Fig. 5-19

Note: By default, the workshop information is blank. You can configure and revise it from the "Shop Information" in "Toolbox" -> "Settings".

Once you configured the information, it will be automatically generated every time the diagnostic report is saved. All vehicle and workshop information will be appended as a tag on the diagnostic report, which allows you to easily retrieve the desired report while performing "Filter" function of Diagnostic Report.

On the report details page, tap on "Share" to share it to others. All diagnostic reports can be accessed from "Toolbox" -> "Saved Reports" -> "Health Report".

Compare Results: After you have made some repairs based on the pre-repair diagnostic report and re-diagnose the vehicle, tap on "Compare Result" to select the pre-repair report to compare. By comparison of the pre- and post- repair reports, you can easily identify which DTCs are cleared and which remain unfixed.

The DTC status of post-repair   The DTC status of pre-repair

Fig. 5-20

Note: Before performing this function, please make sure that:
• You have saved a pre-repair report of the currently tested vehicle, and
• You have already made some repairs and service and cleared the DTCs after the pre-repair reported is generated. Otherwise, no differences exist between the pre- and post- repair reports.

Clear DTCs: Tap to clear the existing diagnostic trouble codes.

Note: Clearing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again and the check engine light will illuminate as soon as the problem that cause the DTC to set manifests itself.

5.2.2.2 System Scan

Use this option to quickly scan and identify which systems are installed on the vehicle.

In Fig. 5-14, tap on "System Scan" to scan the vehicle control modules. When scanning is complete, the following screen appears.
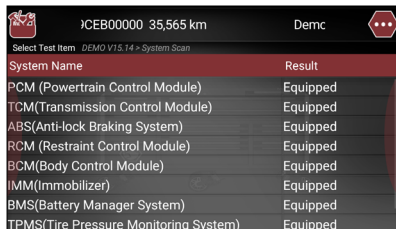

Fig. 5-21

Tap on the desired system to navigate to the test function selection screen. For detailed operations on test function, please refer to Chapter 5.3.2.3.

5.2.2.3 System Selection

This option allows you manually select the test system and function step by step.

In Fig. 5-14, tap on "System Selection", the screen displays as follows:

Fig. 5-22

Swipe the screen from the bottom to view the vehicle system on the next page.

Tap on the desired system (take "ECM" for example) to jump to the test function page.
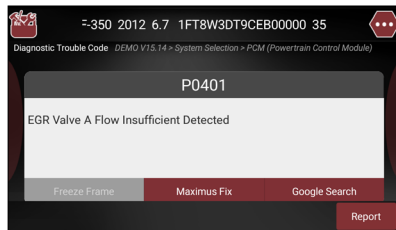
Fig. 5-23

Fig. 5-24

Note: Different vehicle has different diagnostic menus.

A. Version Information

This function is used to read the version information of system mode, vehicle VIN, software and ECU.

In Fig. 5-23, tap on "Version Information", the screen displays the detailed information about the ECU.

Tap on "OK" to confirm and exit.

B. Read Fault Code

This function displays the detailed information of DTC records retrieved from the vehicle's control system.

In Fig. 5-23, tap on "Read Fault Code", the screen will display the diagnostic result.

On-screen Buttons:

Freeze Frame: When an emission-related fault occurs, certain vehicle conditions are recorded by the on-board computer. This information is referred to as freeze frame data. Freeze frame data includes a snapshot of critical parameter values at the time the DTC is set. If it is illuminated, tap on it to view the freeze frame data.

Maximus Fix: Tap to retrieve it and find possible cause & verified solution from the Maximus Fix (sold separately).

Google Search: Highlight the desired DTC, and tap on it to search in the Google engine for more detailed information about the selected DTC.

Report: To save the current data in text format. All diagnostic reports can be accessed from "Toolbox" -> "Saved Reports" -> "Health Report".

WARNING: Retrieving and using DTCs for troubleshooting vehicle operation is only one part of an overall diagnostic strategy. Never replace a part based only on the DTC definition. Each DTC has a set of testing procedures, instructions and flow charts that must be followed to confirm the location of the problem. This information can be found in the vehicle's service manual.

C. Clear Fault Code

After reading the retrieved codes from the vehicle and certain repairs have been carried out, you can use this function to erase the codes from the vehicle. Before performing this function, please be sure the vehicle's ignition key is in the ON position with the engine off.

Clearing DTCs does not fix the problem(s) that caused the code(s) to be set. If proper repairs to correct the problem that caused the code(s) to be set are not made, the code(s) will appear again and the check engine light will illuminate as soon as the problem that cause the DTC to set manifests itself.

In Fig. 5-23, tap on "Clear Fault Code", a confirmation dialog box pops up on the screen. Tap on "Yes" and the system will automatically delete the currently existing trouble code.

Note: After clearing, you should retrieve trouble codes once more or turn ignition on and retrieve codes again. If there are still some trouble codes in the system, please troubleshoot the code using a factory diagnosis guide, then clear the code and recheck.

D. Read Data Stream

This option lets you view and capture (record) real-time Live Data. This data including current operating status for parameters and/or sensor information can provide insight on overall vehicle performance. It can also be used to guide vehicle repair.

DANGER: If you must drive the vehicle in order to perform a troubleshooting procedure, ALWAYS have a second person help you. Trying to drive and operate the diagnostic tool at the same time is dangerous, and could cause a serious traffic accident.

In Fig. 5-23, tap on "Read Data Stream", the system will display data stream items.
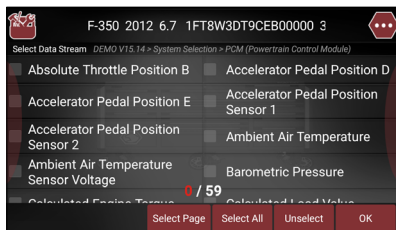
Fig. 5-25

Fig. 5-26

On-screen Buttons:

Select Page: Tap on it to select all items of the current page. To select certain data stream item, just check the box before the item name.

Select All: Tap on it to select all items. To select certain data stream item, just check the box before the item name.

Unselect: Tap on it to deselect all data stream items.

OK: Tap on it to confirm and jump to the next step.

