits are successfully set, two horizontal lines display on each of the data graphs (when Waveform Graph Mode is applied) to indicate the alarm point. The limit lines are shown in different colors for distinction from the parameter waveforms.

- **Record** – displays the configuration screen for Record Setting, where you can set the trigger type, duration and trigger point for the data recording function.

  a) Trigger Type – sets the trigger mode for data recording. There are four options available:

     1) Manual – allows you to manually start and stop data recording.

     2) DTC – auto triggers data recording when any DTC is detected.

     3) DTC Check Mode – auto triggers data recording when certain pre-selected DTC types are detected.

     4) Parameter – auto triggers data recording when any parameter value reaches the preset threshold.

  b) Duration – sets the recording time (for Auto trigger mode only).

  c) Trigger Point – reserves a relative percentage of a record length before the data recording start point for reference (for Auto trigger mode only).

➢ **To perform setting for live data record**

1. Tap the **Setting** functional button at the bottom of the Live Data screen.

2. Tap the **Record** navigation button.

3. Tap the > button to the right of the **Trigger Type** bar and select the required trigger mode.

4. Tap the > button to the right of the **Duration** bar and select a length of time.

5. Tap the > button to the right of the **Trigger Point** bar and select a relative percentage of a record length to be reserved before the data recording start point.

6. Tap **Done** to save the setting and return to the Live Data screen; or tap **Cancel** to exit without saving.

- **Done** – confirms and saves the setting, and redirects you to the Live Data screen.
- **Cancel** – cancels the setting operation, and redirects you to the Live Data screen.

4.6 Active Test

The Active Test function is used to access vehicle-specific subsystem and component tests. Available tests vary by vehicle.

During an active test, the tablet sends commands to the ECU to activate the actuators. This test determines the integrity of the system or part by reading ECU data, or by monitoring the operation of the actuators. Such tests may include switching a solenoid, relay, or switch, between two operating states.

Selecting Active Test displays a menu of test options. Available tests vary by vehicle. Select test from menu options. Follow the instructions displayed on the screen to complete test. Procedures and instructions vary by vehicle.

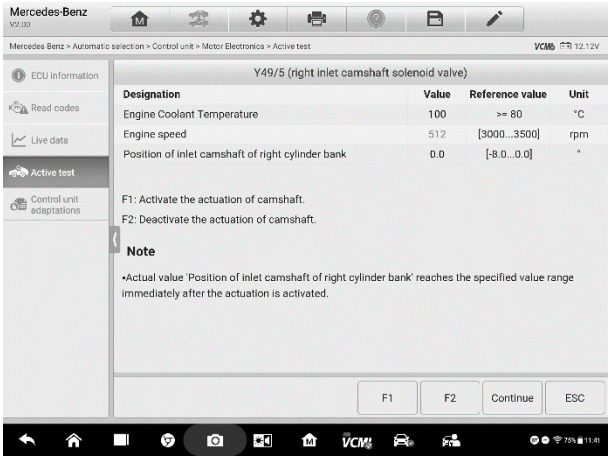


Figure 4-23 ***Sample Active Test Screen***

The functional buttons in the lower right corner of the Active Test screen manipulate the test signals. The operational instructions are displayed in the main section of the test screen. Follow the on-screen instructions and make appropriate selections to complete the tests. Each time an operation is successfully executed, a message such as “Command Finished”, or “Activation Successful” displays.

Tap the **ESC** functional button to exit the test when finished.

4.7 ECU Information

This function retrieves and displays the specific information for the tested control unit, including unit type and version numbers.

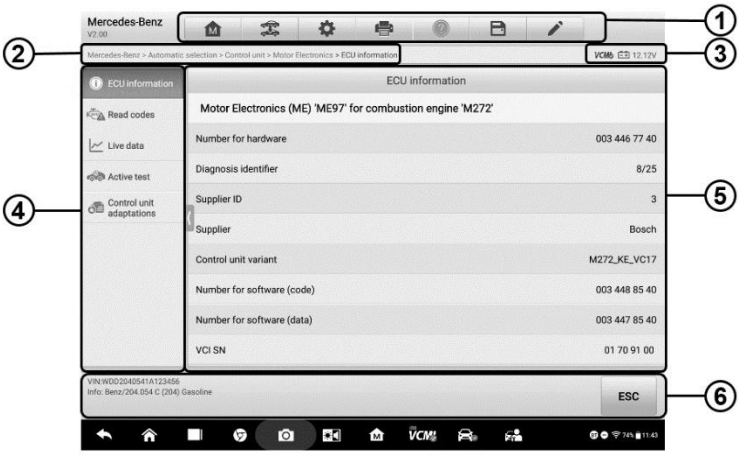


Figure 4-24 ***Sample ECU Information Screen***

1. Diagnostics Toolbar Buttons – see *Table 4-2 Diagnostics Toolbar Buttons* on page 31 for detailed descriptions of the operations of each button.

