



Battery & Electrical Tester with Printer BAT2000

User's Manual

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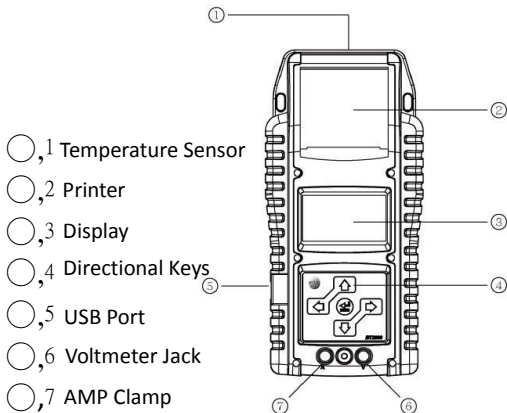
www.magnetimarelli-checkstar.pl

TEST PROCEDURES/ OPERATING INSTRUCTIONS

IMPORTANT:

1. For testing 6 and 12 volt batteries, and 12 and 24 volt charging systems. (ONLY 12 volt for START & STOP battery test)

2. Suggested operation range 32°F(0°C) to 122°F(50°C) in ambient temperature.



Jack

WARNING:

Pursuant to California Proposition 65, this product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. Wash hands after handling.

- 1.** Working in the vicinity of a lead acid battery is dangerous. Batteries generate explosive gases during normal battery operation. For this reason, it is of utmost importance, if you have any doubt, that each time before using your tester, please read these instructions very carefully.
- 2.** To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and manufacturer of any equipment you intend to use in the vicinity of the battery. Observe cautionary markings on these items.
- 3.** Do not expose the tester to rain or snow.

PERSONAL SAFETY PRECAUTIONS:

- 1.** Someone should be within range of your voice or close enough to come to your aid when you work near a lead acid battery.
- 2.** Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing or eyes.

3. Wear safety glasses and protective clothing.
4. 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 ten minutes and get medical attention immediately.
5. NEVER smoke or allow a spark or flame in vicinity of battery or engine.
6. Be extra cautious to reduce risk of dropping a metal tool onto the battery. It could spark or short-circuit the battery or other electrical parts and could cause an explosion.
7. Remove personal metal items such as rings, bracelets, necklaces and watches when working with a lead acid battery. It can produce a short circuit current high enough to weld a ring or the like to metal causing a severe burn.

PREPARING TO TEST

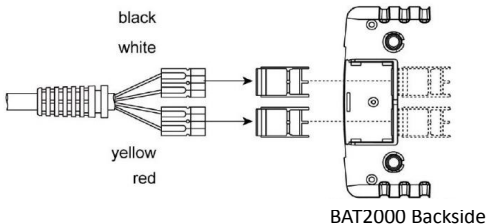
1. Be sure area around battery is well ventilated while battery is being tested.
2. Clean battery terminals. Be careful to keep corrosion from coming in contact with eyes.

3. Inspect the battery for cracked or broken case or cover. If battery is damaged, do not use tester.
4. If the battery is not sealed maintenance free, add distilled water in each cell until battery acid reaches level specified by the manufacturer. This helps purge excessive gas from cells. Do not overfill.
5. If necessary to remove battery from vehicle to test, always remove ground terminal from battery first. Make sure all accessories in the vehicle are off to ensure you do not cause any arcing.

OPERATION & USE:

INSERATION OF REPLACEMENT OF LEAD W

1. Remove the cover on the backslide bottom of the battery tester.
2. Insert the connectors which contain a black-yellow pair and a yellow-red pair in one end of the lead wire into the sockets which can be found when you remove the cover as above. Be sure to make the colors match between the connectors and sockets as shown below:



BEFORE TEST

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 you have put 4pcs 1.5V batteries into the battery chamber. Oxyride batteries are not recommended because of the initial 1.7 Volt output. If the 1.5V battery runs out of power, screen will show "REPLACE INTERNAL BATTERY" or "POWER LOW". Replace those 4pcs 1.5V batteries before starting the test.

Note that nothing will be seen on the display until

the tester is
connected to a vehicle battery.

3. Make sure the battery terminals are clean. Wire brush them if necessary. Clamp the black load lead to the vehicle negative battery terminal. Clamp the red load lead to the vehicle positive battery terminal. Please clamp on the lead part of the terminal only. Clamping on the iron part of the terminal will lead to wrong test results.

