



**B450**

# Battery & Electrical System Analyzer

For Testing 12V Vehicle Batteries individually & in Battery Packs. Also for testing 12V, 24V and 36V Charging & Starter Systems

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## User Manual

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Made in U.S.A.  
Printed in U.S.A. Techno Tools Corporation 2651  
West 81<sup>st</sup> Street, Hialeah, Florida 33016



## INTRODUCTION

The B450 tests all 12V all lead acid batteries individually or in parallel and series battery packs (up to 2000 CCA's).

The tester will display the battery or battery pack condition as % available capacity, rated capacity (i.e. CCA's), state of charge voltage and good, marginal or replace status.

The B450 also tests 12V, 24V and 36V starter and charging systems including starter draw, alternator output (loaded/unloaded), and diode ripple.

The test data for the last test performed is stored in the memory and can be reviewed either when connected to a battery.

### Features:

- **Patented conductance technology**
- **Displays % of capacity and CCA's.**
- **Tests all 12V lead acid batteries including AGM and Gel**
- **No conversion tables needed**
- **Test batteries from 100 CCA to 2000 CCA (battery pack)**
- **Tests 12/24/36V Starting/Charging Systems**
- **Tests both series and parallel batteries**
- **Tests Alternator Ripple**
- **Reviews last test in memory**
- **Bad cell is detected and displayed**
- **Displays Multiple International Units**
- **Loose lead detection**
- **Temperature Compensation**
- **RoHS compliant brass post adapters included**
- **Multiple language (English, Spanish, French)**
- **Reverse polarity protection**
- **Made in USA**



## RETURN FOR REPAIR POLICY

Every effort has been made to provide reliable, superior quality products. However, in the event your instrument requires repair, forward unit to Service Center freight prepaid to the address below with return address, phone number and/or email address.

Techno Tools Corp.  
2651 W 81st Street  
Hialeah, FL 33016

## WARRANTY POLICY

The B450 Electrical System Analyzer is warranted to be free of defects in materials and workmanship for a period of two years from the date of purchase. This warranty applies to all repairable instruments that have not been tampered with or damaged through improper use including unauthorized opening of the unit. Please ship warranty units that require repair freight prepaid to Service Center along with proof of purchase, return address, phone number and/or email address.

CEC DECLARATION OF CONFORMITY 2007	
Application of Council Directives(s)	
EMC Directive 89/336/EEC as amended by 92/31/EEC, 91/263/EEC, 93/88/EEC	
<b>Manufacturer's Name</b> Made in USA to Snap-on Tools specifications Snap-on Tools Corporation 2001 80th Street Kenosha WI 53141-1410	
<b>Equipment Type/Description</b> Battery & Electrical System Analyzer	
<b>Models</b> Snap-on Tools Model YA2836	
<b>Conformance to:</b> EN61000-4-2:2001 (ESD), EN 61000-4-3:2001 (RS), EN 61000-4-4:2001 (EFT)	
The Snap-on Tools Refrigerant Leak Detector was found to meet the requirements described with the specifications of EN 61000-6-1.	
The undersigned hereby declare that the equipment specified above conforms to the above Directive(s).	
<i>Tom Smith</i>	May 23, 2007
Signature-Technical Specification	Date
Tom Smith	EMC Test Engineer
Full Name	Position
<i>Tom Smith</i>	May 23, 2007
Signature - Manufacturer's Representative	Date
Elliott Gerard	Manufacturing Representative
Full Name	Position 123729

## REPLACEMENT PARTS

Item	Part Number
Brass post adapters	B555
Carrying case	B456
Instruction manual	B457

## PRODUCT SPECIFICATIONS

Model #	Micro LCD B450
Name	Electrical System Analyzer
Battery Size Range	100 CCA to 2000 CCA
DC Voltage: Range/Accuracy	4.9V to 49.9V/ +/- 2% reading
LCD Display	2 line-16 character
Power Supply	Battery under test
Cable Length	2 Ft.
Weight, lbs	1.5 lbs
Warranty	2 years