2. Current Directory Path

3. Status Information Bar

4. Navigation Bar

5. Main Section – the left column displays the item names; the right column displays the specifications or descriptions.

6. Functional Button – in this case, only a **Back** (or **ESC**) button is available; tap it to exit after viewing.

4.8 Special Functions

These functions perform various component adaptations, including the recalibration or configuration of certain components after repairs or replacements have been completed.

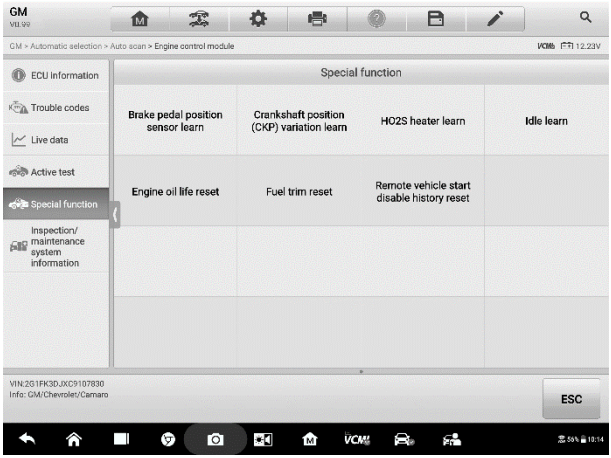


Figure 4-25 ***Sample Special Function Screen 1***

Select function to display detailed Function information and execution screen.

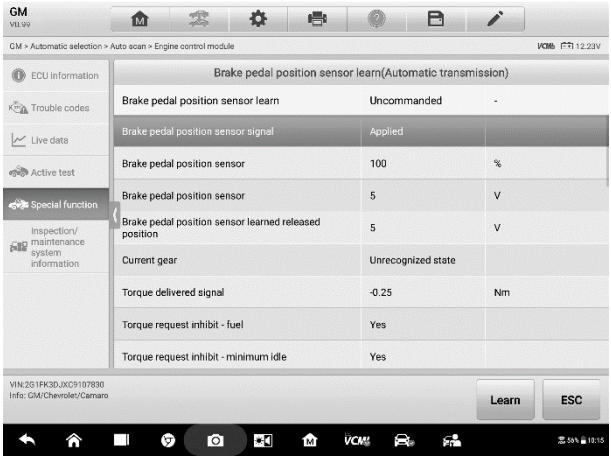


Figure 4-26 ***Sample Special Function Screen 2***

List Tab Page:

- Column 1 – displays the description of the function being performed or displays live data corresponding to the special function
- Column 2 – displays the execution status such as Completed, or Activated or may display live data values that correspond to the special function.
- Column 3 – displays the measurement units of the live data.

Tap the **Learn** button to perform the selected function and tap the **ESC** button to exit the function.

4.9 Programming and Coding

Since the introduction of OBD II and leading up to modern Hybrids and EVs, hardware and software technologies in cars have been advancing at an exponential rate. Updating software may be the only way to fix the following issues:

- Drivability
- Fuel Efficiency
- Power Loss
- Fault Codes
- Durability of Mechanical Parts

The Programming and Coding function is used to re-flash the vehicle control modules, which allows you to update the computer software of the vehicle to the latest version, as well as to reprogram adaptive data of certain components after making repairs or replacements.

NOTE

The programming function applies only when the vehicle is connected with a VCMI or J2534 programming device, which serves as a PassThru interface to establish communication with and transfer data to the vehicle's ECU.

Available programming or coding operations vary by test vehicle. Only the available operations display in the tablet menu.

There are two general types of programming operations:

A. Coding – also known as *Teach-in Program*, or *Component Adaptation*, is used to reprogram adaptive data for vehicle control modules after repairs or replacements of vehicle parts.

B. Reprogramming Operations – downloads the latest version of software from the online server database through Internet access (this procedure is done automatically when the tablet is connected to the Internet, so there is no need to check for software updates yourself), and reprograms the newest version into the vehicle's ECU.

NOTE

Ensure that the tablet is connected to a stable internet access before applying the ECU programming function, so that the tablet is able to obtain access to the vehicle manufacturer's server for update service.

Selecting the Programming or Coding function opens a menu of operation options that varies by vehicle make and model. Selecting a menu option either displays a programming interface or opens another menu of additional choices. Follow all screen instructions while performing the programming or coding operations. How and what information is presented on the screen vary by the type of operation being performed.