After selecting the desired items, tap on "OK" to enter the data stream reading page.
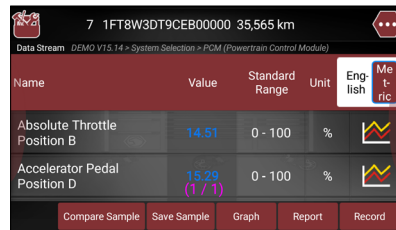
Notes:

1. If the value of the data stream item is out of the range of the standard (reference) value, the whole line will display in red. If it complies with the reference value, it displays in blue (normal mode).

2. The indicator 1/X shown on the bottom of the screen stands for the current page/total page number. Swipe the screen from the right/left to advance/return to the next/previous page.

3. In the Unit column, tap on the desired measurement unit tab to set it.

There are 3 types of display modes available for data viewing, allowing you to view various types of parameters in the most suitable way.

• Value – this is the default mode which displays the parameters in texts and shows in list format.

- Graph – displays the parameters in waveform graphs.
- Combine – this option is mostly used in graph merge status for data comparison. In this case, different items are marked in different colors.

On-screen Buttons:

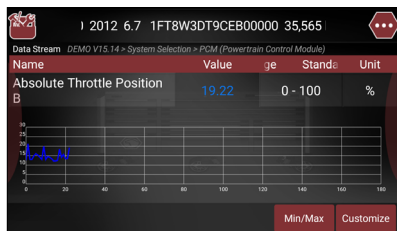: Tap on it to view the waveform graph of the current data stream item.

Fig. 5-27

- Min/Max: Tap on "Min/Max" to define the maximum/ minimum value. Once the value goes beyond the specified value, the system will alarm.
- Customize: If desired, you can customize to show only those PIDs you are interested in viewing. Tap on "Customize" to add/change other data stream items.

Note: The real time (Live Data) vehicle operating information (values/status) that the on-board computer supplies to the tool for each sensor, actuator, switch, etc. is called Parameter Identification Data (IPD).
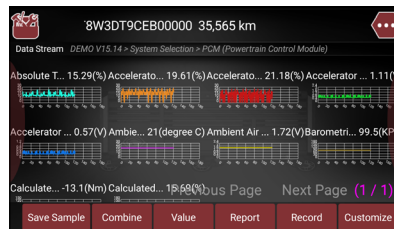
Graph: Tap on it to view the waveform.

Fig. 5-28

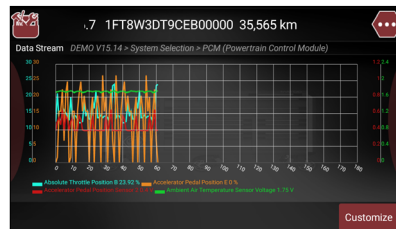- Combine: This option is mostly used in graph merge status for data comparison.

Fig. 5-29

- <u>Value</u>: Tap to display the parameters in texts.
- <u>Customize</u>: This option allows you to select only the PIDs that you wish to display. Tap on it, a pull-down list of the data stream items appears on the screen. Select (Up to 8 data stream items can be selected)/deselect the desired items and then screen will display/remove the corresponding waveforms immediately.
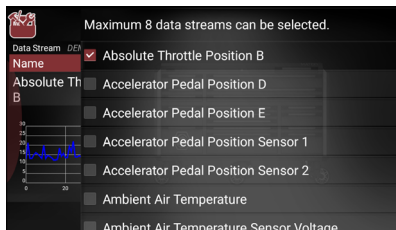

Fig. 5-30

<u>Compare Sample</u>: Tap on it to select the sample DS file, the values you customized and saved in process of DS sampling will be imported into the "Standard Range"(See below) column for your comparison.

Note: Before executing this function, you have to sample the values of data stream items and save it as an sample DS file.
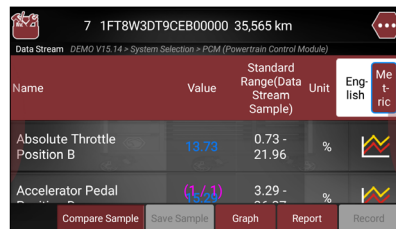

Fig. 5-31

<u>Report</u>: To save the current data as a diagnostic report. All diagnostic reports can be accessed from "Toolbox" -> "Saved Reports" -> "Health Report".

<u>Record</u>: Tap to start recording diagnostic data. Recorded live data can serve as valuable information to help you in troubleshooting of vehicle problems. All diagnostic records can be replayed from "Toolbox" -> "Saved reports" -> "Recorded Data".

Note: The saved file follows the naming rule: It begins with vehicle type, and then the record starting time and ends with .x431 (To differentiate between files, please configure the accurate system time).

<u>Save Sample</u>: This item enables you to customize the standard range of live data stream items and save it as DS sample file. Each time you run the data stream items, you can call out the corresponding sample data to overwrite the current standard range.

Tap on it to start recording the sample data (*Only data stream items with units will be recorded), and the screen displays as below:
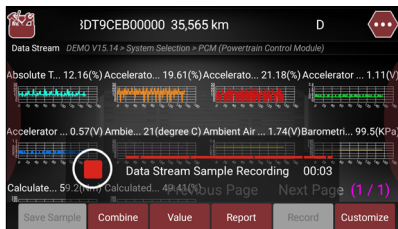

Fig. 5-32

Once recording is complete, tap on (■) to stop it and navigate to the data revision screen.

Fig. 5-33

Tap on the Min./Max. value to change it. After modifying all desired items, tap on "Save" to save it as an sample DS file.

All DS files are stored under the "Data Samples" file of "Save Report" in "Toolbox".

<u>E. Actuation Test</u>

This option is used to access vehicle-specific subsystem and component tests. Available test vary by vehicle manufacturer, year, and model. During the actuation test, the MaxLiteA tablet outputs commands to the ECU in order to drive the actuators, and then determines the integrity of the system or parts by reading the ECU data, or by monitoring the operation of the actuators, such as switching a injector between two operating states.

In Fig. 5-23, tap on "Actuation Test", the system will display as follows:
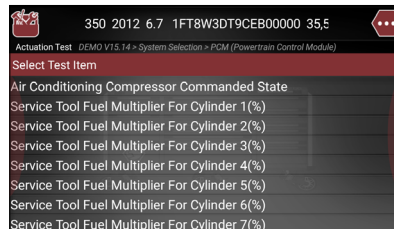

Fig. 5-34

Simply follow the on-screen instructions and make appropriate selections to complete the test. Each time when an operation is successfully executed, "Completed" displays.

