



endeavour



ET8634 Automotive 12V Battery Tester Instruction Manual



1. PRODUCT SUMMARY

1.1 Product Profile

The ET8643 Battery Tester uses advanced conductance testing technology to easily, quickly and accurately measure the actual cold cranking amps capability of the vehicle starting battery, the state of the battery itself, and common faults of the vehicle starting and charging systems.

- Tests all automotive cranking lead acid batteries, including ordinary lead acid, AGM flat plate, AGM spiral, Gel, EFB, etc.
- Directly detect bad battery cells.
- Polarity reverse connection protection; reverse connection will not damage the tester or affect the vehicle and battery.
- Directly test the battery without draining charge. Plus no need to fully charge the battery before testing.
- Testing standards include the majority of battery standards: CCA, BCI, CA, MCA, JIS, DIN, IEC, EN, SAE, GB.

1.2 Product Function

Battery Test

- Analyses the battery health status. Calculates the actual cold cranking capability of the battery and the ageing extent, to provide advance notice to the user of the need to replace the battery.

Cranking Test

- Test and analyse the starting motor. Tests the actual required cranking current and cranking voltage of the starting motor to assess the starting motor condition. There are several reasons why the starting motor may not operate correctly including lubrication system faults causing increased starting load torque, or increased rotor friction.

Charging Test

- Test and analyse the charging system, including the generator, rectifier, rectifier diode, etc. Including whether the output voltage of the generator is normal, the rectifier diode works correctly and the charging current is normal. Should one or more of these elements not be functioning correctly, it can cause overcharging or incomplete charging of the battery, damaging the battery or shortening the life of other components.

Additional functions include a voltmeter and screen brightness adjustment.

1.3 Technical Parameters

- Cold Cranking Amps Measurement Range:

Measurement Standard	Measurement Range
CCA	100-2000
BCI	100-2000
CA	100-2000
MCA	100-2000
JIS	26A17--245H52
DIN	100-1400
IEC	100-1400
EN	100-2000
SAE	100-2000
GB	100-1400

- Voltage Measurement Range: 8-30V DC
- Working Environment Temperature: -20°C to 60°C

2. PRODUCT INFORMATION

2.1 Tool Description



- **Up / Down keys:** Select upwards or downwards via white UP and DOWN keys.
- **Exit key:** Exit to previous menu via blue EXIT key.
- **Enter key:** Confirm the selection via green ENTER key
- **Mini-USB Socket** (on the side of the product): Connect to computer for printing via USB cable.

2.2 Product Specifications

- **Display:** LCD, 2 lines, 8 characters, backlit
- **Operating Temperature:** 0 to 50°C (-32 to 122 F°)
- **Storage Temperature:** -20 to 70°C (-4 to 158 F°)
- **Power:** Provided via detachable alligator clips
- **Dimensions:** 110mm x 70mm x 16mm (Length | Width | Height)
- **Weight:** 450g

2.3 Included Accessories

- User Manual
- USB cable
- Software CD

2.4 Product Setup

You can make the following adjustments and settings:

- **Language:** Select desired language.
- **Contrast adjustment:** Adjusts the LCD display contrast.
- **Tool information:** Version & manufacturing date.

To enter the Tool Setup menu

From the second startup screen, press EXIT button to enter the main menu. Press DOWN button to select the Tool Setup function.

System Setup
Language
Contrast
Tool Information


Language:

From Tool Setup menu, use the ENTER button to select language. Use UP / DOWN buttons to select the desired language and press ENTER to save your selection and return to the previous menu.

Language
English
French
German
Spanish

Contrast:

From the Tool Setup menu, use the ENTER button to select contrast. Use UP / DOWN buttons to select the contrast value and press ENTER button to save your selection and return to the previous menu.

Contrast
38%


Tool Information:

From Tool Setup menu, use the ENTER button to select Tool Information. Press EXIT to return the previous menu.

Tool Information
Software Version: 1.00
Hardware Version: 1.00

3. BATTERY TEST

After entering the battery test programme, the tester displays the tester model and version. The tester will display the following contents in sequence. Select accordingly.

3.1 Quick test

Checks battery status, including voltage, CCA, electronic resistance, rated CCA, charging value, healthy value and testing result in one second. Input the AH value (battery rated capacity), which is marked on the battery label.

- 1) Press UP / DOWN key to select the Quick test, then press ENTER key to confirm.

Main Menu
1.Quick Test
2.Battery in Vehicle
3.Out of Vehicle
4.Review Data
5. Print Data
6.System Setup

- 2) Input the rated battery capacity—xx AH (in general, the battery capacity for 12V vehicles is above 30AH)

Input AH value
50 A-H
Please input the A-HR value shown on the battery label.