4.9.1 Coding

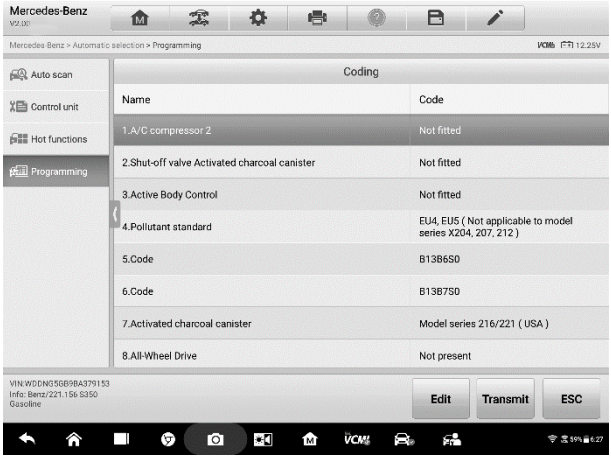


Figure 4-27 ***Sample Coding Screen***

The main section of the Coding screen displays a list of vehicle components and the coding information that mainly consists of two parts:

1. All available systems for coding are displayed on the left side, and the coding data or value on the right side.

2. The bottom of the main section displays the functional buttons that enable you to manipulate the operation.

Check the vehicle condition and the coding information carefully. Use the functional button to edit Codes for the corresponding components. Tap **Send** when you finish editing all items. When the operation is completed, an execution status message such as Completed, Finished or Successful, may display.

Tap the **ESC** button to exit the function.

4.9.2 Reprogramming Operation

Before reprogramming begins:

- It is mandatory that Ultra tablet is connected to stable Wi-Fi network.
- Tablet must be connected to VCMI by USB.
- Tablet battery must be fully charged during module programming. Connect tablet to charger if needed.
- Attach battery maintainer to vehicle battery to ensure a steady voltage is

maintained throughout programming. Voltage requirements differ by vehicle manufacturer. Consult vehicle manufacturer recommendations prior to programming a module.

- Do not quit the application during a module reprogramming as the process may fail and may also result in permanent damage to the module.

Typical reprogramming operations require you to input and validate VIN number first. Tap the input box and enter the correct number. The programming interface then displays.

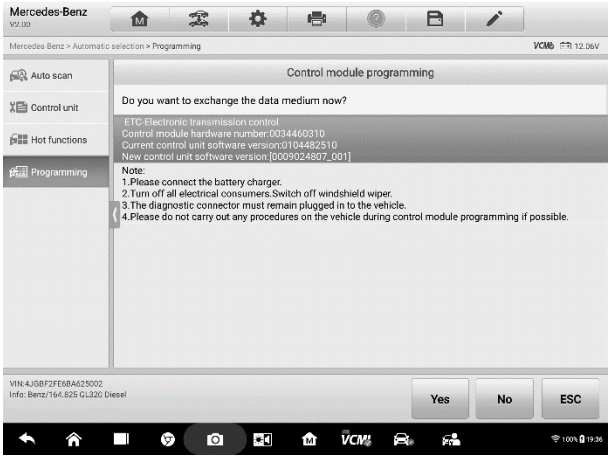


Figure 4-28 ***Sample Reprogramming Operation Screen***

The main section of the reprogramming interface offers information of the hardware, the current software version and the newest software versions to be programmed into the control units.

A series of on-screen operational instructions will display to guide you through the programming procedure.

Carefully read the on-screen information and follow the instruction to execute the programming procedure.

4.9.3 Re-flash Errors

IMPORATANT

When reprogramming onboard, always make sure the vehicle battery is fully charged and in good working condition. During reprogramming, the operation may fail if voltage falls below the proper operation voltage. Sometimes a failed operation can be recovered, but the failed reprogramming can also ruin the control module. We recommend connecting an external battery maintainer to the vehicle to ensure a steady

voltage is maintained throughout programming. The required voltage differs by vehicle manufacturer. Consult vehicle manufacturer for correct voltage to be maintained.

Occasionally a flash update procedure may not complete properly. Common causes of flash errors include poor cable connections between the tablet, VCMI, and vehicle, the vehicle ignition being switched off before the flash procedure is complete, or low vehicle battery voltage.

If the process quits, recheck all the cable connections to assure good communications and initialize the flash procedure. The programming procedure will automatically repeat if the previous operation does not succeed.

4.10 Generic OBD II Operations

The OBD II/EOBD vehicle diagnosis option offers a quick way to check for DTCs, isolate the cause of an illuminated malfunction indicator lamp (MIL), check monitor status prior to emissions certification testing, verify repairs, and perform other emissions-related services. The OBDII direct access option is also used for testing OBD II/EOBD-compliant vehicles that are not included in the Diagnostics database. Diagnostics toolbar buttons at the top of the screen are available for specific vehicle diagnostics. See *Table 4-2 Diagnostics Toolbar Buttons* on page 31 for details.

General Procedure

➢ **To access the OBD II/EOBD diagnostics functions**

1. Tap the **Diagnostics** application button in the MaxiSys Job Menu. The Vehicle Menu displays.

2. Tap the **EOBD** button. There are two options to establish communication with the vehicle.

   - Auto Scan – select it to establish communication using each protocol in order to determine which one the vehicle is using.