5.3 Maintenance Reset

In addition to amazing & powerful diagnostic function, MaxLiteA also features various service functions. The most commonly performed service functions contain:

• Oil Reset Service

• Electronic Parking Brake Reset

• Steering Angle Calibration

• ABS Bleeding

• TPMS (Tire Pressure Monitor System) Reset

• IMMO Service

• Injector Coding

• Battery Maintenance System

• Diesel Particulate Filter (DPF) Regeneration

There are two methods to reset service lamp: Manual reset or Auto reset. Auto reset follows the principle of sending command from the tool to vehicle's ECU to do resetting. While using manual reset, users just follow the on-screen instructions to select appropriate execution options, enter correct data or values, and perform necessary actions, the system will guide you through the complete performance for various service operations.
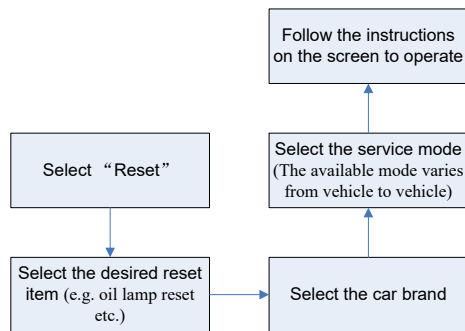
Figure 5-35

5.3.1 Oil Reset Service

This function allows you to perform reset for the engine oil life system, which calculates an optimal oil life change interval depending on the vehicle driving conditions and climate.

This function can be performed in the following cases:

1. If the service lamp is on, you must provide service for the car. After service, you need to reset the driving mileage or driving time so that the service lamp turns off and the system enables the new service cycle.

2. After changing engine oil or electric appliances that monitor oil life, you need to reset the service lamp.

5.3.2 Electronic Parking Brake Reset

1. If the brake pad wears the brake pad sense line, the brake pad sense line sends a signal sense line to the on-board computer to replace the brake pad. After replacing the brake pad, you must reset the brake pad. Otherwise, the car alarms.

2. Reset must be performed in the following cases:

   a) The brake pad and brake pad wear sensor are replaced.

   b) The brake pad indicator lamp is on.

   c) The brake pad sensor circuit is short, which is recovered.

   d) The servo motor is replaced.

5.3.3 Steering Angle Calibration

To reset the steering angle, first find the relative zero point position for the car to drive in straight line. Taking this position as reference, the ECU can calculate the accurate angle for left and right steering.

After replacing the steering angle position sensor, replacing steering mechanical parts (such as steering gearbox, steering column, end tie rod, steering knuckle), performing four-wheel alignment, or recovering car body, you must reset the steering angle.

5.3.4 ABS Bleeding

This function allows you to perform various bi-directional tests to check the operating conditions of Anti-lock Braking System (ABS).

1. When the ABS contains air, the ABS bleeding function must be performed to bleed the brake system to restore ABS brake sensitivity.

2. If the ABS computer, ABS pump, brake master cylinder, brake cylinder, brake line, or brake fluid is replaced, the ABS bleeding function must be performed to bleed the ABS.

5.3.5 Tire Pressure Monitor System Reset

This function allows you to quickly look up the tire sensor IDs from the vehicle's ECU, as well as to perform TPMS replacement and sensor test.

1. After the tire pressure MIL turns on and maintenance is performed, the tire pressure resetting function must be performed to reset tire pressure and turn off the tire pressure MIL.

2. Tire pressure resetting must be performed after maintenance is performed in the following cases: tire pressure is too low, tire leaks, tire pressure monitoring device is replaced or installed, tire is replaced, tire pressure sensor is damaged, and tire is replaced for the car with tire pressure monitoring function.

5.3.6 IMMO Service

An immobilizer is an anti-theft mechanism that prevents a

vehicle's engine from starting unless the correct ignition key or other device is present. Most new vehicles have an immobilizer as standard equipment. An important advantage of this system is that it doesn't require the car owner to activate it since it operates automatically. An immobilizer is considered as providing much more effective anti-theft protection than an audible alarm alone.

As an anti-theft device, an immobilizer disables one of the systems needed to start a car's engine, usually the ignition or the fuel supply. This is accomplished by radio frequency identification between a transponder in the ignition key and a device called a radio frequency reader in the steering column. When the key is placed in the ignition, the transponder sends a signal with a unique identification code to the reader, which relays it to a receiver in the vehicle's computer control module. If the code is correct, the computer allows the fuel supply and ignition systems to operate and start the car. If the code is incorrect or absent, the computer disables the system, and the car will be unable to start until the correct key is placed in the ignition.

To prevent the car being used by unauthorized keys, the anti-theft key matching function must be performed so that the immobilizer control system on the car identifies and authorizes remote control keys to normally use the car.

When the ignition switch key, ignition switch, combined instrument panel, ECU, BCM, or remote control battery is replaced, anti-theft key matching must be performed.

5.3.7 Injector Coding

Write injector actual code or rewrite code in the ECU to the injector code of the corresponding cylinder so as to more accurately control or correct cylinder injection quantity.

After the ECU or injector is replaced, injector code of each cylinder must be confirmed or re-coded so that the cylinder can better identify injectors to accurately control fuel injection.

5.3.8 Battery Maintenance System Reset

This function enables you to perform a resetting operation on the monitoring unit of vehicle battery, in which the original low battery fault information will be cleared and battery matching will be done.

Battery matching must be performed in the following cases:

1) Main battery is replaced. Battery matching must be performed to clear original low battery information and prevent the related control module from detecting false information. If the related control module detects false information, it will invalidate some electric auxiliary functions, such as automatic start & stop function, sunroof without one-key trigger function, power window without automatic function.

2) Battery monitoring sensor. Battery matching is performed to re-match the control module and motoring sensor to detect battery power usage more accurately, which can avoid an error message displaying on the instrument

panel.

5.3.9 Diesel Particulate Filter (DPF) Regeneration

DPF regeneration is used to clear PM (Particulate Matter) from the DPF filter through continuous combustion oxidation mode (such as high temperature heating combustion, fuel additive or catalyst reduce PM ignition combustion) to stabilize the filter performance.

DPF regeneration may be performed in the following cases:

1) The exhaust back pressure sensor is replaced.

2) The PM trap is removed or replaced.

3) The fuel additive nozzle is removed or replaced.