- 3) Press ENTER key. The testing result will show one of five alternative results (see below).

Good Battery The battery is operating correctly.

Healthy:96%	490CCA
Charge:98%	12.64V
Internal R=6.1m	
Rated: 500A	
GOOD BATTERY	

Good, Recharge Good battery but low current. Recharge before using.

Healthy:78%	440CCA
Charge:30%	12.20V
Internal R=7.2m	
Rated: 500A	
GOOD, RECHARGE	

Replace The battery is near to or has already reached the end of its useful life. Replace battery immediately.

Healthy:46%	490CCA
Charge:80%	12.68V
Internal R=18.1m	
Rated: 500A	
REPLACE	

Bad Cell, Replace Battery interior damaged, due either to a bad cell or short circuit. Replace battery immediately

Healthy:0%	0CCA
Charge:20%	10.64V
Internal R=45.2m	
Rated: 500A	
BAD CELL, REPLACE	

Charge, Retest Unstable battery should be recharged and retested to avoid error. If same test result appears after recharge and retest, the battery should be regarded as damaged. In which case, replace immediately.

Healthy:39%	310CCA
Charge:20%	12.08V
Internal R=30.1m	
Rated: 500A	
CHARGE-RETEST	

Battery In-Vehicle or Battery Out-Of-Vehicle

Press UP / DOWN key to select the battery location (in vehicle or out of vehicle), then press ENTER to confirm. Battery in vehicle means Battery in vehicle means battery is connected with the vehicle generator or a vehicle electrical appliance.

Main Menu
1.Quick Test
2.Battery in Vehicle
3.Out of Vehicle
4.Review Data
5. Print Data
6.System Setup

3.2 Battery in vehicle

Choose BATTERY IN VEHICLE and press ENTER. The tester will enter the below menu.

Test in Vehicle
1.Battery Test
2.Cranking Test
3.Charging Test

3.2.1 Battery Test In Vehicle

When surface charge is detected, it will prompt "SURFACE CHARGE, TURN LIGHTS ON". Turn vehicle lights on, as prompted, to eliminate battery surface charge. Tester will then display the message below. Once the tester detects that the surface charge has been eliminated, turn headlights off as prompted. Then press ENTER.

Battery Test
1.Check surface charge, Turn lights on.
2. Leave headlights on for 10 seconds.
3.Turn headlights off.

Select Battery Type

After selecting the battery connection, the tester will prompt for battery type. Press UP/DOWN key to select the battery type.

Battery Type
1. Regular Flooded
2. AGM Flat Plate
3.AGM spiral
4. GEL
5. EFB

Battery System Standard and Rating

The tester will test 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. See example in the picture below, with the arrow indicating the relevant information.



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 Electro technical Commission Standard

EN: European Automobile Industry Association Standard

SAE: Society of Automotive Engineers Standard

GB: China National Standard

Select Input
CCA

Rating range as following:

Measurement Standard	Measurement Range
CCA	100-2000
BCI	100-2000
CA	100-2000
MCA	100-2000
JIS	26A17--245H52
DIN	100-1400
IEC	100-1400
EN	100-2000
SAE	100-2000
GB	100-1400

Input correct test standard and rating. Press ENTER key. Tester starts to test, and dynamic interface "TESTING" prompted.

Setting Rate
500 CCA

The battery test result will be displayed after about 3 seconds.

Battery Test Result

The testing result will show one of five alternative results (see below).

Good Battery The battery is operating correctly.

Healthy:96%	490CCA
Charge:98%	12.64V
Internal R=6.1m	
Rated: 500A	
GOOD BATTERY	

Good, Recharge Good battery but low current. Recharge before using.

Healthy:78%	440CCA
Charge:30%	12.20V
Internal R=7.2m	
Rated: 500A	
GOOD, RECHARGE	

Replace The battery is near to or has already reached the end of its useful life. Replace battery immediately.

Healthy:46%	490CCA
Charge:80%	12.68V
Internal R=18.1m	
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REPLACE	

Bad Cell, Replace Battery interior damaged, due either to a bad cell or short circuit. Replace battery immediately

Healthy:0%	0CCA
Charge:20%	10.64V
Internal R=45.2m	
Rated: 500A	
BAD CELL, REPLACE	

Charge, Retest Unstable battery should be recharged and retested to avoid error. If same test result appears after recharge and retest, the battery should be regarded as damaged. In which case, replace immediately.