   - Protocol – select it to open a submenu of various protocols. A communication protocol is a standardized way of data communication between an ECM and a diagnostic tool. Global OBD may use several different communication protocols.

3. Select a specific protocol if the **Protocol** option is selected. Wait for the OBD II Diagnostic Menu to appear.

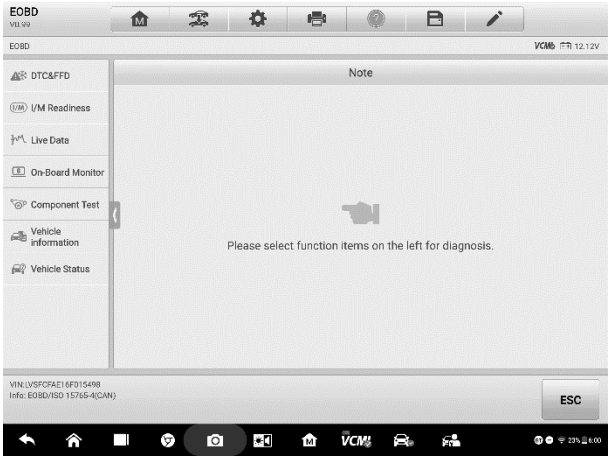


Figure 4-29 ***Sample OBD II Diagnostic Menu***

4. Select a function option to continue.

- DTC & FFD
- I/M Readiness
- Live Data
- O2 Sensor Monitor
- On-Board Monitor
- Component Test
- Vehicle Information
- Vehicle Status

NOTE
Support functions may vary by vehicle.

Function Descriptions

This section describes the various functions of each diagnostic option:

DTC & FFD

When this function is selected, the screen displays a list of Stored Codes and Pending Codes. When the Freeze Frame data of certain DTCs are available for viewing, a snowflake button will display on the right side of the DTC item. The Erase Codes function can be applied by tapping the functional button at the bottom of the screen.

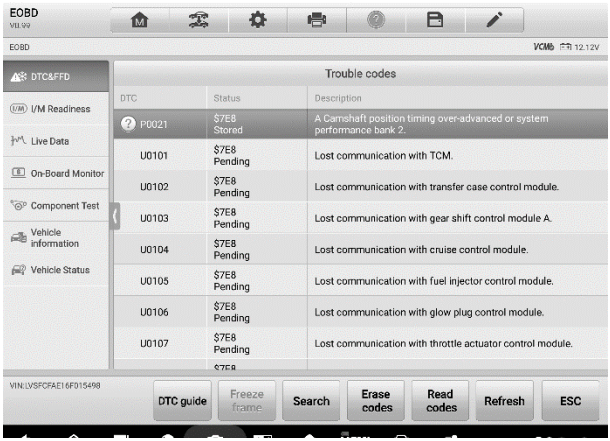


Figure 4-30 ***Sample DTC & FFD Screen***

- **Stored Codes**

  Stored codes are emission-related DTCs from the ECM of the vehicle. OBD II/EOBD Codes have a priority according to their emission severity, with higher-priority codes overwriting lower-priority ones. The priority of the code determines the illumination of the Malfunction Indicator Light (MIL) and the codes erase procedure. Manufacturers rank codes differently, so DTCs may vary by vehicle.

- **Pending Codes**

  These are codes whose storing conditions have been met during the last drive cycle, but need to be met on two or more consecutive drive cycles before the DTC stored. The purpose of displaying pending codes is to assist the service technician after a vehicle repair when diagnostic information is cleared, by reporting test results after a single driving cycle.

  a) If a test fails during the driving cycle, the DTC associated is reported. If the pending fault does not occur again within 40 to 80 warm-up cycles, the fault is automatically cleared from memory.

  b) Test results reported do not necessarily indicate a faulty component or system. If test results indicate another failure after additional driving, a DTC is stored to indicate a faulty component or system.

- **Freeze Frame**

  In most cases the stored frame is the last DTC reported. Certain DTCs, those that have a greater impact on vehicle emission, have a higher priority. In these cases, DTC of the highest priority is the one for which the freeze frame records are

retained. Freeze frame data includes a “snapshot” of critical parameter values at the time the DTC is stored.

- **Erase Codes**

  This option is used to clear all emission-related diagnostic data including DTCs, freeze frame data and specific manufacturer-enhanced data from the vehicle ECM. This option resets the I/M Readiness Monitor Status for all vehicle monitors to Not Ready or Not Complete status.

  A confirmation screen displays when the clear codes option is selected to prevent accidental loss of data. Select **Yes** on the confirmation screen to continue, or **No** to exit.

