KONNWEI®

KW650

User's Manual

Motorcycle & Car BATTERY TESTER

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1 Product Summary

1.1 Product Profile

KW650 Battery Tester adopts the state-of-the -art conductance testing technology in the word to easily, quickly and accurately measure the actual cold cranking amps capability of the vehicle starting battery, healthy state of the battery itself, and common fault of the vehicle starting system and charging system, which can help maintenance personnel to find the find the problem quickly and accurately, thus to achieve quick vehicle repair.

1. Test all automotive cranking lead acid battery, including ordinary lead acid battery, AGM flat plate battery, AGM spiral battery, and Gel battery, etc.
2. Directly detect bad cell battery.
3. Feature reverse polarity protection; reverse connection may not damage the tester or affect the vehicle and battery.
4. Directly test the battery with loss of electricity, full charge 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:
Chinese simple, Dutch, English, French, German, Italian, Japanese, Korean ,Portuguese, Polish, Russian, Spanish.
7. Upload the recorded test data to computer (windows) and print it out.
8. Life time update free by updating tool BTLINK from www.konnwei.com. If you have any good idea or problems, please contact us by email: konnwei@konnwei.com

1.2 Product Function

KW650 battery tester features the following functions: battery test, cranking test, charging test and other additional functions.

Battery test mainly aims to analyze the battery healthy status to calculate the actual cold cranking capability of the battery of the battery and the aging extent, which provide reliable analysis evidence for the test and maintenance of the battery. If may notify the user to replace battery in advance when the battery 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 malfunction 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., thus to find out whether the output voltage of the generator is normal, the rectifier diode works properly and the abnormal, it will lead to over charge or incomplete charge of the battery, thus cause quick damage to the battery and greatly shorthen the life of other loaded appliance.

1.3 Technical Parameters

1. Cold Craning Amps Measurement Range:

Measurement Standard	Measurement Range
CCA	100-2000
BCI	100-2000
CA	100-2000
MCA	100-2000
JIS	26A17-245H2
DIN	100-1400
IEC	100-1400
EN	100-2000
SAE	100-2000

2. Voltage Measurement Range： 6-16V DC

1.4 Working Environment Requirement

Working Environment Temp: 0°C – 50°C/ -32°F – 122°F

It is applicable for automotive manufacturers, automotive maintenance and repair workshops, automotive battery factories, automotive battery factories, automotive battery distributors, and educational organizations, etc.

2. Product Information

2.1 Tool Description

UP SCROLL BUTTON: Move cursor up for selection.

DOWN SCROLL BUTTON: Move cursor down for selection.

ENTER BUTTON: confirms a selection(or action) from a menu list.

ESC BUTTON: Returns to previous menu.

WAVEFORM FUNCTION: display voltage waveform

2.2 Product Specifications

1. Display: LCD
2. Operating Temperature: 0°C – 50°C/ 32°F – 122°F
3. Storage Temperature: -20°C – 70°C/ -4°F – 158°F
4. Power: Provided via cable from car battery
5. Dimensions:

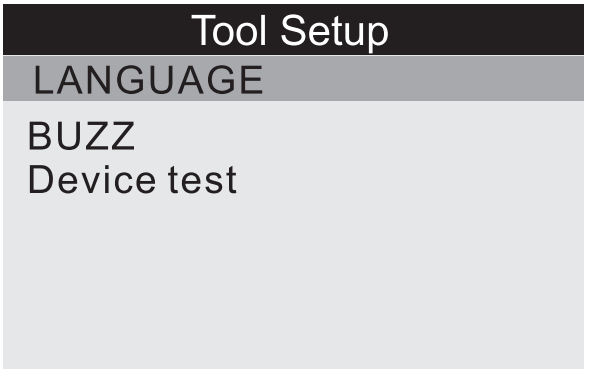
Length	Width	Height
124mm(4. 88")	70mm (2.76")	20mm(0.79")

2.3 Accessories Included

1. 1 x Mini USB cable
2. User's Manual

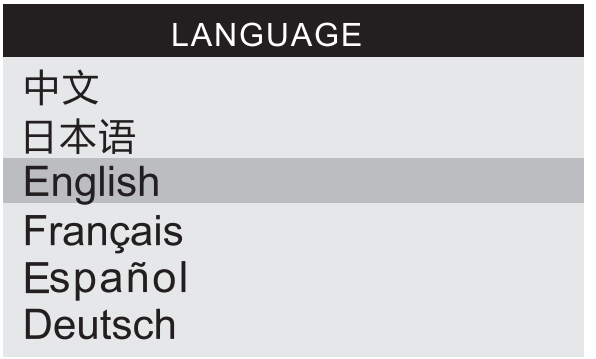
2.4 Tool Setup

From the startup screen, or press **EXIT** button to enter Main Menu. Press **UP/DOWN** button to select the **[Setup]** function in the Main Menu and press **ENTER** button, The screen will display the interface as shown below:



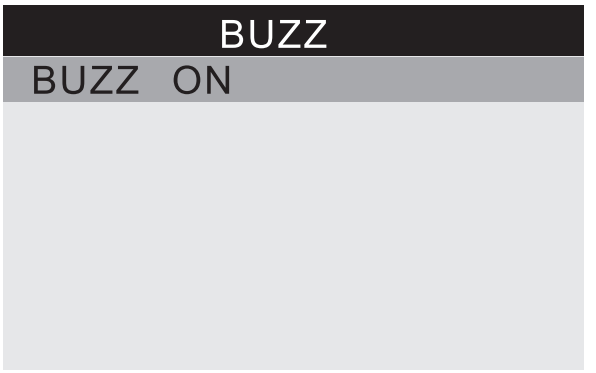
The Tool allows you to make the following adjustments, settings:

1. **Select language**: Selects desired language.
   Press **UP/DOWN** key to choose **[Language]** and press **ENTER** button, the screen will display the interface as shown bellow:



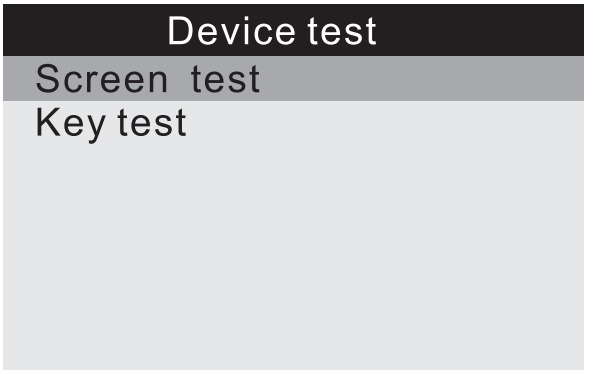
You can press **UP/DOWN** key to select any language and press **ENTER** button to confirm. The system will convert to the chosen language interface at once.

2. **Beep**: ON/OFF the Beeper.
Press **UP/DOWN** key to choose [BUZZ] and press **ENTER** button, the screen will display the interface as shown below:



You can press **ENTER** button to cover ON or OFF, Press **ESC** key to return.

3. **Device test**: Keyboard, LCD display detection.
Press UP/DOWN key to choose [Device test] and press ENTER button, the screen will display the interface as shown below:



A. Screen test
The Screen test function checks if the LCD display is working normally.

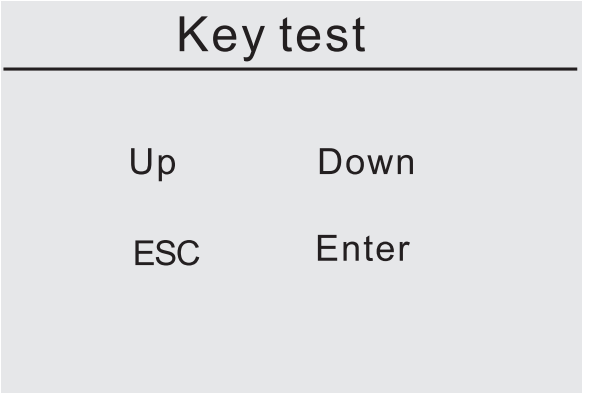
1. From Setup screen, use **UP/DOWN** scroll button to select Device test, and press the **ENTER** button.

2. Select Screen test from Device test menu and press the **ENTER** button to start test, Press **ESC** key to return.
3. Look for missing spots in the colour bar, white, black LCD display.
4. When completed, press **ESC** button to exit.

B. Key test

The key test function verifies if the keys are functioning properly.

1. Use the **UP/DOWN** scroll button to select key test from the Device test menu, and then press the **ENTER** button.
2. Press any key to start test. When you press a key, the key name should be observed 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:



3. Double press **ESC** to return to previous menu.

2.5 About

From the startup screen, or press **ESC** button to enter Main Menu Press **UP/DOWN** button to select the **[About]** function in the Main Menu and press **ENTER** button, The screen will display the interface as shown below:

Press **ESC** to return the previous menu.

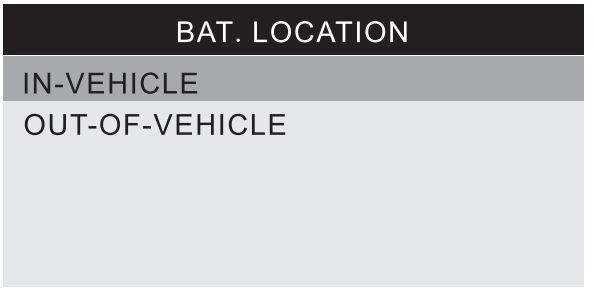
3 Car Battery Test

After entering battery test program, tester displays Main Menu, Tester will display the following contents in a sequence, select accordingly.

From the startup screen , or press ESC button to enter Main Menu, the screen will display the interface as shown below:

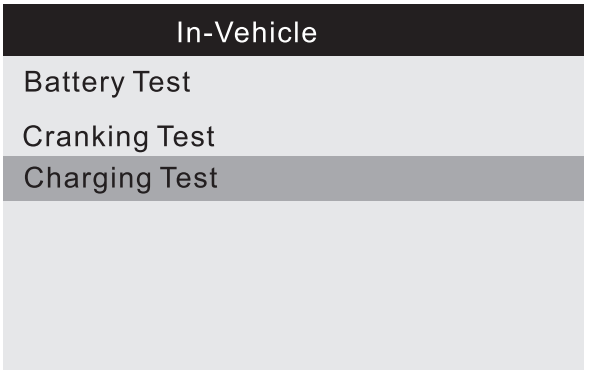
Battery In-vehicle or Out-of-Vehicle

Press **UP/DOWN** key to select the battery location, in vehicle or out of vehicle, then press **ENTER** key to confirm.



