



**Battery and System Tester
Model No. BA9**



⚠ WARNING



Failure to follow instructions may cause damage or explosion, always shield eyes. **Read entire instruction manual before use.**

Warning: This product contains chemicals, including lead, known to the State of California to cause cancer, birth defects and other reproductive harm. ***Wash hands after handling.***

⚠ WARNING



Read these instructions completely before using the tester and save them for future reference. Before using the tester near a car, truck or boat, read these instructions and the instruction manual/safety information provided by the car, truck, boat or equipment manufacturer. Following all manufacturers' instructions and safety procedures will reduce the risk of accident.



Working around lead-acid batteries may be dangerous. Lead-acid batteries release explosive gases during normal operation, charging and jump starting. Carefully read and follow these instructions for safe use. Always follow the specific instructions in this manual and on the tester each time you use it.

All lead-acid batteries (car, truck and boat) produce hydrogen gas which may violently explode in the presence of fire or sparks. **Do not smoke, use matches or a cigarette lighter while near batteries.** Do not handle the battery while wearing vinyl clothing because static electricity sparks are generated when vinyl clothing is rubbed. Review all cautionary material on the tester and in the engine compartment.



Always wear eye protection, appropriate protective clothing and other safety equipment when working near lead-acid batteries. Do not touch eyes while working on or around lead-acid batteries.



Use extreme care while working within the engine compartment, because moving parts may cause severe injury. Read and follow all safety instructions published in the vehicle's Owner's Manual.



Batteries being tested with the tester likely contain liquid acids which are hazardous if spilled.

Personal Precautions

Someone should always be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.

Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes. Protective eyewear should always be worn when working near lead-acid batteries.

If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with running cold water for at least 10 minutes and get medical attention immediately.

Be extra cautious to reduce risk of dropping a metal tool onto a battery. It might spark or short circuit the battery or another electrical part that may cause explosion.

Remove personal metal items such as rings, bracelets, necklaces and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or the like to metal, causing a severe burn.

Use the tester for testing lead-acid batteries only. Do not use for testing dry-cell batteries that are commonly used with home appliances.

NEVER test, charge or jump start a frozen battery.

Do not submerge in water.

Do not operate with flammables such as gasoline, etc.

If the tester receives a sharp blow or is otherwise damaged in any way, have it checked by a qualified service person.

Do not disassemble the tester. Have it checked by a qualified service person.

About Your Battery and System Tester

The battery tester is designed to test only 12 Volt batteries and systems. The tester is compatible with a wide range of battery types, including Conventional, Maintenance Free, AGM, Gel Cell, Marine and Start-Stop batteries. The tester can test these types of batteries against several battery capacity rating systems. Below is a chart of the operating range of the tester, based on the applicable capacity rating systems:

<i>Rating System</i>	<i>Testing Capacity</i>
CCA	40-1200 CCA
DIN	20-670 CCA
IEC	25-790 CCA
EN	35-1125 CCA
CA(MCA)	70-1440 CA(MCA)

The tester has a recommended operating ambient temperature range of 32° F to 122° F.

Preparing Battery to Be Tested

1. Be sure area around battery is well ventilated while battery is being tested.
2. Clean battery terminals. Wire brush them if necessary. Be careful to keep corrosion from coming in contact with eyes.
3. Inspect the battery for cracked or broken case or cover. If the battery is damaged, do not use tester.
4. If the battery is not a sealed Maintenance Free battery, add distilled water in each cell until battery acid reaches level specified by the manufacturer. This helps purge excessive gas from cells. Be careful not to overfill.
5. Confirm that all vehicle accessories are turned OFF to ensure you do not cause any arcing and that the tested battery has a nominal voltage of 12 Volts.
6. If it is necessary to remove battery from vehicle to test, always remove ground terminal from battery first.

Battery Tester Operation

Battery Testing

1. Before you test a battery in a vehicle, turn off the ignition, all accessories and loads. Close all the vehicle doors and the trunk lid.
2. Make sure the battery terminals are clean. See *Preparing Battery to Be Tested*.
3. Connect tester leads to the battery, clamping the red clamp to the vehicle positive battery terminal first. Then, clamp the black clamp to the vehicle negative battery terminal second.