I/M Readiness

This function is used to check the readiness of the monitoring system. It is an excellent function to use prior to having a vehicle inspected for state emissions compliance. Selecting I/M Readiness opens a submenu with two choices:

- Since DTCs Cleared – displays the status of monitors since the last time the DTCs are erased.
- This Driving Cycle – displays the status of monitors since the beginning of the current drive cycle.

Live Data

This function enables the display of real-time PID data from the ECU. Displayed data includes analog and digital input and output, and system status information broadcast in the vehicle data stream.

Live data can be displayed in various modes, see *4.5 Live Data* on page 43 for detailed information.

O2 Sensor Monitor

This function allows retrieval and review of recent O2 sensor monitor test results stored on the vehicle’s on-board computer.

The O2 Sensor Monitor test function is not supported by vehicles that communicate using a controller area network (CAN). For O2 Sensor Monitor tests results of CAN-equipped vehicles, refer to *On-Board Monitor*.

On-Board Monitor

This function allows you to view the results of On-Board Monitor tests. The tests are useful after the service when a vehicle’s control module memory is already erased.

Component Test

This function enables dual-directional control of the ECM so that the diagnostic tool can transmit control commands to operate the vehicle systems. This function is useful in determining how well the ECM responds to a command.

Vehicle Information

This function enables the display of the vehicle identification number (VIN), calibration identification number, calibration verification number (CVN), and other information of the test vehicle.

Vehicle Status

This function checks the current condition of the vehicle, such as the communication protocols of OBD II modules, number of fault codes, and status of the Malfunction Indicator Light (MIL).

4.11 Diagnostic Report

Pre-Scan and Post-Scan

➢ To perform the pre-scan and post-scan functions:

1. Auto SCAN the Vehicle - the Auto VID function can automatically identify the vehicle and its equipped systems. All available modules in all systems will be scanned automatically. Then DTCs and code details will be listed.
2. Print Pre-SCAN Report - vehicle images can be taken with tablet and attached to SCAN report. The report file can be generated and submitted. The report can be customized with shop and vehicle information.
3. Repair Vehicle - creates efficient repair plan from the start.
4. Auto SCAN Repaired Vehicle - ensures no new faults were created during repair and no DTCs are present at completion.
5. Print Post-SCAN Report - proves all DTCs on Pre-SCAN report are fixed.

Diagnostic Report PDF

The diagnostic report can be reviewed, saved, and printed in multiple applications of the Ultra platform.

a) Via the **History** function:

- Enter the Diagnosis main page, and tap **History** in the Top Toolbar.

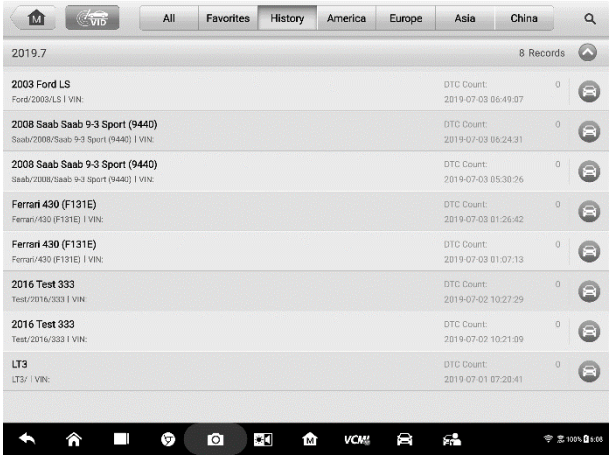


Figure 4-31 ***Sample History Screen***

- Select a history record, and tap the ••• button in the upper right corner to view, print, email or delete the PDF document.

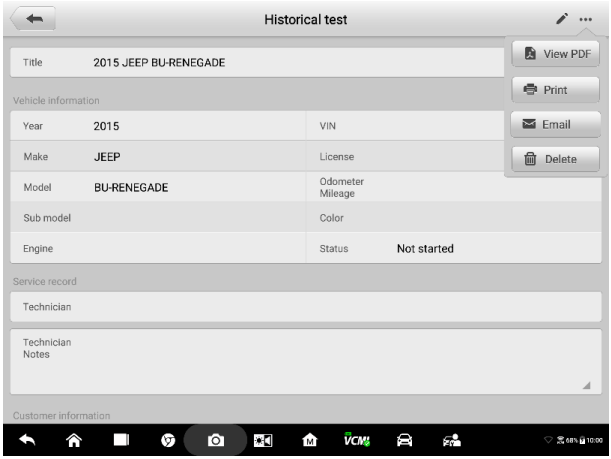


Figure 4-32 ***Sample Historical Test Screen***

b) Via the Auto Scan function:

- Enter the Auto Scan page and tap **Fault Scan** in the Functional Button Bar at the bottom of the screen.

