

## **NOTES:**

- Carefully read the user manual before using, and keep it well for future reference.
- Carefully check the device parts list before using. For any doubt, contact distributor immediately.
- Due to the product upgrade, tiny difference between the user manual and the device will not be further noticed. Take the device as standard.

## **Disclaimer**

All information, illustrations, and specifications contained in this manual are based on the latest information available at the time of publication. The right is reserved to make change at any time without notice.

## **Safety Precautions and Warnings**

To prevent personal injury or damage to vehicles and/or the NB300, please read this user's manual first carefully and observe the following safety precautions at a minimum whenever working on a vehicle:

- Always perform automotive testing in a safe environment.
- Do not attempt to operate or observe the tool while driving a vehicle. Operating or observing the tool will cause driver distraction and could cause a fatal accident.
- Wear safety eye protection that meets ANSI standards.
- Keep clothing, hair, hands, tools, test equipment, etc. away from all moving or hot engine parts.
- Operate the vehicle in a well-ventilated work area: Exhaust gases are poisonous.
- Put blocks in front of the drive wheels and never leave the vehicle unattended while running tests.
- Use extreme caution when working around the ignition coil, distributor cap, ignition wires and spark plugs. These components create hazardous voltages when the engine is running.
- Put the transmission in P (for A/T) or N (for M/T) and make sure the parking brake is engaged.
- Keep a fire extinguisher suitable for gasoline/chemical/ electrical fires nearby.
- Don't connect or disconnect any test equipment while the ignition is on or the engine is running.

Keep the NB300 dry, clean, free from oil/water or grease. Use a mild detergent on a clean cloth to clean the outside of the NB300, when necessary.

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# Chapter 1 General Information

## 1.1 Product Profile

NB300 Battery Tester adopts the conductance testing technology 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 technician to find the problem quickly and accurately.

1. Test all automotive 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, IEC, EN, SAE and GB.
6. Support multi-languages, includes: English, Spanish, French, Italian, German, Russian, Finland, Portuguese, Swedish, Polish etc. Other languages can also be customized according to user's need.

## 1.2 Product Feature

NB300 battery tester features the following functions: battery test, starter 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 and the aging extent, which provide reliable analysis evidence for the test and maintenance of the battery. It may notify the user to replace battery in advance when the battery gets aged.

**Starter test** measures the cranking voltage. If the engine cranking speed is good, and the cranking voltage reading is within specifications, you can generally conclude that the starting system is functioning properly. But, if the starter does not crank, cranks too slowly, or the volts reading is not within

specifications, further testing will be required. To get more accurate results, this scan tool incorporates a temperature compensation feature to aid in tests. Before performing the **STARTER TEST**, the starting system should be visually inspected for physical defects, and some preliminary checks should be performed that will aid you in diagnosing a starting system problem. These are taken care of during the pretest.

**Additional functions** include: Set language, Set Beep on or off , Get the tool information.

### 1.3 Testing Range

#### 1. Cold Cranking Amps Testing Range:

| Testing Standard | Testing Range |
|------------------|---------------|
| CCA              | 100-1000      |
| BCI              | 100-1000      |
| CA               | 100-1000      |
| MCA              | 100-1000      |
| JIS              | 26A17--245H52 |
| DIN              | 100-800       |
| IEC              | 100-800       |
| EN               | 100-1000      |
| SAE              | 100-1000      |
| GB               | 100-800       |

#### 2. Voltage Measurement Range: 8-18V DC

## 1.4 Specifications

- Screen: 126\*64 LCD display
- Input voltage range: 8~18V
- Operating current: <100mA@12V (Typical)
- Power consumption: < 1.2W (Typical)
- Operating temperature: 32°F~122°F / 0°C~50°C
- Storage temperature: -4°F~158°F / -20°C ~70°C @ RH60%
- Outline dimension: 210\*150\*35 mm
- Weight : < 12.35 oz (350g)

## Chapter 2 Product Description



| No.   | Name                | Descriptions   |
|-------|---------------------|--|
| ①     | <b>LCD display</b>  | 128*64, backlit, Indicates test results                        |
| ②     | <b>OBD Cable</b>    | .Connects the NL100 to the vehicle's Data Link Connector (DLC) |
| ③ / ⑥ | <b>▲ / ▼ button</b> | Move cursor up or down for selection                           |
| ④     | <b>ENTER button</b> | Confirm a selection or action                                  |
| ⑤     | <b>ESC button</b>   | Cancel a selection or action or return to menu                 |

## Chapter 3 Operation

### 3.1 Pre-Test

Before testing, clean battery poles with metal wire brush and alkaline detergent to avoid the tolerance caused by oil and dust to the test result.

