Model B400

Heavy Duty
Battery Condition & Charging
System Tester

Test 12V Auto/Truck and Non Auto Batteries and
Test 12/24/36V Starter/Charging Systems

User Manual

CE

Made in USA

INTRODUCTION

Your new Model B400 Battery Diagnostic Tester employs conductance testing to determine the condition of the battery. The patented circuit eliminates the need for time consuming CCA input or conversions to other rating systems. When the ENTER button is pressed, the B400 will immediately display BOTH the percent available capacity of the battery and the condition of the battery. The B400 also tests 12V alternator systems and displays charging test data for Rev, Idle, and Load conditions including Ripple output. The B400 will display up to 49.9V output volts mode and can also test 24V and 36V charging systems in this mode.

FEATURES

- **Displays % of available battery capacity**
- **Tests all 12V lead acid batteries**
- **100 CCA to 1700 CCA battery size range**
- **Color Coded LED Bar Graph**
- **3 Range Battery Size Selection**
- **5.5V to 49.9V operating range**
- **Tests discharged batteries down to 5.5V**
- **No need to input battery CCA's**
- **Patented conductance technology**
- **Tests 12/24/36V Start/Charging Systems**
- **LCD Display with Backlight**
- **Alternator Rev, Load & Ripple Test**
- **Reverse polarity protection**
- **Bad cell is detected and displayed**

SPECIFICATIONS

Stock part number	B400
Description	Battery Condition & Starter/ Charging Tester
Battery Size Range:	100 to 1700 CCA
Battery Selection Range	Small/Non Auto, Auto, Truck
Battery Voltage Range :	12V Batteries
DC Voltage: Range Volts Mode	5.5V to 49.9V
Accuracy (Volts	+/- 2% of reading
LCD Display	1 line 16 character with backlight
Battery cable length	24"
Dimensions	7.25" x 4"
Weight	.8 lbs

Model B400

Heavy Duty Abrasion Resistant Cables

Displays % Capacity & DC Volts

Bar Graph Indicator

Test Options; Battery Test Only or Starter or Charging Test

Press ENTER to Select a Test Option or Start Test

WARNING
Batteries produce explosive gases and can explode

Wear safety goggles (user and bystander)

Wear protective clothing (user and bystander)
Chemical burns can cause injury

Keep flames and sparks away from batteries

Read and follow instructions
Battery explosion and ignited gases can cause injury

TESTING BATTERY STATE OF CHARGE

Connect the red clip to the positive battery post and the black clip to the negative post*. Following the model number briefly displayed, the battery's State of Charge (SOC) voltage will be displayed as follows:

12.4V to 12.9V = "GOOD", Bar Graph Green
11.0V to 12.3V = "LOW", Bar Graph Yellow
<11.0V = "LOW", Bad Cell, Bar Graph Red (FLASHING)
>13.0V = "HIGH", Surface Charge

**Note: for side mount batteries, use adapter posts P/N B555 (not included-*sold separately*).*

TESTING BATTERY CONDITION

1. Select the battery size range by pressing the TEST OPTIONS button. The B400 will scroll the three ranges on the display each time the TEST OPTIONS button is pressed as follows:

   AUTO: 390 to 749 cca
   TRUCK: 750 to 1700 cca
   NON AUTO: 100 to 389 cca

2. Once the correct battery size range is displayed, Press the ENTER button and the battery condition will be displayed as percent available capacity.

   80% to 100%* = GOOD, bar graph- 1 or more green led's
   70% to 79% = MARGINAL, bar graph- 1 or more yellow led's
   < 70% = REPLACE, bar graph- 1 or more red led's

Notes:
1. Some batteries may display above 100%. This means that the available capacity is greater than the rated capacity.

2. Recharge and retest MARGINAL batteries that show SOC LOW voltage.

3. New Batteries: Nearly all new batteries will not reach full capacity until cycled 10-30 times. A brand new battery will have a capacity of about 5-10% less than the rated capacity. Inactivity can be extremely harmful to a battery. New batteries that have been on the shelf for many months may show "marginal" or "replace" when tested, depending on the storage conditions. In that case, always charge and retest the battery before replacing.

STARTER TEST- 12V SYSTEM

Important: The battery condition must be tested to make sure it is in good condition before performing this test. Note: The auxiliary 12V battery in mild hybrid systems may not show changes to the battery voltage when testing the starter and charging system. Check with vehicle manufacturer for information on testing mild hybrid vehicles.

1. After testing the battery condition and while still clamped to the battery, press the TEST OPTIONS button.

2. "STARTER TEST" will be displayed.