4. Paper load:

- a.** Open the clear cover.
- b.** Place a new paper roll in the compartment.
- c.** Put a short length of paper from the compartment and press down the clear cover to close.

START-STOP BATTERY TEST

1. Press the ◀ ▶ key to select START-STOP Test. In this stage, you will find the 3 tests for selection.

START-STOP
BATTERY TEST
SYSTEM TEST

START-STOP
XX.XX V

2. Press the ◀ ▶ key to select battery type:

- a. EFB (ENHANCED FLOODED)
- b. AGM FLAT PLATE

Press «ENTER» button to confirm choice.

SS BAT. TYPE
EFB

3. Press the ◀ ▶ key to select battery rating : SAE (CCA), EN, IEC, or DIN. Press «ENTER» button to confirm choice.

SELECT RATING
SAE

4. Press the ◀ ▶ key to input the battery capacity:

SAE (CCA): 40~3,000

EN: 40~2,830

DIN: 25~1,685

IEC: 30~1,985

Press «ENTER» to begin test.

SET CAPACITY
xxxx SAE

TEST IN VEHICLE?
NO

5. Press the ◀ ▶ key to confirm the location of the battery if a surface charge is detected, follow the tester 's introductions to remove the surface charge.

6. Testing battery.

TESTING

7. Aim the "Temperature Measurement sensor" 2.5cm (1 inch) from the top or sides of the battery case and press <<ENETR>>. Measured temperature may vary by distance from the battery, under hood conditions, and cabinet temperature.

POINT TO BATTERY
PRESS ENTER

8. When the test is completed, the display shows the results as follows. {Press the ◀ ▶ key to select: Temperature, SOH (STATE OF HEALTH) , and SOC (STATE OF CHARGE)}.

GOOD & PASS

The battery is good and capable of holding a charge.

GOOD & PASS

XX.XXV XXXX SAE

GOOD & RECHARGE

The battery is good but needs

GOOD & RECHARGE

XX.XXV XXXX SAE

to be recharged.

RECHARGE & RETEST

Battery is discharged, the battery condition cannot be determined until it is fully charged. Recharge & retest the battery.

RECHARGE &
RETEST

BAD & REPLACE

The battery will not hold a charge. It should be replaced immediately.

BAD & REPLACE
XX.XXV XXXX SAE

BAD CELL & REPLACE

The battery has at least one cell short circuit. It should be replaced immediately.

BAD CELL & REPLACE
XX.XXV XXXX SAE

NOTE: Under certain conditions the follow messages may be displayed.

LOAD ERROR

The tested battery is bigger than 3000 SAE (CCA) or the connection is not established. Check the capacity of the battery & make sure the clamps are properly connected.

LOAD ERROR

24V SYSTEM PRINTING

To print a 24V system test result, user must save the test result first. The test result will be saved until you connect to 12V battery. The message to check printout will be displayed after you reconnect to the battery.

PRINT 24V SYSTEM
RESULT? YES

MEMORY FULL

The test records 1,000 test results. After a 1,000 tests the tester will over write previous saved test data. It is recommended to transfer the test data to a PC through the SYNC.

MEMORY FULL WILL
OVERWRITE MEMORY
PRESS ENTER

MEMORY ERROR

BAT2000 is unable to save the test result due to the memory error. Please execute the CLEAR MEMORY function, the stored test data will be deleted.

MEMORY ERROR
REFER TO MANUAL
PRESS ENTER

BATTERY TEST

1. Press the ◀ ▶ key to select Battery Test. In this stage, you will find the 3 tests for selection.

START-STOP

BATTERY TEST

SYSTEM TEST

BATTERY TEST

XX.XX V

Press «ENTER» button to proceed the test for regular starting battery.

2. Press the ◀ ▶ key to select the battery type :
 - a. FLOODED
 - b. AGM FLAT PLATE
 - c. AGM SPIRAL
 - d. VRLA/GEL

BATTERY TYPE
AGM FLAT PLATE

Press «ENTER» to confirm choice.

3. Press the ◀ ▶ key to select battery rating : SAE (CCA), EN, IEC or DIN. Press «ENTER» to confirm choice.

SELECT RATING
SAE

4. Press the ◀ ▶ key to input the battery capacity :
- SAE (CCA) : 40~3,000
 - EN : 40~2,830
 - DIN : 25~1,685
 - IEC : 30~1,985
 - JIS : Battery Type No.