While testing, ensure none of the in-vehicle electrical appliance is on, doors are closed and the ignition key is in OFF status.

Connect the red test clamp with battery anode and the black one with cathode. Shake the clamps back and forth to make sure they are well connected.

Make sure the handbrake on and the gearbox is on N or P .

The tester requires the two clamps are well connected with the battery poles. Otherwise, the tester cannot power on. In this case, clean the poles and re-connect it properly.

Tester has reverse connection protection function. When clamps are reversely connected, tester screen will not light, but it damages neither the tester nor the automotive load.

**NOTE:** *For parallel connected batteries, break off the cathode connection first, then do single test to each battery. Suppose cathode connection is not cut off, there will be error in test result.*

**CAUTION:** NB300 Tester may be damaged when connected to voltage above 18V!

## 3.2 Tester Startup

The tester automatically starts up after the clamps are correctly connected, and displays the startup interface, within this 2 seconds, it enters the function menu. as shown in Figure 1.

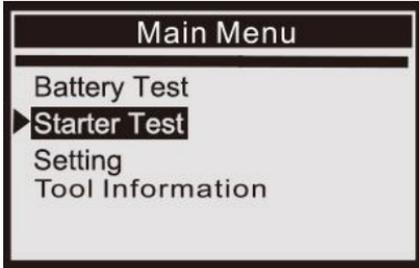


Figure 1

## 3.3 Battery Test

After entering battery test program, the tester will display the tester model and version approx. 2 seconds, see figure 1. The tester will display the following contents in a sequence, select the desired items accordingly.

### 3.3.1 IN-VEHICLE or OUT-OF-VEHICLE

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

1) **ON VEHICLE** means the battery is connected with vehicle engine or vehicle electrical appliance. as shown in Figure 3.

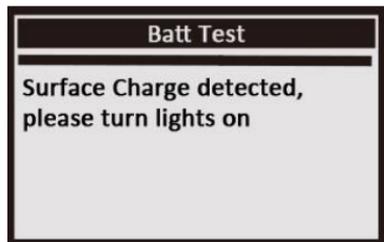
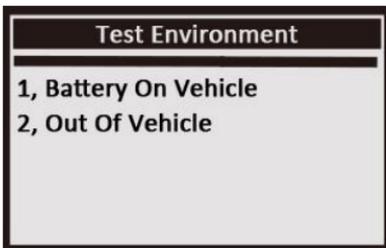


Figure 3

Figure 4

When the tester detects surface charge, a prompt message "SURFACE CHARGE DETECTED, TURN LIGHTS ON" will appear on the screen, as shown in Figure 4.

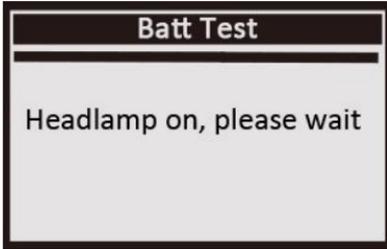


Figure 5

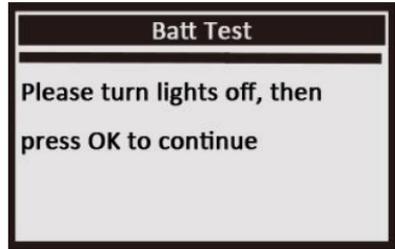


Figure 6

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

2) **OUT OF VEHICLE** means battery is not connected with any of the vehicle load, namely, battery connection is cut off.

### 3.3.2 Select Battery Type

After the battery charge status is chosen, the tester will enter battery type selection interface: Regular Flooded, AGM Flat Plate, AGM Spiral or Gel battery. Press UP/DOWN key to select, and press OK key to confirm.

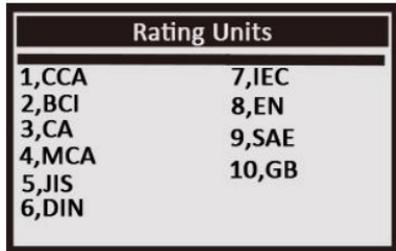


Figure 7

Figure 8

### 3.3.3 Battery System Standard and Rating

NB300 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 the arrow position as indicated in the below picture. as shown in Figure 7,8.

**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

Rating range is as follows:

| Measurement Standard | Measurement Range |
|----------------------|-------------------|
| CCA                  | 100-1000          |
| BCI                  | 100-1000          |
| CA                   | 100-1000          |

|     |               |
|-----|---------------|
| MCA | 100-1000      |
| JIS | 26A17--245H52 |
| DIN | 100-800       |
| IEC | 100-800       |
| EN  | 100-1000      |
| SAE | 100-1000      |
| GB  | 100-800       |

Input correct test standard and rating, press OK key, It takes around 3 seconds to display the battery test result as shown below.

