USER MANUAL

BT300 BATTERY TESTER FOR CAR & MOTORCYCLE,
STARTER ALTERNATOR TESTER



www.vdiagtool.com

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1. Product Introduction

1.1 Product Introduction

VDIAGTOOL BT300 Battery Tester adopts state - of - the - art conductance testing technology to easily, quickly and accurately measure the actual cold cranking amps capability of the vehicle starter battery, state of health of the battery itself, and common fault of the vehicle starting system and charging system, which can help maintenance personnel to find the problem quickly and accurately, thus to achieve quick vehicle repair.

1.2 Product Features

VDIAGTOOL BT300 battery tester features the following functions: battery test, cranking test, charging test and other additional functions.

The battery test mainly aims to analyze the battery healthy status to calculate the actual cold cranking capability of the battery and the aging extent, which provide reliable analysis evidence for the test and maintenance of the battery. You may notify the user to replace the battery in advance when it gets aged.

Cranking test is used to test and analyze the starting motor. Testing the actual required cranking current and cranking voltage of the starting motor is helpful to determine whether the starting motor works properly or not. If the starting motor malfunctions, it may cause an increased starting loaded torque; or rotor friction of the starting motor generates an increasing friction of the starting motor itself. Charging test is to check and analyze the charging system, including generator, rectifier, rectifier diode, etc., to find out whether the output voltage of the generator is normal, whether the rectifier diode works properly. And if the rectifier diode works abnormally, whether it caused over charge of the battery. Over charge or incomplete charge of the battery will cause quick damage to the battery and greatly shorten the life of other loaded appliances.

1. Test all automotive starting lead acid storage battery, including regular lead acid battery, AGM flat plate battery, AGM spiral battery, and Gel battery, etc.
2. Detect bad battery.
3. Feature reverse polarity protection; reverse connection may not damage the tester, the vehicle or battery.
4. Directly test the battery with loss of electricity, fully charge the battery is not required before testing.
5. Testing standards cover the majority of world's battery standards, such as CCA, BCI, CA, MCA, JIS, DIN, SAE.
6. Support multi-languages, customer can select different language package, which includes: English, Spanish, French, German, Italian, Portuguese, Polish, Russian, Dutch, Japanese, Korean, Simplified Chinese.
7. Upload recorded test data(test result, report) to computer (windows PC) and print it out.
8. Lifetime free update through updating tool BT300 from www.vdiagtool.com.

1.3 Technical Specifications

Cold Cranking Amps Measurement Range:

Measurement Standard	Measurement Range
CCA	100-2000 (5-3000)
BCI	100-2000 (5-3000)
CA	100-2000 (5-3000)
MCA	100-2000 (5-3000)
JIS	26A17-245H52
DIN	100-2000 (5-3000)
IEC	100-2000 (5-3000)
EN	100-2000 (5-3000)
SAE	100-2000 (5-3000)

Product Parameters:

Display:	LCD Display
Voltage Measurement Range :	6 - 16V DC
Operating Temperature:	0℃ - 50℃ / 32℉ - 122℉
Storage Temperature:	- 20℃ - 70℃ / - 4℉ - 158℉
Working Environment Temp:	0℃ - 50℃ / - 32℉- 122℉
Power Source:	Provided by connecting to car battery

Product Dimensions:

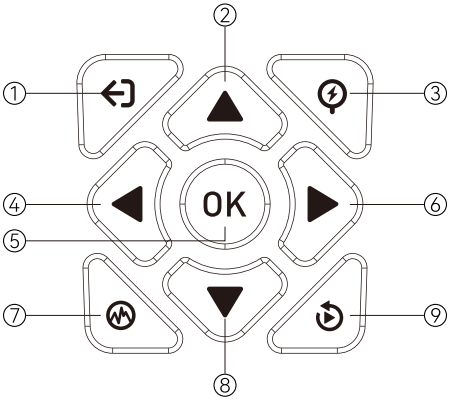
Length	Width	Height
164mm (6.45")	85.3mm (3.35")	24.4mm (0.96")

Accessories Included:

- 1 × Type - C data cable
- 1 × User's Manual

The working environment temperature above is applicable for automotive manufacturers, automotive maintenance and repair workshops, automotive battery factories, automotive battery distributors, and educational organizations, etc.

1.4 Keypad Introduction



① **ESC Button:** Returns to the previous screen. Press and hold ESC button to exit voltage waveform interface. For other tests, press ESC button once to exit.

② **Up Button:** Moves up through menu. Moves to previous screen if information covers more than one screen. Press Up button once to increase by 50 while in CCA selection interface. Press Up / Down button to switch between SOH and SOC while in battery test interface.

③ **Quick Battery Test Button:** Quickly enter the battery test and analyze the health status of the battery.

④ **Left Button:** Moves to previous screen if information covers more than one screen. Press Left Button once to decrease by 5 while in CCA selection interface.

⑤ **OK Button:** Confirms a selection from a menu. Press and hold OK button to pause playback while in review interface. Press OK button once again to resume playback.