SET CAPACITY
XXXX SAE

Press «ENTER» to begin the test.

TEST IN VEHICLE?
NO

5. Press the ◀ ▶ key to confirm the location of the battery if a surface charge is detected, follow the tester 's instruction to remove the surface charge.

TESTING

6. Testing battery.

7. Aim the "Temperature Measurement sensor" 2.5cm (1 inch) from the top or sides of the battery case and press <<ENETR>>. Measured temperature may vary by

POINT TO BATTERY
PRESS ENTER

distance from the battery, under hood conditions, and cabinet temperature.

8. When the test is completed, the display shows the results as following. {Press the ◀ ▶ key to select: Temperature, SOH (STATE OF HEALTH), and SOC (STATE OF CHARGE)}.

GOOD & PASS

The battery is good and capable of holding a charge.

GOOD & PASS
XX.XXV XXXX SAE

GOOD & RECHARGE

The battery is good but needs to be recharged.

GOOD & RECHARGE
XX.XXV XXXX SAE

RECHARGE & RETEST

Battery is discharged, the battery condition cannot be determined until it is fully charged. Recharge & retest the battery.

RECHARGE &
RETEST

BAD & REPLACE

The battery will not hold a charge. It should be replaced immediately.

BAD & REPLACE
XX.XXV XXXX SAE

BAD CELL & REPLACE

The battery has at least one cell short circuit. It should be replaced immediately.

BAD CELL & REPLACE
XX.XXV XXXX SAE

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The tested battery is bigger than 3000 SAE (CCA) or the connection is not established. Check the capacity of the battery & make sure the clamps are properly connected.

LOAD ERROR

24V SYSTEM PRINTING

To print a 24V system test result, user must save the test result first. The test result will be

PRINT 24V SYSTEM
RESULT? YES

saved until you connect to 12V battery. The message to check printout will be displayed after you reconnect to the battery.

MEMORY FULL

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MEMORY FULL WILL
OVERWRITE MEMORY
PRESS ENTER

MEMORY ERROR

BAT2000 is unable to save the test result due to the memory error. Please execute the CLEAR MEMORY function, the stored test data will be deleted.

MEMORY ERROR
REFER TO MANUAL
PRESS ENTER

SYSTEM TEST

1. Press «ENTER» button, you will view the following

SYSTEM TEST
XX.XX V

screen.

2. Turn off all vehicle accessory loads such as light, air conditioning, radio, etc. before starting the engine.

TURN OFF LOADS
START ENGINE

3. When the engine is started, one of the three results will be displayed along with the actual measured result.

CRANKING VOLTS NORMAL

The system is showing normal draw. Press «ENTER» to perform the charging system test.

CRANKING VOLTS
XX.XX V NORMAL

CRANKING VOLTS LOW

The cranking voltage is below normal limits, troubleshoot the starter with manufacturers recommended procedure.

CRANKING VOLTS
XX.XX V LOW

CRANKING VOLTS NO DETECTED

The cranking voltage is not detected.

CRANKING VOLTS
NO DETECTED

4. If the cranking voltage is normal, press «ENTER» to begin charging system test.

PRESS ENTER FOR
=CHARGING TEST=

5. Press the «ENTER» key, you will view the following screen.

MAKE SURE ALL
LOADS ARE OFF

6. Press the «ENTER» key, one of the three results will be displayed along with the actual reading measured.

LOW CHARGING VOLTS WHEN TEST AT IDLE

The alternator is not providing sufficient current to the battery. Check the belts to ensure the alternator is rotating with engine running. If the belts are slipping or broken, replace the belts and retest. Check the connections from the alternator to the battery. If the connection is loose or heavily corroded, clean or replace the

ALT. IDLE VOLTS
XX.XXV LOW

cable and retest. If the belts and connections are in good condition, replace the alternator

CHARGING SYSTEM NORMAL WHEN TEST AT IDLE

The system is showing normal output from the alternator, no problem is detected.