4) The catalytic oxidizer is removed or replaced.

5) The DPF regeneration MIL is on and maintenance is performed.

6) The DPF regeneration control module is replaced.

5.4 Diagnostic History (Previous Sessions)

Generally once a vehicle diagnosis is performed, MaxLiteA will record the every details of diagnostic process. The History function provides a quick access to the tested vehicles and users can resume from the last operation, without the necessity of starting from scratch.

Tap on "Previous Sessions", all diagnostic records will be listed on the screen in date sequence.
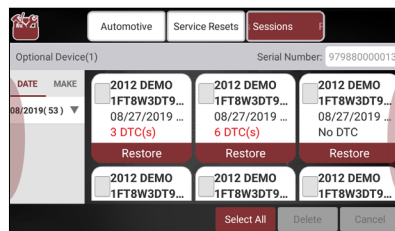

Fig. 5-36

- Tap on certain vehicle model to view the details of the last diagnostic report.

- To delete certain diagnostic history, select it and then tap on "Delete". To delete all historical records, tap on "Select All" and then tap on "Delete".

- Tap on "Restore" to directly navigate to the function selection page of last diagnostic operation. Choose the desired option to proceed.

5.5 I/M Readiness

I/M refers to Inspection and Maintenance that is legislated by the Government to meet federal clean-air standards. I/M Readiness indicates whether or not the various emissions-related systems on the vehicle are operating properly and are ready for Inspection and Maintenance testing.

The purpose of the I/M Readiness Monitor Status is to indicate which of the vehicle's Monitors have run and

completed their diagnosis and testing, and which ones have not yet run and completed testing and diagnosis of their designated sections of the vehicle's emissions system.

The I/M Readiness Monitor Status function also can be used (after repair of a fault has been performed) to confirm that the repair has been performed correctly, and/or to check for Monitor Run Status.

Tap on [I/M Readiness] from the Automotive main menu screen, the screen will start reading the I/M readiness and display the result.
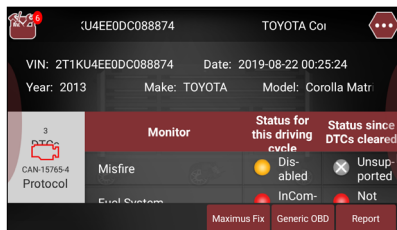

Fig. 5-37

Currently, fifteen Monitors are supported by OBD II systems. Additional monitors may be added as a result of Government regulations as the OBD II system grows and matures. Not all vehicles support all fifteen Monitors. Additionally, some Monitors are supported by "spark ignition" vehicles only, while others are supported by "compression ignition" vehicles only.

Monitor operation is either "Continuous" or "Non-

Continuous," depending on the specific monitor.

5.5.1 Continuous Monitors

Some of the vehicle components or systems are continuously tested by the vehicle's OBD 2 system, while others are tested only under specific vehicle operating conditions. The continuously monitored components listed below are always ready:

1. Misfire Monitor

This Monitor continuously checks for engine misfires. A misfire occurs when the air-fuel mixture in the cylinder does not ignite. The misfire Monitor uses changes in crankshaft speed to sense an engine misfire. When a cylinder misfires, it no longer contributes to the speed of the engine, and engine speed decreases each time the affected cylinder(s) misfire. The misfire Monitor is designed to sense engine speed fluctuations and determine from which cylinder(s) the misfire is coming, as well as how bad the misfire is.

There are three types of engine misfires, Types 1, 2, and 3.

- Type 1 and Type 3 misfires are two-trip monitor faults. If a fault is sensed on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The MIL is not commanded on at this time. If the fault is found again on the second trip, under similar conditions of engine speed, load and temperature, the computer commands the MIL "On," and the code is saved in its long term memory.

- Type 2 misfires are the most severe type of misfire. When a Type 2 misfire is sensed on the first trip, the computer commands the MIL to light when the misfire is sensed. If the computer determines that a Type 2 misfire is severe, and may cause catalytic converter damage, it commands the MIL to "flash" once per second as soon as the misfire is sensed. When the misfire is no longer present, the MIL reverts to steady "On" condition.

The Misfire Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles.

2. Fuel System Monitor

This Monitor uses a Fuel System Correction program, called Fuel Trim, inside the on-board computer. Fuel Trim is a set of positive and negative values that represent adding or subtracting fuel from the engine. This program is used to correct for a lean (too much air/not enough fuel) or rich (too much fuel/not enough air) air-fuel mixture. The program is designed to add or subtract fuel, as needed, up to a certain percent. If the correction needed is too large and exceeds the time and percent allowed by the program, a fault is indicated by the computer.

The Fuel System Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles. The Fuel System Monitor may be a "One-Trip" or "Two-Trip" Monitor, depending on the severity of the problem.

3. Comprehensive Components Monitor (CCM)

This Monitor continuously checks all inputs and outputs from sensors, actuators, switches and other devices that provide a signal to the computer. The Monitor checks for shorts, opens, out of range value, functionality and "rationality* (See Note)."

Rationality: Each input signal is compared against all other inputs and against information in the computer's memory to see if it makes sense under the current operating conditions.

Example: The signal from the throttle position sensor indicates the vehicle is in a wide-open throttle condition, but the vehicle is really at idle, and the idle condition is confirmed by the signals from all other sensors. Based on the input data, the computer determines that the signal from the throttle position sensor is not rational (does not make sense when compared to the other inputs). In this case, the signal would fail the rationality test.

The CCM is supported by both "spark ignition" vehicles and "compression ignition" vehicles. The CCM may be either a "One-Trip" or a "Two-Trip" Monitor, depending on the component.

5.5.2 Non-Continuous Monitors

The other twelve Monitors are "non-continuous" Monitors. "Non-continuous" Monitors perform and complete their testing once per trip. The "non-continuous" Monitors are:

1. O$_2$ Sensor Monitor

The Oxygen Sensor monitors how much oxygen is in the vehicle's exhaust. It generates a varying voltage of up to one volt, based on how much oxygen is in the exhaust gas, and sends the signal to the computer. The computer uses this signal to make corrections to the air/fuel mixture. If the exhaust gas has a large amount of oxygen (a lean air/fuel mixture), the oxygen sensor generates a "low" voltage signal. If the exhaust gas has very little oxygen (a rich mixture condition), the oxygen sensor generates a "high" voltage signal. A 450mV signal indicates the most efficient, and least polluting, air/fuel ratio of 14.7 parts of air to one part of fuel.