⑥ **Right Button:** Moves to next screen if information covers more than one screen. Press Right Button once to increase CCA by 5 while in CCA selection interface.

⑦ **Waveform Button:** Enter the voltage test interface and display the real-time voltage waveform.

⑧ **Down Button:** Moves down through menu and sub-menus. Moves to next screen if information covers more than one screen. Press Down Button once to decrease CCA by 50 while in CCA selection interface. Press Up/Down button to switch between SOH and SOC while in battery test interface.

⑨ **Quick Review Button:** Quickly enter the review interface.

1.5 How to Set Up the Tool

Press Down Button and Right Button to select the [Setup] function in the Main Menu and press OK button. The screen will display interface as shown below:

Setup
Language
Buzzer
Equipment test
About

You can make below adjustments or settings to the device:

1.5.1 Select Language:

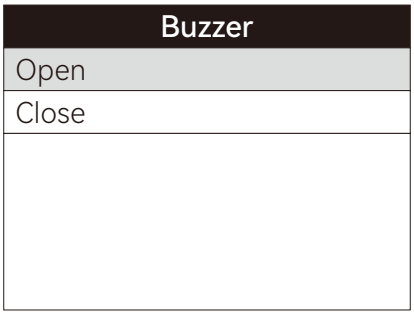
Selects desired language.Press Up Button or Down Button key to choose [Language] and press OK button, the screen will display interface as shown bellow:

Language
English
中文
日本語
한국어
Français
Deutsch

You can press Up Button or Down Button key to select any language and press OK button to confirm. The system will convert to the chosen language interface at once.

1.5.2 Buzzer: ON/OFF the Buzzer.

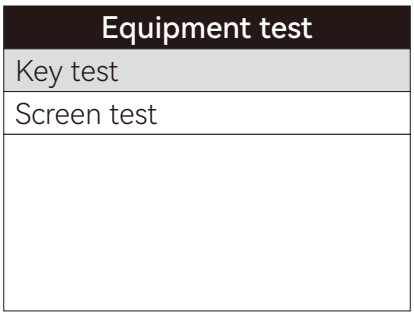
Press Up Button or Down Button key to choose [buzzer] and press OK button to confirm. The screen will display interface as shown below:



You can press OK button to turn the buzzer OFF or ON, Press ESC key to exit.

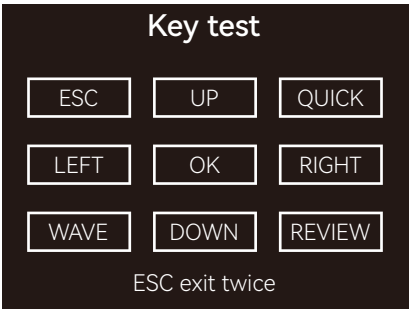
1.5.3 Equipment test: Key Test / Screen Test.

Press Up Button or Down Button to choose [Equipment test] and press OK button to confirm. The screen will display interface as shown below:



Key test: The key test function verifies if the keys are functioning properly

1. Use the Up / Down Button to select key test from the Equipment test menu, and then press the OK button to confirm.
2. Press any key to start test. When you press a key, the corresponding key name should appear on the display. If the key name does not show up, then the key is not functioning properly, the screen will display the interface as shown below:



Note: Press ESC button twice (like double click) to exit the key test interface.

Screen test: The Screen test function checks if the LCD display is working properly.

1. Use Up Button or Down Button to select “Equipment test” from the Setup menu, and press the OK button to enter “Equipment test” menu.
2. Select Screen test from “Equipment test” menu and press the OK button to start test, Press ESC button to return.
3. Look for missing spots in the color bar, white, black LCD display.
4. When completed, press ESC button (one time) to exit the interface.

1.5.4 About

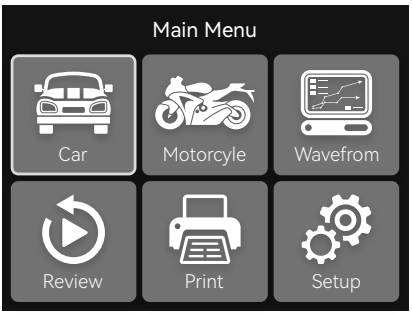
Select the [About] icon in the Main Menu and press OK button to confirm. The screen will display interface as shown below:



Press ESC (one time) to exit the [About] interface.

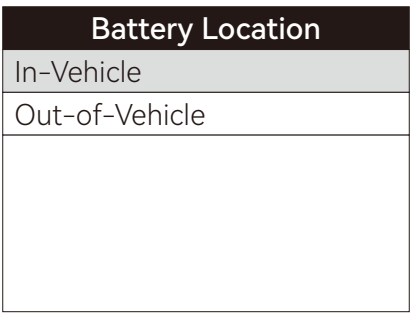
2. Car Battery Test

Select [Car] icon at the top left of the main menu and press OK button to confirm and enter car battery test interface.