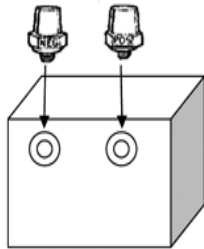
## B450 Controls



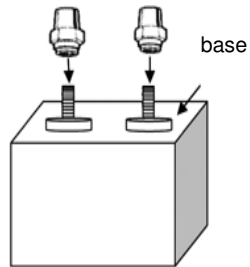
## PRIOR TO TESTING

**Important:** Use stud or post adapters when connecting to side mount or Group 31 batteries outside of the vehicle. Or connect battery clips on the base of threaded stud when testing (see Fig. below). Make sure adapters are properly tightened. Connecting the tester directly to threaded studs or bolts will result in false readings. When connecting to batteries inside or outside of the vehicle, rock the clips back and forth to ensure a good connection. **CHECK CONNECTION** may show on the display if a poor connection is detected. Reset clips if necessary.

Side-mount male post adapters



Group 31 female Stud adapters



## REVIEWING TEST RESULTS

The B450 stores the last test results in memory for review while **connected** to the test battery. The review prompt will only display if data is stored in the memory and has not been erased.

To review stored data, press the NEXT + button until the REVIEW prompt is displayed. If Battery Test data is stored in the memory the display will show the **REVIEW BATTERY TEST**. Press **ENTER** ← to see the Battery Test data.

Press **NEXT +** to review Starter Test data (if stored) and **NEXT +** to review Charging System Test.

## CHARGING SYSTEM TEST:

**NOTE: Engine must be off before testing charging system.**

After completing the starter test, press **NEXT +**. The display will prompt the user **TEST CHARGING SYSTEM**. (*The maximum starter/charging voltage is 36V*). To test the charging system:

1. Press **ENTER←**: The user will be prompted to **START THE ENGINE (ACCESSORIES OFF)**. The tester will automatically detect that the engine has started and will display **ENGINE STARTED PLEASE WAIT**.
2. The display will prompt the user to Press **NEXT +** and **REV ENGINE FOR 15 SECONDS**. After revving, the user will be prompted to **TURN ON ACCESSORY LOADS** (lights & AC or heater) and press **NEXT +** again.
3. The user will be prompted to **REV ENGINE FOR 15 SECONDS** *again*. After revving the display will show one of the following the test results:

### CHARGING SYSTEM IS OK

**NO CHARGING:** The alternator is not supplying a charging voltage to the battery. Check also for loose, slipping or broken alternator belt

**BAD DIODE REPLACE ALTERNATOR:** The tester detected **excess ripple** coming from the alternator indicating defective diode(s). If diodes are not replaceable, replace alternator.

**BAD DIODE AND/OR CHECK CONNECTIONS:** The tester detected low charging voltage that could be caused by a bad diode (although alternator ripple is within normal limits) or high resistance connections. If connections and diode are found to be good, check regulator and replace if necessary.

**REPLACE REGULATOR:** The tester detected abnormally high alternator output voltage caused by a defective regulator.

## Out of Vehicle Test

### BATTERY TEST:

1. Connect the B450 to the battery to be tested. "**Techo Tools B500**" will appear momentarily on the display and then the display will show **IN VEHICLE TEST? PRESS NO (+)**.
2. The display will then prompt the user to **SELECT BATTERY VOLTAGE**. Press the **+ UP** or **- Down** buttons to select the battery or battery pack voltage i.e. 12V, 24V to be tested.  
**NOTE:** The maximum battery pack voltage for testing is 24V (2-12V batteries in series).
3. Press **ENTER ←**: The display will show the battery's State of Charge (SOC) and display **GOOD, LOW, BAD CELL REPLACE or SURFACE CHARGE\***.
4. Press **NEXT +**: The display will prompt the user **TEST BATTERY**.
5. Press **ENTER ←**: The display will prompt the use to select the units of the battery rating: **CCA/SAE, EN, DIN, EIC or JIS**. Press **+ UP** or **- DOWN** to select desired units.
6. Press **ENTER ←**: The display will prompt the user to select the rated battery size. Press the **+ UP** or **- DOWN** buttons to select the battery's numerical rating i.e. 550 CCA.
7. Press **ENTER ←**: The display will show **TESTING.....PLEASE WAIT** for a few seconds. The display will then show the % available capacity\*\* and the battery condition as **GOOD, MARGINAL\*\*\* REPLACE, RECHARGE & RETEST or BAD CELL-REPLACE**.