The oxygen sensor must reach a temperature of at least 600-650°F, and the engine must reach normal operating temperature, for the computer to enter into closed-loop operation.

The oxygen sensor only functions when the computer is in closed-loop. A properly operating oxygen sensor reacts quickly to any change in oxygen content in the exhaust stream. A faulty oxygen sensor reacts slowly, or its voltage signal is weak or missing.

The Oxygen Sensor Monitor is supported by "spark ignition" vehicles only. The Oxygen Sensor Monitor is a "Two-Trip" monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

2. O$_2$ Sensor Heater Monitor

The Oxygen Sensor Heater Monitor tests the operation of the oxygen sensor's heater. There are two modes of operation on a computer-controlled vehicle: "open-loop" and "closed-loop." The vehicle operates in open-loop when the engine is cold, before it reaches normal operating temperature. The vehicle also goes to open-loop mode at other times, such as heavy load and full throttle conditions. When the vehicle is running in open-loop, the oxygen sensor signal is ignored by the computer for air/fuel mixture corrections. Engine efficiency during open-loop operation is very low, and results in the production of more vehicle emissions.

Closed-loop operation is the best condition for both vehicle emissions and vehicle operation. When the vehicle is operating in closed-loop, the computer uses the oxygen sensor signal for air/fuel mixture corrections.

In order for the computer to enter closed-loop operation, the oxygen sensor must reach a temperature of at least 600°F. The oxygen sensor heater helps the oxygen sensor reach and maintain its minimum operating temperature (600°F) more quickly, to bring the vehicle into closed-loop operation as soon as possible.

The Oxygen Sensor Heater Monitor is supported by "spark ignition" vehicles only. The Oxygen Sensor Heater Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip,

the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

3. Catalyst Monitor

The catalytic converter is a device that is installed downstream of the exhaust manifold. It helps to oxidize (burn) the unburned fuel (hydrocarbons) and partially burned fuel (carbon monoxide) left over from the combustion process. To accomplish this, heat and catalyst materials inside the converter react with the exhaust gases to burn the remaining fuel. Some materials inside the catalytic converter also have the ability to store oxygen, and release it as needed to oxidize hydrocarbons and carbon monoxide. In the process, it reduces vehicle emissions by converting the polluting gases into carbon dioxide and water.

The computer checks the efficiency of the catalytic converter by monitoring the oxygen sensors used by the system. One sensor is located before (upstream of) the converter; the other is located after (downstream of) the converter. If the catalytic converter loses its ability to store oxygen, the downstream sensor signal voltage becomes almost the same as the upstream sensor signal. In this case, the monitor fails the test.

The Catalyst Monitor is supported by "spark ignition" vehicles only. The Catalyst Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On" and saves the code in its long-term memory.

4. Heated Catalyst Monitor

Operation of the "heated" catalytic converter is similar to the catalytic converter. The main difference is that a heater is added to bring the catalytic converter to its operating temperature more quickly. This helps reduce emissions by reducing the converter's down time when the engine is cold. The Heated Catalyst Monitor performs the same diagnostic tests as the catalyst Monitor, and also tests the catalytic converter's heater for proper operation.

The Heated Catalyst Monitor is supported by "spark ignition" vehicles only. This Monitor is also a "Two-Trip" Monitor.

5. EGR (Exhaust Gas Recirculation) System Monitor

The Exhaust Gas Recirculation (EGR) system helps reduce the formation of Oxides of Nitrogen during combustion. Temperatures above 2500°F cause nitrogen and oxygen to combine and form Oxides of Nitrogen in the combustion chamber. To reduce the formation of Oxides of Nitrogen, combustion temperatures must be kept below 2500°F. The EGR system recirculates small amounts of exhaust gas back into the intake manifold, where it is mixed with the incoming air/fuel mixture. This reduces combustion temperatures by

up to 500°F. The computer determines when, for how long, and how much exhaust gas is recirculated back to the intake manifold. The EGR Monitor performs EGR system function tests at preset times during vehicle operation.

The EGR Monitor is supported by both "spark ignition" vehicles and "compression ignition" vehicles. The EGR Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

6. EVAP System Monitor

OBD II vehicles are equipped with a fuel Evaporative system (EVAP) that helps prevent fuel vapors from evaporating into the air. The EVAP system carries fumes from the fuel tank to the engine where they are burned during combustion. The EVAP system may consist of a charcoal canister, fuel tank cap, purge solenoid, vent solenoid, flow monitor, leak detector and connecting tubes, lines and hoses.

Fumes are carried from the fuel tank to the charcoal canister by hoses or tubes. The fumes are stored in the charcoal canister. The computer controls the flow of fuel vapors from the charcoal canister to the engine via a purge solenoid. The computer energizes or deenergizes the purge solenoid (depending on solenoid design). The purge solenoid opens a valve to allow engine vacuum to draw the fuel vapors from

the canister into the engine where the vapors are burned. The EVAP Monitor checks for proper fuel vapor flow to the engine, and pressurizes the system to test for leaks. The computer runs this Monitor once per trip.

The EVAP Monitor is supported by "spark ignition" vehicles only. The EVAP Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the PCM commands the MIL "On," and saves the code in its long-term memory.

7. Secondary Air System Monitor

When a cold engine is first started, it runs in open-loop mode. During open-loop operation, the engine usually runs rich. A vehicle running rich wastes fuel and creates increased emissions, such as carbon monoxide and some hydrocarbons. A Secondary Air System injects air into the exhaust stream to aid catalytic converter operation:

• It supplies the catalytic converter with the oxygen it needs to oxidize the carbon monoxide and hydrocarbons left over from the combustion process during engine warmup.

• The extra oxygen injected into the exhaust stream also helps the catalytic converter reach operating temperature more quickly during warm-up periods. The catalytic converter must heat to operating temperature to work properly.

The Secondary Air System Monitor checks for component integrity and system operation, and tests for faults in the system. The computer runs this Monitor once per trip.

The Secondary Air System Monitor is a "Two-Trip" monitor. If a fault is found on the first trip, the computer temporarily saves this fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

Note: The following Monitors became standard beginning in 2010. The majority of vehicles produced before this time will not support these Monitors.