### 3.3.4 Battery Test Result

Battery test result is mainly classified into 5 types:

#### 1) Good Battery

| Test Results  |           |
|---------------|-----------|
| SOH           | 97.00%    |
| SOC           | 98.03%    |
| VOLTAGE       | 12.63V    |
| Crank Current | 625A      |
| RATED         | JIS 80D26 |
| Good Battery  |           |

Figure 9

| Test Results   |           |
|----------------|-----------|
| SOH            | 76.00%    |
| SOC            | 28.00%    |
| VOLTAGE        | 12.10V    |
| Crank Current  | 590A      |
| RATED          | JIS 80D26 |
| Good, Recharge |           |

Figure 10

The battery is in good health, please be free to use!

#### 2) Charge Battery

The battery is good but with low power. Please recharge it before using.

### 3) Replace

| Test Results   |           |
|----------------|-----------|
| SOH:           | 45.00%    |
| SOC:           | 29.00%    |
| VOLTAGE:       | 12.10V    |
| Crank Current: | 490A      |
| RATED:         | JIS 80D26 |
| Replace        |           |

Figure 11

| Test Results      |           |
|-------------------|-----------|
| SOH:              | 0.00%     |
| SOC:              | 23.00%    |
| VOLTAGE:          | 12.50V    |
| Crank Current:    | 625A      |
| RATED:            | JIS 80D26 |
| Bad Cell, Repalce |           |

Figure 12

The battery is near to or already reached the end of its service life, replace it immediately, otherwise, potential hazard will be followed.

### 4) Bad Cell

The battery has internal damage, broken cell or short circuit, please replace it.

### 5) Charge, Retest

| Test Results      |           |
|-------------------|-----------|
| SOH:              | 38.00%    |
| SOC:              | 21.00%    |
| VOLTAGE:          | 12.10V    |
| Crank Current:    | 310A      |
| RATED:            | JIS 80D26 |
| Charge And Retest |           |

Figure 13

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, please replace it.

**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:** To exit after testing, press RETURN key to directly return to the startup interface. After testing: if it's "IN-VEHICLE" mode, press OK key to enter Cranking Test.

**SOH** means State of Health

**SOC** means State of Charge

### 3.5 Starter Test

Tester prompts as following:



Figure 14

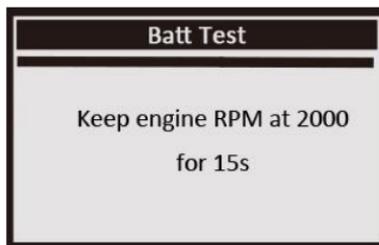


Figure 15

**NOTE:** While the system prompts you to start engine, pressing RETURN key can not exit the current interface.

Follow the on-screen instructions to start the engine, the tester will automatically complete the cranking test and display the result. as shown in Figure 16.

**1) Charge Status:Normal**

Charging system shows the generator's output is normal, no problems are detected.

**2) Charge Status:Low Output**

Charging volt of the charging system is low.

Check whether slip or running off occurs on the generator drive belt. Check the connection between generator and battery is normal or not. If both of the drive belt and the connection are in good condition, follow the manufacturer's suggestion to eliminate generator fault.

**3) Charge Status:High Output** Generator output volt is high.

Since most of the vehicle generators are using built-in regulator, the generator assembly has to be replaced. (For some old style cars using external regulator, directly replace the regulator.)

The normal high volt of the voltage regulator is maximum  $14.7\pm 0.5V$ . If charging volt is too high, it will overcharge the battery. Therefore, the battery life will be shortened and troubles will be caused.

**4) Crank Status: Normal**

The starter voltage is normal and the starting system is OK.

| Test Results   |        |
|----------------|--------|
| Charge Status  | Normal |
| Charge Voltage | 10.00V |
| Crank Status   | Normal |
| Crank Voltage  | 10.00V |
| Crank Current  | 10.00A |
| Crank Time     | 1000ms |

Figure 16

| Tool Setup       |
|------------------|
| Language         |
| Contrast         |
| Tool Information |

Figure 17

**5) Crank Status: Low**

The starter voltage is low and you'd better check the starter system before a problem happens.

## 3.6 Tool Setup

As shown on figure 17.

### 3.6.1 Select Language

The language include English, Spanish, French, Italian, German, Russian, Finland, Portuguese, Swedish, Polish etc. As shown on figure 18



Figure 18



Figure 19

### 3.6.2 Tool Information

This item show the software version, hardware version and SN as shown on figure 19