ALT. IDLE VOLTS	
XX.XXV	NORMAL

HIGH CHARGING VOLTS WHEN TEST AT IDLE

The voltage output from the alternator to the battery exceeds the normal limits of a functioning regulator. Check to ensure there is no loose connection and the ground connection is normal. If there is no connection issue, replace the regulator. Since most alternators have the regulator built-in, this will require you to replace the alternator. The normal high limit of a typical automotive regulator is 14.7 volts +/- 0.05. Check manufacturer specifications for the correct limit, as it will vary by vehicle type and manufacturer.

ALT. IDLE VOLTS	
XX.XXV	HIGH

7. Following the charging system at idle, press «ENTER» for the charging system with accessory loads. Turn on the heater blower to high, high beam headlights, and rear defogger (if equipped). Do not use cyclical loads such as air conditioning or windshield wipers.

TURN ON LOADS
AND PRESS ENTER

8. When testing older model diesel engines, the user need to run up the engine to 2500 rpm for 15 seconds. You will see the run engine up instruction screen.

RUN ENGINE UP TO
2500 RPM 15 SEC.

9. Press «ENTER» to look for the amount of ripple from the charging system to the battery. One of two testing results will be displayed along with the actual testing measured.

RIPPLE DETECTED NORMAL

Diodes function well in the alternator / stator.

RIPPLE DETECTED
xx.xxV NORMAL

OR

EXCESS RIPPLE

NO RIPPLE DETECT

One or more diodes in the alternator are not functioning or there is stator damage. Check to ensure the

RIPPLE DETECTED	
XX.XXV	HIGH

alternator mounting is affixed securely and that the belts are in good shape and functioning properly. If the mounting and belts are good, replace the alternator.

10. Press the «ENTER» key to continue the charging system with accessory loads. One of the three results will be displayed along with the actual testing measured.

CHARGING SYSTEM **LOW** WHEN TEST WITH ACC. LOADS

The alternator is not providing sufficient current for the system's electrical loads and the

ALT. LOAD VOLTS	
XX.XXV	LOW

charging current for the battery. Check the belts to ensure the alternator is rotating with the engine running. If the belts are slipping or broken, replace

the belts and retest. Check the connections from the alternator to the battery. If the connection is loose or heavily corroded, clean or replace the cable and retest. If the belts and connections are in good working condition, replace the alternator.

CHARGING SYSTEM **NORMAL** WHEN TEST WITH ACC. LOAD

The system is showing normal output from the alternator, no problem detected.

ALT. LOAD VOLTS	
XX.XXV	NORMAL

CHARGING SYSTEM **HIGH** WHEN TEST WITH ACC. LOADS

The voltage output from the alternator to the battery exceeds the normal limits of a functioning regulator. Check to ensure there are no loose connections and that the ground connection is connected properly. If there are no connection

ALT. LOAD VOLTS	
XX.XXV	HIGH

issues, replace the regulator. Since most alternators have the regulator built-in, this will require you to replace the alternator.

SETTING AND INFORMATION RETRIEVAL

LANGUAGE SELECT

1. Hook the tester up to a battery.
2. The tester defaults to the BATTERY TEST display. Press the directional keys to get to the LANGUAGE SELECT display.
3. Press ENTER and the display will show the language options. Press the directional keys to select the language you want the tester to display.
4. Press ENTER and the display returns to BATTERY TEST.

SETTING THE DATE AND TIME

1. Hook the tester up to a battery.
2. The tester defaults to the BATTERY TEST display. Press the directional keys to get to the CURRENT DATE/TIME display.
3. Press ENTER and the display will show the ADJUST YEAR. Press the directional keys to change the setting.

4. Press ENTER and the display will show the ADJUST MONTH. Press the directional keys to change the setting.
5. Press ENTER and the display will show the ADJUST DAY. Press the directional keys to change the setting.
6. Press ENTER and the display will show the ADJUST HOUR. Press the directional keys to change the setting.
7. Press ENTER and the display will show the ADJUST MINUTE. Press the directional keys to change the setting.
8. Press ENTER and the display will show the ADJUST SECOND. Press the directional keys to change the setting.
9. Press ENTER and the display returns to BATTERY TEST.

ADJUST THE DISPLAY BRIGHTNESS

1. Hook the tester up to a battery.
2. GET to the BRIGHTNESS display.
3. Press the directional keys to adjust the brightness of the display.

PC NAVIGATION GUIDE

Each BAT2000 comes with a CD, including the driver of the software installation and its user guide. You can follow the instruction to install the specific software for the diverse demand.