8. NMHC (Non-Methane Hydrocarbon Catalyst) Monitor

The non-methane hydrocarbon catalyst is a type of catalytic converter. It helps to remove non-methane hydrocarbons (NMH) left over from the combustion process from the exhaust stream. To accomplish this, heat and catalyst materials react with the exhaust gases to convert NMH to less harmful compounds. The computer checks the efficiency of the catalyst by monitoring the quantity of NMH in the exhaust stream. The monitor also verifies that sufficient temperature is present to aid in particulate matter (PM) filter regeneration.

The NMHC Monitor is supported by "compression ignition" vehicles only. The NMHC Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

9. NOx Adsorber Monitor

NOx aftertreatment is based on a catalytic converter support that has been coated with a special washcoat containing zeolites. NOx Aftertreatment is designed to reduce oxides of nitrogen emitted in the exhaust stream. The zeolite acts as a molecular "sponge" to trap the NO and NO_2 molecules in the exhaust stream. In some implementations, injection of a reactant before the aftertreatment purges it. NO_2 in particular is unstable, and will join with hydrocarbons to produce H_2O and N_2. The NOx Aftertreatment Monitor monitors the function of the NOx aftertreatment to ensure that tailpipe emissions remain within acceptable limits.

The NOx Aftertreatment Monitor is supported by "compression ignition" vehicles only. The NOx Aftertreatment Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

10. Boost Pressure System Monitor

The boost pressure system serves to increase the pressure produced inside the intake manifold to a level greater than atmospheric pressure. This increase in pressure helps to ensure compete combustion of the air-fuel mixture. The Boost Pressure System Monitor checks for component integrity and system operation, and tests for faults in the system. The computer runs this Monitor once per trip.

The Boost Pressure System Monitor is supported by "compression ignition" vehicles only. The Boost Pressure System Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

11. Exhaust Gas Sensor Monitor

The exhaust gas sensor is used by a number of systems/monitors to determine the content of the exhaust stream. The computer checks for component integrity, system operation, and tests for faults in the system, as well as feedback faults that may affect other emission control systems.

The Exhaust Gas Sensor Monitor is supported by "compression ignition" vehicles only. The Exhaust Gas Sensor Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

12. PM Filter Monitor

The particulate matter (PM) filter removes particulate matter from the exhaust stream by filtration. The filter has a honeycomb structure similar to a catalyst substrate, but with the channels blocked at alternate ends. This forces the exhaust gas to flow through the walls between the channels, filtering the particulate matter out. The filters are self-cleaning by periodic modification of the exhaust gas concentration in order to burn off the trapped particles (oxidizing the particles to form CO_2 and water). The computer monitors the efficiency of the filter in trapping particulate matter, as well as the ability of the filter to regenerate (self-clean).

The PM Filter Monitor is supported by "compression ignition" vehicles only. The PM Filter Monitor is a "Two-Trip" Monitor. If a fault is found on the first trip, the computer temporarily saves the fault in its memory as a Pending Code. The computer does not command the MIL on at this time. If the fault is sensed again on the second trip, the computer commands the MIL "On," and saves the code in its long-term memory.

5.6 Vehicle Voltage

This option allows you to perform a check of the vehicle's battery to ensure the system is operating within acceptable

limits.

Tap on [Vehicle Voltage] from the Automotive main menu screen, the following screen will appear.
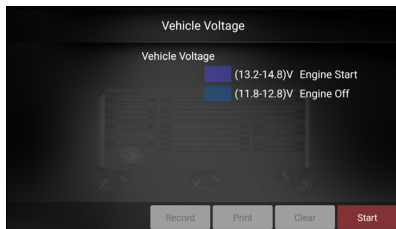

Fig. 5-38

On-screen Buttons:

Start: Tap on it to start checking the real-time vehicle voltage.

Record: Tap on it to start recording the running waveform graph. All recorded files are saved under "Saved Report" -> "Recorded Data".

Print: Tap on it to print the current screen via the printer.

Clear: Tap on it to clear the running waveform graph.

6 Toolbox

6.1 Saved Reports

Tap on "Saved Reports", it mainly includes the following options:

1). Health report

2). Recorded data

3). Data samples

4). Shared data samples

6.1.1 Health Report

This module stores all diagnostic reports generated in process of vehicle diagnosis.

All the diagnostic reports are sorted by Date and Make. Tap on the desired type to re-arrange and filter it.

- To select certain report, check the box before the report. To select all reports, tap on "Select All". To deselect all, tap on "Unselect".
- To revise the filename of the report, select the desired one and tap on "Rename".
- To share the report with others, select the desired one and then tap on "Share".
- Select the desired report and then tap on "Delete" to delete it.

6.1.2 Recorded Data

If user records the running parameters or waveform graphs while reading data stream, it will be saved as diagnostic records and appear under this tab. You can use this option to view recorded live data. Frame playback and auto playback are supported.

Tap on "Recorded Data", and select certain diagnostic record and data stream items and tap on "OK" to jump to the playback page.

Note: While viewing recorded live data, carefully look for any irregularities in any of the PID values/signal information (TEMP, RPM, etc). If any PIDs go beyond the standard range value, or irregularities are detected, follow the procedures in the vehicle's service manual to perform additional troubleshooting and repair.


Fig. 6-1

On-screen Buttons:

Graph – Displays the parameters in waveform graphs.

Combine – This option is mostly used in graph merge status for data comparison. In this case, different items are marked in different colors.

Value – This is the default mode which displays the parameters in texts and shows in list format.

Frame Playback – Plays back the recorded data stream items frame by frame. Tap on ▶ to start playing. Tap on ■ to stop it. Tap on ▶▶ to fast forward to next frame. Tap on ◀◀ to reverse to previous frame. Once it is in frame playback mode, this button changes into "Auto Playback".

6.1.3 Data Samples

This feature allows you to manage the recorded data stream sample files.

6.1.4 Shared Data Samples

This feature lets you view the data stream sample files shared with others.

6.2 Feedback

This item allows you to feedback your diagnostic problems to us for analysis and troubleshooting.

Tap on "Feedback", the following 3 options will be displayed on the left column of the screen.

A. Feedback

Tap on a tested vehicle model to enter the feedback screen.

1) Tap on "Choose File" to open the target folder and choose the desired diagnostic logs.

2) Choose the failure type and fill in the detailed failure description in the blank text box and telephone or email address. After inputting, tap on "Submit Result" to send it to us.