In-Vehicle or Out-of-Vehicle Test

Select [Car] icon and confirm, you will see In-Vehicle and Out-of-Vehicle in the sub-menu. Select the option in accordance with your current battery location and then press OK key to continue.



2.1 In-Vehicle Battery Test

Select [Car] icon from the main menu and press OK to confirm and then select In-Vehicle to view In-Vehicle battery test menu and select “Battery test” to start In-Vehicle Battery Test. If surface charge detected by the tool, it prompts “Surface charge, turn lights on". Turn headlights on as prompted to eliminate battery surface charge, the tool will then display the following prompts in a sequence.

Battery test
1.Check surface charge, turn lights on. 2.Turn headlights on about 10 seconds. 3.Turn lights off.

When the tool detects the surface charge has been eliminated, turn the headlights off as prompted on the screen, then press OK button and the tool will resume automatic In-Vehicle Battery Test.

2.1.1 Select Battery Type

After the battery surface charge has been eliminated, the tool will prompt to select battery type, i.e. Regular Flooded, AGM Flat plate, AGM Spiral, Gel or EFB battery, Press Up Button or Down Button key to select battery type, then press OK button key to confirm.

2.1.2 Battery System Standard and Rating

VDIAGTOOL BT300 battery tester tests each battery according to the selected system and ratings. Use Up Button, Down Button, Left Button or Right Button to select according to the actual system standard and rating marked on the battery, as seen in picture below.



Battery Standards:

CCA: Cold Cranking Amps, specified by SAE & BCI, most frequently used value for starting battery at 0°F(-18°C).

BCI: Battery Council international standard.

CA: Cranking Amps standard, effective starting current value at 0℃.

MCA: Marine Cranking Amps standard, effective starting current value at 0℃.

JIS: Japan Industrial Standard, displayed on the battery as combination of the numbers and letters, e.g.55D23,80D26.

DIN: German Auto Industry Committee Standard.

IEC: Internal Electron technical Commission Standard.

EN: European Automobile Industry Association Standard.

SAE: Society of Automotive Engineers Standard.

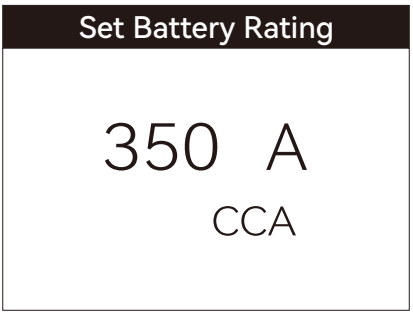
From the [Select Standard] screen, Press Up/Down Button key to select the Standard, then press OK key to confirm.

Select Standard
CCA
IEC
EN
DIN
CA
BCI

Rating range as below:

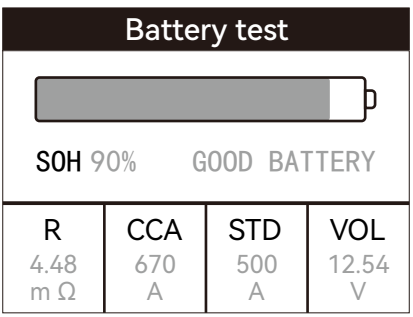
Measurement Standard	Measurement Range
CCA	100-2000 (5-3000)
BCI	100-2000 (5-3000)
CA	100-2000 (5-3000)
MCA	100-2000 (5-3000)
JIS	26A17-245H52
DIN	100-2000 (5-3000)
IEC	100-2000 (5-3000)
EN	100-2000 (5-3000)
SAE	100-2000 (5-3000)

Input correct test standard and rating, press OK button key, the tool starts to test, and dynamic interface "Testing, please wait" prompted. See bellow:



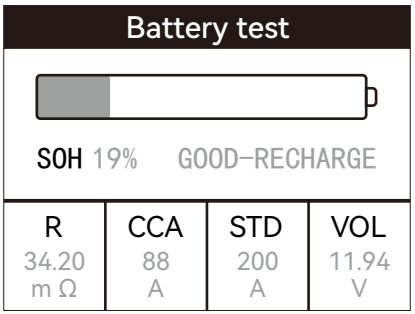
It takes around 1 second to display the battery test result. NOTE: Press Up/Down button to switch between SOH(State of Health) and SOC (State of Charge) interfaces. And below are the 5 possible test results for your references:

1. Good Battery



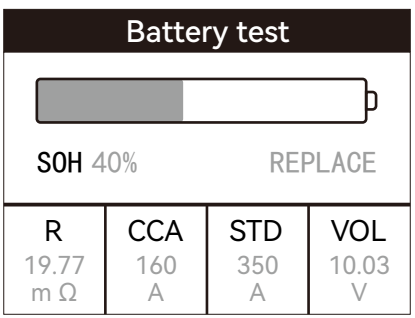
The battery is good. You can continue to use the battery.