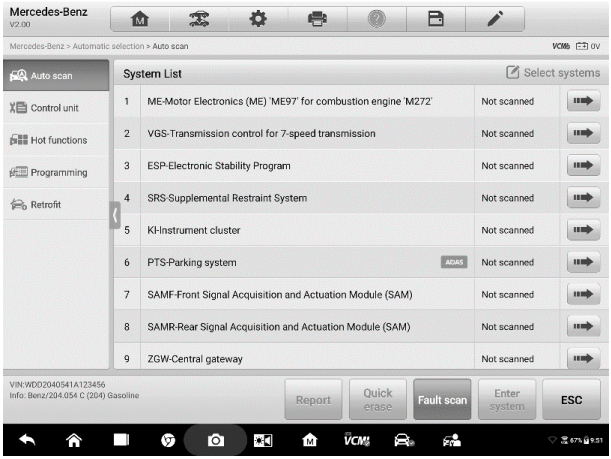


Figure 4-33 ***Sample Auto Scan Screen 1***

- When the system scan is completed, tap **Report** in the Functional Button Bar at the bottom of the screen.

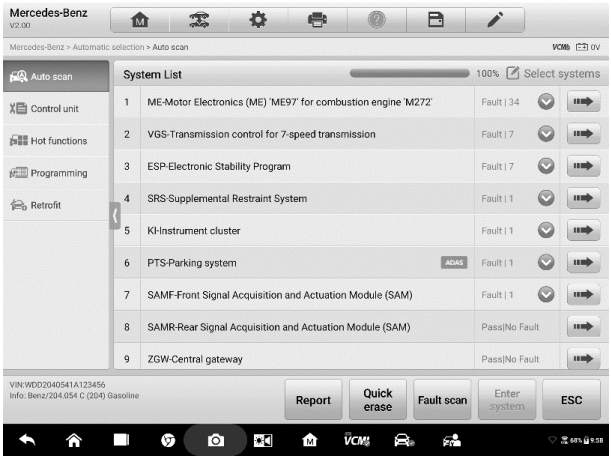


Figure 4-34 ***Sample Auto Scan Screen 2***

- Tap the button in the Diagnostics Toolbar, and select **Save all data** to save the PDF document or select Save this page to save the screen shot of the current page.

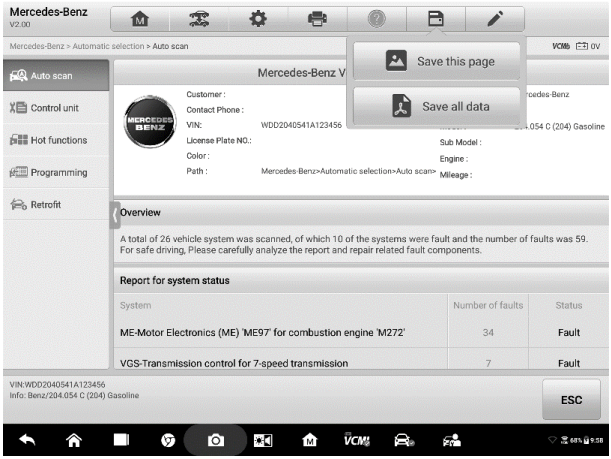


Figure 4-35 ***Sample Auto Scan Screen 3***

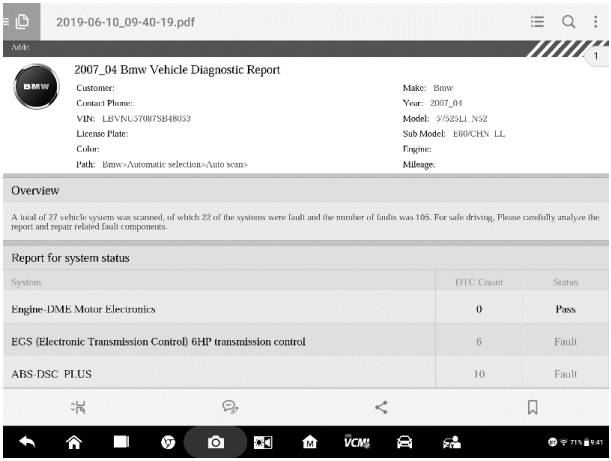


Figure 4-36 ***Sample PDF Document Screen***

c) Via the functions on the Navigation Bar:

- The diagnostic report can also be viewed from such diagnostics functions screen including Auto Scan, Read Codes, Live Data, And Active Test. Tap the button in the Diagnostics Toolbar, and select **Save all data** to save the PDF document or select **Save this page** to save the screen shot of the current page.