Healthy:39%	310CCA
Charge:20%	12.08V
Internal R=30.1m	
Rated: 500A	
CHARGE-RETEST	

Please note: If "REPLACE" resulted from testing in IN VEHICLE mode, it may be due to the battery cable not being correctly connected to the battery. To check, remove the cable and retest the battery in OUT OF VEHICLE mode before making a decision to replace the battery.

Note: After testing, if you wish to exit testing mode, press EXIT key to directly Exit to the startup interface. After testing: if the unit is "IN VEHICLE" test state, pressing the ENTER key will select the Crank Test.

3.2.2 Cranking Test

Tester prompts as follows:

Cranking Test
Start Engine

Start the engine as prompted. Tester will automatically complete the cranking test and display the result.

Cranking Test	
RPM Detected	

Normally, a cranking voltage lower than 9.6V is regarded as abnormal. Press ENTER if it is higher than 9.6V. Test results show actual cranking voltage and actual cranking time.

Cranking Test	
Times	780ms
Cranking	Normal
	10.13V

When cranking test is abnormal, the battery test result will also be displayed.

Cranking Test	
Times	1020ms
Cranking	Low
Replace	10.13V


This is for the convenience of the maintenance personnel to quickly know the whole state of the starting system. After testing is finished, do NOT turn off the engine. Press ENTER to enter the Charging Test mode.

3.2.3 Charging System and Rectifier Diode Test

To enter the charging test, please choose "Charging Test"

Test in Vehicle
1.Battery Test
2.Cranking Test
3.Charging Test

Press ENTER again to start the charging test. **NOTE:** Do NOT turn off the engine during the test. All electrical appliances and devices should be in the OFF state. Turning on / off any electrical appliance in the vehicle during the test will affect the accuracy of the test result. The following tests will be conducted.

Ripple Test


The tester will display the real time ripple. The ripple voltage and charging voltage values will be displayed below. The ripple test takes approximately 6 seconds. After the ripple test, the tester will automatically start the Loaded Voltage test.

Charging Test
Loaded Testing

The Loaded Voltage test takes approximately 3s. You will then be prompted to "Step on accelerator to increase engine rotation speed".

Charging Test
Increase RPM to 2,500RPM Hold for 5 seconds Press OK to continue

Operate accordingly to increase the engine rotation speed to 2500 RPM or above, and hold for 5 seconds. The Charging Voltage test starts after increased revolutions are detected.

Charging Test
Testing ****

After the test is completed, the tester displays the effective charging volts, ripple test result and charging test result.

Cranking Test	
Loaded	14.16V
Unloaded	14.39V
Replace	15mV
Charging	Normal

NOTE: If increased revs are not detected, it may be due to a faulty generator regulator or poor battery connection. Tester will try a further 3 times. If it still fails, it will skip this test and the test result will display "No Voltage Output". Check the connection between generator and battery, then retest.

Charging Test Results

1) Charging Voltage: Normal

Charging system shows the generator output normal, no problem detected.

2) Charging Voltage: Low

Charging voltage of the charging system is low. Check whether the generator drive belt is slipping or has come off. Check that the connection between generator and the battery is correct. If the drive belt and the connection are in good condition, follow the manufacturer's suggestion to eliminate generator faults.

3) Charging Voltage: High

Generator output voltage is high. Since most vehicle generators now use an internal regulator, the generator assembly will need to be replaced. Some older models will use an external regulator, in which case the regulator can be replaced. The voltage regulator will normally limit voltage to $14.7 \pm 0.5V$. If charging voltage is too high, it will overcharge the battery. This will cause damage to the battery.

4) No Voltage Output

No generator voltage output detected. Check that the generator connection cable and the belt are fitted correctly.

5) Diode Test

The charging current ripple test will also determine whether the diode is normal or not. When the ripple voltage is too high, it will prove that at least one diode is damaged. Check and replace the diode.

3.3 Battery Out Of Vehicle Test

OUT OF VEHICLE means that the battery is not connected with any of the vehicle systems. i.e. the battery is disconnected. Choose the battery OUT OF VEHICLE test.

Main Menu
1.Quick Test
2.Battery in Vehicle
3.Out of Vehicle
4.Review Data
5. Print Data
6.System Setup

3.3.1 Select Battery Type

After selecting the battery charge status, the tester will prompt to select battery type, i.e. Regular Flooded, AGM Flat Plate, AGM Spiral, Gel or EFB battery. Press UP/DOWN key to select the battery type. Press ENTER to confirm.

Battery System Standard and Rating

The battery tester will test 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. See example in the picture below, with the arrow indicating the relevant information.