2. Good, Recharge



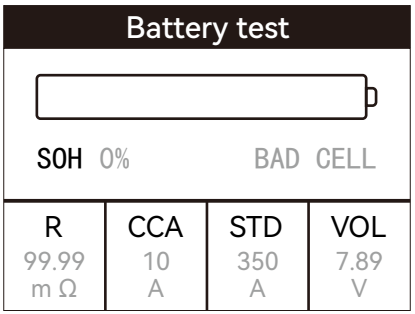
Good battery but low current, recharge before use.

3. Replace



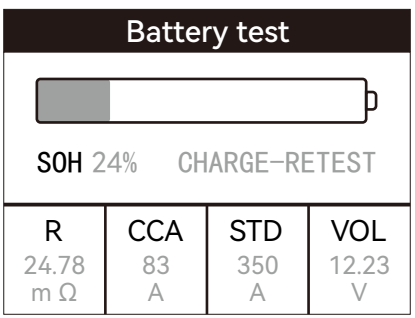
The battery is about to or already reached its lifespan. Please replace the battery. Otherwise, there could be danger in future usage.

4. Bad cell, Replace



Battery interior damaged, bad cell or short circuit, replace battery.

5. Charge, Retest



Battery unstable. Please recharge and retest it to avoid error. If same test result showed up after recharge and retest, the battery is regarded as damaged and should be replaced.

Attention: If "Replace" result displayed in In-Vehicle mode, it could also caused by the battery is not well connected. Disconnect the battery and retest the battery in Out - of - Vehicle mode before making a decision to replace the battery.

NOTE: After testing the battery, press ESC key (one time) to exit the interface.

2.1.3 Abbreviations:

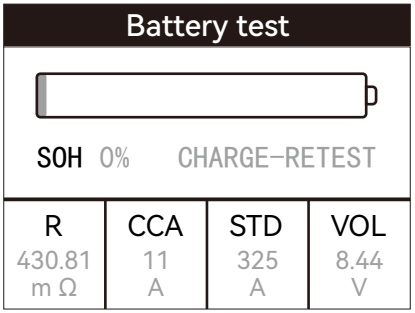
SOC: State of Charge(Press Up/Down button to switch between SOC/SOH)

SOH: State of Health(Press Up/Down button to switch between SOC/SOH)

STD: Standard rating of the lead acid battery

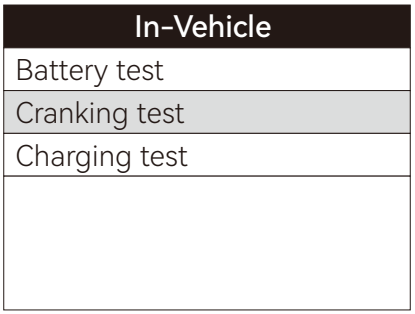
VOL: Voltage of the lead acid battery

R: Internal Resistance of the lead acid battery

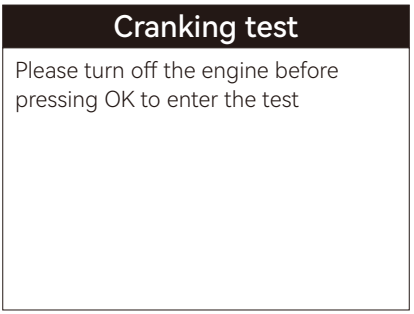


2.2 Cranking Test

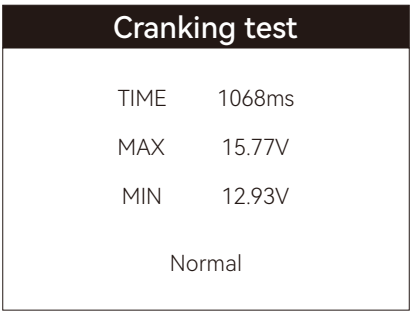
Select [Car] icon from the main menu and press OK to confirm. Select In-Vehicle from the sub-menu, then select [Cranking test] to enter the Cranking Test menu. The screen will display interface as shown below:



Select the Cranking test and press OK to enter Cranking test interface. The display will prompt you to turn off the engine and then press OK as below:



Press OK after the engine is turned off. And it will show cranking test result as shown below:



Time: Time used to crank the engine

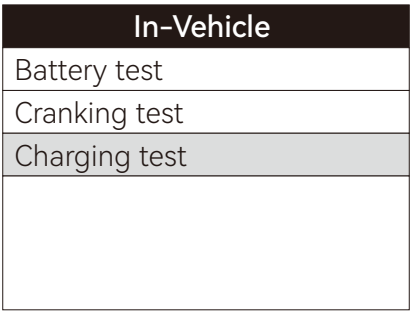
MAX: The maximum voltage while cranking the engine

MIN: The minimum voltage while cranking the engine

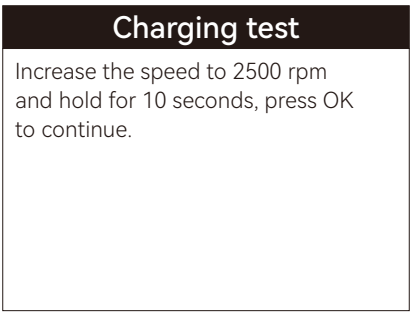
Cranking Test Possible Results: Normal, Cranking Voltage Low