3.1 Battery Test in vehicle

When surface charge detected by the tester, it prompts “Surface charge, turn lights on”, Turn lights on as prompted to eliminate battery surface charge, tester will then display the following messages in a sequence.



Now the tester detects the surface charge has been eliminated, turn lights off as prompted, then press ENTER key, the tester will recover automatic test

Select Battery Type

After the battery charge status selected, tester will promt to select battery type, i.e. Regular Flooded, AGM Flat plate or AGM Spiral, Gel and EFB battery, Press UP/DOWN key to select battery type, then press OK key to confirm.

Battery System Standard and Rating

KW650 battery tester each battery according to the selected system and rating.

Use UP/DOWN key to select according to the actual system standard and rating marked on the battery. Use UP/DOWN key to select according to the actual system standard and rating marked on the battery. See in the below picture, the arrow indicated location.

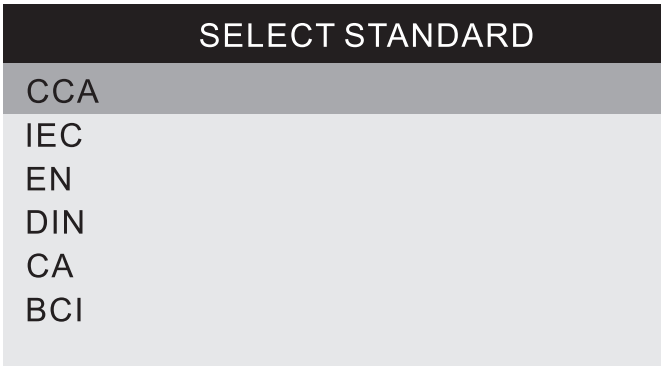
CCA: Cold Cranking Amps, specified by SAE&BCI, most frequently used value for starting battery at 0°F(-18°C).

BCI: Battery Council international standard.

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

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

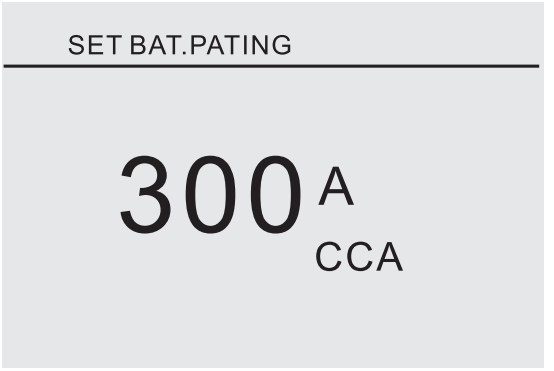
From the **[Select Type]** screen, Press **UP/DOWN** key to select the Standard, then press **ENTER** key to confirm.



Rating range as following:

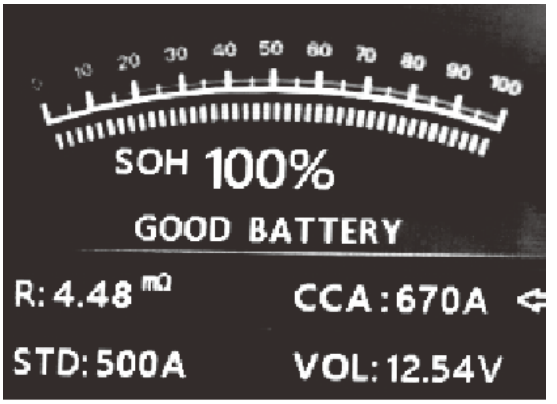
Measurement Standard	Measurement Range
CCA	100-2000
BCI	100-2000
CA	100-2000
MCA	100-2000
JIS	26A17-245H2
DIN	100-1400
IEC	100-1400
EN	100-2000
SAE	100-2000

Input correct test standard and rating, press ENTER key, tester starts to test, and dynamic interface “Under measurement ...” prompted. See bellow:



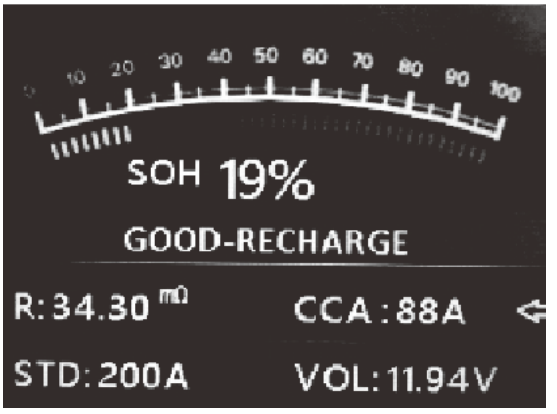
It takes around 1 seconds to display the battery test result.

1 Good Battery



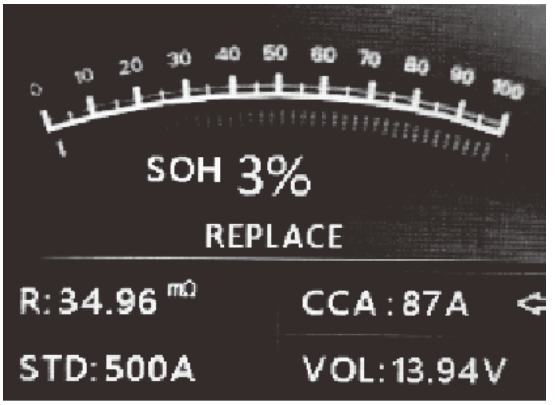
The battery is without any problem, please be relaxed to use.