Note: Whenever possible, connect directly to the terminals/posts of the battery.

4. Display will power up and show the open circuit voltage of the battery on the display.

Note: If you see **HI / Lo / ---- / RIPPLE** on the display, please refer to *Troubleshooting*.

5. Battery Test (BAT.) is the default mode upon power up. Press ENTER to initiate the testing process.
6. Press Arrow Keys to select type of battery to be tested: SLI, AGMF, AGMS, GEL, SSA or SSEFB. SLI refers to standard Starting/Lighting/Ignition flooded batteries, AGMF refers specifically to traditionally shaped AGM batteries, AGMS refers specifically to AGM-designated Spiral Wound batteries, GEL specifically refers to Gel Cell batteries, SSA refers specifically to AGM-designated Start-Stop batteries and SSEFB refers specifically to Enhanced Flooded Start-Stop batteries. Press ENTER.
7. Press UP or DOWN arrow key to select the applicable battery rating that you plan to test against. Options include SAE/CCA, DIN, IEC, En or CA(MCA). Press ENTER.
8. Press UP or DOWN arrow key to input the battery rating. Press ENTER to perform the battery test (lasts 1-2 seconds).
9. *(Optional sequence that is determined by the tester.)*
 - a. If the display shows **BAT. CHARGED** (Is tested battery charged?), press UP or DOWN arrow key to show **YES** or **NO** as applicable and press ENTER.
 - b. If the display shows **BAT.** and voltage, please recharge and retest.

10. When the test is complete, the display will show the actual determined rating (as compared to the nominal rating entered in Step 8) and provide an assessment. Assessment corresponds as follows:
 - OK** – The battery is good and capable of holding a charge.
 - OK RECHARGE** – The battery is good but needs to be charged.
 - RECHARGE/RETEST** – Battery is discharged. The battery condition cannot be determined until it is fully charged. Recharge and retest the battery. If result is the same after a second test, the battery should be replaced immediately.
 - BAD** – The battery cannot hold a charge. It should be replaced immediately. Or, the battery has at least one short-circuited cell. It should be replaced immediately.
 - ERROR** – The clamps are not connected properly or the tested battery is has a higher CCA/CA (MCA) capacity than the tester's operating range.
11. Press the up/down arrow keys to display the battery's State of Health (**SOH**), State of Charge (**SOC**) and internal resistance (**mΩ**).
12. Press ENTER return to the home screen and once again display the battery's open circuit voltage. Remove the test leads from the battery posts after completion of testing, always removing the negative clamp first and then the positive clamp.

System Testing: Starting and Charging System Tests

1. Make sure the battery terminals are clean. See *Preparing Battery to Be Tested*.
2. Connect tester leads to the battery, clamping the red clamp to the vehicle's positive battery terminal first. Then, clamp the black clamp to the vehicle's negative battery terminal second.
 - Note:** Whenever possible, connect directly to the terminals/posts of the battery.
3. Display will power up and show the open circuit voltage of the battery on the screen.
 - Note:** If you see **HI / Lo / ----** on the display, please refer to *Troubleshooting*.
4. Turn off all vehicle accessory loads such as lighting, air conditioning, radio, etc.
5. Press UP or DOWN arrow keys to choose the type of test you would like to perform. Choose CRANKING to perform a Starting System Test. Press ENTER.