2.3 Charging Test

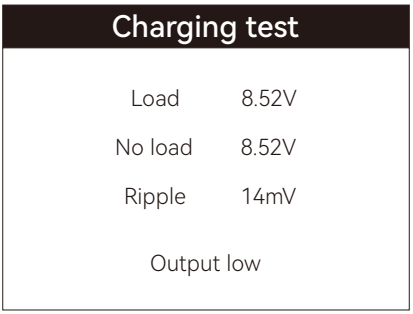
Select [Car] icon from the main menu and press OK to confirm. Select In-Vehicle from the sub-menu and then select [Charging test]. The tool will enter Charging test mode and the screen will display interface as below:



Press OK to enter Charging test mode and it will display “Testing, please wait” prompt. Followed by a new prompt reminds you to increase the engine speed to 2500 rpm and hold for 10 seconds as shown below:



Press OK to continue and it will show the charging test result in around 5 seconds as below:



Load: Charging voltage when there is vehicle load, like lights, air conditioner etc.

No Load: Charging voltage when there is no vehicle load

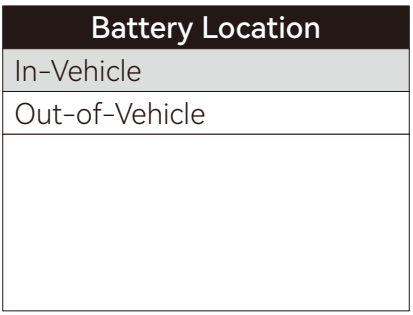
Ripple: Undesirable amount of AC voltage fluctuation from the alternator.

Charging test possible results: It could show any one of the 5 charging test results: Normal, Output High, Output Low, No Output, Ripple High.

2.4 Out-of-Vehicle Battery Test

Out-of-Vehicle battery test mode means battery is not connected with any of the vehicle load, i.e. battery is disconnected.

Select the [Car] icon from the main menu, then press OK button to confirm and select Out-of-Vehicle to enter Out-of-Vehicle battery test mode.

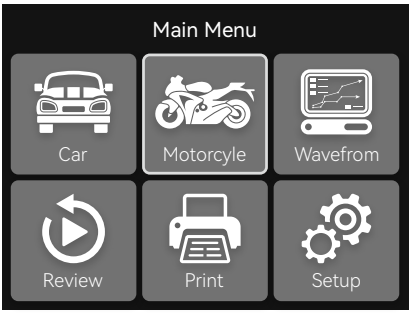


Select Battery Type, Battery Standard and Rating as instructed in 2.1.1, 2.1.2 and read the battery test result in reference with 2.1.3.

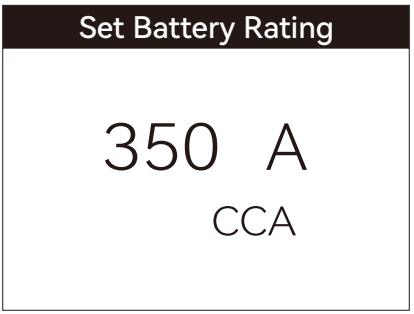
2.5 Battery Test for Motorcycle

This function checks the lead acid battery status of a motorcycle, including voltage, CCA, resistance, rated CCA, battery charging status, battery health status and gets test result in one second.

Select [Motorcycle] icon from the main menu and press OK to enter battery test for motorcycle mode. The interface will show as below:



Select rated capacity



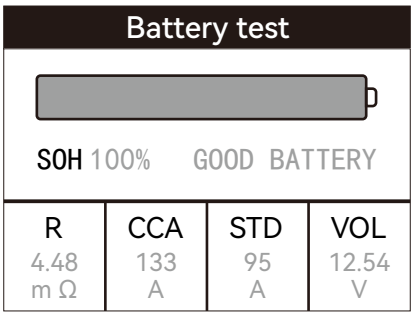
Select Test Standard

Select Standard
12C16A-3B
12N10
12N10-3A
12N10-3A-1
12N10-3A-2
12N10-3B
Page 1/55

Use Up Button or Down Button key to select motorcycle battery model. Then press OK button key to confirm, and you will see test result in one of the 5 types as below:

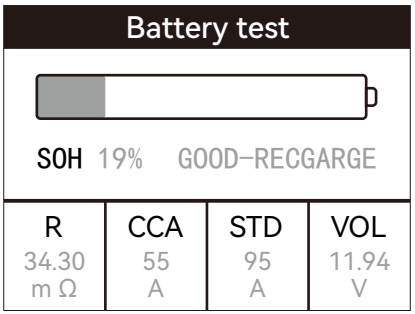
It takes around 1 second to display the battery test result.

1 Good Battery



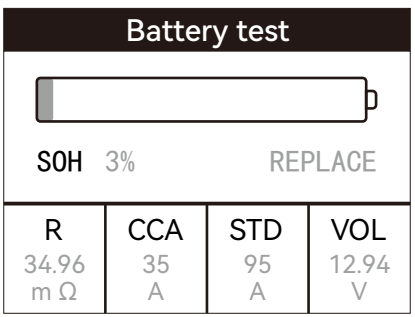
The battery is good. You can continue to use the battery.