2 Good, Recharge



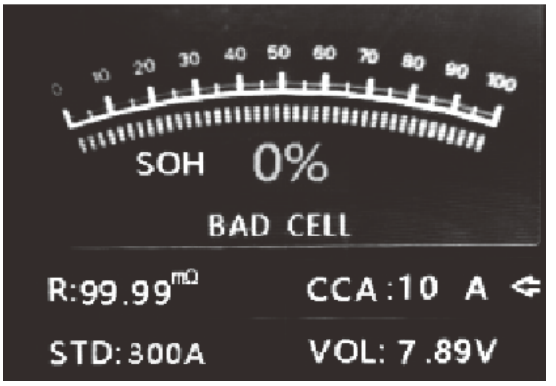
Good battery but low current, recharge before using.

3 Replace



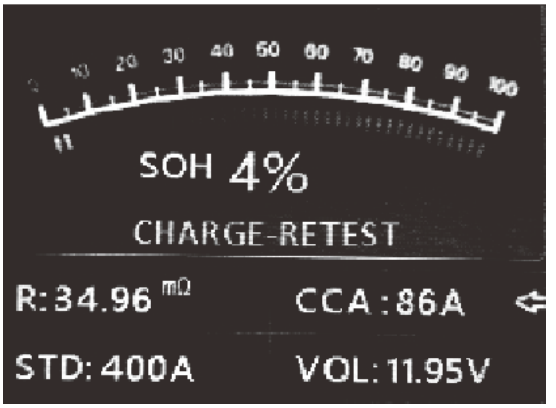
The battery is near to or already reached the end of the using life, replace battery otherwise, bigger danger will be followed.

4 Bad cell, Replace



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

5 Charge, Retest



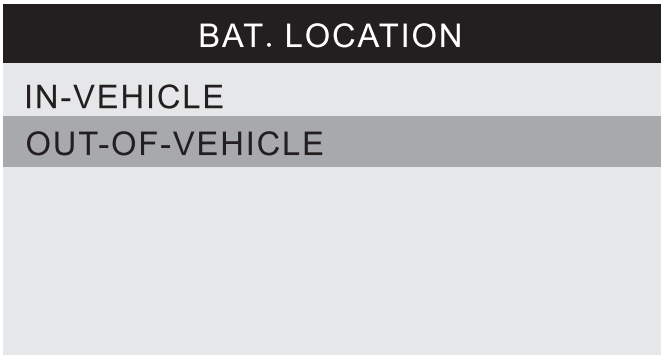
Unstable battery shall be recharged and retested to avoid error. If same test result appears after recharge and retest, the battery is regarded as damaged, replace the battery.

Attention: If “Replace” resulted from IN-VEHICLE mode, it might be the reason that vehicle cable is not well connected with the battery, Ensure to cut off the cable and retest the battery under OUT-OF-VEHICLE before making a decision to replace battery.
NOTE: After testing, if need to **ESC**, press **ESC** key to directly Exit to the startup interface.

3.2 Battery out of vehicle test

OUT-OF-VEHICLE means battery is not connected with any of the vehicle loaded, i.e. battery connection is cut off.

From the startup screen, or press **ESC** button to enter Main Menu. Press **UP/DOWN** key to select the battery location, in vehicle or out of vehicle, then press **ENTER** key to confirm.



Select Battery Type
After the battery charge status selected, tester will promt to select battery type, i.e. Regular Flooded, AGM Flat plate or AGM Spiral, Gel and EFB battery, Press UP/DOWN key to select battery type, then press OK key to confirm.

Battery System Standard and Rating
KW650 battery tester each battery according to the selected system and rating.
Use UP/DOWN key to select according to the actual system standard and rating marked on the battery. Use UP/DOWN key to select according to the actual system standard and rating marked on the battery. See in the below picture, the arrow indicated location.

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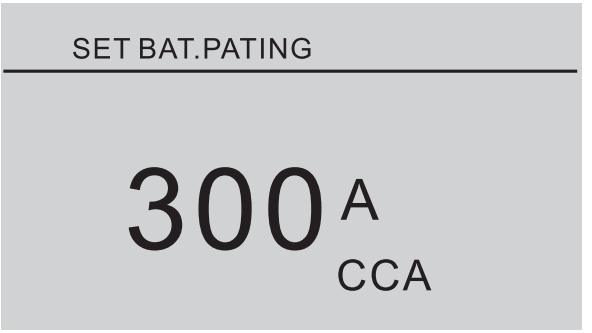
BCI: Battery Council international standard.
CA: Cranking Amps standard, effective starting current value at 0°C.
MCA: Marine Cranking Amps standard, effective starting current value at 0°C.
JIS: Japan Industrial Standard, displayed on the battery as combination of the numbers and letters, e.g. 55D23, 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 Type]** screen, Press **UP/DOWN** key to select the Standard, then press **ENTER** key to confirm.