3. Press ENTER. "START ENG ACCESSORY OFF" will be displayed.

4. Crank engine until engine starts and then turn engine off. The following test results may be displayed:

   NORMAL= 9.7V bar graph- GREEN
   CHECK = <9.7V bar graph – RED
   RETEST = READING UNSTABLE bar graph- YELLOW

5. For 12V systems the normal cranking voltage at the battery should be equal to or greater than 9.7 volts*.

If the cranking voltage is less than 9.7 volts, starting system has a problem. Check wires, connections and starter and check manufacturer's specifications for 12V systems.*

STARTER TEST- VOLTS ONLY OPTION (for 12V, 24V and 36V systems). After connecting the battery clips to the battery posts and displaying the battery SOC, press ENTER. In this VOLTS ONLY MODE the real-time voltage at the battery will be displayed. For 12V systems the normal cranking voltage at the battery should be equal to or greater than 9.7V and equal to or greater than 19.4V for 24V systems. *Note: Press ENTER again to return to the SOC screen.*

CHARGING *SYSTEM TEST TIP*

**Note: After running the STARTER TEST, the CHARGING SYSTEM TEST can be run next without testing the battery condition. Otherwise, the battery condition must be tested first to make sure it is in good condition before performing this test.*

It is not necessary to view the tester display on the tester while conducting this test. Start this procedure with engine off and press ENTER to select CHARGER TEST. The test can then be run inside the vehicle because the tester will auto detect engine started and engine revving. Once the engine is started, revv the engine while accessories are <u>off</u> first and then revv the engine while accessories are <u>on</u> allowing about 6-8 seconds of revving each time. When the test is completed, the results can then be viewed on the tester See Next Section.

12V CHARGING SYSTEM TEST

Note: First check for a loose, worn or broken alternator belt. If okay, proceed to #1. If monitoring the display, the following messages will be displayed:

1. With engine off after testing the battery condition or Starter Test and while still clamped to the battery, press the TEST OPTIONS button until “CHARGER TEST” is displayed.
2. Press ENTER. The display will show: “ACCESSORY OFF-START ENGINE”.
3. Start engine. The display will auto detect engine started after displaying “PLEASE WAIT”.
4. The display will then show “REVV ENGINE”. The tester will auto detect engine revving and then display “TURN ON LIGHTS” (while continuing to rev).
5. Stop revving after 6 seconds or when the display shows “IDLE ENGINE”.
6. The test results will display as follows:

   CHARGING NORMAL bar graph GREEN
   NO CHARGING DETECTED bar graph RED
   REPLACE ALTERNATOR bar graph RED (>.250mv Ripple)
   REPLACE REGULATOR (charging >15V)

CHARGING TEST- VOLTS ONLY OPTION (for 12V, 24V and 36V systems).

12V 24V and 36V Charging systems can be tested in VOLTS ONLY MODE. After connecting the battery clips to battery posts and displaying the battery SOC, press ENTER. In this VOLTS ONLY MODE only the real- time voltage at the battery is displayed. *Note: Press ENTER again to return to the SOC screen.*

1. With engine running and lights on, the real time alternator output voltage will be displayed. The reading should display between 13V and 15V for 12V charging systems and 26.0V to 30V for 24V charging systems.
2. Low charging voltage: Check belts for slippage. Check connections from the alternator to the battery. If no problems are found, replace the alternator.
3. High charging voltage: Check for loose connections including the ground connection. If OK, replace the voltage regulator. Newer alternators house the regulator inside. In this case replacing the alternator is necessary.

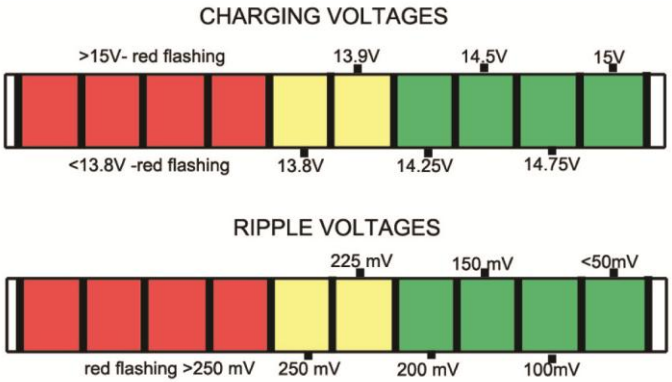
REVIEW 12V CHARGING TEST RESULTS

Once CHARGING TEST is completed, press ENTER to review charging test results. The following messages will display for each charging condition and the bar graph will display the corresponding voltage measured.

Press TEST OPTIONS to scroll the following test results for each of the charging conditions displayed below:

IDLE NO LOAD
IDLE LOADED
REVVING NO LOAD
REVVING LOADED
RIPPLE

For each of these charging conditions, the bar graph will display the corresponding voltages as shown below:



Low charging voltage: Check belts for slippage. Check connections from the alternator to the battery. If no problems are found, replace the alternator.

High charging voltage: Check for loose connections including the ground connection. If OK, replace the voltage regulator. Newer alternators house the regulator inside. In this case replacing the alternator is necessary.

CONVERTING % to CCA, DIN, JIS, Ah

If required, the available CCA, Ah, DIN, & JIS, can easily be determined by multiplying the percent displayed times the battery's original rating. For example, a 600 CCA battery with 80% capacity available would have 480 CCA (.80 x 600) available. A 20Ah battery with 80% would have 16 Ah available.

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.

SERVICE CENTER
2651 W 81st Street
Hialeah, FL 33016

WARRANTY POLICY

The B400 Battery Diagnostic Tester 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.

US PATENT # 6,768,309

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