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

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SAE: Society of Automotive Engineers Standard

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Select Input
CCA

Rating range as following:

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MCA	100-2000
JIS	26A17--245H52
DIN	100-1400
IEC	100-1400
EN	100-2000
SAE	100-2000
GB	100-1400

Input correct test standard and rating. Press ENTER key. Tester starts to test, and dynamic interface "TESTING" prompted. It will take around 3 seconds to display the test result.

Setting Rate
500 CCA

Battery Test Result

The testing result will show one of five alternative results please refer to section 3 (page 4) for an explanation of these results.

3.4 Review Data

Choose the Review Data function

Main Menu
1.Quick Test
2.Battery in Vehicle
3.Out of Vehicle
4.Review Data
5. Print Data
6.System Setup

This function displays previous test results

Healthy:96%	490CCA
Charge:98%	12.64V
Internal R=6.1m	
Rated: 500A	
GOOD BATTERY	

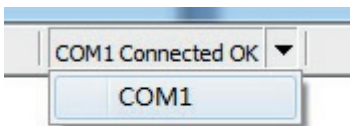
3.5 Print Data

Before selecting the Print Data function, connect the tester to a Windows computer via the USB cable supplied. Insert the CD into the computer.

1. Install the USB driver.

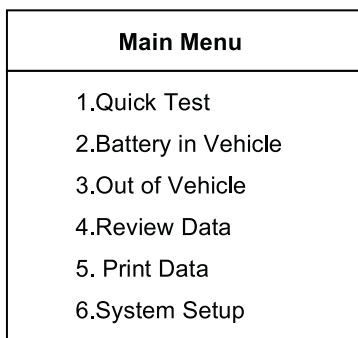


2. Open the print software. This is the application called Print COM. Depending upon your PC's security settings, you may need to right click and select 'Run As Administrator'.
3. Choose the COM Port No. The PC may use a random port, but often it will be COM4. You may need to try different COM ports from the ribbon at the top of the print program



If there is data history in the print software, please clear this.

4. Choose the Print Data function from the Main Menu.



5. Once the data is transferred to the computer, a print report (similar to that shown) will appear on the screen. Select print to bring up the print menu.

Battery Test Report

Store Name

Vehicle Registration

Date & Time
01 01 2016 14:41

BATTERY TEST

Test Result: REPLACE

Battery Type.....GB
 Rated CCA.....450 A
 Measured CCA.....105CCA
 Battery Voltage.....12.29V
 Internal Resistance.....27.94mΩ

SOC(State of Charge): 48%

SOH (State of Health): 5%

START PERFORMANCE TEST

Test Result: NORMAL

Cranking.....11.50V
 Time.....2436mS

CHARGING SYSTEM TEST

Test Result: NORMAL

Loaded.....13.90V
 Unloaded.....14.16V
 Ripple.....15mV

4. WARRANTY

4.1 Limited One Year Warranty

Endeavour Tools guarantees this tool against defects in material and workmanship for a period of 12 months from date of purchase.

- A. Endeavour Tools warrants the quality of these goods against defects in material and workmanship only.
- B. Defective goods shall only be replaced, repaired or the purchase price refunded if:
 - the customer notifies Endeavour Tools by providing a full report describing the defect in writing within 7 days of discovery of the defect; and
 - the notification above provided to Endeavour Tools is prior to the expiry of the warranty period;
 - the customer forwards the defective goods together with proof of purchase from Endeavour Tools or its authorized distributor at their expense, within 14 days of any request by Endeavour Tools to do so; and
 - the goods since the date of delivery to the customer have been properly maintained, store and housed and the goods have not been abused or modified; and
 - Endeavour Tools determines that there is a defect due to faulty workmanship or the use of a defective material.
- C. Endeavour Tools may replace or repair the defective good (or part thereof) or refund the purchase price of the defective good at its option.
- D. Endeavour Tools shall not be responsible for any loss or damage arising from or in any way connected with the use of the goods.
- E. To the maximum extent permitted by law, a claim in respect to a defective good shall not be permitted in the event that the goods have not been installed, used, maintained, or housed in a proper and workmanlike manner or in accordance with the usual standards or manufacturers specifications or instructions or if the goods have been modified, repaired or altered by any person apart from Endeavour Tools.

Notwithstanding our warranty terms above, our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

The benefits under our warranty are in addition to other rights and remedies under a law in relation to the goods.

This warranty is provided by Endeavour Tools Pty Ltd, 50 Jellico Drive, Scoresby VIC 3179. Warranty claims in the first instance should be addressed to the distributor from which you purchased this product.

For customer service please contact (03) 9753 3800, or support@endeavourtools.com.au