SELECT STANDARD
CCA
IEC
EN
DIN
CA
BCI

Rating range as following:

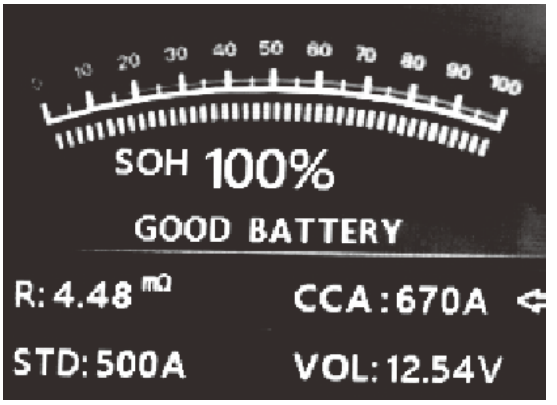
Measurement Standard	Measurement Range
CCA	100-2000
BCI	100-2000
CA	100-2000
MCA	100-2000
JIS	26A17-245H2
DIN	100-1400
IEC	100-1400
EN	100-2000
SAE	100-2000

Input correct test standard and rating, press ENTER key, tester starts to test, and dynamic interface “Under measurement ...” prompted. See bellow:



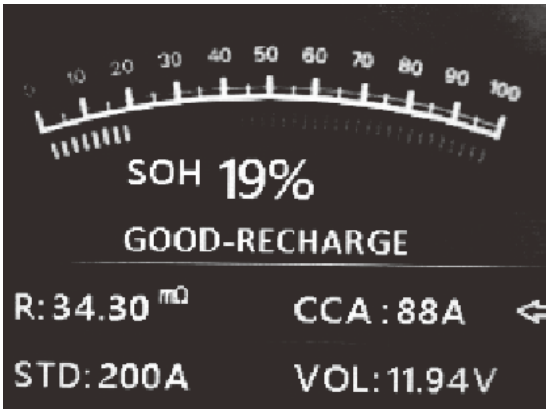
It takes around 1 seconds to display the battery test result.

1 Good Battery



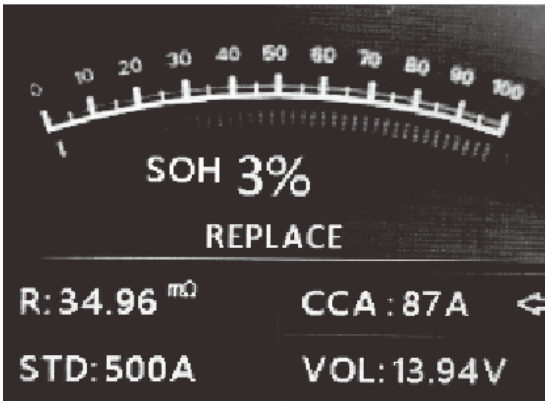
The battery is without any problem, please be relaxed to use.

2 Good, Recharge



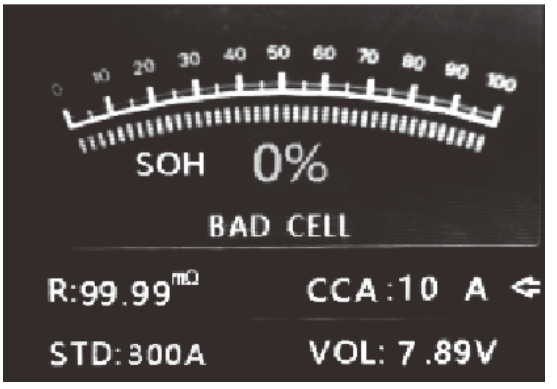
Good battery but low current, recharge before using.

3 Replace



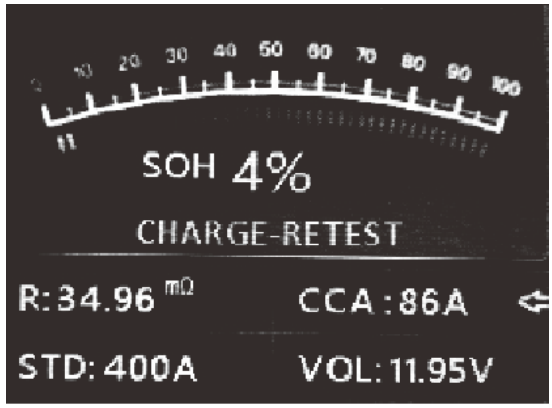
The battery is near to or already reached the end of the using life, replace battery otherwise, bigger danger will be followed.

4 Bad cell, Replace



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

5 Charge, Retest

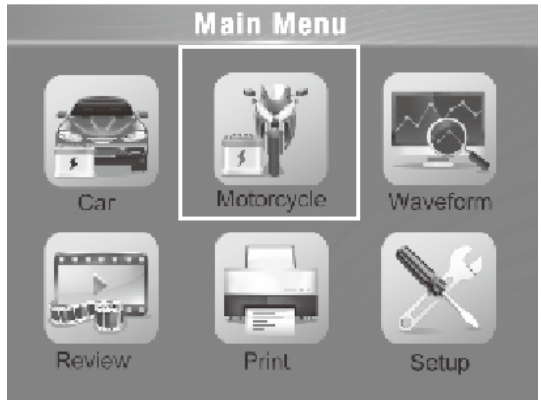


Unstable battery shall be recharged and retested to avoid error. If same test result appears after recharge and retest, the battery is regarded as damaged, replace the battery.