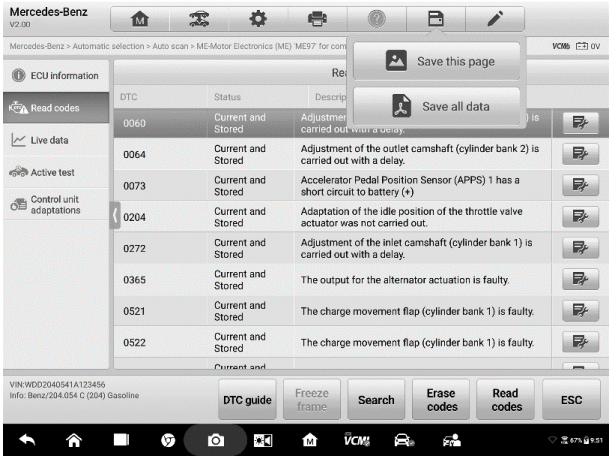


Figure 4-37 ***Sample Read Codes Screen***

4.12 Exit Diagnostics

The Diagnostics application operates while communication with the vehicle is still active. It is important to properly exit from the diagnostics operation interface to stop all communications with the vehicle before closing the Diagnostics application.

NOTE

Damage to the vehicle electronic control module (ECM) may occur if communication is disrupted. Ensure all forms of communication link such as data cable, USB cable, and wireless or wired network, are properly connected throughout the test. Exit all interfaces before disconnecting the test cable and power supply.

➢ **To exit the Diagnostics application**

1. On an active diagnostic screen, tap the **Back** or **ESC** functional button to exit a diagnostic session; Or
2. Tap the **Vehicle Swap** button in the diagnostics toolbar to return to the Vehicle Menu screen.
3. On the vehicle menu screen, tap the **Home** button in the top toolbar; or tap the **Back** button on the navigation bar at the bottom of the screen. Or
4. Tap the **Home** button on the diagnostics toolbar to exit the application directly and return to the MaxiSys Job Menu.

Now, the Diagnostics application is no longer communicating with the vehicle and it is safe to open other MaxiSys applications, or exit the MaxiSys Diagnostic System and return to the Android System's Home screen.

5 Repair Assist (内容待更新)

Repair Assist is a specific fault code analysis function, with which you can access the most comprehensive and the latest code-specific data, tests information, real repair cases and relevant fixes. It is finely assembled based on real shop repair orders and industry professionals.

Repair Assist adopts the scientific data cloud computing technology to match the specific fault code with the exact model of various vehicle brands. And the data has been verified strictly by maintenance experts.

The following are main parts of the code data contained in Repair Assist:

1. Technical Service Bulletin (OEM Information)
2. Frequency of Occurrence
3. Troubleshooting
4. Real Fixes
5. Relevant Repair Information
6. Recommended Cases

5.1 Access the System

Before starting Repair Assist, please ensure that the vehicle communication has been established properly. Connect the MaxiSys Ultra Diagnostic tablet to the test vehicle through the VCMI device. For detailed directions to establish vehicle communication with the MaxiSys tablet, see *Establish Vehicle Communication*.

Once communication has been established, select Auto Scan to scan all available system modules. The scanned modules will display on the main screen.

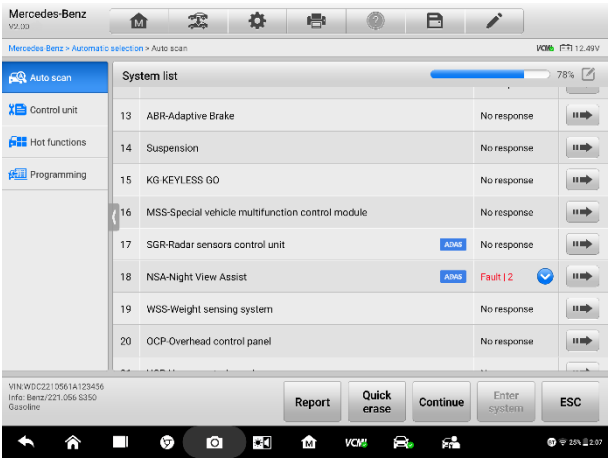


Figure 5-1 ***Sample System List Screen***

For some vehicles, including Volkswagen, Audi, BMW, Ford, Land Rover, Jaguar, Chrysler, Fiat, Volvo, a topology map is available to display the relationship between vehicle systems.

Figure 5-2 ***Sample Topology Display Screen***

To review the Auto scan procedures, see Chapter 4 Basic Diagnostic Operation (Getting Started).

➢ To access the system

1. Tap the **List** button, a list of modules is scanned or in the process of scanning.

2. Select a module from the displayed list.

3. Tap the gray arrow icon (***Figure 5-1 System list***) on the right of the entry to display a dropdown menu of code results.

5.2 Code Results Dropdown Menu

Read the DTCs with **Read codes** function. For detailed procedure, see *Read Code* in Basic Diagnostic Operation.

After DTCs have been read, the code results dropdown menu is displayed together with status and description. A gray arrow icon will display on the right under the DTC guide heading (***Figure 5-3 DTC code dropdown menu***). This icon indicates that Repair Assist – repair case is available to review.