2 Good, Recharge



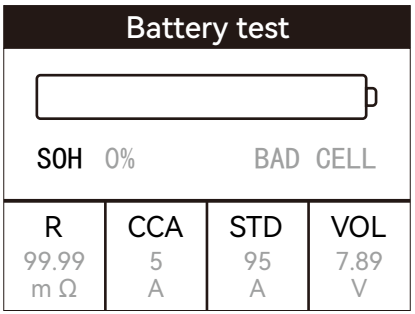
Good battery but low current, recharge before use.

3 Replace



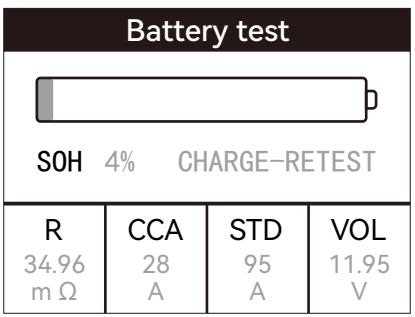
The battery is about to or already reached its lifespan. Please replace the battery. Otherwise, there could be danger in future usage.

4 Bad cell, Replace



Battery interior damaged, bad cell or short circuit, replace battery.

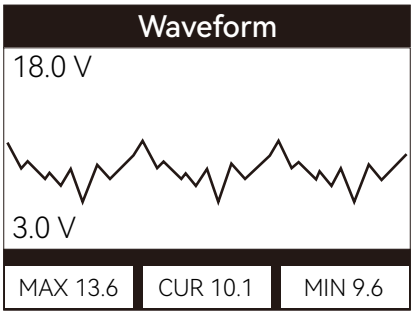
5 Charge, Retest



Battery unstable. Please recharge and retest it to avoid error. If same test result appears after recharge and retest, the battery is regarded as damaged and should be replaced.

2.6 Waveform

Select [Waveform] icon from the main menu and press OK button to confirm or press the Waveform button at the bottom left of the keypad for quick access. The screen will display interface as below:



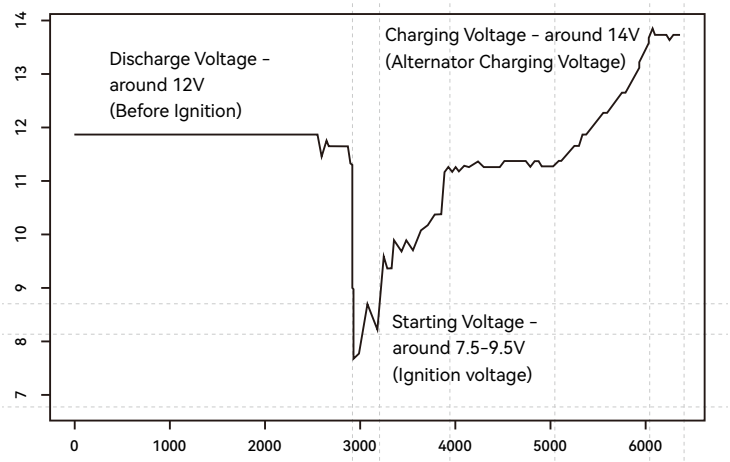
MAX: Maximum voltage during ignition

CUR: Current detected battery voltage

MIN: Minimum voltage during ignition

The waveform will remain static until there's change detected in the voltage.

Vehicle Voltage Analysis



- **Starting Voltage:** During ignition, the voltage will drop to a certain point, at this minimum point is Starting Voltage (Around 7.5- 9.5V). If the Starting Voltage stays under 7.5V, it means battery capacity is low and needs to be replaced.

- **Charging Voltage:** When the ignition ON, engine ON, the alternator will continuously charge the car battery, normally it's around 14V.

Battery Status corresponding with Battery Voltage (Before Ignition)

Battery Voltage	Battery Status	Effects and Measures
<10.8V	Too Low	Hard to start vehicles; Replace battery
10.8V-11.8V	Slightly Low	Hard to start vehicles.

Battery Status corresponding with Battery Voltage (Before Ignition)

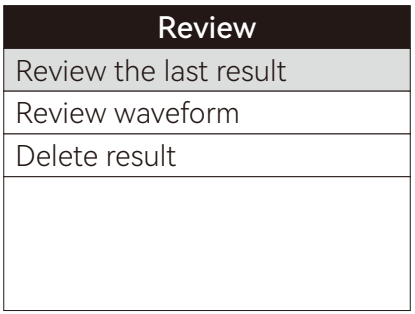
Battery Voltage	Battery Status	Effects and Measures
12.8V-13.2V	Too Low	Battery may not be charged: Check alternator or other electrical load
13.2-14.8V	Normal	Normal
>14.8V	High Voltage	May damage the battery: Check alternator stabilizer

Notice: If the current detected battery voltage is 11.9V, and the battery voltage stays low after a few hours trip, then the battery could be damaged. (Under the circumstance that the alternator works well). Please replace the battery ASAP.