Motorcycle Battery Test

It can make sure the battery status, including voltage, CCA, electronic resistance, rated CCA, charging value, healthy value and testing result in one second.
From the startup screen, or press ESC button to enter Main Menu. The screen will display

1.the interface as shown below:



Set Battery Rating	
12N5.5-4A	12N5.5A-3B
12N5-3B	12N5-4B
12N7-3B	12N7-4A
12N7-4B	12N7D-3B
12N9-3A	12N9-4B-1
ETX12	ETX14

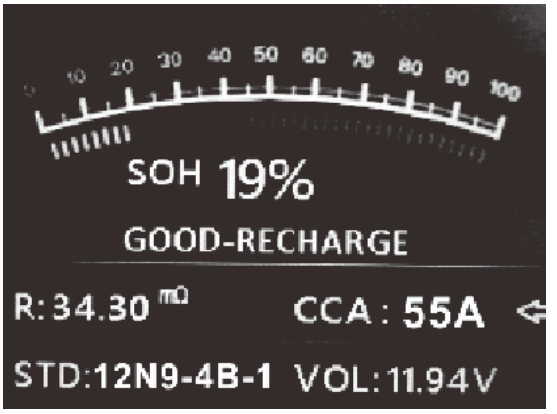
2. Use UP/DOWN key to select Motorcycle battery model, The press ENTER key, the testing result will show one of these, as below: (Battery test result includes 5 types as following:)

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

1 Good Battery

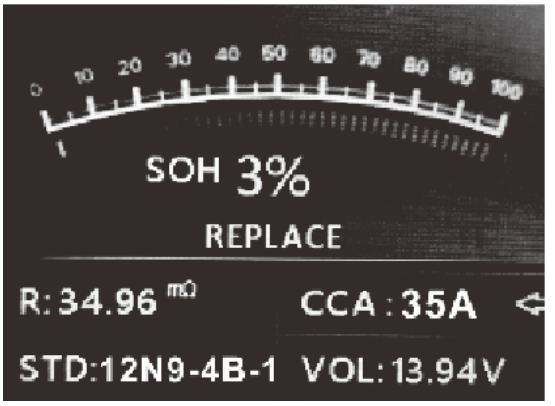
The battery is without any problem, please be relaxed to use.

2 Good, Recharge



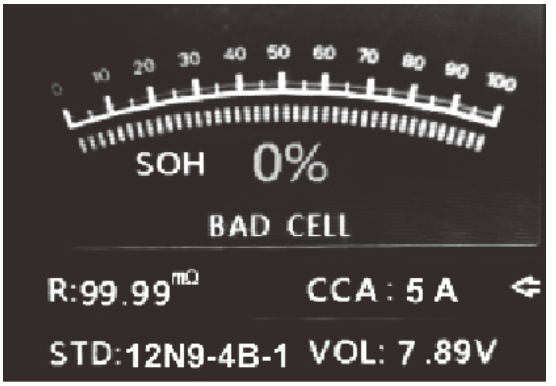
Good battery but low current, recharge before using.

3 Replace



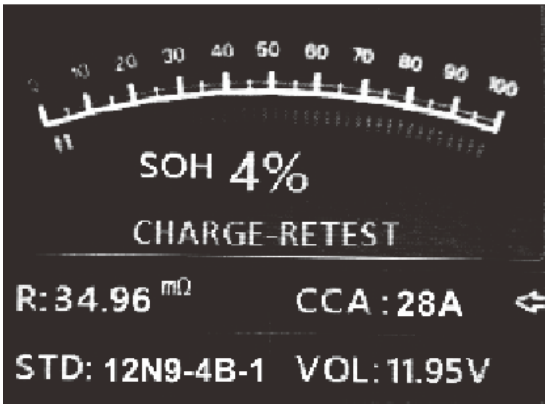
The battery is near to or already reached the end of the using life, replace battery otherwise, bigger danger will be followed.

4 Bad cell, Replace



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

5 Charge, Retest

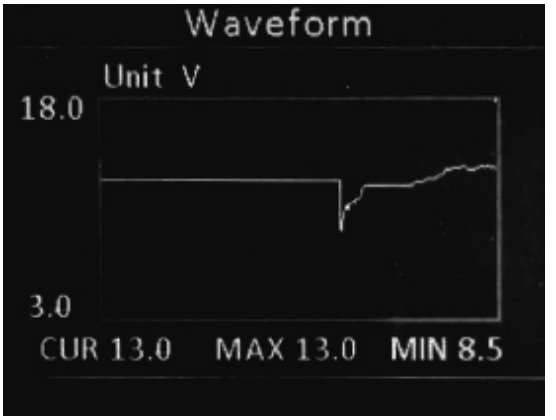


Unstable battery shall be recharged and retested to avoid error. If same test result appears after recharge and retest, the battery is regarded as damaged, replace the battery.