6. The display shows **CRANKING**, the battery's voltage and a blinking key icon.
7. Start the engine. The display will show the minimum voltage reach by the battery and provide an assessment of starting system condition. Assessment corresponds as follows:
 - OK** – Starting System OK.
 - LO** – Starting System Weak
 - – Starting System Problem. Check connections, wiring and starter immediately.
8. After Starting System Test, press ENTER to go to Charging System Test. Display will show ALT.
9. Run the engine to 1200 – 1500 rpm. The tester will display the charging system voltage without loads and provide an assessment of that reading. Assessment corresponds as follows:
 - OK** – Charging System OK
 - HI** – Charging Voltage is High
 - LO** – Charging Voltage is Low
10. Next, the tester can provide an assessment of the charging system under load.
11. Without pressing ENTER, turn on the following accessories: blower to high (heat), high beam headlights, and rear defroster.
 - Note:** Do not use cycling loads such as air conditioning or windshield wipers.
12. The tester will display the charging system voltage under loads and provide an assessment of that reading. Assessment correspond as follows:
 - OK** – Charging System OK
 - HI** – Charging Voltage is High
 - LO** – Charging Voltage is Low
13. Press ENTER to perform an assessment of alternator ripple.
14. The tester will display the detected alternator ripple and provide an assessment of that reading:
 - OK** – Normal Ripple Detected
 - HI** – Excess Ripple Detected

15. Turn engine OFF and remove the test leads from the battery posts after completion of testing, always removing the negative clamp first and then the positive clamp.

Troubleshooting

Question: What does it mean if the Tester Display shows **HI**?

Answer: The voltage of the tested battery is over 16V and too high of a reading for a 12V battery. The tester will not work under this situation. Confirm that the tested battery has a nominal voltage of 12 Volts.

Question: What does it mean if the Tester Display shows **LO**?

Answer: The voltage of the tested battery is under 4.5V and too low to power the tester. Confirm that all vehicle accessories are turned OFF and that the tested battery has a nominal voltage of 12 Volts. If so, charge the battery. If reading is the same after charging, the battery should be replaced.

Question: What does it mean if the Tester Display is blank?

Answer: The voltage of the tested battery is too low to power the tester. Check battery connections and be sure that you have not made a reverse connection. If condition persists, confirm that all vehicle accessories are turned OFF and that the tested battery has a nominal voltage of 12 Volts. If so, charge the battery. If reading is the same after charging, the battery should be replaced.

Question: What does it mean if the Tester Display flickers or shows **RIPPLE**?

Answer: The voltage reading is unstable. Confirm that all vehicle accessories are turned OFF and that the tested battery has a nominal voltage of 12 Volts. If condition persists, place a short (15-20 seconds) load on the battery by turning on the lights or another accessory and then turn accessory OFF. This temporary load may assist in stabilizing the battery voltage by removing any surface charge on the battery.

Question: What might cause sparking at the connection to the negative or positive terminal?

Answer: It is important that the tester clamps make a good connection to the battery terminal (preferred) or to the battery connection hardware. Avoid connecting to any screws that are used as part of the vehicle's battery connection. In some circumstances, usually when connecting to such screws, an inefficient connection is made that provides very little surface contact from the clamp to the connected surface. In such cases, the tester's electrical pulse will try to follow the easiest path to the battery posts. If such a situation occurs, disconnect tester immediately and attempt to make a better connection with greater surface contact between the clamp and the connected surface.

Warranty

Clore Automotive, LLC warrants your **SOLAR** Battery Tester to be free from defects in material and workmanship for a period of one year from the date of sale to the original user or consumer purchaser.

This warranty excludes and does not cover defects, malfunctions, or failures of your tester which were caused by repairs made by an unauthorized person, mishandling, modifications, normal wear, unreasonable use or damage to the tester while in your possession, as determined by Clore Automotive, LLC.

In no event shall Clore Automotive, LLC be liable for consequential or incidental damages. Some states do not allow limitations on the length of the implied warranty or the exclusion or limitation of incidental or consequential damages so the above limitations or exclusions may not apply to you. This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

This warranty is in lieu of all other express warranties. The duration of any implied warranty, including but not limited to any implied warranty of merchantability or fitness for a particular purpose, made in respect to your product is limited to the period of the express warranty set forth above.

Instructions for obtaining service under this warranty:

To obtain service under this warranty, return your **SOLAR** Battery Tester to the place of purchase, along with your dated sales receipt, for an exchange.

Check out the collection of automotive tools we offer.