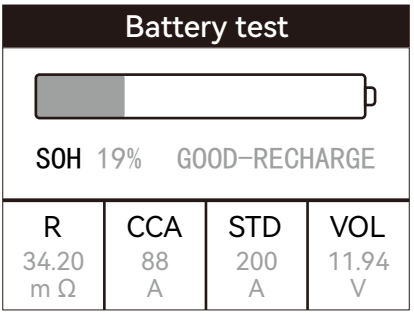
3. Battery Test Records & Waveform Review

3.1 Review the last result

Select [Review] icon from the main menu and press OK to enter or press the Quick Review button at the bottom right of the keypad to enter [Review] interface as shown below:



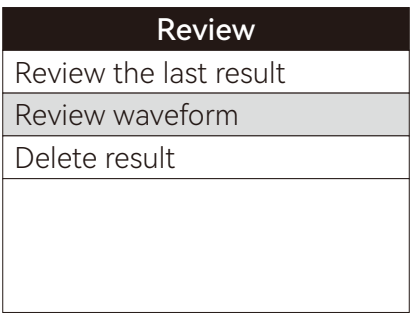
Select Review the last result function and press OK button to confirm to review the battery test result records. The screen will display interface as shown below:



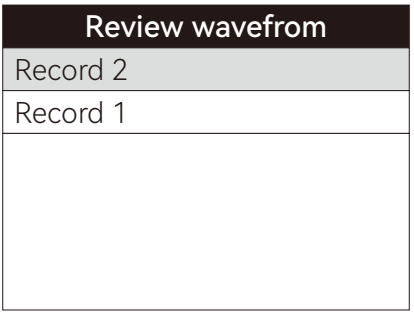
Note: Press UP/DOWN button to switch between the result of SOH and SOC.

3.2 Review Waveform

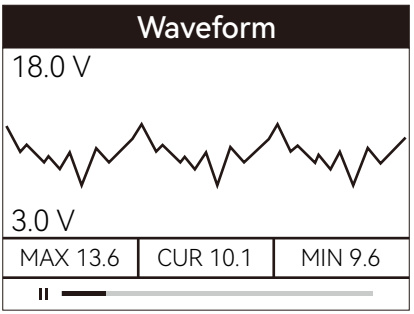
Select [Review] icon from the main menu, then press OK to confirm. The screen will display interface as shown below:



(1) Press Down button to select Review waveform function and press OK button to confirm. The screen will display interface as shown below:



(2) Press Up/Down button to select the waveform record you want to review and press OK button to confirm. The screen will display the voltage waveform recorded as shown below:



Note: Press and hold the OK button to pause the waveform playback. And press the OK button once again to resume waveform playback.

Note: Press and hold ESC button to exit waveform playback interface while it's still playing.

Note: Press ESC one time to exit waveform playback interface if playback is on pause.

3.3 Delete result

Select [Review] icon from the main menu, then press OK to confirm. The screen will display interface as shown below:

Review
Review the last result
Review waveform
Delete result

Select [Delete result] function by pressing the Down button, and press OK button to delete result records.

Caution: Press [Delete result] will delete ALL saved battery test records and waveform records and there is no option to recover the deleted data.

4. Data Printing

The Data Printing function allows printing out battery testing results and/or voltage waveform records saved on the tool.

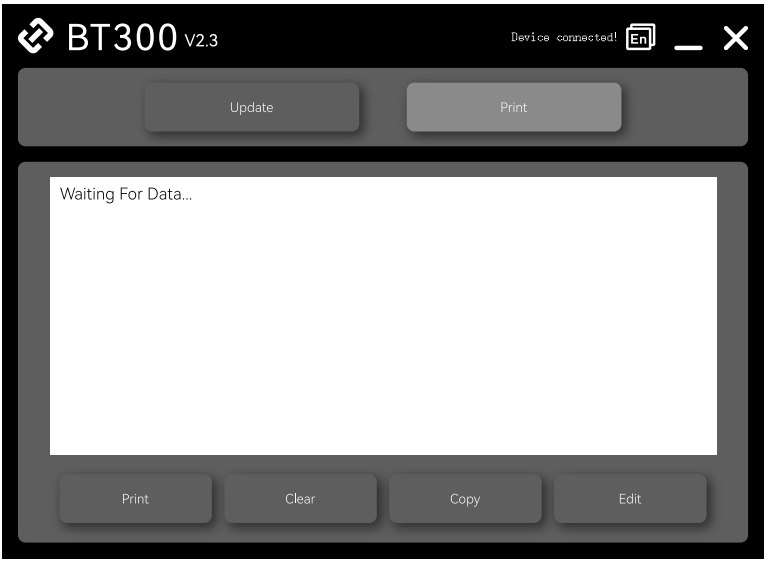
To print out recorded data, you need the following tools and upload the recorded data to Windows PC or laptop first:

- The tool
- A Windows PC or laptop that comes with USB ports
- A USB cable

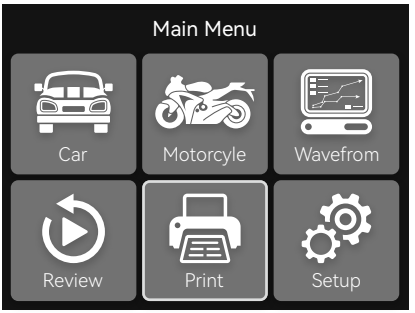
① Download the latest version software from our website: www.vdiagtool.com to a Windows PC or laptop.