B. History

Tap on it to view all diagnostic feedback records. Different process states are marked with different colors.

C. Offline list

Tap on it to display all diagnostic feedback logs which have not been submitted successfully due to network failure. Once the tablet gets a stable network signal, it will be uploaded to the remote server automatically.

6.3 Update

This module allows you to update the diagnostic software & App and set frequently used software.

If you did not download the software in process of product activation or a number (indicating the available software quantity) displaying on the upper right corner of the 📋 icon, you may use this option to download it or keep it synchronized with the latest version.

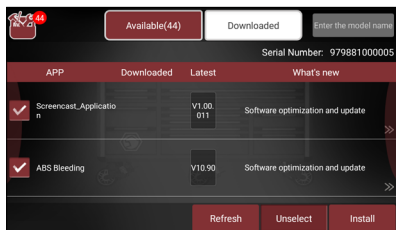Tap "Update" to enter the update center.

Fig. 6-2

6.3.1 Update Diagnostic Software & APP

The Available tab displays a list of software that can be updated. Under it, all software is categorized into three kinds:

• Common software: mainly includes some common apps that are associated with the diagnostic app. The software of this kind always stays at the top of the list, which can be deselected manually (excluding the system app, such as firmware and ECU aid).

• Frequently used vehicle software: refers to the diagnostic software that is frequently used, including the vehicle diagnostic software and Reset software. It is generally displayed following the Common software list.

• Other vehicle software: refers to the diagnostic software that is rarely used or never used. It is generally displayed following the Frequently used software list.

1). If the user does not download any diagnostic software during the sign-up process, all diagnostic software is selected by default. Tap "Install" to start downloading.

2). If the user downloaded all/some vehicle software during the sign-up process and had it serviced for a long period of time, only the frequently used software is selected. Tap "Install" to start downloading. Other vehicle software that is rarely used will also be listed under the Available tab, but it is not selected at default.

To download certain software that is not frequently used, check the box before the vehicle model. Tap "Install" to start downloading.

Once download is finished, the software packages will be installed automatically.

6.3.2 Set Frequently Used software

If the user only intends to update the frequently used software, tap the Downloaded tab.

Tap "Install" to start downloading. Once download is finished, the software packages will be installed automatically.

6.4 Settings

This module allows you to manage diagnostic reports, VCI devices, configure wireless printer and print information and add favorite website etc.
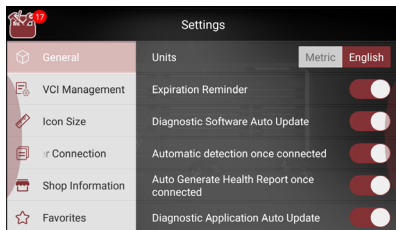
6.4.1 General

Fig. 6-3

6.4.1.1 Units of Measurement

It is designed to set the measurement unit. Metric System and English System are available.

6.4.1.2 Expiration Reminder

All pre-installed diagnostic software is free to use for 30 days. Once it expires, it will be locked automatically and the system will prompt you to activate your VCI if the expiration reminder is ON.

6.4.1.3 Diagnostic Software Auto Update

This option is designed to turn on/off the automatic diagnostic software update function. If set as ON, the system will automatically update the available diagnostic software when the tablet has a network connection and a newer version is detected.

6.4.1.4 Automatic detection once connected

This option enables you to determine whether to start an automatic VIN detection once the handset is properly connected to the vehicle's DLC.

6.4.1.5 Auto Generate Health Report once connected

Once it is set as ON, the system will automatically output a health report once the AutoDetect diagnostic session is finished.

6.4.1.6 Diagnostic Application Auto Update

This option is used to set whether to update the available diagnostic application automatically when the tablet has stable Wi-Fi signal.
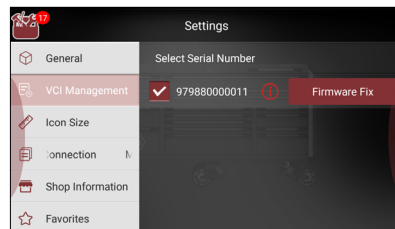
6.4.2 VCI Management

Fig. 6-4

If the current VCI comes across communication failure, tap on "Firmware Fix" to update and fix the diagnostic firmware.

During fixing, please do not cut power or switch to other interfaces.

Note: please be sure to keep the VCI device powered on while performing the operation.

6.4.3 Icon Size

This feature allows you to set the size of the diagnostic software icon according to your preference.

Drag the slider to different size and the system will display the corresponding effect.

6.4.4 MD Printer Connection

This option is used to establish a wireless connection between the tablet and the printer (sold separately) while performing printing operations.

The App is compatible with the "Matco Tools Wi-Fi Printer" (sold separately) and "System" (external printer).

Follow the steps below to connect the Wi-Fi printer.

1. Tap on "MD Printer Connection".

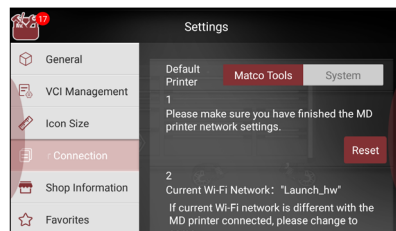Below describes how to configure the Wi-Fi Printer.

Fig. 6-5

A. If it is the first time you have operated this printer, please proceed the following:

2. For initial use, you are suggested to reset the printer: Press and hold [MODE] & [FEED] for 8 seconds, the following resetting command will be printed out:

at + default = 1

ok

at + reboot = 1

rebooting...

3. Tap on "Reset" to configure Wi-Fi printer.

Step 1: Connect the printer:

Tap on "Scan" to select the desired printer hotspot named with X-431PRINTER-XXXX (XXXX stands for 4 characters), and then tap on "Connect" to enter Step 2.

Step 2: Join the printer into LAN:

Tap on "Scan" to select the desired local Wi-Fi network

from the list, and type in the security password (If it is an open network, password is not required), and then tap on "Confirm".

4. Once the Wi-Fi network of the printer is connected and the printer is found, tap on "Test Print" to test the printing.

Now you can use the Wi-Fi printer to print!

If the printer is not found, please reset the printer to default factory settings (refer to Step 2 for details) and check whether the current device and the printer are on the same LAN.