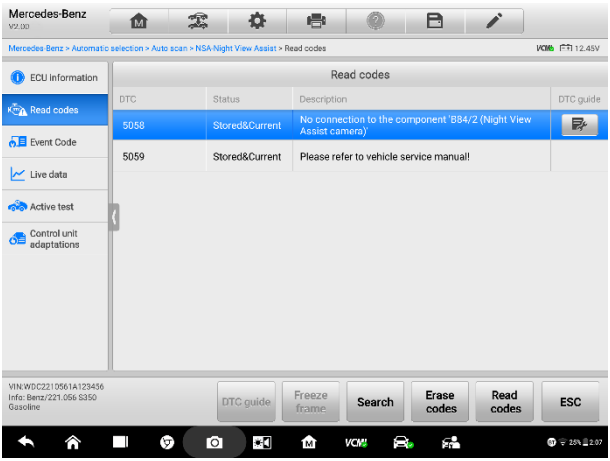


Figure 5-3 ***Sample DTC Code Dropdown Menu***

5.3 Repair Case Screen Layout

Repair Assist is divided into 6 main sections and sub-sections with multiple diagnostic procedures and repair cases. Each section contains detailed description and introduction.

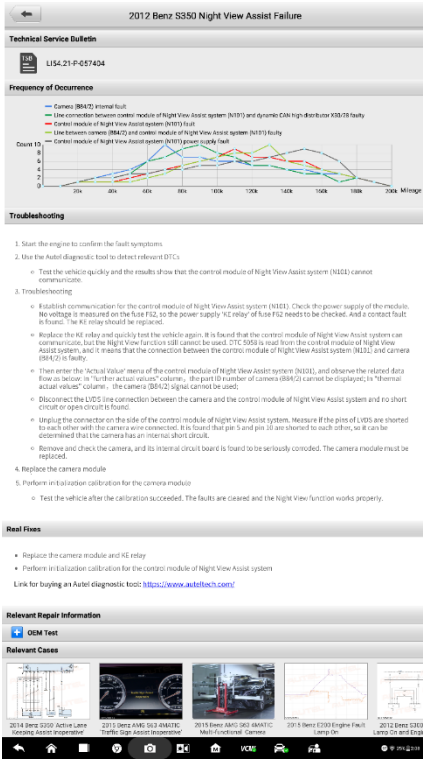


Figure 5-4 ***Sample Repair Case Layout***

1. Title - displays the vehicle make, model and year and the detected vehicle fault.
2. **Technical Service Bulletin** - contains code-specific Recalls, TSB, and OEM campaigns.
3. **Frequency of Occurrence** - graphically displays the frequency tendencies of different types of faults as mileage increases.
4. **Troubleshooting** - displays detailed steps to detect and clear DTCs.
5. **Real Fixes** – displays overview of real repair plan.
6. Autel tool link – displays link to Autel Mall for direct purchase of Autel tools and software.
7. **Relevant Repair Information** - describes repair procedures in detail.
8. Subdivision steps - shows specific operations for component maintenance.
9. **Relevant Cases** - recommends other relevant fault-clearing cases for the same type of vehicle.

5.4 Technical Service Bulletin (OEM Information)

The Technical Service Bulletin function matches the selected fault code with relevant TSB from vehicle manufacturer to display relevant repair data directly, greatly improving vehicle diagnostics efficiency.

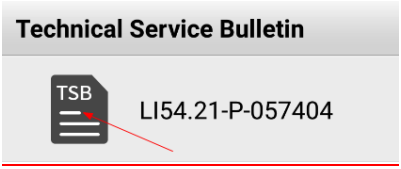


Figure 5-5 *Sample TSB Screen*

Tap the TSB icon to display OEM Information. The following screen displays a TSB on a vehicle night vision system and a complaint of image interference. The document displays symptoms, causes and remedy of issue.

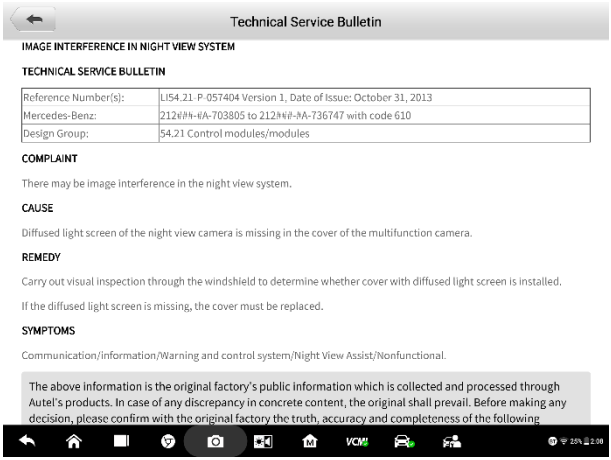


Figure 5-6 *Sample Detailed TSB Screen*

5.5 Frequency of Occurrence

The Frequency of Occurrence graph displays the frequency of particular faults as vehicle mileage increases.