② Connect the tool to the Windows PC or laptop using the USB cable supplied.

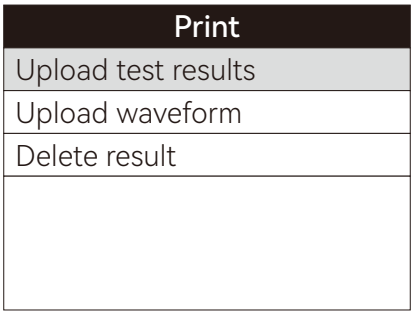
③ Run BT300.exe software installed on the Windows PC or laptop as below:



④ Select Print icon from the main menu as shown in picture below



⑤ Select the [Print] function in the Main Menu and press OK button to confirm. The screen will display interface as shown below:



⑥ Press Up / Down button to select Upload test results and / or Upload waveform, and press OK button to upload the recorded data to the Windows PC or laptop.

Caution: Select Delete result and press OK button will Delete All saved data on the tool.

⑦ When the recorded data have been uploaded to the Windows PC or laptop, you will be able to check the data in the BT300 software and click "print" on the screen will proceed to data printing.

5. Software Update/Upgrade

This function allows you to update the software of the tool.
To update the software of your tool, you need the following items.

- The tool
- A Windows PC or laptop that comes with USB ports
- A USB cable

Procedure to update the software:

① Download the latest version of the BT300 update software from our website: www.vdiagtool.com

② Run BT300.exe on the Windows PC.

③ Press and hold the OK button on the device when you have connected it to the Windows PC using the USB cable. Release the OK button until the tool's green light flashes.

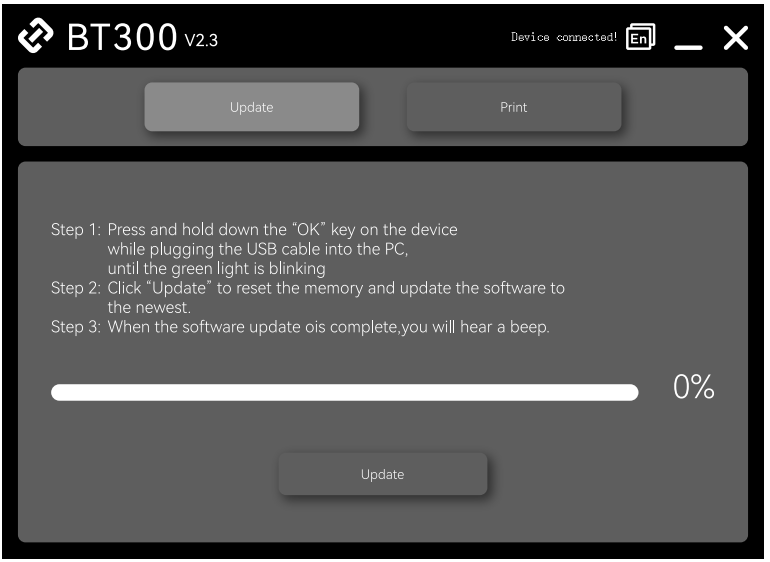
④ Click the Check Update button of the BT300 software to update/upgrade the software to the latest version.

⑤ If verification fails during the update/upgrade process and the update/upgrade cannot be performed successfully, the red light will light up and the buzzer will sound for 3 seconds.

⑥ During the update/upgrade process, the yellow light of the tool flashes.

⑦ When the update/upgrade process is complete, the green light stays on for 3 seconds and the buzzer beeps 2 times quickly.

⑧ When the update/upgrade is finished, unplug and re-plug the tool to restart.



6. Warranty and Service

6.1 Limited One Year Warranty

This warranty is expressly limited to buyer who purchase VDIAGTOOL BT300 product for purposes of resale or use in the ordinary course of the buyer's bussiness.

VDIAGTOOL BT300 is warranted against defects in materials and workmanship for one year (12 months) from date of delivery to the buyer. This warranty does not cover any part that has been abused, altered, used for a purpose other than for which it was intended, or used in a manner inconsistent with instructions regarding use. The exclusive remedy for any tool found to be defective is repair or replacement, and it shall not be liable for any consequential or incidental damages.

6.2 Service Procedures

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Warranty & Support

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Website: www.vdiagtool.com

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E-Mail: sales@vdiagtool.com

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