B. If you have configured the Wi-Fi printer to the LAN:

2. Tap on "Connect to Printer":

a). If the local network remains as it is, tap on "Test Print" directly to test the printing.

b). If the local network changes, you have to reboot and reconfigure the Wi-Fi printer.

6.4.5 Shop Information

This option lets you define the detailed information of your workshop. It mainly includes Workshop, Address, Zip Code, Telephone, Email etc.
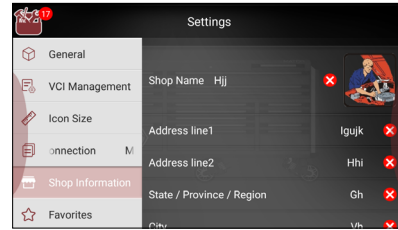

Fig. 6-6

After inputting, tap on "Save".

Once you saved the shop information, it will be loaded automatically in the "More Information" box every time you save the diagnostic report.

6.4.6 Favorites

This feature provides you quick accesses to some renowned and popular repair and maintenance website links. These may include general information about a component or system, diagnostic and troubleshooting procedures and/or repair instructions. Moreover you can also add more repair websites into Favorites so that you can quickly open them in future.
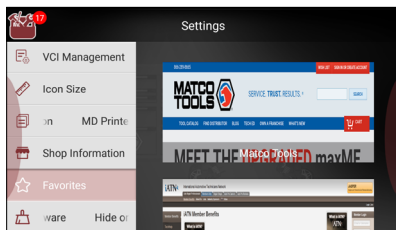
Fig. 6-7

Tap on the desired website to visit it.

To add certain website into favorites, scroll the screen to until it reaches to the bottom, tap on "+", a dialog box similar to the following appears.
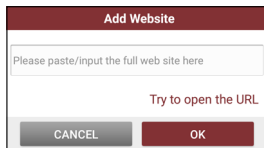

Fig. 6-8

Type in the full web site in the blank, and tap on "OK", it will be listed in the Favorites.

6.4.7 Hide or Remove Software

This item allows you to hide/clear the diagnostic software that is not frequently used.

Tap on "Hide or Remove Software" to enter.

Under the "Hide Software" tab, select the desired software logo (a "Checkmark" will show in the checkbox located at the lower right corner) and tap on "Hide", it will become invisible. Tap on "Unhide" to undo the hide operation.

Under the "Remove Software" tab, select the desired software logo and tap on "Delete", it will disappear from the screen.

Note: Removing software may completely delete the software from the tablet. If some software is not used and the tablet runs out of space, you can use this feature to remove it. To re-download it, go to "Update" -> "All Software".

6.5 About

FAQ, Vehicle Coverage, Quick Start Guide and User Manual are included.

Appendix - FAQ

1. Communication error with vehicle ECU?

Please confirm:

1. Whether diagnostic cable is correctly connected.
2. Whether ignition switch is ON.
3. If all checks are normal, send vehicle year, make, model and VIN number to us using "Feedback" feature.

2. Failed to enter into vehicle ECU system?

Please confirm:

1. Whether the vehicle is equipped with this system.
2. Whether the diagnostic cable is correctly connected.
3. Whether ignition switch is ON.
4. If all checks are normal, send vehicle year, make, model and VIN number to us using "Feedback" feature.

3. Can I use any power adapter other than the included 5V to charge the tablet?

No. Please use the included 5V power adapter to recharge the tablet. We assume no responsibility for damage or loss resulting from the use of any other adapters.

4. How to save power?

• Please turn off the screen while MaxLiteA keeps idle.
• Set a shorter standby time.
• Decrease the brightness of the screen.
• If Wi-Fi connection is not required, please turn it off.
• Disable GPS function if GPS service is not in use.

5. How to reset the tablet?

1. Ensure the tablet is in ON mode.
2. Select "Settings" on the home screen.
3. Select "Backup & reset".
4. Tap on "Factory data reset".
5. Tap on "RESET TABLET" to confirm.
6. After resetting is complete, follow the on-screen instructions to finish the system settings.

WARNING: Resetting may cause data loss. Before doing so, please make sure important data has been backed up.

6. How to update Android system?

Preparation

A newer Android version will be released to bring better user experience. Please see below details. Please make sure your tool battery has at least 70%.

Do NOT run any other programs during the update.

1. Press the home key to navigate to the home screen.

2. Tap on "System Update".

3. Tap on "Check version". Once a newer version is found, follow the on-screen instructions to download and install the update file.

4. Be patient to wait until the update is done.

<u>7. My software subscription has expired, how do I renew it?</u>

Open and sign in the MaxLiteA App, tap on "MANAGE SUBSCRIPTIONS", select the desired recurring plan and follow the on-screen instructions to finish the subscription renewal.

<u>8. How to register the MaxLiteA?</u>

1. Turn the MaxLiteA tablet on.

2. Turn on Wi-Fi: Select "Settings" -> "Wi-Fi". Choose preferred network and tap on "Connect".

3. Open the MaxLiteA Software. Select "REGISTER BASIC MODE".

4. Fill in the account information and device information (Serial number is a 12-digit number starting with 98 -- you can find it on the back of your tool. Verification code is a 8-digit number stored in the included Private & Confidential sheet. Activation code is printed on the receipt, or consult your dealer for it), and then tap on "ACTIVATE".

5. Tap on "RUN DIAGNOSTICS" to launch diagnostics.

6. Tap on the "Toolbox" icon on the top left-hand corner of the screen to switch to the Toolbox module.

7. Tap on "Update" to enter the update center.

8. Make sure all brands are selected, tap on "Update" on the update page to start updating. Download and installation will take approximately 10 minutes depending on the internet connection.

<u>9. The diagnostics application is failing.</u>

1. Tap on the home key to navigate to the home screen.

2. Select "Settings".

3. Select "Apps".

4. Select the MaxLiteA Application from the Apps list.

5. Select "Force Stop".

6. Tap on "OK" to confirm.

7. Select "Storage" -> "Clear Data".

8. Tap on "OK" to confirm.

If you have any questions on the operation of the unit, please contact Matco customer service number: 877-853-3738

Statement:

We reserve the rights to make any change to product designs and specifications without notice. The actual object may differ a little from the descriptions in the manual in physical appearance, color and configuration. We have tried our best to make the descriptions and illustrations in the manual as accurate as possible, and defects are inevitable, if you have any question, please contact local dealer or after-sale service center, we shall not bear any responsibility arising from misunderstandings.