- -

3.3 Waveform

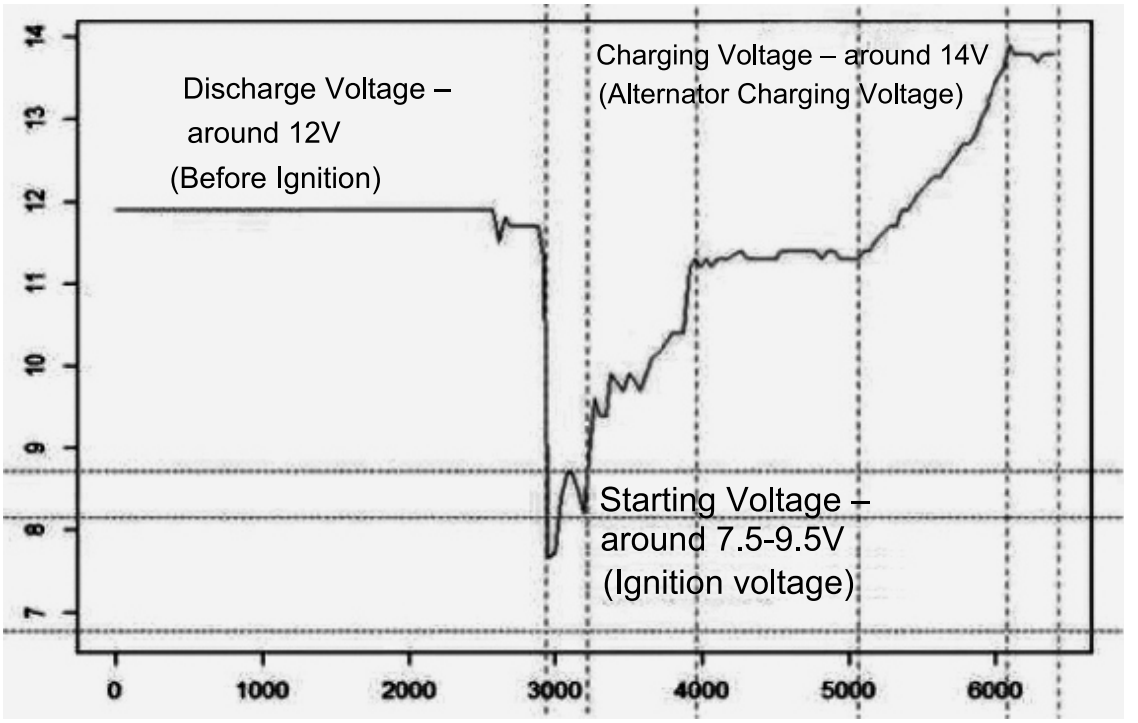
press WAVEFORM FUNCTION button, The screen will display the interface as shown below:



CUR: Current Voltage
MAX: Maximum Voltage during Ignition
MIN: Minimum Voltage during Ignition

The waveform will stay in static until there's changes in the voltage changes detected.

Various vehicle voltage analyses



•Discharge Voltage: When the ignition OFF, engine OFF (Over 20 Minutes), the Discharge Voltage should be around 12V. If the discharge voltage is lower than 11V, it will be hard to turn the ignition ON. If the discharge voltage continuously stay under 11V, it means the battery is aging and replacement is needed.

•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 continuously stay under 7.5, 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 is 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;

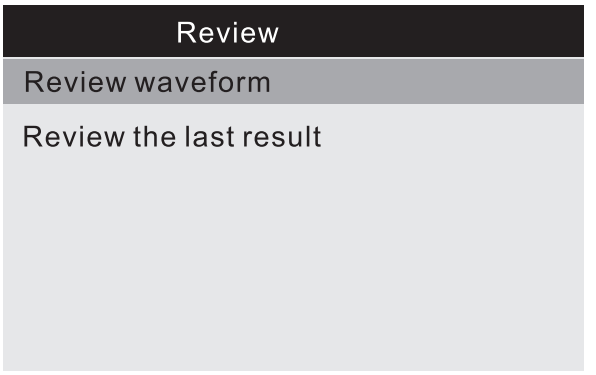
Battery Status corresponding with Battery Voltage (After Ignition)

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

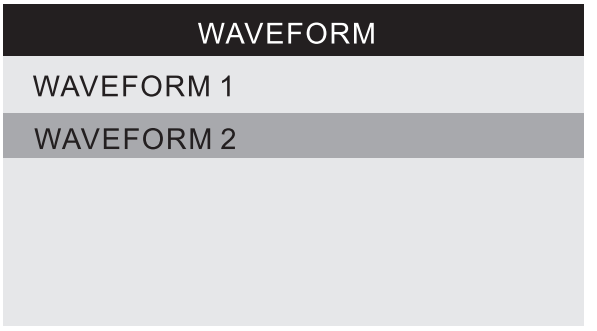
Notice: If the current detected battery voltage is 11.9V, after a few hours trip, the battery voltage is still stay low, the cause could battery damage. (Under circumstance of normal alternator). Please replace the battery ASAP.

3.4 Review

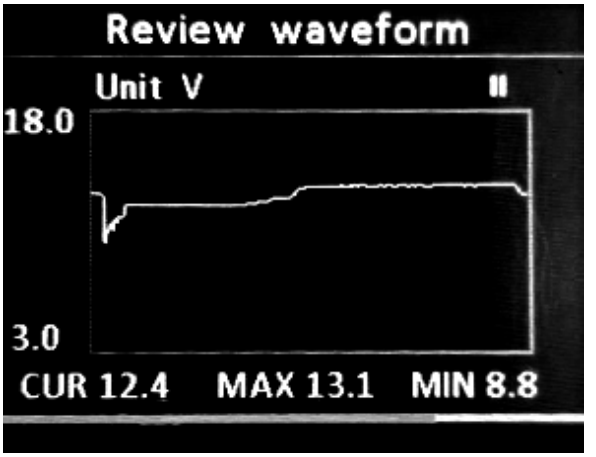
Review waveform
From the startup screen, or press **ESC** button to enter Main Menu. Press **UP/DOWN** button to select the **[Review]** function in the Main Menu and press **ENTER** button, The screen will display the interface as shown below:



1) Press **UP/DOWN** button to select Review waveform function and press **ENTER** button, The screen will display the interface as shown below:



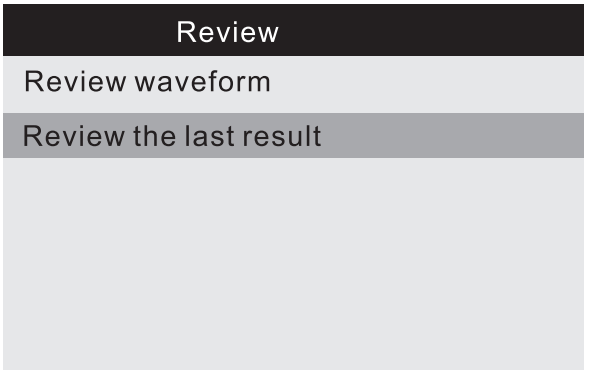
2) Press **UP/DOWN** button to select and press **ENTER** button, The screen will display the interface as shown below:



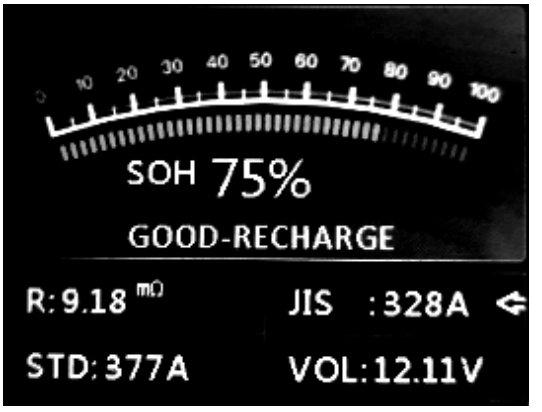
Press ENTER button to pause and play, and press UP button to Backward playback, press DOWN to Play forward.

Review the last result

From the startup screen, or press **ESC** button to enter Main Menu. Press **UP/DOWN** button to select the **[Review]** function in the Main Menu and press **ENTER** button, The screen will display the interface as shown below:



1) Press **UP/DOWN** button to select Review the last result function and press **ENTER** button, The screen will display the interface as shown below:

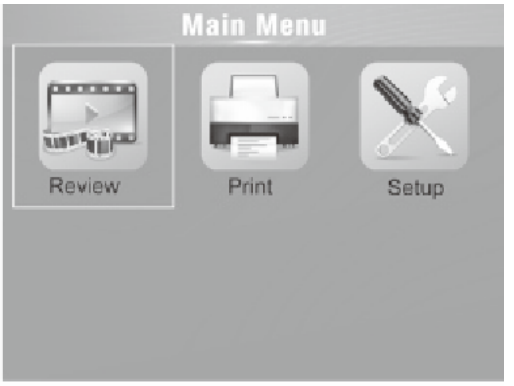


Press **UP/DOWN** button to select Review SOH or SOC .

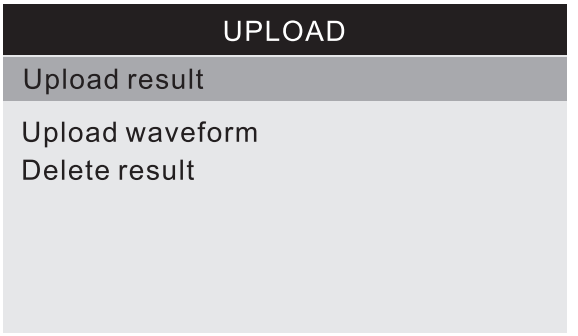
3.5 Print

The Print Data function allows printing out testing data recorded by the testing tool for or customized test reports.
To print out retrieved data, you need the following tools:
1. Tester tool
2. A PC or laptop with USB ports
3. A USB cable
1) downloading the applications from our website:
   www.konnwei.com
2) connect the tester tool to computer with the USB cable supplied.
3) run btlink.exe in your computer. as below:

4) From the tester tool startup screen, or press **ESC** button to enter Main Menu. as below:



5) Press **UP/DOWN** button to select the **[Print]** function in the Main Menu and press **ENTER** button, The screen will display the interface as shown below:



6) Press **UP/DOWN** button to select Upload result or Upload waveform, and press **ENTER** button.

7) Press **UP/DOWN** button to select Delete result, and press **ENTER** button to Delete all save of the tester tool test data.

4 Update Mode

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

1. tester tool
2. A PC or laptop with USB ports
3. USB cable

1) downloading the applications from our website: www.konnwei.com
2) run btlink.exe in your computer(Mac OS and linux does not compatible)
3) press and hold any button until the USB cable is connected with computer and release it after the tool display a message “Update Mode”
4) open the btlink software, click “Check update” button, will download the upgrade file from internet then update to tester tool
5) wait for few minutes until update succeed
6) during the update procedure
7) restart tester tool finish the whole update See bellow:

NOTE: when you made a wrong choice and the tool is unable to work properly, you may need to update the programs. The hold LEFT scroll button and power on the tool, you will enter the update mode forcedly, the follow the update procedure to refresh the program.

5. Service Procedures

If you have any questions, please contact your local store, distributor or visit our website at http:// www.konnwei.com
If it becomes necessary to return the tool for repair, contact your local distributor for more information.