\*Removing the surface charge may improve the test accuracy when testing **MARGINAL** batteries. To remove surface charge, load the battery for several seconds until the **SOC** voltage drops to 12.8V or less.

\*\*If available capacity is 800 CCA's or greater the Tester will prompt the user if the battery is an AGM type battery.

\*\*\*For **MARGINAL** batteries the B450 will prompt the user "**TEMPERATURE ABOVE 32°F?**"

# In Vehicle Tests

## BATTERY TEST:

Connect the B450 to the battery to be tested. “**Techno Tools B450**” will appear momentarily on the display and then the display will show **IN VEHICLE TEST? PRESS YES** (←). The display will then prompt the user to **SELECT BATTERY/SYSTEM VOLTAGE**. Press the **+ UP** or **- Down** buttons to select the battery or battery pack voltage i.e. 12V, 24V, 36V to be tested.

**NOTE:** When testing the battery in the vehicle, make sure vehicle engine is **not** running and all accessory loads are **off**. If **SURFACE CHARGE** (SOC) is displayed, turn on accessory loads (lights, AC or heater) for 15 seconds with engine off.

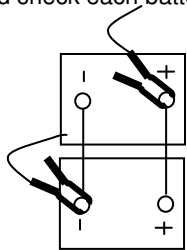
### Testing Battery Packs:

The B450 tests battery packs when they are connected to the vehicle as though it is testing a single battery. When testing a battery pack, enter the battery voltage and rating of the pack as a single battery.

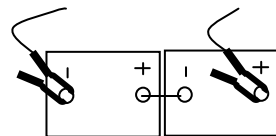
**Batteries in parallel:** For batteries connected in parallel, add the rated capacity of each single battery to determine the rated capacity of the pack. For example two 500 CCA batteries in parallel would have a rating 1,000 CCA (see figure below). The voltage of the pack remains the same regardless of the number of batteries in the pack. The B450 can test batteries in parallel up to 2000 CCA.

**Batteries in series:** A pack consisting of 2 single 12V batteries in series would have 24V. The rated capacity of the two 12V batteries in series is 1/2 the rating of the single battery. For example two 500 CCA 12V batteries in series would have a rating of only 250 CCA. The B450 can test two 12V batteries in series

**IMPORTANT:** The B450 determines the condition of the pack as whole but does not determine the condition of the individual battery in the pack. If the condition of the parallel pack is determined to be bad, disconnect the batteries from the pack and check each battery individually.



2- 12V batteries in parallel: add rated capacities of single battery. Pack is still 12V.



2- 12V batteries in series: add 1/2 rated capacities of single battery. Pack is 24V.

## STARTER TEST:

Note: Before the starter can be properly tested, make sure the battery or battery-pack SOC (state of charge) and battery condition tests GOOD and the engine is OFF.

To test the Starter, scroll to the starter test pressing the **NEXT +** button. The display will prompt the user **TEST STARTER SYSTEM**. To test the starter: Press **ENTER** ←.

1. The display will prompt you to **START ENGINE (ACCESSORIES OFF)**.
2. Crank the engine and if it starts, turn engine off. The Tester will display the voltage drop at the battery while cranking and one of the following messages:

**STARTING SYSTEM NORMAL:** The starter system is operating properly.

**CHECK STARTER:** The Starter is drawing excess current. Check starter and starter wires and connections for abnormally high resistance.

**RETEST BATTERY & RETEST STARTER:** The B450 detected unusually low voltage at the battery during cranking indicating that the battery may need replacing. Retest the battery and retest starter.